



## BRIDGE / MEMBER DATA

Structure I. D. HAM500

Material of Construction CSC  
 Year of Construction 1959  
 Roadway Width 32.000  
 Number of Spans 1

Floor Beam Spacing 25.00

Comments:

Member I. D. B01 Symmetry:

|              |        |        |        |        |        |
|--------------|--------|--------|--------|--------|--------|
| Span Length: | Span 1 | Span 2 | Span 3 | Span 4 | Span 5 |
|              | 38.833 | 0.000  | 0.000  | 0.000  | 0.000  |

Range Length -- Non-Composite:

| Span No. | Range No. | Range Length | Section Left | Section Right | Section Variation | Hinge Location No. 1 | Hinge Location No. 2 |
|----------|-----------|--------------|--------------|---------------|-------------------|----------------------|----------------------|
| 1        | 1         | 15.000       | 1            | 0             |                   | 0.0                  | 0.0                  |
| 1        | 2         | 3.000        | 2            | 0             |                   | 0.0                  | 0.0                  |
| 1        | 3         | 20.833       | 1            | 0             |                   | 0.0                  | 0.0                  |

Range Length -- Composite:

| Span No. | Range No. | Range Length | Composite Code |
|----------|-----------|--------------|----------------|
| 1        | 1         | 38.833       | C              |

Superimposed Dead Load:

| Span No. | Load Type | Dist. from Left Supp. | Distributed Load (lbs/ft) |       | Length | Concentrated Load (kips) |
|----------|-----------|-----------------------|---------------------------|-------|--------|--------------------------|
|          |           |                       | Left                      | Right |        |                          |
| 1        | W         | 1.917                 | 235.5                     | 235.5 | 35.000 | 0.0                      |
| 1        | P         | 5.417                 | 0.0                       | 0.0   | 0.000  | 7.6                      |
| 1        | P         | 12.417                | 0.0                       | 0.0   | 0.000  | 6.2                      |
| 1        | P         | 19.417                | 0.0                       | 0.0   | 0.000  | 6.9                      |
| 1        | P         | 26.417                | 0.0                       | 0.0   | 0.000  | 6.9                      |
| 1        | P         | 33.420                | 0.0                       | 0.0   | 0.000  | 7.6                      |

NOTE: All distances are shown in decimal feet, moments are shown in foot-kips, and shears are shown in kips. Section and section properties are shown as: in., in.\*\*2, in.\*\*3, and in.\*\*4.

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. B01  
Check Point I. D. 1.474

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |
| Fy (reinf.)   | 40000.                      | 40000.    | 0.      | 0.      |
| f'c (conc.)   | 3000.                       | 3000.     | 0.      | 0.      |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  |       |       |       |      |      |
| 36.5           | 33.36     | 0.880 | bott | 16.57 | 16.60 | 16.60 | 1.57 | 3.84 |
|                |           |       |      | 16.79 | 16.60 | 16.60 | 1.57 | 3.84 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

## Composite Structural Steel Section Properties:

| Effective Slab Width | Effective Slab Thick. | Effective Dist. to Top of Beam | Negative Moment Area | Reinf. Dy | Fy     |
|----------------------|-----------------------|--------------------------------|----------------------|-----------|--------|
| 116.50               | 10.50                 | 7.25                           | 11.2                 | 5.8       | 60000. |

  

| Section Gross | Area Net | Neutral Axis Top | Axis Bott. | Moment of Inertia Positive Bending | Inertia Negative Bending |
|---------------|----------|------------------|------------|------------------------------------|--------------------------|
| 81.10         | 81.10    | 18.14            | 18.36      | 18488.9                            | 18488.9                  |
| n= 8 234.01   | 234.01   | 1.55             | 34.95      | 54059.9                            | 18488.9                  |
| 3n= 24 132.07 | 132.07   | 8.34             | 28.16      | 39134.3                            | 18488.9                  |

| Section Modulus |              |               |              |               | Plastic Section Modulus - Z (Fy * Z) |
|-----------------|--------------|---------------|--------------|---------------|--------------------------------------|
|                 | Positive Top | Bending Bott. | Negative Top | Bending Bott. |                                      |
| n= 8            | 1019.3       | 1006.9        | 1019.3       | 1006.9        | 3196.59                              |
| 3n= 24          | 34854.0      | 1546.8        | 1019.3       | 1006.9        |                                      |
|                 | 4690.9       | 1389.8        | 1019.3       | 1006.9        |                                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. B01  
 Check Point I. D. 1.474

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 7.86 | 1.57 | 10.570 | 0.01     | 0.00  | 37.69 | 18.72 |
| bott | 8.30 | 1.57 | 10.570 | 84.00    | 21.85 |       | 18.97 |

## ASD - Moment Values

| Cb   | Iy     |        | J      | fb    |          |
|------|--------|--------|--------|-------|----------|
|      | top    | bott   |        | top   | bott     |
| 1.75 | 598.47 | 598.47 | 50.535 | 0.000 | 1167.812 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu      | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|---------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 3196.59 | 109.1                   |
| bott | 22.62            |                   | 0.00 |         | 109.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## Composite Compact Values

| C steel | C slab  | aa   | Af Fy | C'   | ybar  | Mu      |
|---------|---------|------|-------|------|-------|---------|
| 2694.37 | 3794.29 | 6.80 | 0.00  | 0.00 | 0.000 | 5500.24 |

| TOP       |           |       | BOTTOM    |           |       |
|-----------|-----------|-------|-----------|-----------|-------|
| Mu (pier) | Ms (pier) | A_FAC | Mu (pier) | Ms (pier) | A_FAC |
| 0.00      | 0.00      | 0.000 | 0.00      | 0.00      | 0.000 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 7.00       | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 565.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
 INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. B01  
 Check Point I. D. 1.474

Dead Load Moment 340.1  
 Superimposed Dead Load Moment 229.1

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 3300.1C         | -1681.9            | 2552.3          | -1918.0C           | 2197.0                      | -1635.3            | 1621.7          | -1816.9            |
| OPER        | 5500.2C         | -2803.1            | 4253.8          | -3196.6C           | 3661.7                      | -2725.5            | 2702.9          | -3028.1            |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .000

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 866.70 R     | 666.69             | 28.42  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           | 0.00         |
|           |           | 0.00 R       | 0.00               | 0.00   | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           | 0.00         |
| OPER      | 5C1T      | 669.59 R     | 515.07             | 28.42  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           | 0.00         |
|           |           | 0.00 R       | 0.00               | 0.00   | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           | 0.00         |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | Rating bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|---------------------------|--------------|----------------------|
| HS20        | 2.54            | 999.00                    | 1.87                      | 999.00                    | HS 37.42     | 67.4                 |
| 5C1T        | 5.47            | 999.00                    | 4.04                      | 999.00                    | 0.00         | 484.4                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. B01  
Check Point I. D. 1.474

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.0       | 0.0          | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 339.0             | -260.8                 | 260.8        |
| OPER      | 565.1             | -434.7                 | 434.7        |

## Live Load Effect

Impact Factors: +bend - .000 -bend - .000

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | 0.00                  | 0.00 | 0.00     | 0.00 | 0.00                 | 0.00 | 0.00     | 0.00 |
| OPER      | 5C1T      | 0.00                  | 0.00 | 0.00     | 0.00 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 999.00     | 999.00     | HS 999.00    | 999.0                |
| 5C1T   | 999.00     | 999.00     | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. B01  
Check Point I. D. 1.474Dead Load Moment 340.1  
Superimposed Dead Load Moment 229.1

| Rating Veh. ber | Moment Capacity |              | Available Capacity for LL+I |           |
|-----------------|-----------------|--------------|-----------------------------|-----------|
|                 | top fiber       | bottom fiber | top fiber                   | bottom fi |
| bend            | +bend           | -bend        | +bend                       | -bend     |
| INV. 919.9      | 47204.0         | -1370.1      | 2527.4                      | -1350.7   |
| OPER 199.8      | 78293.8         | -2663.0      | 3832.8                      | -2630.6   |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .000

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-------------------------|------------------------------|----------------------|--------|
| INV.      | HS20       | 866.70 R                | 666.69                  | 28.42                        | 0.0                  | 0.00   |
|           |            | 0.00 R                  | 0.00                    | 0.00                         | 0.0                  | 0.00   |
| OPER      | 5C1T       | 669.59 R                | 515.07                  | 28.42                        | 0.0                  | 0.00   |
|           |            | 0.00 R                  | 0.00                    | 0.00                         | 0.0                  | 0.00   |

## Serviceability

| Rating Veh. | Rating top fiber | Factor bottom fiber | Rating Value | Load Capacity (tons) |
|-------------|------------------|---------------------|--------------|----------------------|
|             | +bend            | -bend               | +bend        | -bend                |
| HS20        | 53.81            | 999.00              | 2.26         | 999.00               |
| 5C1T        | 116.08           | 999.00              | 4.87         | 999.00               |

## BRIDGE / MEMBER DATA

Structure I. D. HAM500

Material of Construction CSC  
 Year of Construction 1959  
 Roadway Width 32.000  
 Number of Spans 1

Floor Beam Spacing 25.00

Comments:

Member I. D. B02 Symmetry:

|              |        |        |        |        |        |
|--------------|--------|--------|--------|--------|--------|
| Span Length: | Span 1 | Span 2 | Span 3 | Span 4 | Span 5 |
|              | 38.833 | 0.000  | 0.000  | 0.000  | 0.000  |

Range Length -- Non-Composite:

| Span No. | Range No. | Range Length | Section Left | Section Right | Section Variation | Hinge Location No. 1 | Hinge Location No. 2 |
|----------|-----------|--------------|--------------|---------------|-------------------|----------------------|----------------------|
| 1        | 1         | 38.833       | 1            | 0             |                   | 0.0                  | 0.0                  |

Range Length -- Composite:

| Span No. | Range No. | Range Length | Composite Code |
|----------|-----------|--------------|----------------|
| 1        | 1         | 38.833       | C              |

Superimposed Dead Load:

| Span No. | Load Type | Dist. from Left Supp. | Distributed Load (lbs/ft) |       |        | Concentrated Load (kips) |
|----------|-----------|-----------------------|---------------------------|-------|--------|--------------------------|
|          |           |                       | Left                      | Right | Length |                          |
| 1        | W         | 2.750                 | 121.2                     | 121.2 | 33.330 | 0.0                      |
| 1        | P         | 5.417                 | 0.0                       | 0.0   | 0.000  | 21.6                     |
| 1        | P         | 12.417                | 0.0                       | 0.0   | 0.000  | 17.5                     |
| 1        | P         | 19.417                | 0.0                       | 0.0   | 0.000  | 19.5                     |
| 1        | P         | 26.417                | 0.0                       | 0.0   | 0.000  | 19.5                     |
| 1        | P         | 33.420                | 0.0                       | 0.0   | 0.000  | 21.6                     |

NOTE: All distances are shown in decimal feet, moments are shown in foot-kips, and shears are shown in kips. Section and section properties are shown as: in., in.\*\*2, in.\*\*3, and in.\*\*4.

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. B02  
Check Point I. D. 1.474

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |
| Fy (reinf.)   | 40000.                      | 40000.    | 0.      | 0.      |
| f'c (conc.)   | 3000.                       | 3000.     | 0.      | 0.      |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  |       |       |       |      |      |
| 36.7           | 33.34     | 0.940 | bott | 16.67 | 16.70 | 16.70 | 1.68 | 3.86 |
|                |           |       |      | 16.67 | 16.70 | 16.70 | 1.68 | 3.86 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

## Composite Structural Steel Section Properties:

| Effective Slab Width | Effective Slab Thick. | Effective Dist. to Top of Beam | Negative Moment Area | Reinf. Dy | Fy     |
|----------------------|-----------------------|--------------------------------|----------------------|-----------|--------|
| 116.50               | 10.50                 | 7.25                           | 11.2                 | 5.8       | 60000. |

  

| Section Gross | Area Net | Neutral Axis Top | Axis Bott. | Moment of Inertia Positive Bending | Inertia Negative Bending |
|---------------|----------|------------------|------------|------------------------------------|--------------------------|
| 87.60         | 87.60    | 18.35            | 18.35      | 20135.6                            | 20135.6                  |
| n= 8 240.51   | 240.51   | 2.08             | 34.62      | 58044.4                            | 20135.6                  |
| 3n= 24 138.57 | 138.57   | 8.93             | 27.77      | 41722.0                            | 20135.6                  |

| Section Modulus |              |               |              |               | Plastic Section Modulus - Z (Fy * Z) |
|-----------------|--------------|---------------|--------------|---------------|--------------------------------------|
|                 | Positive Top | Bending Bott. | Negative Top | Bending Bott. |                                      |
| n= 8            | 1097.3       | 1097.3        | 1097.3       | 1097.3        | 3424.10                              |
| 3n= 24          | 27965.5      | 1676.4        | 1097.3       | 1097.3        |                                      |
|                 | 4669.5       | 1502.7        | 1097.3       | 1097.3        |                                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. B02  
Check Point I. D. 1.474

|      | b'   | t    | b/t   | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|-------|----------|-------|-------|-------|
| top  | 7.88 | 1.68 | 9.940 | 0.01     | 0.00  | 35.28 | 17.64 |
| bott | 7.88 | 1.68 | 9.940 | 84.00    | 21.75 |       | 17.64 |

## ASD - Moment Values

| Cb   | Iy     | J      | fb       |
|------|--------|--------|----------|
| top  | bott   |        | top      |
| bott |        |        | bott     |
| 1.75 | 652.04 | 652.04 | 62.169   |
|      |        |        | 0.000    |
|      |        |        | 1176.285 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu      | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|---------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 3424.10 | 109.1                   |
| bott | 22.62            |                   | 0.00 |         | 109.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## Composite Compact Values

| C steel | C slab  | aa   | Af Fy | C'   | ybar  | Mu      |
|---------|---------|------|-------|------|-------|---------|
| 2891.40 | 3794.29 | 7.46 | 0.00  | 0.00 | 0.000 | 5824.37 |

| TOP       |           |       | BOTTOM    |           |       |
|-----------|-----------|-------|-----------|-----------|-------|
| Mu (pier) | Ms (pier) | A_FAC | Mu (pier) | Ms (pier) | A_FAC |
| 0.00      | 0.00      | 0.000 | 0.00      | 0.00      | 0.000 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 7.00       | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 603.0     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. B02  
Check Point I. D. 1.474

Dead Load Superimposed Dead Load  
Moment Moment  
702.2 548.6

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 3494.6C            | -1810.6               | 2766.1             | -2054.5C              | 1937.7                      | -2143.2               | 1377.3             | -2330.8               |
| OPER        | 5824.4C            | -3017.6               | 4610.1             | -3424.1C              | 3229.5                      | -3572.0               | 2295.5             | -3884.7               |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .000

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment w/o imp. | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment w/o imp. | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|-----------------|---------------------|----------|-------------|--------------------|-----------------|----------------|--------------|
| INV.      | HS20      | 932.91 R     | 717.62             | 28.42           | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00            | 0.00           | 0.00         |
|           |           | 0.00 R       | 0.00               | 0.00            | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00            | 0.00           | 0.00         |
| OPER      | 5C1T      | 705.70 R     | 542.85             | 28.42           | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00            | 0.00           | 0.00         |
|           |           | 0.00 R       | 0.00               | 0.00            | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00            | 0.00           | 0.00         |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 2.08               | 999.00                       | 1.48                               | 999.00       | 53.1                 |
| 5C1T        | 4.58               | 999.00                       | 3.25                               | 999.00       | 390.3                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. B02  
Check Point I. D. 1.474

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.0       | 0.0          | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 361.8             | -278.3                 | 278.3                 |
| OPER      | 603.0             | -463.9                 | 463.9                 |

## Live Load Effect

Impact Factors: +bend - .000 -bend - .000

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | 0.00                  | 0.00 | 0.00     | 0.00 | 0.00                 | 0.00 | 0.00     | 0.00 |
| OPER      | 5C1T      | 0.00                  | 0.00 | 0.00     | 0.00 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 999.00     | 999.00     | HS 999.00    | 999.0                |
| 5C1T   | 999.00     | 999.00     | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. B02  
Check Point I. D. 1.474Dead Load Moment 702.2  
Superimposed Dead Load Moment 548.6

| Rating Veh. ber | Moment Capacity |              | Available Capacity for LL+I |           |
|-----------------|-----------------|--------------|-----------------------------|-----------|
|                 | top fiber       | bottom fiber | top fiber                   | bottom fi |
|                 | +bend           | -bend        | +bend                       | -bend     |
| INV. 470.5      | 32378.0         | -1219.7      | 2867.7                      | -1219.7   |
| OPER 117.5      | 53129.4         | -2866.7      | 3945.6                      | -2866.7   |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .000

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-------------------------|-----------|-------------------------|----------------------|--------|
| INV.      | HS20       | 932.91 R                | 717.62                  | 28.42     | 0.0                     | 0.00                 | 0.00   |
|           |            | 0.00 R                  | 0.00                    | 0.00      | 0.0                     | 0.00                 | 0.00   |
| OPER      | 5C1T       | 705.70 R                | 542.85                  | 28.42     | 0.0                     | 0.00                 | 0.00   |
|           |            | 0.00 R                  | 0.00                    | 0.00      | 0.0                     | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor |              | Rating Value |              | Load Capacity (tons) |
|-------------|---------------|--------------|--------------|--------------|----------------------|
|             | top fiber     | bottom fiber | top fiber    | bottom fiber |                      |
|             | +bend         | -bend        | +bend        | -bend        |                      |
| HS20        | 33.37         | 999.00       | 1.73         | 999.00       | HS 34.66             |
| 5C1T        | 73.51         | 999.00       | 3.82         | 999.00       | 0.00                 |

## BRIDGE / MEMBER DATA

Structure I. D. HAM500

Material of Construction CSC  
 Year of Construction 1959  
 Roadway Width 32.000  
 Number of Spans 1

Floor Beam Spacing 25.00

Comments:

Member I. D. B03 Symmetry:

|              |        |        |        |        |        |
|--------------|--------|--------|--------|--------|--------|
| Span Length: | Span 1 | Span 2 | Span 3 | Span 4 | Span 5 |
|              | 38.833 | 0.000  | 0.000  | 0.000  | 0.000  |

Range Length -- Non-Composite:

| Span No. | Range No. | Range Length | Section Left | Section Right | Section Variation | Hinge Location No. 1 | Hinge Location No. 2 |
|----------|-----------|--------------|--------------|---------------|-------------------|----------------------|----------------------|
| 1        | 1         | 38.833       | 1            | 0             |                   | 0.0                  | 0.0                  |

Range Length -- Composite:

| Span No. | Range No. | Range Length | Composite Code |
|----------|-----------|--------------|----------------|
| 1        | 1         | 38.833       | C              |

Superimposed Dead Load:

| Span No. | Load Type | Dist. from Left Supp. | Distributed Load (lbs/ft) |       |        | Concentrated Load (kips) |
|----------|-----------|-----------------------|---------------------------|-------|--------|--------------------------|
|          |           |                       | Left                      | Right | Length |                          |
| 1        | W         | 2.750                 | 131.7                     | 131.7 | 33.330 | 0.0                      |
| 1        | P         | 5.417                 | 0.0                       | 0.0   | 0.000  | 18.6                     |
| 1        | P         | 12.417                | 0.0                       | 0.0   | 0.000  | 15.0                     |
| 1        | P         | 19.417                | 0.0                       | 0.0   | 0.000  | 16.8                     |
| 1        | P         | 26.417                | 0.0                       | 0.0   | 0.000  | 16.8                     |
| 1        | P         | 33.420                | 0.0                       | 0.0   | 0.000  | 18.6                     |

NOTE: All distances are shown in decimal feet, moments are shown in foot-kips, and shears are shown in kips. Section and section properties are shown as: in., in.\*\*2, in.\*\*3, and in.\*\*4.

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. B03  
Check Point I. D. 1.474

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |
| Fy (reinf.)   | 40000.                      | 40000.    | 0.      | 0.      |
| f'c (conc.)   | 3000.                       | 3000.     | 0.      | 0.      |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  |       |       |       |      |      |
| 36.5           | 33.36     | 0.880 | bott | 16.68 | 16.60 | 16.60 | 1.57 | 3.83 |
|                |           |       |      | 16.68 | 16.60 | 16.60 | 1.57 | 3.83 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

## Composite Structural Steel Section Properties:

| Effective Slab Width | Effective Slab Thick. | Effective Dist. to Top of Beam | Negative Moment Area | Reinf. Dy | Fy     |
|----------------------|-----------------------|--------------------------------|----------------------|-----------|--------|
| 116.50               | 10.50                 | 7.25                           | 11.2                 | 5.8       | 60000. |

  

| Section Gross | Area Net | Neutral Axis Top | Axis Bott. | Moment of Inertia Positive Bending | Inertia Negative Bending |
|---------------|----------|------------------|------------|------------------------------------|--------------------------|
| 81.60         | 81.60    | 18.25            | 18.25      | 18647.9                            | 18647.9                  |
| n= 8 234.51   | 234.51   | 1.63             | 34.87      | 54663.2                            | 18647.9                  |
| 3n= 24 132.57 | 132.57   | 8.45             | 28.05      | 39520.9                            | 18647.9                  |

| Section Modulus |              |               |              |               | Plastic Section Modulus - Z (Fy * Z) |
|-----------------|--------------|---------------|--------------|---------------|--------------------------------------|
|                 | Positive Top | Bending Bott. | Negative Top | Bending Bott. |                                      |
| n= 8            | 1021.8       | 1021.8        | 1021.8       | 1021.8        | 3180.57                              |
| 3n= 24          | 33608.1      | 1567.5        | 1021.8       | 1021.8        |                                      |
|                 | 4677.3       | 1408.9        | 1021.8       | 1021.8        |                                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. B03  
Check Point I. D. 1.474

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 7.86 | 1.57 | 10.570 | 0.01     | 0.00  | 37.69 | 18.85 |
| bott | 7.86 | 1.57 | 10.570 | 84.00    | 21.92 |       | 18.85 |

## ASD - Moment Values

| Cb   | Iy     |        | J      | fb    |          |
|------|--------|--------|--------|-------|----------|
|      | top    | bott   |        | top   | bott     |
| 1.75 | 598.47 | 598.47 | 50.535 | 0.000 | 1150.822 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu      | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|---------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 3180.57 | 109.1                   |
| bott | 22.62            |                   | 0.00 |         | 109.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## Composite Compact Values

| C steel | C slab  | aa   | Af Fy | C'   | ybar  | Mu      |
|---------|---------|------|-------|------|-------|---------|
| 2694.37 | 3794.29 | 6.80 | 0.00  | 0.00 | 0.000 | 5501.69 |

| TOP       |           |       | BOTTOM    |           |       |
|-----------|-----------|-------|-----------|-----------|-------|
| Mu (pier) | Ms (pier) | A_FAC | Mu (pier) | Ms (pier) | A_FAC |
| 0.00      | 0.00      | 0.000 | 0.00      | 0.00      | 0.000 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 7.00       | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 565.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
 INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. B03  
 Check Point I. D. 1.474

Dead Load Superimposed Dead Load  
 Moment Moment  
 697.5 476.7

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 3301.0C            | -1686.0               | 2586.3             | -1908.3C              | 1834.7                      | -2001.4               | 1284.9             | -2172.5               |
| OPER        | 5501.7C            | -2810.0               | 4310.5             | -3180.6C              | 3057.8                      | -3335.7               | 2141.6             | -3620.8               |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .000

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment w/o imp. | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment w/o imp. | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|-----------------|---------------------|----------|-------------|--------------------|-----------------|----------------|--------------|
| INV.      | HS20      | 932.91 R     | 717.62             | 28.42           | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00            | 0.00           | 0.00         |
|           |           | 0.00 R       | 0.00               | 0.00            | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00            | 0.00           | 0.00         |
| OPER      | 5C1T      | 705.70 R     | 542.85             | 28.42           | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00            | 0.00           | 0.00         |
|           |           | 0.00 R       | 0.00               | 0.00            | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00            | 0.00           | 0.00         |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 1.97               | 999.00                       | 1.38                               | 999.00       | HS 27.55 49.6        |
| 5C1T        | 4.33               | 999.00                       | 3.04                               | 999.00       | 0.00 364.2           |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. B03  
Check Point I. D. 1.474

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.0       | 0.0          | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 339.0             | -260.8                 | 260.8                 |
| OPER      | 565.1             | -434.7                 | 434.7                 |

## Live Load Effect

Impact Factors: +bend - .000 -bend - .000

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | 0.00                  | 0.00 | 0.00     | 0.00 | 0.00                 | 0.00 | 0.00     | 0.00 |
| OPER      | 5C1T      | 0.00                  | 0.00 | 0.00     | 0.00 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 999.00     | 999.00     | HS 999.00    | 999.0                |
| 5C1T   | 999.00     | 999.00     | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. B03  
Check Point I. D. 1.474Dead Load Moment 697.5  
Superimposed Dead Load Moment 476.7

| Rating Veh. ber | Moment Capacity |              | Available Capacity for LL+I |           |
|-----------------|-----------------|--------------|-----------------------------|-----------|
|                 | top fiber       | bottom fiber | top fiber                   | bottom fi |
|                 | +bend           | -bend        | +bend                       | -bend     |
| INV. 306.2      | 38034.7         | -1132.0      | 2671.0                      | -1132.0   |
| OPER 843.7      | 62608.4         | -2669.5      | 3668.9                      | -2669.5   |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .000

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-------------------------|-----------|-------------------------|----------------------|--------|
| INV.      | HS20       | 932.91 R                | 717.62                  | 28.42     | 0.0                     | 0.00                 | 0.00   |
|           |            | 0.00 R                  | 0.00                    | 0.00      | 0.0                     | 0.00                 | 0.00   |
| OPER      | 5C1T       | 705.70 R                | 542.85                  | 28.42     | 0.0                     | 0.00                 | 0.00   |
|           |            | 0.00 R                  | 0.00                    | 0.00      | 0.0                     | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating top fiber | Factor bottom fiber | Rating Value | Load Capacity (tons) |
|-------------|------------------|---------------------|--------------|----------------------|
|             | +bend            | -bend               | +bend        | -bend                |
| HS20        | 39.51            | 999.00              | 1.60         | 999.00               |
| 5C1T        | 87.05            | 999.00              | 3.54         | 999.00               |

## BRIDGE / MEMBER DATA

Structure I. D. HAM500

Material of Construction CSC  
 Year of Construction 1959  
 Roadway Width 32.000  
 Number of Spans 1

Floor Beam Spacing 25.00

Comments:

Member I. D. B04 Symmetry:

|              |        |        |        |        |        |
|--------------|--------|--------|--------|--------|--------|
| Span Length: | Span 1 | Span 2 | Span 3 | Span 4 | Span 5 |
|              | 38.833 | 0.000  | 0.000  | 0.000  | 0.000  |

Range Length -- Non-Composite:

| Span No. | Range No. | Range Length | Section Left | Section Right | Section Variation | Hinge Location No. 1 | Hinge Location No. 2 |
|----------|-----------|--------------|--------------|---------------|-------------------|----------------------|----------------------|
| 1        | 1         | 38.833       | 1            | 0             |                   | 0.0                  | 0.0                  |

Range Length -- Composite:

| Span No. | Range No. | Range Length | Composite Code |
|----------|-----------|--------------|----------------|
| 1        | 1         | 38.833       | C              |

Superimposed Dead Load:

| Span No. | Load Type | Dist. from Left Supp. | Distributed Load (lbs/ft) |       |        | Concentrated Load (kips) |
|----------|-----------|-----------------------|---------------------------|-------|--------|--------------------------|
|          |           |                       | Left                      | Right | Length |                          |
| 1        | W         | 2.750                 | 131.7                     | 131.7 | 33.330 | 0.0                      |
| 1        | P         | 5.417                 | 0.0                       | 0.0   | 0.000  | 19.3                     |
| 1        | P         | 12.417                | 0.0                       | 0.0   | 0.000  | 15.6                     |
| 1        | P         | 19.417                | 0.0                       | 0.0   | 0.000  | 17.5                     |
| 1        | P         | 26.417                | 0.0                       | 0.0   | 0.000  | 17.5                     |
| 1        | P         | 33.420                | 0.0                       | 0.0   | 0.000  | 19.3                     |

NOTE: All distances are shown in decimal feet, moments are shown in foot-kips, and shears are shown in kips. Section and section properties are shown as: in., in.\*\*2, in.\*\*3, and in.\*\*4.

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. B04  
Check Point I. D. 1.474

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |
| Fy (reinf.)   | 40000.                      | 40000.    | 0.      | 0.      |
| f'c (conc.)   | 3000.                       | 3000.     | 0.      | 0.      |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  |       |       |       |      |      |
| 36.5           | 33.36     | 0.880 | bott | 16.68 | 16.60 | 16.60 | 1.57 | 3.83 |
|                |           |       |      | 16.68 | 16.60 | 16.60 | 1.57 | 3.83 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

## Composite Structural Steel Section Properties:

| Effective Slab Width | Effective Slab Thk. | Effective Dist. to Top of Beam | Negative Moment Area | Reinf. Dy | Fy     |
|----------------------|---------------------|--------------------------------|----------------------|-----------|--------|
| 116.50               | 10.50               | 7.25                           | 11.2                 | 5.8       | 60000. |

  

| Section Gross | Area Net | Neutral Axis Top | Axis Bott. | Moment of Inertia Positive Bending | Inertia Negative Bending |
|---------------|----------|------------------|------------|------------------------------------|--------------------------|
| 81.60         | 81.60    | 18.25            | 18.25      | 18647.9                            | 18647.9                  |
| n= 8 234.51   | 234.51   | 1.63             | 34.87      | 54663.2                            | 18647.9                  |
| 3n= 24 132.57 | 132.57   | 8.45             | 28.05      | 39520.9                            | 18647.9                  |

| Section Modulus |              |               |              |               | Plastic Section Modulus - Z (Fy * Z) |
|-----------------|--------------|---------------|--------------|---------------|--------------------------------------|
|                 | Positive Top | Bending Bott. | Negative Top | Bending Bott. |                                      |
| n= 8            | 1021.8       | 1021.8        | 1021.8       | 1021.8        | 3180.57                              |
| 3n= 24          | 33608.1      | 1567.5        | 1021.8       | 1021.8        |                                      |
|                 | 4677.3       | 1408.9        | 1021.8       | 1021.8        |                                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. B04  
 Check Point I. D. 1.474

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 7.86 | 1.57 | 10.570 | 0.01     | 0.00  | 37.69 | 18.85 |
| bott | 7.86 | 1.57 | 10.570 | 84.00    | 21.92 |       | 18.85 |

## ASD - Moment Values

| Cb   | Iy     | J      | fb       |
|------|--------|--------|----------|
| top  | bott   |        | top      |
| 1.75 | 598.47 | 598.47 | 50.535   |
|      |        |        | 0.000    |
|      |        |        | 1150.822 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu      | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|---------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 3180.57 | 109.1                   |
| bott | 22.62            |                   | 0.00 |         | 109.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## Composite Compact Values

| C steel | C slab  | aa   | Af Fy | C'   | ybar  | Mu      |
|---------|---------|------|-------|------|-------|---------|
| 2694.37 | 3794.29 | 6.80 | 0.00  | 0.00 | 0.000 | 5501.69 |

| TOP       |           |       | BOTTOM    |           |       |
|-----------|-----------|-------|-----------|-----------|-------|
| Mu (pier) | Ms (pier) | A_FAC | Mu (pier) | Ms (pier) | A_FAC |
| 0.00      | 0.00      | 0.000 | 0.00      | 0.00      | 0.000 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 7.00       | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 565.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. B04  
Check Point I. D. 1.474

Dead Load Moment 697.5  
Superimposed Dead Load Moment 494.8

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 3301.0C         | -1686.0            | 2586.3          | -1908.3C           | 1823.9                      | -2012.3            | 1274.1          | -2183.3            |
| OPER        | 5501.7C         | -2810.0            | 4310.5          | -3180.6C           | 3039.8                      | -3353.8            | 2123.5          | -3638.9            |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .000

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 932.91 R     | 717.62             | 28.42  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           | 0.00         |
|           |           | 0.00 R       | 0.00               | 0.00   | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           | 0.00         |
| OPER      | 5C1T      | 705.70 R     | 542.85             | 28.42  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           | 0.00         |
|           |           | 0.00 R       | 0.00               | 0.00   | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           | 0.00         |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------|--------------|----------------------|
| HS20        | 1.96            | 999.00                    | 1.37   | 27.32        | 49.2                 |
| 5C1T        | 4.31            | 999.00                    | 3.01   | 0.00         | 361.1                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. B04  
Check Point I. D. 1.474

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| 0.0       | 0.0                    |
|           | 0.0                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 339.0             | -260.8                 | 260.8        |
| OPER      | 565.1             | -434.7                 | 434.7        |

## Live Load Effect

Impact Factors: +bend - .000 -bend - .000

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | 0.00                  | 0.00 | 0.00     | 0.00 | 0.00                 | 0.00 | 0.00     | 0.00 |
| OPER      | 5C1T      | 0.00                  | 0.00 | 0.00     | 0.00 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 999.00     | 999.00     | HS 999.00    | 999.0                |
| 5C1T   | 999.00     | 999.00     | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. B04  
Check Point I. D. 1.474Dead Load Moment 697.5  
Superimposed Dead Load Moment 494.8

| Rating Veh. ber | Moment Capacity |         |              |         | Available Capacity for LL+I |         |           |    |
|-----------------|-----------------|---------|--------------|---------|-----------------------------|---------|-----------|----|
|                 | top fiber       |         | bottom fiber |         | top fiber                   |         | bottom fi |    |
| bend            | +bend           | -bend   | +bend        | -bend   | +bend                       | -bend   | +bend     | -  |
| INV. 317.0      | 37975.0         | -1124.8 | 2677.0       | -1124.8 | 36782.7                     | -2317.0 | 1484.8    | -2 |
| OPER 861.7      | 62496.8         | -2669.5 | 3666.9       | -2669.5 | 61304.6                     | -3861.7 | 2474.6    | -3 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .000

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 932.91 R                | 717.62          | 28.42                   | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | 0.00 R                  | 0.00            | 0.00                    | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |
| OPER      | 5C1T       | 705.70 R                | 542.85          | 28.42                   | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | 0.00 R                  | 0.00            | 0.00                    | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |        | bottom fiber |        | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------|--------------|--------|--------------|----------------------|
|             | top fiber +bend | -bend  | +bend        | -bend  |              |                      |
| HS20        | 39.43           | 999.00 | 1.59         | 999.00 | HS 31.83     | 57.3                 |
| 5C1T        | 86.87           | 999.00 | 3.51         | 999.00 | 0.00         | 420.8                |

## BRIDGE / MEMBER DATA

Structure I. D. HAM500

Material of Construction CSC  
 Year of Construction 1959  
 Roadway Width 32.000  
 Number of Spans 1

Floor Beam Spacing 25.00

Comments:

Member I. D. B05 Symmetry:

|              |        |        |        |        |        |
|--------------|--------|--------|--------|--------|--------|
| Span Length: | Span 1 | Span 2 | Span 3 | Span 4 | Span 5 |
|              | 38.833 | 0.000  | 0.000  | 0.000  | 0.000  |

Range Length -- Non-Composite:

| Span No. | Range No. | Range Length | Section Left | Section Right | Section Variation | Hinge Location No. 1 | Hinge Location No. 2 |
|----------|-----------|--------------|--------------|---------------|-------------------|----------------------|----------------------|
| 1        | 1         | 15.000       | 1            | 0             |                   | 0.0                  | 0.0                  |
| 1        | 2         | 3.000        | 2            | 0             |                   | 0.0                  | 0.0                  |
| 1        | 3         | 20.833       | 1            | 0             |                   | 0.0                  | 0.0                  |

Range Length -- Composite:

| Span No. | Range No. | Range Length | Composite Code |
|----------|-----------|--------------|----------------|
| 1        | 1         | 38.833       | C              |

Superimposed Dead Load:

| Span No. | Load Type | Dist. from Left Supp. | Distributed Load (lbs/ft) |       | Length | Concentrated Load (kips) |
|----------|-----------|-----------------------|---------------------------|-------|--------|--------------------------|
| 1        | W         | 2.750                 | 131.7                     | 131.7 | 33.330 | 0.0                      |
| 1        | P         | 5.417                 | 0.0                       | 0.0   | 0.000  | 19.1                     |
| 1        | P         | 12.417                | 0.0                       | 0.0   | 0.000  | 15.5                     |
| 1        | P         | 19.417                | 0.0                       | 0.0   | 0.000  | 17.3                     |
| 1        | P         | 26.417                | 0.0                       | 0.0   | 0.000  | 17.3                     |
| 1        | P         | 33.420                | 0.0                       | 0.0   | 0.000  | 19.1                     |

NOTE: All distances are shown in decimal feet, moments are shown in foot-kips, and shears are shown in kips. Section and section properties are shown as: in., in.\*\*2, in.\*\*3, and in.\*\*4.

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. B05  
Check Point I. D. 1.474

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |
| Fy (reinf.)   | 40000.                      | 40000.    | 0.      | 0.      |
| f'c (conc.)   | 3000.                       | 3000.     | 0.      | 0.      |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  |       |       |       |      |      |
| 36.5           | 33.36     | 0.880 | bott | 16.18 | 16.60 | 16.60 | 1.57 | 3.89 |
|                |           |       |      | 17.18 | 16.60 | 16.60 | 1.57 | 3.89 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

## Composite Structural Steel Section Properties:

| Effective Slab Width | Effective Slab Thick. | Effective Dist. to Top of Beam | Negative Moment Area | Dy  | Reinf. Fy |
|----------------------|-----------------------|--------------------------------|----------------------|-----|-----------|
| 116.50               | 10.50                 | 7.25                           | 11.2                 | 5.8 | 60000.    |

|        | Section Gross | Area Net | Neutral Axis Top | Axis Bott. | Moment of Inertia Positive Bending | Inertia Negative Bending |
|--------|---------------|----------|------------------|------------|------------------------------------|--------------------------|
|        | 79.30         | 79.30    | 17.75            | 18.75      | 17940.7                            | 17940.7                  |
| n= 8   | 232.21        | 232.21   | 1.29             | 35.21      | 51980.1                            | 17940.7                  |
| 3n= 24 | 130.27        | 130.27   | 7.97             | 28.53      | 37798.0                            | 17940.7                  |

|        | Section Modulus |               |              |               | Plastic Section Modulus - Z (Fy * Z) |
|--------|-----------------|---------------|--------------|---------------|--------------------------------------|
|        | Positive Top    | Bending Bott. | Negative Top | Bending Bott. |                                      |
|        | 1010.9          | 956.7         | 1010.9       | 956.7         | 3253.31                              |
| n= 8   | 40350.9         | 1476.2        | 1010.9       | 956.7         |                                      |
| 3n= 24 | 4743.5          | 1324.8        | 1010.9       | 956.7         |                                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. B05  
Check Point I. D. 1.474

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 7.86 | 1.57 | 10.570 | 0.01     | 0.00  | 37.69 | 18.28 |
| bott | 8.30 | 1.57 | 10.570 | 84.00    | 21.61 |       | 19.42 |

## ASD - Moment Values

| Cb   | Iy     |        | J      | fb    |          |
|------|--------|--------|--------|-------|----------|
|      | top    | bott   |        | top   | bott     |
| 1.75 | 598.47 | 598.47 | 50.535 | 0.000 | 1229.165 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu      | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|---------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 3253.31 | 109.1                   |
| bott | 22.62            |                   | 0.00 |         | 109.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## Composite Compact Values

| C steel | C slab  | aa   | Af Fy | C'   | ybar  | Mu      |
|---------|---------|------|-------|------|-------|---------|
| 2694.37 | 3794.29 | 6.80 | 0.00  | 0.00 | 0.000 | 5495.27 |

| TOP       |           |       | BOTTOM    |           |       |
|-----------|-----------|-------|-----------|-----------|-------|
| Mu (pier) | Ms (pier) | A_FAC | Mu (pier) | Ms (pier) | A_FAC |
| 0.00      | 0.00      | 0.000 | 0.00      | 0.00      | 0.000 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 7.00       | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 565.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. B05  
Check Point I. D. 1.474

Dead Load Superimposed Dead Load  
Moment Moment  
609.7 490.0

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 3297.2C         | -1668.0            | 2435.7          | -1952.0C           | 1876.5                      | -1942.9            | 1213.8          | -2161.3            |
| OPER        | 5495.3C         | -2780.0            | 4059.6          | -3253.3C           | 3127.4                      | -3238.2            | 2023.1          | -3602.2            |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .000

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 932.91 R     | 717.62             | 28.42  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           | 0.00         |
|           |           | 0.00 R       | 0.00               | 0.00   | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           | 0.00         |
| OPER      | 5C1T      | 705.70 R     | 542.85             | 28.42  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           | 0.00         |
|           |           | 0.00 R       | 0.00               | 0.00   | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           | 0.00         |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | Rating bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|---------------------------|--------------|----------------------|
| HS20        | 2.01            | 999.00                    | 1.30                      | 999.00                    | HS 26.02     | 46.8                 |
| 5C1T        | 4.43            | 999.00                    | 2.87                      | 999.00                    | 0.00         | 344.0                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. B05  
Check Point I. D. 1.474

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear     | (-) Shear (+) Shear    |
| 0.0       | 0.0 0.0                |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 339.0             | -260.8                 | 260.8        |
| OPER      | 565.1             | -434.7                 | 434.7        |

## Live Load Effect

Impact Factors: +bend - .000 -bend - .000

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | 0.00                  | 0.00 | 0.00     | 0.00 | 0.00                 | 0.00 | 0.00     | 0.00 |
| OPER      | 5C1T      | 0.00                  | 0.00 | 0.00     | 0.00 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 999.00     | 999.00     | HS 999.00    | 999.0                |
| 5C1T   | 999.00     | 999.00     | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. B05  
Check Point I. D. 1.474Dead Load Moment 609.7  
Superimposed Dead Load Moment 490.0

| Rating Veh. ber | Moment Capacity |              | Available Capacity for LL+I |           |
|-----------------|-----------------|--------------|-----------------------------|-----------|
|                 | top fiber       | bottom fiber | top fiber                   | bottom fi |
|                 | +bend           | -bend        | +bend                       | -bend     |
| INV. 159.4      | 47246.6         | -1144.7      | 2521.6                      | -1059.7   |
| OPER 599.0      | 78011.3         | -2641.0      | 3469.5                      | -2499.3   |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .000

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 932.91 R                | 717.62          | 28.42                   | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | 0.00 R                  | 0.00            | 0.00                    | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |
| OPER      | 5C1T       | 705.70 R                | 542.85          | 28.42                   | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | 0.00 R                  | 0.00            | 0.00                    | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor |              | Load Capacity (tons) |              |
|-------------|---------------|--------------|----------------------|--------------|
|             | top fiber     | bottom fiber | top fiber            | bottom fiber |
|             | +bend         | -bend        | +bend                | -bend        |
| HS20        | 49.47         | 999.00       | 1.52                 | 999.00       |
| 5C1T        | 108.99        | 999.00       | 3.36                 | 999.00       |

## BRIDGE / MEMBER DATA

Structure I. D. HAM500

Material of Construction CSC  
 Year of Construction 1959  
 Roadway Width 32.000  
 Number of Spans 1

Floor Beam Spacing 25.00

Comments:

Member I. D. B06 Symmetry:

|              |        |        |        |        |        |
|--------------|--------|--------|--------|--------|--------|
| Span Length: | Span 1 | Span 2 | Span 3 | Span 4 | Span 5 |
|              | 38.833 | 0.000  | 0.000  | 0.000  | 0.000  |

Range Length -- Non-Composite:

| Span No. | Range No. | Range Length | Section Left | Section Right | Section Variation | Hinge Location No. 1 | Hinge Location No. 2 |
|----------|-----------|--------------|--------------|---------------|-------------------|----------------------|----------------------|
| 1        | 1         | 15.000       | 1            | 0             |                   | 0.0                  | 0.0                  |
| 1        | 2         | 3.000        | 2            | 0             |                   | 0.0                  | 0.0                  |
| 1        | 3         | 20.833       | 1            | 0             |                   | 0.0                  | 0.0                  |

Range Length -- Composite:

| Span No. | Range No. | Range Length | Composite Code |
|----------|-----------|--------------|----------------|
| 1        | 1         | 38.833       | C              |

Superimposed Dead Load:

| Span No. | Load Type | Dist. from Left Supp. | Distributed Load (lbs/ft) |       | Length | Concentrated Load (kips) |
|----------|-----------|-----------------------|---------------------------|-------|--------|--------------------------|
|          |           |                       | Left                      | Right |        |                          |
| 1        | W         | 2.750                 | 131.7                     | 131.7 | 33.330 | 0.0                      |
| 1        | P         | 5.417                 | 0.0                       | 0.0   | 0.000  | 19.2                     |
| 1        | P         | 12.417                | 0.0                       | 0.0   | 0.000  | 15.5                     |
| 1        | P         | 19.417                | 0.0                       | 0.0   | 0.000  | 17.4                     |
| 1        | P         | 26.417                | 0.0                       | 0.0   | 0.000  | 17.4                     |
| 1        | P         | 33.420                | 0.0                       | 0.0   | 0.000  | 19.2                     |

NOTE: All distances are shown in decimal feet, moments are shown in foot-kips, and shears are shown in kips. Section and section properties are shown as: in., in.\*\*2, in.\*\*3, and in.\*\*4.

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. B06  
Check Point I. D. 1.474

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |
| Fy (reinf.)   | 40000.                      | 40000.    | 0.      | 0.      |
| f'c (conc.)   | 3000.                       | 3000.     | 0.      | 0.      |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  |       |       |       |      |      |
| 36.5           | 33.36     | 0.880 | bott | 16.48 | 16.60 | 16.60 | 1.57 | 3.86 |
|                |           |       |      | 16.88 | 16.60 | 16.60 | 1.57 | 3.86 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

## Composite Structural Steel Section Properties:

| Effective Slab Width | Effective Slab Thick. | Effective Dist. to Top of Beam | Negative Moment Area | Reinf. Dy | Fy     |
|----------------------|-----------------------|--------------------------------|----------------------|-----------|--------|
| 116.50               | 10.50                 | 7.25                           | 11.2                 | 5.8       | 60000. |

  

| Section Gross | Area Net | Neutral Axis Top | Axis Bott. | Moment of Inertia Positive Bending | Inertia Negative Bending |
|---------------|----------|------------------|------------|------------------------------------|--------------------------|
| 80.60         | 80.60    | 18.05            | 18.45      | 18378.2                            | 18378.2                  |
| n= 8 233.51   | 233.51   | 1.48             | 35.02      | 53565.9                            | 18378.2                  |
| 3n= 24 131.57 | 131.57   | 8.25             | 28.25      | 38830.3                            | 18378.2                  |

| Section Modulus |              |               |              |               | Plastic Section Modulus - Z (Fy * Z) |
|-----------------|--------------|---------------|--------------|---------------|--------------------------------------|
|                 | Positive Top | Bending Bott. | Negative Top | Bending Bott. |                                      |
| n= 8            | 1018.4       | 995.9         | 1018.4       | 995.9         | 3209.81                              |
|                 | 36099.1      | 1529.7        | 1018.4       | 995.9         |                                      |
| 3n= 24          | 4707.2       | 1374.5        | 1018.4       | 995.9         |                                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. B06  
 Check Point I. D. 1.474

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 7.86 | 1.57 | 10.570 | 0.01     | 0.00  | 37.69 | 18.62 |
| bott | 8.30 | 1.57 | 10.570 | 84.00    | 21.78 |       | 19.08 |

## ASD - Moment Values

| Cb   | Iy     |        | J      | fb    |          |
|------|--------|--------|--------|-------|----------|
|      | top    | bott   |        | top   | bott     |
| 1.75 | 598.47 | 598.47 | 50.535 | 0.000 | 1180.718 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu      | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|---------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 3209.81 | 109.1                   |
| bott | 22.62            |                   | 0.00 |         | 109.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## Composite Compact Values

| C steel | C slab  | aa   | Af Fy | C'   | ybar  | Mu      |
|---------|---------|------|-------|------|-------|---------|
| 2694.37 | 3794.29 | 6.80 | 0.00  | 0.00 | 0.000 | 5499.03 |

| TOP       |           |       | BOTTOM    |           |       |
|-----------|-----------|-------|-----------|-----------|-------|
| Mu (pier) | Ms (pier) | A_FAC | Mu (pier) | Ms (pier) | A_FAC |
| 0.00      | 0.00      | 0.000 | 0.00      | 0.00      | 0.000 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 7.00       | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 565.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. B06  
Check Point I. D. 1.474

Dead Load Superimposed Dead Load  
Moment Moment  
609.7 491.5

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 3299.4C         | -1680.3            | 2524.1          | -1925.9C           | 1877.3                      | -1953.3            | 1280.8          | -2142.2            |
| OPER        | 5499.0C         | -2800.5            | 4206.8          | -3209.8C           | 3128.8                      | -3255.5            | 2134.7          | -3570.3            |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .000

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 932.91 R     | 717.62             | 28.42  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           | 0.00         |
|           |           | 0.00 R       | 0.00               | 0.00   | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           | 0.00         |
| OPER      | 5C1T      | 705.70 R     | 542.85             | 28.42  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           | 0.00         |
|           |           | 0.00 R       | 0.00               | 0.00   | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           | 0.00         |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | Rating bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|---------------------------|--------------|----------------------|
| HS20        | 2.01            | 999.00                    | 1.37                      | 999.00                    | HS 27.46     | 49.4                 |
| 5C1T        | 4.43            | 999.00                    | 3.03                      | 999.00                    | 0.00         | 363.0                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. B06  
Check Point I. D. 1.474

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.0       | 0.0          | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 339.0             | -260.8                 | 260.8        |
| OPER      | 565.1             | -434.7                 | 434.7        |

## Live Load Effect

Impact Factors: +bend - .000 -bend - .000

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | 0.00                  | 0.00 | 0.00     | 0.00 | 0.00                 | 0.00 | 0.00     | 0.00 |
| OPER      | 5C1T      | 0.00                  | 0.00 | 0.00     | 0.00 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 999.00     | 999.00     | HS 999.00    | 999.0                |
| 5C1T   | 999.00     | 999.00     | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. B06  
Check Point I. D. 1.474Dead Load Moment 609.7  
Superimposed Dead Load Moment 491.5

| Rating Veh. ber | Moment Capacity |              | Available Capacity for LL+I |           |
|-----------------|-----------------|--------------|-----------------------------|-----------|
|                 | top fiber       | bottom fiber | top fiber                   | bottom fi |
|                 | +bend           | -bend        | +bend                       | -bend     |
| INV. 221.9      | 42456.7         | -1155.8      | 2609.0                      | -1120.6   |
| OPER 703.1      | 70027.0         | -2660.5      | 3614.1                      | -2601.9   |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .000

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-------------------------|------------------------------|----------------------|--------|
| INV.      | HS20       | 932.91 R                | 717.62                  | 28.42                        | 0.0                  | 0.00   |
|           |            | 0.00 R                  | 0.00                    | 0.00                         | 0.0                  | 0.00   |
| OPER      | 5C1T       | 705.70 R                | 542.85                  | 28.42                        | 0.0                  | 0.00   |
|           |            | 0.00 R                  | 0.00                    | 0.00                         | 0.0                  | 0.00   |

## Serviceability

| Rating Veh. | Rating top fiber | Factor bottom fiber | Rating Value | Load Capacity (tons) |
|-------------|------------------|---------------------|--------------|----------------------|
|             | +bend            | -bend               | +bend        | -bend                |
| HS20        | 44.33            | 999.00              | 1.62         | 999.00               |
| 5C1T        | 97.67            | 999.00              | 3.56         | 999.00               |

## BRIDGE / MEMBER DATA

Structure I. D. HAM500

Material of Construction CSC  
 Year of Construction 1959  
 Roadway Width 32.000  
 Number of Spans 1

Floor Beam Spacing 25.00

Comments:

Member I. D. B07 Symmetry:

|              |        |        |        |        |        |
|--------------|--------|--------|--------|--------|--------|
| Span Length: | Span 1 | Span 2 | Span 3 | Span 4 | Span 5 |
|              | 38.833 | 0.000  | 0.000  | 0.000  | 0.000  |

Range Length -- Non-Composite:

| Span No. | Range No. | Range Length | Section Left | Section Right | Section Variation | Hinge Location No. 1 | Hinge Location No. 2 |
|----------|-----------|--------------|--------------|---------------|-------------------|----------------------|----------------------|
| 1        | 1         | 15.000       | 1            | 0             |                   | 0.0                  | 0.0                  |
| 1        | 2         | 3.000        | 2            | 0             |                   | 0.0                  | 0.0                  |
| 1        | 3         | 20.833       | 1            | 0             |                   | 0.0                  | 0.0                  |

Range Length -- Composite:

| Span No. | Range No. | Range Length | Composite Code |
|----------|-----------|--------------|----------------|
| 1        | 1         | 38.833       | C              |

Superimposed Dead Load:

| Span No. | Load Type | Dist. from Left Supp. | Distributed Load (lbs/ft) |       | Length | Concentrated Load (kips) |
|----------|-----------|-----------------------|---------------------------|-------|--------|--------------------------|
|          |           |                       | Left                      | Right |        |                          |
| 1        | W         | 2.750                 | 131.7                     | 131.7 | 33.330 | 0.0                      |
| 1        | P         | 5.417                 | 0.0                       | 0.0   | 0.000  | 19.1                     |
| 1        | P         | 12.417                | 0.0                       | 0.0   | 0.000  | 15.5                     |
| 1        | P         | 19.417                | 0.0                       | 0.0   | 0.000  | 17.3                     |
| 1        | P         | 26.417                | 0.0                       | 0.0   | 0.000  | 17.3                     |
| 1        | P         | 33.420                | 0.0                       | 0.0   | 0.000  | 19.1                     |

NOTE: All distances are shown in decimal feet, moments are shown in foot-kips, and shears are shown in kips. Section and section properties are shown as: in., in.\*\*2, in.\*\*3, and in.\*\*4.

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. B07  
Check Point I. D. 1.474

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |
| Fy (reinf.)   | 40000.                      | 40000.    | 0.      | 0.      |
| f'c (conc.)   | 3000.                       | 3000.     | 0.      | 0.      |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  |       |       |       |      |      |
| 36.5           | 33.36     | 0.880 | bott | 16.45 | 16.60 | 16.60 | 1.57 | 3.91 |
|                |           |       |      | 16.91 | 16.60 | 16.60 | 1.57 | 3.91 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

## Composite Structural Steel Section Properties:

| Effective Slab Width | Effective Slab Thick. | Effective Dist. to Top of Beam | Negative Moment Area | Dy  | Reinf. Fy |
|----------------------|-----------------------|--------------------------------|----------------------|-----|-----------|
| 116.50               | 10.50                 | 7.25                           | 11.2                 | 5.8 | 60000.    |

|        | Section Gross | Area Net | Neutral Axis Top | Axis Bott. | Moment of Inertia Positive Bending | Inertia Negative Bending |
|--------|---------------|----------|------------------|------------|------------------------------------|--------------------------|
|        | 78.50         | 78.50    | 18.02            | 18.48      | 18134.1                            | 18134.1                  |
| n= 8   | 231.41        | 231.41   | 1.32             | 35.18      | 52667.4                            | 18134.1                  |
| 3n= 24 | 129.47        | 129.47   | 8.07             | 28.43      | 38338.1                            | 18134.1                  |

|        | Section Modulus |               |              |               | Plastic Section Modulus - Z (Fy * Z) |
|--------|-----------------|---------------|--------------|---------------|--------------------------------------|
|        | Positive Top    | Bending Bott. | Negative Top | Bending Bott. |                                      |
|        | 1006.4          | 981.2         | 1006.4       | 981.2         | 3213.76                              |
| n= 8   | 39779.7         | 1497.3        | 1006.4       | 981.2         |                                      |
| 3n= 24 | 4748.7          | 1348.7        | 1006.4       | 981.2         |                                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. B07  
 Check Point I. D. 1.474

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 7.86 | 1.57 | 10.570 | 0.01     | 0.00  | 37.69 | 18.59 |
| bott | 8.30 | 1.57 | 10.570 | 84.00    | 21.50 |       | 19.11 |

## ASD - Moment Values

| Cb   | Iy     | J      | fb       |
|------|--------|--------|----------|
| top  | bott   |        | top      |
| 1.75 | 598.47 | 598.47 | 50.535   |
|      |        |        | 0.000    |
|      |        |        | 1198.388 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu      | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|---------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 3213.76 | 109.1                   |
| bott | 22.62            |                   | 0.00 |         | 109.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## Composite Compact Values

| C steel | C slab  | aa   | Af Fy | C'   | ybar  | Mu      |
|---------|---------|------|-------|------|-------|---------|
| 2694.37 | 3794.29 | 6.80 | 0.00  | 0.00 | 0.000 | 5496.75 |

| TOP       |           |       | BOTTOM    |           |       |
|-----------|-----------|-------|-----------|-----------|-------|
| Mu (pier) | Ms (pier) | A_FAC | Mu (pier) | Ms (pier) | A_FAC |
| 0.00      | 0.00      | 0.000 | 0.00      | 0.00      | 0.000 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 7.00       | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 565.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
 INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. B07  
 Check Point I. D. 1.474

Dead Load Moment 609.7  
 Superimposed Dead Load Moment 490.0

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 3298.0C         | -1660.5            | 2470.5          | -1928.3C           | 1877.1                      | -1937.1            | 1240.5          | -2143.1            |
| OPER        | 5496.7C         | -2767.5            | 4117.4          | -3213.8C           | 3128.6                      | -3228.6            | 2067.6          | -3571.8            |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .000

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 932.91 R     | 717.62             | 28.42  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           | 0.00         |
|           |           | 0.00 R       | 0.00               | 0.00   | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           | 0.00         |
| OPER      | 5C1T      | 705.70 R     | 542.85             | 28.42  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           | 0.00         |
|           |           | 0.00 R       | 0.00               | 0.00   | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           | 0.00         |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | Rating bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|---------------------------|--------------|----------------------|
| HS20        | 2.01            | 999.00                    | 1.33                      | 999.00                    | HS 26.60     | 47.9                 |
| 5C1T        | 4.43            | 999.00                    | 2.93                      | 999.00                    | 0.00         | 351.6                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. B07  
Check Point I. D. 1.474

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear     | (-) Shear (+) Shear    |
| 0.0       | 0.0 0.0                |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 339.0             | -260.8                          | 260.8 |
| OPER      | 565.1             | -434.7                          | 434.7 |

## Live Load Effect

Impact Factors: +bend - .000 -bend - .000

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | 0.00                  | 0.00 | 0.00     | 0.00 | 0.00                 | 0.00 | 0.00     | 0.00 |
| OPER      | 5C1T      | 0.00                  | 0.00 | 0.00     | 0.00 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 999.00     | 999.00     | HS 999.00    | 999.0                |
| 5C1T   | 999.00     | 999.00     | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. B07  
Check Point I. D. 1.474Dead Load Moment 609.7  
Superimposed Dead Load Moment 490.0

| Rating Veh. ber | Moment Capacity |              | Available Capacity for LL+I |           |
|-----------------|-----------------|--------------|-----------------------------|-----------|
|                 | top fiber       | bottom fiber | top fiber                   | bottom fi |
|                 | +bend           | -bend        | +bend                       | -bend     |
| INV. 197.9      | 46530.9         | -1137.6      | 2562.1                      | -1098.2   |
| OPER 663.2      | 76818.3         | -2629.1      | 3537.0                      | -2563.5   |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .000

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-------------------------|-----------|-------------------------|----------------------|--------|
| INV.      | HS20       | 932.91 R                | 717.62                  | 28.42     | 0.0                     | 0.00                 | 0.00   |
|           |            | 0.00 R                  | 0.00                    | 0.00      | 0.0                     | 0.00                 | 0.00   |
| OPER      | 5C1T       | 705.70 R                | 542.85                  | 28.42     | 0.0                     | 0.00                 | 0.00   |
|           |            | 0.00 R                  | 0.00                    | 0.00      | 0.0                     | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating top fiber | Factor bottom fiber | Rating Value | Load Capacity (tons) |
|-------------|------------------|---------------------|--------------|----------------------|
|             | +bend            | -bend               | +bend        | -bend                |
| HS20        | 48.70            | 999.00              | 1.57         | 999.00               |
| 5C1T        | 107.30           | 999.00              | 3.45         | 999.00               |

## BRIDGE / MEMBER DATA

Structure I. D. HAM500

Material of Construction CSC  
 Year of Construction 1959  
 Roadway Width 32.000  
 Number of Spans 1

Floor Beam Spacing 25.00

Comments:

Member I. D. B08 Symmetry:

|              |        |        |        |        |        |
|--------------|--------|--------|--------|--------|--------|
| Span Length: | Span 1 | Span 2 | Span 3 | Span 4 | Span 5 |
|              | 38.833 | 0.000  | 0.000  | 0.000  | 0.000  |

Range Length -- Non-Composite:

| Span No. | Range No. | Range Length | Section Left | Section Right | Section Variation | Hinge Location No. 1 | Hinge Location No. 2 |
|----------|-----------|--------------|--------------|---------------|-------------------|----------------------|----------------------|
| 1        | 1         | 15.000       | 1            | 0             |                   | 0.0                  | 0.0                  |
| 1        | 2         | 3.000        | 2            | 0             |                   | 0.0                  | 0.0                  |
| 1        | 3         | 20.833       | 1            | 0             |                   | 0.0                  | 0.0                  |

Range Length -- Composite:

| Span No. | Range No. | Range Length | Composite Code |
|----------|-----------|--------------|----------------|
| 1        | 1         | 38.833       | C              |

Superimposed Dead Load:

| Span No. | Load Type | Dist. from Left Supp. | Distributed Load (lbs/ft) |       | Length | Concentrated Load (kips) |
|----------|-----------|-----------------------|---------------------------|-------|--------|--------------------------|
|          |           |                       | Left                      | Right |        |                          |
| 1        | W         | 2.750                 | 131.7                     | 131.7 | 33.330 | 0.0                      |
| 1        | P         | 5.417                 | 0.0                       | 0.0   | 0.000  | 19.3                     |
| 1        | P         | 12.417                | 0.0                       | 0.0   | 0.000  | 15.6                     |
| 1        | P         | 19.417                | 0.0                       | 0.0   | 0.000  | 17.5                     |
| 1        | P         | 26.417                | 0.0                       | 0.0   | 0.000  | 17.5                     |
| 1        | P         | 33.420                | 0.0                       | 0.0   | 0.000  | 19.3                     |

NOTE: All distances are shown in decimal feet, moments are shown in foot-kips, and shears are shown in kips. Section and section properties are shown as: in., in.\*\*2, in.\*\*3, and in.\*\*4.

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. B08  
Check Point I. D. 1.474

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |
| Fy (reinf.)   | 40000.                      | 40000.    | 0.      | 0.      |
| f'c (conc.)   | 3000.                       | 3000.     | 0.      | 0.      |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  |       |       |       |      |      |
| 36.5           | 33.36     | 0.880 | bott | 16.59 | 16.60 | 16.60 | 1.57 | 3.84 |
|                |           |       |      | 16.77 | 16.60 | 16.60 | 1.57 | 3.84 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

## Composite Structural Steel Section Properties:

| Effective Slab Width | Effective Slab Thick. | Effective Dist. to Top of Beam | Negative Moment Area | Reinf. Dy | Fy     |
|----------------------|-----------------------|--------------------------------|----------------------|-----------|--------|
| 116.50               | 10.50                 | 7.25                           | 11.2                 | 5.8       | 60000. |

  

| Section Gross | Area Net | Neutral Axis Top | Axis Bott. | Moment of Inertia Positive Bending | Inertia Negative Bending |
|---------------|----------|------------------|------------|------------------------------------|--------------------------|
| 81.10         | 81.10    | 18.16            | 18.34      | 18538.9                            | 18538.9                  |
| n= 8 234.01   | 234.01   | 1.56             | 34.94      | 54171.5                            | 18538.9                  |
| 3n= 24 132.07 | 132.07   | 8.36             | 28.14      | 39219.5                            | 18538.9                  |

| Section Modulus |              |               |              |               | Plastic Section Modulus - Z (Fy * Z) |
|-----------------|--------------|---------------|--------------|---------------|--------------------------------------|
|                 | Positive Top | Bending Bott. | Negative Top | Bending Bott. |                                      |
| n= 8            | 1020.9       | 1010.8        | 1020.9       | 1010.8        | 3193.56                              |
| 3n= 24          | 34733.9      | 1550.4        | 1020.9       | 1010.8        |                                      |
|                 | 4693.1       | 1393.6        | 1020.9       | 1010.8        |                                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. B08  
Check Point I. D. 1.474

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 7.86 | 1.57 | 10.570 | 0.01     | 0.00  | 37.69 | 18.75 |
| bott | 8.30 | 1.57 | 10.570 | 84.00    | 21.85 |       | 18.95 |

## ASD - Moment Values

| Cb   | Iy     | J      | fb       |
|------|--------|--------|----------|
| top  | bott   | top    | bott     |
| 1.75 | 598.47 | 598.47 | 50.535   |
|      |        |        | 0.000    |
|      |        |        | 1163.331 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu      | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|---------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 3193.56 | 109.1                   |
| bott | 22.62            |                   | 0.00 |         | 109.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## Composite Compact Values

| C steel | C slab  | aa   | Af Fy | C'   | ybar  | Mu      |
|---------|---------|------|-------|------|-------|---------|
| 2694.37 | 3794.29 | 6.80 | 0.00  | 0.00 | 0.000 | 5500.49 |

| TOP       |           |       | BOTTOM    |           |       |
|-----------|-----------|-------|-----------|-----------|-------|
| Mu (pier) | Ms (pier) | A_FAC | Mu (pier) | Ms (pier) | A_FAC |
| 0.00      | 0.00      | 0.000 | 0.00      | 0.00      | 0.000 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 7.00       | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 565.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
 INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. B08  
 Check Point I. D. 1.474

Dead Load Moment 609.7  
 Superimposed Dead Load Moment 494.8

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 3300.3C         | -1684.5            | 2558.2          | -1916.1C           | 1876.0                      | -1958.4            | 1305.1          | -2136.6            |
| OPER        | 5500.5C         | -2807.4            | 4263.6          | -3193.6C           | 3126.7                      | -3264.1            | 2175.2          | -3561.1            |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .000

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 932.91 R     | 717.62             | 28.42  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           | 0.00         |
|           |           | 0.00 R       | 0.00               | 0.00   | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           | 0.00         |
| OPER      | 5C1T      | 705.70 R     | 542.85             | 28.42  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           | 0.00         |
|           |           | 0.00 R       | 0.00               | 0.00   | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           | 0.00         |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 2.01            | 999.00                    | 1.40         | 999.00             | HS 27.98     | 50.4                 |
| 5C1T        | 4.43            | 999.00                    | 3.08         | 999.00             | 0.00         | 369.9                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. B08  
Check Point I. D. 1.474

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.0       | 0.0          | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 339.0             | -260.8                 | 260.8                 |
| OPER      | 565.1             | -434.7                 | 434.7                 |

## Live Load Effect

Impact Factors: +bend - .000 -bend - .000

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | 0.00                  | 0.00 | 0.00     | 0.00 | 0.00                 | 0.00 | 0.00     | 0.00 |
| OPER      | 5C1T      | 0.00                  | 0.00 | 0.00     | 0.00 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 999.00     | 999.00     | HS 999.00    | 999.0                |
| 5C1T   | 999.00     | 999.00     | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. B08  
Check Point I. D. 1.474Dead Load Moment 609.7  
Superimposed Dead Load Moment 494.8

| Rating Veh. ber | Moment Capacity |              | Available Capacity for LL+I |           |
|-----------------|-----------------|--------------|-----------------------------|-----------|
|                 | top fiber       | bottom fiber | top fiber                   | bottom fi |
|                 | +bend           | -bend        | +bend                       | -bend     |
| INV. 247.2      | 40905.9         | -1158.4      | 2643.4                      | -1142.7   |
| OPER 745.3      | 67440.1         | -2667.1      | 3669.3                      | -2640.8   |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .000

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-------------------------|------------------------------|----------------------|--------|
| INV.      | HS20       | 932.91 R                | 717.62                  | 28.42                        | 0.0                  | 0.00   |
|           |            | 0.00 R                  | 0.00                    | 0.00                         | 0.0                  | 0.00   |
| OPER      | 5C1T       | 705.70 R                | 542.85                  | 28.42                        | 0.0                  | 0.00   |
|           |            | 0.00 R                  | 0.00                    | 0.00                         | 0.0                  | 0.00   |

## Serviceability

| Rating Veh. | Rating top fiber | Factor bottom fiber | Rating Value | Load Capacity (tons) |
|-------------|------------------|---------------------|--------------|----------------------|
|             | +bend            | -bend               | +bend        | -bend                |
| HS20        | 42.66            | 999.00              | 1.65         | 999.00               |
| 5C1T        | 94.00            | 999.00              | 3.63         | 999.00               |

## BRIDGE / MEMBER DATA

Structure I. D. HAM500

Material of Construction CSC  
 Year of Construction 1959  
 Roadway Width 32.000  
 Number of Spans 1

Floor Beam Spacing 25.00

Comments:

Member I. D. B09 Symmetry:

|              |        |        |        |        |        |
|--------------|--------|--------|--------|--------|--------|
| Span Length: | Span 1 | Span 2 | Span 3 | Span 4 | Span 5 |
|              | 38.833 | 0.000  | 0.000  | 0.000  | 0.000  |

Range Length -- Non-Composite:

| Span No. | Range No. | Range Length | Section Left | Section Right | Section Variation | Hinge Location No. 1 | Hinge Location No. 2 |
|----------|-----------|--------------|--------------|---------------|-------------------|----------------------|----------------------|
| 1        | 1         | 15.000       | 1            | 0             |                   | 0.0                  | 0.0                  |
| 1        | 2         | 3.000        | 2            | 0             |                   | 0.0                  | 0.0                  |
| 1        | 3         | 20.833       | 1            | 0             |                   | 0.0                  | 0.0                  |

Range Length -- Composite:

| Span No. | Range No. | Range Length | Composite Code |
|----------|-----------|--------------|----------------|
| 1        | 1         | 38.833       | C              |

Superimposed Dead Load:

| Span No. | Load Type | Dist. from Left Supp. | Distributed Load (lbs/ft) |       | Length | Concentrated Load (kips) |
|----------|-----------|-----------------------|---------------------------|-------|--------|--------------------------|
|          |           |                       | Left                      | Right |        |                          |
| 1        | W         | 2.750                 | 131.7                     | 131.7 | 33.330 | 0.0                      |
| 1        | P         | 5.417                 | 0.0                       | 0.0   | 0.000  | 18.6                     |
| 1        | P         | 12.417                | 0.0                       | 0.0   | 0.000  | 15.0                     |
| 1        | P         | 19.417                | 0.0                       | 0.0   | 0.000  | 16.8                     |
| 1        | P         | 26.417                | 0.0                       | 0.0   | 0.000  | 16.8                     |
| 1        | P         | 33.420                | 0.0                       | 0.0   | 0.000  | 18.6                     |

NOTE: All distances are shown in decimal feet, moments are shown in foot-kips, and shears are shown in kips. Section and section properties are shown as: in., in.\*\*2, in.\*\*3, and in.\*\*4.

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. B09  
Check Point I. D. 1.474

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |
| Fy (reinf.)   | 40000.                      | 40000.    | 0.      | 0.      |
| f'c (conc.)   | 3000.                       | 3000.     | 0.      | 0.      |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  |       |       |       |      |      |
| 36.5           | 33.36     | 0.880 | bott | 16.23 | 16.60 | 16.60 | 1.57 | 3.88 |
|                |           |       |      | 17.13 | 16.60 | 16.60 | 1.57 | 3.88 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

## Composite Structural Steel Section Properties:

| Effective Slab Width | Effective Slab Thick. | Effective Dist. to Top of Beam | Negative Moment Area | Reinf. Dy | Fy     |
|----------------------|-----------------------|--------------------------------|----------------------|-----------|--------|
| 116.50               | 10.50                 | 7.25                           | 11.2                 | 5.8       | 60000. |

  

| Section Gross | Area Net | Neutral Axis Top | Axis Bott. | Moment of Inertia Positive Bending | Inertia Negative Bending |
|---------------|----------|------------------|------------|------------------------------------|--------------------------|
| 79.50         | 79.50    | 17.80            | 18.70      | 18030.0                            | 18030.0                  |
| n= 8 232.41   | 232.41   | 1.32             | 35.18      | 52270.8                            | 18030.0                  |
| 3n= 24 130.47 | 130.47   | 8.02             | 28.48      | 37993.5                            | 18030.0                  |

| Section Modulus |              |               |              |               | Plastic Section Modulus - Z (Fy * Z) |
|-----------------|--------------|---------------|--------------|---------------|--------------------------------------|
|                 | Positive Top | Bending Bott. | Negative Top | Bending Bott. |                                      |
|                 | 1012.8       | 964.3         | 1012.8       | 964.3         | 3245.22                              |
| n= 8            | 39543.5      | 1485.9        | 1012.8       | 964.3         |                                      |
| 3n= 24          | 4738.7       | 1333.9        | 1012.8       | 964.3         |                                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. B09  
Check Point I. D. 1.474

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 7.86 | 1.57 | 10.570 | 0.01     | 0.00  | 37.69 | 18.34 |
| bott | 8.30 | 1.57 | 10.570 | 84.00    | 21.64 |       | 19.35 |

## ASD - Moment Values

| Cb   | Iy     | J      | fb       |
|------|--------|--------|----------|
| top  | bott   | top    | bott     |
| 1.75 | 598.47 | 598.47 | 50.535   |
|      |        |        | 0.000    |
|      |        |        | 1219.454 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu      | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|---------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 3245.22 | 109.1                   |
| bott | 22.62            |                   | 0.00 |         | 109.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## Composite Compact Values

| C steel | C slab  | aa   | Af Fy | C'   | ybar  | Mu      |
|---------|---------|------|-------|------|-------|---------|
| 2694.37 | 3794.29 | 6.80 | 0.00  | 0.00 | 0.000 | 5495.95 |

| TOP       |           |       | BOTTOM    |           |       |
|-----------|-----------|-------|-----------|-----------|-------|
| Mu (pier) | Ms (pier) | A_FAC | Mu (pier) | Ms (pier) | A_FAC |
| 0.00      | 0.00      | 0.000 | 0.00      | 0.00      | 0.000 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 7.00       | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 565.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
 INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. B09  
 Check Point I. D. 1.474

Dead Load Moment      Superimposed Dead Load Moment  
 609.7                      476.7

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 3297.6C            | -1671.1               | 2451.7             | -1947.1C              | 1884.7                      | -1937.3               | 1234.1             | -2149.7               |
| OPER        | 5495.9C            | -2785.2               | 4086.2             | -3245.2C              | 3141.2                      | -3228.9               | 2056.8             | -3582.8               |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .000

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 932.91 R     | 717.62             | 28.42  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           | 0.00         |
|           |           | 0.00 R       | 0.00               | 0.00   | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           | 0.00         |
| OPER      | 5C1T      | 705.70 R     | 542.85             | 28.42  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           | 0.00         |
|           |           | 0.00 R       | 0.00               | 0.00   | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           | 0.00         |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 2.02               | 999.00                       | 1.32                               | 999.00       | HS 26.46 47.6        |
| 5C1T        | 4.45               | 999.00                       | 2.91                               | 999.00       | 0.00 349.7           |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. B09  
Check Point I. D. 1.474

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.0       | 0.0          | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 339.0             | -260.8                 | 260.8                 |
| OPER      | 565.1             | -434.7                 | 434.7                 |

## Live Load Effect

Impact Factors: +bend - .000 -bend - .000

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | 0.00                  | 0.00 | 0.00     | 0.00 | 0.00                 | 0.00 | 0.00     | 0.00 |
| OPER      | 5C1T      | 0.00                  | 0.00 | 0.00     | 0.00 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 999.00     | 999.00     | HS 999.00    | 999.0                |
| 5C1T   | 999.00     | 999.00     | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. B09  
Check Point I. D. 1.474Dead Load Moment 609.7  
Superimposed Dead Load Moment 476.7

| Rating Veh. ber | Moment Capacity top fiber |         | bottom fiber |         | Available Capacity for LL+I |         |        |           |
|-----------------|---------------------------|---------|--------------|---------|-----------------------------|---------|--------|-----------|
|                 | +bend                     | -bend   | +bend        | -bend   | top fiber                   | -bend   | +bend  | bottom fi |
| INV. 163.4      | 46400.2                   | -1153.0 | 2533.2       | -1077.0 | 45313.7                     | -2239.4 | 1446.8 | -2        |
| OPER 605.7      | 76609.4                   | -2645.9 | 3497.8       | -2519.2 | 75522.9                     | -3732.4 | 2411.3 | -3        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .000

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 932.91 R                | 717.62          | 28.42                   | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | 0.00 R                  | 0.00            | 0.00                    | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |
| OPER      | 5C1T       | 705.70 R                | 542.85          | 28.42                   | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | 0.00 R                  | 0.00            | 0.00                    | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating top fiber |        | Factor bottom fiber |        | Rating Value | Load Capacity (tons) |
|-------------|------------------|--------|---------------------|--------|--------------|----------------------|
|             | +bend            | -bend  | +bend               | -bend  |              |                      |
| HS20        | 48.57            | 999.00 | 1.55                | 999.00 | HS 31.02     | 55.8                 |
| 5C1T        | 107.02           | 999.00 | 3.42                | 999.00 | 0.00         | 410.0                |

## BRIDGE / MEMBER DATA

Structure I. D. HAM500

Material of Construction CSC  
 Year of Construction 1959  
 Roadway Width 32.000  
 Number of Spans 1

Floor Beam Spacing 25.00

Comments:

Member I. D. B10 Symmetry:

|              |        |        |        |        |        |
|--------------|--------|--------|--------|--------|--------|
| Span Length: | Span 1 | Span 2 | Span 3 | Span 4 | Span 5 |
|              | 38.833 | 0.000  | 0.000  | 0.000  | 0.000  |

Range Length -- Non-Composite:

| Span No. | Range No. | Range Length | Section Left | Section Right | Section Variation | Hinge Location No. 1 | Hinge Location No. 2 |
|----------|-----------|--------------|--------------|---------------|-------------------|----------------------|----------------------|
| 1        | 1         | 15.000       | 1            | 0             |                   | 0.0                  | 0.0                  |
| 1        | 2         | 3.000        | 2            | 0             |                   | 0.0                  | 0.0                  |
| 1        | 3         | 20.833       | 1            | 0             |                   | 0.0                  | 0.0                  |

Range Length -- Composite:

| Span No. | Range No. | Range Length | Composite Code |
|----------|-----------|--------------|----------------|
| 1        | 1         | 38.833       | C              |

Superimposed Dead Load:

| Span No. | Load Type | Dist. from Left Supp. | Distributed Load (lbs/ft) |       |        | Concentrated Load (kips) |
|----------|-----------|-----------------------|---------------------------|-------|--------|--------------------------|
|          |           |                       | Left                      | Right | Length |                          |
| 1        | W         | 2.750                 | 121.2                     | 121.2 | 33.330 | 0.0                      |
| 1        | P         | 5.417                 | 0.0                       | 0.0   | 0.000  | 21.6                     |
| 1        | P         | 12.417                | 0.0                       | 0.0   | 0.000  | 17.5                     |
| 1        | P         | 19.417                | 0.0                       | 0.0   | 0.000  | 19.5                     |
| 1        | P         | 26.417                | 0.0                       | 0.0   | 0.000  | 19.5                     |
| 1        | P         | 33.420                | 0.0                       | 0.0   | 0.000  | 21.6                     |

NOTE: All distances are shown in decimal feet, moments are shown in foot-kips, and shears are shown in kips. Section and section properties are shown as: in., in.\*\*2, in.\*\*3, and in.\*\*4.

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. B10  
Check Point I. D. 1.474

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |
| Fy (reinf.)   | 40000.                      | 40000.    | 0.      | 0.      |
| f'c (conc.)   | 3000.                       | 3000.     | 0.      | 0.      |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  |       |       |       |      |      |
| 36.7           | 33.34     | 0.940 | bott | 16.15 | 16.70 | 16.70 | 1.68 | 3.92 |
|                |           |       |      | 17.19 | 16.70 | 16.70 | 1.68 | 3.92 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

## Composite Structural Steel Section Properties:

| Effective Slab Width | Effective Slab Thick. | Effective Dist. to Top of Beam | Negative Moment Area | Dy  | Reinf. Fy |
|----------------------|-----------------------|--------------------------------|----------------------|-----|-----------|
| 116.50               | 10.50                 | 7.25                           | 11.2                 | 5.8 | 60000.    |

|        | Section Gross | Area Net | Neutral Axis Top | Axis Bott. | Moment of Inertia Positive Bending | Inertia Negative Bending |
|--------|---------------|----------|------------------|------------|------------------------------------|--------------------------|
|        | 85.10         | 85.10    | 17.83            | 18.87      | 19331.6                            | 19331.6                  |
| n= 8   | 238.01        | 238.01   | 1.71             | 34.99      | 55107.3                            | 19331.6                  |
| 3n= 24 | 136.07        | 136.07   | 8.43             | 28.27      | 39841.7                            | 19331.6                  |

|        | Section Modulus |               |              |               | Plastic Section Modulus - Z (Fy * Z) |
|--------|-----------------|---------------|--------------|---------------|--------------------------------------|
|        | Positive Top    | Bending Bott. | Negative Top | Bending Bott. |                                      |
|        | 1084.5          | 1024.2        | 1084.5       | 1024.2        | 3505.67                              |
| n= 8   | 32148.9         | 1575.1        | 1084.5       | 1024.2        |                                      |
| 3n= 24 | 4725.6          | 1409.4        | 1084.5       | 1024.2        |                                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. B10  
Check Point I. D. 1.474

|      | b'   | t    | b/t   | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|-------|----------|-------|-------|-------|
| top  | 7.88 | 1.68 | 9.940 | 0.01     | 0.00  | 35.28 | 17.09 |
| bott | 8.35 | 1.68 | 9.940 | 84.00    | 21.44 |       | 18.19 |

## ASD - Moment Values

| Cb   | Iy     |        | J      | fb    |          |
|------|--------|--------|--------|-------|----------|
|      | top    | bott   |        | top   | bott     |
| 1.75 | 652.04 | 652.04 | 62.169 | 0.000 | 1260.194 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu      | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|---------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 3505.67 | 109.1                   |
| bott | 22.62            |                   | 0.00 |         | 109.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## Composite Compact Values

| C steel | C slab  | aa   | Af Fy | C'   | ybar  | Mu      |
|---------|---------|------|-------|------|-------|---------|
| 2891.40 | 3794.29 | 7.46 | 0.00  | 0.00 | 0.000 | 5811.07 |

| TOP       |           |       | BOTTOM    |           |       |
|-----------|-----------|-------|-----------|-----------|-------|
| Mu (pier) | Ms (pier) | A_FAC | Mu (pier) | Ms (pier) | A_FAC |
| 0.00      | 0.00      | 0.000 | 0.00      | 0.00      | 0.000 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 7.00       | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 603.0     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
 INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. B10  
 Check Point I. D. 1.474

Dead Load Superimposed Dead Load  
 Moment Moment  
 613.8 548.6

| Rating Veh. | Moment Capacity |             |                    |             | Available Capacity for LL+I |             |                    |             |
|-------------|-----------------|-------------|--------------------|-------------|-----------------------------|-------------|--------------------|-------------|
|             | top fiber +bend | fiber -bend | bottom fiber +bend | fiber -bend | top fiber +bend             | fiber -bend | bottom fiber +bend | fiber -bend |
| INV.        | 3486.6C         | -1789.4     | 2599.0             | -2103.4C    | 1984.6                      | -2073.9     | 1301.8             | -2315.4     |
| OPER        | 5811.1C         | -2982.3     | 4331.6             | -3505.7C    | 3307.7                      | -3456.4     | 2169.6             | -3859.1     |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .000

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 932.91 R     | 717.62             | 28.42  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |
|           |           | 0.00 R       | 0.00               | 0.00   | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           | 0.00         |
| OPER      | 5C1T      | 705.70 R     | 542.85             | 28.42  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |
|           |           | 0.00 R       | 0.00               | 0.00   | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           | 0.00         |

## Moment

| Rating Veh. | Rating Factor   |             |                    |             | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------------|--------------------|-------------|--------------|----------------------|
|             | top fiber +bend | fiber -bend | bottom fiber +bend | fiber -bend |              |                      |
| HS20        | 2.13            | 999.00      | 1.39               | 999.00      | HS 27.91     | 50.2                 |
| 5C1T        | 4.69            | 999.00      | 3.07               | 999.00      | 0.00         | 368.9                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. B10  
Check Point I. D. 1.474

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear     | (-) Shear (+) Shear    |
| 0.0       | 0.0 0.0                |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 361.8             | -278.3                          | 278.3 |
| OPER      | 603.0             | -463.9                          | 463.9 |

## Live Load Effect

Impact Factors: +bend - .000 -bend - .000

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | 0.00                  | 0.00 | 0.00     | 0.00 | 0.00                 | 0.00 | 0.00     | 0.00 |
| OPER      | 5C1T      | 0.00                  | 0.00 | 0.00     | 0.00 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 999.00     | 999.00     | HS 999.00    | 999.0                |
| 5C1T   | 999.00     | 999.00     | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. B10  
Check Point I. D. 1.474

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| 613.8               | 548.6                            |

| Rating<br>Veh.<br>ber | Moment Capacity |              |           |           | Available Capacity for LL+I |           |           |           |
|-----------------------|-----------------|--------------|-----------|-----------|-----------------------------|-----------|-----------|-----------|
|                       | top fiber       | bottom fiber | top fiber | bottom fi | top fiber                   | bottom fi | top fiber | bottom fi |
| bend                  | +bend           | -bend        | +bend     | -bend     | +bend                       | -bend     | +bend     | -         |
| INV.<br>302.9         | 38398.4         | -1234.9      | 2697.2    | -1140.5   | 37236.0                     | -2397.3   | 1534.8    | -2        |
| OPER<br>838.2         | 63222.4         | -2833.2      | 3720.4    | -2675.8   | 62060.0                     | -3995.5   | 2558.0    | -3        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .000

| Rat.<br>Typ. | Truck<br>Veh. | Live Load Moment<br>w/imp. | Moment<br>w/o imp. | Loc. of Ax.<br>Front<br>Wheel | Lane<br>Dis. | Live Load Moment<br>w/imp. | Moment<br>w/o imp. | Loc. of Conc.<br>Load 1 | Load 2 |
|--------------|---------------|----------------------------|--------------------|-------------------------------|--------------|----------------------------|--------------------|-------------------------|--------|
| INV.         | HS20          | 932.91 R                   | 717.62             | 28.42                         | 0.0          | 0.00                       | 0.00               | 0.00                    |        |
|              |               | 0.00 R                     | 0.00               | 0.00                          | 0.0          | 0.00                       | 0.00               | 0.00                    | 0.00   |
| OPER         | 5C1T          | 705.70 R                   | 542.85             | 28.42                         | 0.0          | 0.00                       | 0.00               | 0.00                    |        |
|              |               | 0.00 R                     | 0.00               | 0.00                          | 0.0          | 0.00                       | 0.00               | 0.00                    | 0.00   |

## Serviceability

| Rating<br>Veh. | Rating    |              | Factor    |              | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|-----------|--------------|-----------|--------------|-----------------|----------------------------|
|                | top fiber | bottom fiber | top fiber | bottom fiber |                 |                            |
|                | +bend     | -bend        | +bend     | -bend        |                 |                            |
| HS20           | 39.91     | 999.00       | 1.64      | 999.00       | HS 32.90        | 59.2                       |
| 5C1T           | 87.94     | 999.00       | 3.62      | 999.00       | 0.00            | 435.0                      |

## BRIDGE / MEMBER DATA

Structure I. D. HAM500

Material of Construction CSC  
 Year of Construction 1959  
 Roadway Width 32.000  
 Number of Spans 1

Floor Beam Spacing 25.00

Comments:

Member I. D. B11 Symmetry:

|              |        |        |        |        |        |
|--------------|--------|--------|--------|--------|--------|
| Span Length: | Span 1 | Span 2 | Span 3 | Span 4 | Span 5 |
|              | 38.833 | 0.000  | 0.000  | 0.000  | 0.000  |

Range Length -- Non-Composite:

| Span No. | Range No. | Range Length | Section Left | Section Right | Section Variation | Hinge Location No. 1 | Hinge Location No. 2 |
|----------|-----------|--------------|--------------|---------------|-------------------|----------------------|----------------------|
| 1        | 1         | 15.000       | 1            | 0             |                   | 0.0                  | 0.0                  |
| 1        | 2         | 3.000        | 2            | 0             |                   | 0.0                  | 0.0                  |
| 1        | 3         | 20.833       | 1            | 0             |                   | 0.0                  | 0.0                  |

Range Length -- Composite:

| Span No. | Range No. | Range Length | Composite Code |
|----------|-----------|--------------|----------------|
| 1        | 1         | 38.833       | C              |

Superimposed Dead Load:

| Span No. | Load Type | Dist. from Left Supp. | Distributed Load (lbs/ft) |       |        | Concentrated Load (kips) |
|----------|-----------|-----------------------|---------------------------|-------|--------|--------------------------|
|          |           |                       | Left                      | Right | Length |                          |
| 1        | W         | 1.917                 | 235.5                     | 235.5 | 35.000 | 0.0                      |
| 1        | P         | 5.417                 | 0.0                       | 0.0   | 0.000  | 7.6                      |
| 1        | P         | 12.417                | 0.0                       | 0.0   | 0.000  | 6.2                      |
| 1        | P         | 19.417                | 0.0                       | 0.0   | 0.000  | 6.9                      |
| 1        | P         | 26.417                | 0.0                       | 0.0   | 0.000  | 6.9                      |
| 1        | P         | 33.420                | 0.0                       | 0.0   | 0.000  | 7.6                      |

NOTE: All distances are shown in decimal feet, moments are shown in foot-kips, and shears are shown in kips. Section and section properties are shown as: in., in.\*\*2, in.\*\*3, and in.\*\*4.

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. B11  
Check Point I. D. 1.474

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |
| Fy (reinf.)   | 40000.                      | 40000.    | 0.      | 0.      |
| f'c (conc.)   | 3000.                       | 3000.     | 0.      | 0.      |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  |       |       |       |      |      |
| 36.5           | 33.36     | 0.880 | bott | 15.46 | 16.60 | 16.60 | 1.57 | 3.96 |
|                |           |       |      | 17.90 | 16.60 | 16.60 | 1.57 | 3.96 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

## Composite Structural Steel Section Properties:

| Effective Slab Width | Effective Slab Thick. | Effective Dist. to Top of Beam | Negative Moment Area | Reinf. Dy | Fy     |
|----------------------|-----------------------|--------------------------------|----------------------|-----------|--------|
| 116.50               | 10.50                 | 7.25                           | 11.2                 | 5.8       | 60000. |

  

| Section Gross | Area Net | Neutral Axis Top | Axis Bott. | Moment of Inertia Positive Bending | Inertia Negative Bending |
|---------------|----------|------------------|------------|------------------------------------|--------------------------|
| 76.30         | 76.30    | 17.03            | 19.47      | 16914.8                            | 16914.8                  |
| n= 8 229.21   | 229.21   | 0.84             | 35.66      | 48347.4                            | 16914.8                  |
| 3n= 24 127.27 | 127.27   | 7.31             | 29.19      | 35407.1                            | 16914.8                  |

| Section Modulus |               |              |               | Plastic Section Modulus - Z (Fy * Z) |
|-----------------|---------------|--------------|---------------|--------------------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. |                                      |
| 993.0           | 869.0         | 993.0        | 869.0         | 3358.38                              |
| n= 8 57791.3    | 1355.7        | 993.0        | 869.0         |                                      |
| 3n= 24 4842.4   | 1213.1        | 993.0        | 869.0         |                                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. B11  
 Check Point I. D. 1.474

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 7.86 | 1.57 | 10.570 | 0.01     | 0.00  | 37.69 | 17.47 |
| bott | 8.30 | 1.57 | 10.570 | 84.00    | 21.20 |       | 20.22 |

## ASD - Moment Values

| Cb   | Iy     | J      | fb       |
|------|--------|--------|----------|
| top  | bott   |        | top      |
| 1.75 | 598.47 | 598.47 | 50.535   |
|      |        |        | 0.000    |
|      |        |        | 1353.226 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu      | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|---------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 3358.38 | 109.1                   |
| bott | 22.62            |                   | 0.00 |         | 109.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## Composite Compact Values

| C steel | C slab  | aa   | Af Fy | C'   | ybar  | Mu      |
|---------|---------|------|-------|------|-------|---------|
| 2694.37 | 3794.29 | 6.80 | 0.00  | 0.00 | 0.000 | 5486.78 |

| TOP       |           |       | BOTTOM    |           |       |
|-----------|-----------|-------|-----------|-----------|-------|
| Mu (pier) | Ms (pier) | A_FAC | Mu (pier) | Ms (pier) | A_FAC |
| 0.00      | 0.00      | 0.000 | 0.00      | 0.00      | 0.000 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 7.00       | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 565.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. B11  
Check Point I. D. 1.474

Dead Load Superimposed Dead Load  
Moment Moment  
340.1 229.1

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 3292.1C            | -1638.4               | 2236.8             | -2015.0C              | 2190.8                      | -1601.8               | 1379.1             | -1891.6               |
| OPER        | 5486.8C            | -2730.7               | 3728.1             | -3358.4C              | 3651.4                      | -2669.7               | 2298.5             | -3152.6               |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .000

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment w/o imp. | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment w/o imp. | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|-----------------|---------------------|----------|-------------|--------------------|-----------------|----------------|--------------|
| INV.      | HS20      | 866.70 R     | 666.69             | 28.42           | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00            | 0.00           | 0.00         |
|           |           | 0.00 R       | 0.00               | 0.00            | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00            | 0.00           | 0.00         |
| OPER      | 5C1T      | 669.59 R     | 515.07             | 28.42           | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00            | 0.00           | 0.00         |
|           |           | 0.00 R       | 0.00               | 0.00            | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00            | 0.00           | 0.00         |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 2.53               | 999.00                       | 1.59                               | 999.00       | HS 31.82 57.3        |
| 5C1T        | 5.45               | 999.00                       | 3.43                               | 999.00       | 0.00 411.9           |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. B11  
Check Point I. D. 1.474

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear     | (-) Shear (+) Shear    |
| 0.0       | 0.0 0.0                |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 339.0             | -260.8                          | 260.8 |
| OPER      | 565.1             | -434.7                          | 434.7 |

## Live Load Effect

Impact Factors: +bend - .000 -bend - .000

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | 0.00                  | 0.00 | 0.00     | 0.00 | 0.00                 | 0.00 | 0.00     | 0.00 |
| OPER      | 5C1T      | 0.00                  | 0.00 | 0.00     | 0.00 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 999.00     | 999.00     | HS 999.00    | 999.0                |
| 5C1T   | 999.00     | 999.00     | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. B11  
Check Point I. D. 1.474Dead Load Moment 340.1  
Superimposed Dead Load Moment 229.1

| Rating Veh. ber | Moment Capacity |              | Available Capacity for LL+I |           |
|-----------------|-----------------|--------------|-----------------------------|-----------|
|                 | top fiber       | bottom fiber | top fiber                   | bottom fi |
|                 | +bend           | -bend        | +bend                       | -bend     |
| INV. 703.6      | 77640.0         | -1328.8      | 2222.2                      | -1134.4   |
| OPER 839.4      | 100569.1        | -2594.1      | 3324.2                      | -2270.2   |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .000

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-------------------------|-----------|-------------------------|----------------------|--------|
| INV.      | HS20       | 866.70 R                | 666.69                  | 28.42     | 0.0                     | 0.00                 | 0.00   |
|           |            | 0.00 R                  | 0.00                    | 0.00      | 0.0                     | 0.00                 | 0.00   |
| OPER      | 5C1T       | 669.59 R                | 515.07                  | 28.42     | 0.0                     | 0.00                 | 0.00   |
|           |            | 0.00 R                  | 0.00                    | 0.00      | 0.0                     | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|------------------------|---------------------------|---------------------------|--------------|----------------------|
| HS20        | 88.92                  | 999.00                    | 1.91                      | 38.15        | 68.7                 |
| 5C1T        | 149.35                 | 999.00                    | 4.11                      | 0.00         | 493.7                |

## BRIDGE / MEMBER DATA

Structure I. D. HAM500

Material of Construction SS  
 Year of Construction 1959  
 Roadway Width 32.000  
 Number of Spans 10

Live Load Distribution Factor 1.143

Second Live Load Dist. Factor 1.143

Comments:

Member I. D. S01 Symmetry:

|              |                  |                  |                  |                  |                   |
|--------------|------------------|------------------|------------------|------------------|-------------------|
| Span Length: | Span 1<br>25.000 | Span 2<br>25.000 | Span 3<br>25.000 | Span 4<br>25.000 | Span 5<br>25.000  |
|              | Span 6<br>25.000 | Span 7<br>25.000 | Span 8<br>25.000 | Span 9<br>25.000 | Span 10<br>25.000 |

| Range<br>Span<br>No. | Length<br>Range<br>No. | -- Non-Composite:<br>Range<br>Length | Section<br>Left | Section<br>Right | Section<br>Variation | Hinge Location<br>No. 1 | Hinge Location<br>No. 2 |
|----------------------|------------------------|--------------------------------------|-----------------|------------------|----------------------|-------------------------|-------------------------|
| 1                    | 1                      | 25.000                               | 1               | 0                |                      | 0.0                     | 0.0                     |
| 2                    | 1                      | 25.000                               | 2               | 0                |                      | 0.0                     | 0.0                     |
| 3                    | 1                      | 25.000                               | 2               | 0                |                      | 0.0                     | 0.0                     |
| 4                    | 1                      | 12.208                               | 2               | 0                |                      | 0.0                     | 0.0                     |
| 4                    | 2                      | 0.583                                | 3               | 0                |                      | 0.0                     | 0.0                     |
| 4                    | 3                      | 12.208                               | 2               | 0                |                      | 0.0                     | 0.0                     |
| 5                    | 1                      | 12.208                               | 2               | 0                |                      | 0.0                     | 0.0                     |
| 5                    | 2                      | 0.583                                | 3               | 0                |                      | 0.0                     | 0.0                     |
| 5                    | 3                      | 12.208                               | 2               | 0                |                      | 0.0                     | 0.0                     |
| 6                    | 1                      | 25.000                               | 2               | 0                |                      | 0.0                     | 0.0                     |
| 7                    | 1                      | 25.000                               | 2               | 0                |                      | 0.0                     | 0.0                     |
| 8                    | 1                      | 10.000                               | 2               | 0                |                      | 0.0                     | 0.0                     |
| 8                    | 2                      | 5.000                                | 3               | 0                |                      | 0.0                     | 0.0                     |
| 8                    | 3                      | 10.000                               | 2               | 0                |                      | 0.0                     | 0.0                     |
| 9                    | 1                      | 25.000                               | 2               | 0                |                      | 0.0                     | 0.0                     |
| 10                   | 1                      | 25.000                               | 1               | 0                |                      | 0.0                     | 0.0                     |

## Superimposed Dead Load:

| Span<br>No. | Load<br>Type | Dist. from<br>Left Supp. | Distributed Load (lbs/ft) |       |        | Concentrated<br>Load (kips) |
|-------------|--------------|--------------------------|---------------------------|-------|--------|-----------------------------|
|             |              |                          | Left                      | Right | Length |                             |
| 1           | W            | 0.000                    | 765.0                     | 765.0 | 25.000 | 0.0                         |
| 1           | P            | 12.500                   | 0.0                       | 0.0   | 0.000  | 0.1                         |
| 2           | W            | 0.000                    | 765.0                     | 765.0 | 25.000 | 0.0                         |
| 2           | P            | 12.500                   | 0.0                       | 0.0   | 0.000  | 0.1                         |
| 3           | W            | 0.000                    | 765.0                     | 765.0 | 25.000 | 0.0                         |
| 3           | P            | 12.500                   | 0.0                       | 0.0   | 0.000  | 0.1                         |
| 4           | W            | 0.000                    | 765.0                     | 765.0 | 25.000 | 0.0                         |
| 4           | P            | 12.500                   | 0.0                       | 0.0   | 0.000  | 0.1                         |
| 5           | W            | 0.000                    | 765.0                     | 765.0 | 25.000 | 0.0                         |
| 5           | P            | 12.500                   | 0.0                       | 0.0   | 0.000  | 0.1                         |

|    |   |        |       |       |        |     |
|----|---|--------|-------|-------|--------|-----|
| 6  | W | 0.000  | 765.0 | 765.0 | 25.000 | 0.0 |
| 6  | P | 12.500 | 0.0   | 0.0   | 0.000  | 0.1 |
| 7  | W | 0.000  | 765.0 | 765.0 | 25.000 | 0.0 |
| 7  | P | 12.500 | 0.0   | 0.0   | 0.000  | 0.1 |
| 8  | W | 0.000  | 765.0 | 765.0 | 25.000 | 0.0 |
| 8  | P | 12.500 | 0.0   | 0.0   | 0.000  | 0.1 |
| 9  | W | 0.000  | 765.0 | 765.0 | 25.000 | 0.0 |
| 9  | P | 12.500 | 0.0   | 0.0   | 0.000  | 0.1 |
| 10 | W | 0.000  | 765.0 | 765.0 | 25.000 | 0.0 |
| 10 | P | 12.500 | 0.0   | 0.0   | 0.000  | 0.1 |

NOTE: All distances are shown in decimal feet, moments are shown in foot-kips, and shears are shown in kips. Section and section properties are shown as: in., in.\*\*2, in.\*\*3, and in.\*\*4.

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 1.000

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.60 | 8.30  | 8.30  | 0.74 | 1.80 |
| 22.7           | 21.20     | 0.460 | bott | 10.60 | 8.30  | 8.30  | 0.74 | 1.80 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.90         | 21.90    | 11.34        | 11.34 | 1840.1            | 1840.1           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 162.3           | 162.3         | 162.3        | 162.3         | 511.17                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 1.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.220 | 0.01     | 0.01  | 46.59 | 23.30 |
| bott | 3.92 | 0.74 | 11.220 | 150.00   | 83.55 |       | 23.30 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.75 | 35.26 | 35.26 | 2.908 | 999999.000 | 92.602 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 511.17 | 109.1                   |
| bott | 22.62            |                   | 0.00 |        | 109.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 184.6     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
 INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
 Check Point I. D. 1.000

Dead Load Moment      Superimposed Dead Load Moment  
 0.0                      0.0

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 235.9C             | -206.0                | 206.0              | -235.9C               | 235.9                       | -206.0                | 206.0              | -235.9                |
| OPER        | 393.2C             | -343.3                | 343.3              | -393.2C               | 393.2                       | -343.3                | 343.3              | -393.2                |

## Live Load Effect

Impact Factors: +bend - .000 -bend - .000

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 0.00         | R                  | 0.00   | 0.00                | 0.0      | 0.00        | 0.00               | 0.00   | 0.00           |              |
|           |           | 0.00         | R                  | 0.00   | 0.00                | 0.0      | 0.00        | 0.00               | 0.00   | 0.00           | 0.00         |
| OPER      | 5C1T      | 0.00         | R                  | 0.00   | 0.00                | 0.0      | 0.00        | 0.00               | 0.00   | 0.00           |              |
|           |           | 0.00         | R                  | 0.00   | 0.00                | 0.0      | 0.00        | 0.00               | 0.00   | 0.00           | 0.00         |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 999.00             | 999.00                       | 999.00                             | 999.00       | 999.0                |
| 5C1T        | 999.00             | 999.00                       | 999.00                             | 999.00       | 999.0                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 1.000

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| 0.8       | 0.0                    |
|           | 7.6                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 110.8             | -90.2                  | 80.2                  |
| OPER      | 184.6             | -150.4                 | 133.6                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -2.43                 | 32.05 | -1.87    | 24.65 | -2.39                | 24.73 | -1.84    | 19.02 |
| OPER      | 5C1T      | -2.21                 | 25.42 | -1.70    | 19.56 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 37.20      | 2.50       | HS 50.04     | 90.1                 |
| 5C1T   | 67.94      | 5.26       | 0.00         | 630.8                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 1.000Dead Load Moment 0.0  
Superimposed Dead Load Moment 0.0

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 214.2      | 214.2           | -214.2 | 214.2        | -214.2 | 214.2                       | -214.2 | 214.2     | - |
| OPER 357.0      | 357.0           | -357.0 | 357.0        | -357.0 | 357.0                       | -357.0 | 357.0     | - |

## Live Load Effect

Impact Factors: +bend - .000 -bend - .000

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-------------------------|------------------------------|----------------------|--------|
| INV.      | HS20       | 0.00 R                  | 0.00                    | 0.00                         | 0.00                 | 0.00   |
|           |            | 0.00 R                  | 0.00                    | 0.00                         | 0.00                 | 0.00   |
| OPER      | 5C1T       | 0.00 R                  | 0.00                    | 0.00                         | 0.00                 | 0.00   |
|           |            | 0.00 R                  | 0.00                    | 0.00                         | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 |                    |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 999.00          | 999.00          | 999.00             | 999.00             | HS 999.00    | 999.0                |
| 5C1T        | 999.00          | 999.00          | 999.00             | 999.00             | 0.00         | 999.0                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 1.100

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.60 | 8.30  | 8.30  | 0.74 | 1.80 |
| 22.7           | 21.20     | 0.460 | bott | 10.60 | 8.30  | 8.30  | 0.74 | 1.80 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.90         | 21.90    | 11.34        | 11.34 | 1840.1            | 1840.1           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 162.3           | 162.3         | 162.3        | 162.3         | 511.17                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 1.100

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.220 | 0.01     | 0.01  | 46.59 | 23.30 |
| bott | 3.92 | 0.74 | 11.220 | 150.00   | 83.55 |       | 23.30 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.75 | 35.26 | 35.26 | 2.908      |
|      |       |       | 999999.000 |
|      |       |       | 92.602     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 511.17 | 109.1                   |
| bott | 22.62            |                   | 0.00 |        | 109.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 184.6     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 1.100

Dead Load Moment 1.6  
Superimposed Dead Load Moment 16.7

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 235.9C          | -206.0             | 206.0           | -235.9C            | 224.9                       | -216.9             | 195.0           | -246.9             |
| OPER        | 393.2C          | -343.3             | 343.3           | -393.2C            | 374.9                       | -361.6             | 324.9           | -411.5             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 66.99 L      | 51.53              | -11.50 | 0.0                 | 41.83    | 32.18       | 2.50               |        |                |              |
|           |           | -6.33 R      | -4.87              | 58.00  | 0.0                 | -4.68    | -3.60       | 35.00              | 0.00   |                |              |
| OPER      | 5C1T      | 54.25 R      | 41.73              | 105.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -5.96 R      | -4.58              | 134.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 3.36            | 34.28                     | 2.91                      | 39.01              | HS 58.21     | 104.8                |
| 5C1T        | 6.91            | 60.70                     | 5.99                      | 69.08              | 0.00         | 718.7                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 1.100

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.6       | 0.0          | 5.7       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 110.8             | -89.0                  | 81.4                  |
| OPER      | 184.6             | -148.3                 | 135.7                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -2.95                 | 26.80 | -2.27    | 20.61 | -3.17                | 21.22 | -2.44    | 16.32 |
| OPER      | 5C1T      | -3.85                 | 21.70 | -2.96    | 16.69 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 28.10      | 3.04       | HS 60.79     | 109.4                |
| 5C1T   | 38.51      | 6.26       | 0.00         | 750.6                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 1.100

Dead Load Moment 1.6  
Superimposed Dead Load Moment 16.7

| Rating Veh. ber | Moment Capacity top fiber |        | Moment Capacity bottom fiber |        | Available Capacity for LL+I |        |           |   |
|-----------------|---------------------------|--------|------------------------------|--------|-----------------------------|--------|-----------|---|
|                 | +bend                     | -bend  | +bend                        | -bend  | top fiber                   | -bend  | bottom fi |   |
| INV. 225.2      | 221.5                     | -206.9 | 221.5                        | -206.9 | 203.2                       | -225.2 | 203.2     | - |
| OPER 375.3      | 357.0                     | -357.0 | 357.0                        | -357.0 | 338.7                       | -375.3 | 338.7     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 66.99 L                 | 51.53                | -11.50      | 0.0       | 41.83                   | 32.18                  | 2.50   |        |
|           |            | -6.33 R                 | -4.87                | 58.00       | 0.0       | -4.68                   | -3.60                  | 35.00  | 0.00   |
| OPER      | 5C1T       | 54.25 R                 | 41.73                | 105.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -5.96 R                 | -4.58                | 134.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor top fiber |       | Rating Factor bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-------------------------|-------|----------------------------|-------|--------------|----------------------|
|             | +bend                   | -bend | +bend                      | -bend |              |                      |
| HS20        | 3.03                    | 35.58 | 3.03                       | 35.58 | HS 60.66     | 109.2                |
| 5C1T        | 6.24                    | 63.00 | 6.24                       | 63.00 | 0.00         | 749.1                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 1.200

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.60 | 8.30  | 8.30  | 0.74 | 1.80 |
| 22.7           | 21.20     | 0.460 | bott | 10.60 | 8.30  | 8.30  | 0.74 | 1.80 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.90         | 21.90    | 11.34        | 11.34 | 1840.1            | 1840.1           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 162.3           | 162.3         | 162.3        | 162.3         | 511.17                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 1.200

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.220 | 0.01     | 0.01  | 46.59 | 23.30 |
| bott | 3.92 | 0.74 | 11.220 | 150.00   | 83.55 |       | 23.30 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.75 | 35.26 | 35.26 | 2.908 | 999999.000 | 92.602 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 511.17 | 109.1                   |
| bott | 22.62            |                   | 0.00 |        | 109.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 184.6     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 1.200

Dead Load Superimposed Dead Load  
Moment Moment  
2.8 28.6

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 235.9C             | -206.0                | 206.0              | -235.9C               | 217.1                       | -224.8                | 187.1              | -254.8                |
| OPER        | 393.2C             | -343.3                | 343.3              | -393.2C               | 361.8                       | -374.6                | 311.9              | -424.6                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 109.03 L     | 83.87              | -9.00  | 0.0                 | 71.50    | 55.00       | 5.00               |        |                |              |
|           |           | -12.66 R     | -9.74              | 58.00  | 0.0                 | -9.35    | -7.19       | 35.00              | 0.00   |                |              |
| OPER      | 5C1T      | 90.31 R      | 69.47              | 108.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -11.91 R     | -9.16              | 134.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 1.99               | 17.76                        | 1.72                               | 20.12        | HS 34.32 61.8        |
| 5C1T        | 4.01               | 31.45                        | 3.45                               | 35.64        | 0.00 414.4           |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 1.200

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.4       | 0.0          | 3.8       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 110.8             | -87.7                  | 82.7                  |
| OPER      | 184.6             | -146.2                 | 137.8                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -5.86                 | 21.81 | -4.51    | 16.77 | -5.75                | 17.88 | -4.43    | 13.76 |
| OPER      | 5C1T      | -5.83                 | 18.06 | -4.48    | 13.89 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 14.97      | 3.79       | HS 75.85     | 136.5                |
| 5C1T   | 25.09      | 7.63       | 0.00         | 915.7                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 1.200

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| 2.8                 | 28.6                             |

| Rating<br>Veh.<br>ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                       | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend                  | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV.<br>233.0         | 226.7           | -201.6 | 226.7        | -201.6 | 195.4                       | -233.0 | 195.4     | - |
| OPER<br>388.4         | 357.0           | -357.0 | 357.0        | -357.0 | 325.6                       | -388.4 | 325.6     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Truck<br>Veh. | Live Load Moment<br>w/imp. | Moment<br>w/o imp. | Loc. of Ax.<br>Front<br>Wheel | Lane<br>Dis. | Live Load Moment<br>w/imp. | Moment<br>w/o imp. | Loc. of Conc.<br>Load 1 | Load 2 |
|--------------|---------------|----------------------------|--------------------|-------------------------------|--------------|----------------------------|--------------------|-------------------------|--------|
| INV.         | HS20          | 109.03 L                   | 83.87              | -9.00                         | 0.0          | 71.50                      | 55.00              | 5.00                    |        |
|              |               | -12.66 R                   | -9.74              | 58.00                         | 0.0          | -9.35                      | -7.19              | 35.00                   | 0.00   |
| OPER         | 5C1T          | 90.31 R                    | 69.47              | 108.00                        | 0.0          | 0.00                       | 0.00               | 0.00                    |        |
|              |               | -11.91 R                   | -9.16              | 134.00                        | 0.0          | 0.00                       | 0.00               | 0.00                    | 0.00   |

## Serviceability

| Rating<br>Veh. | Rating       |                | Factor          |                | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------|----------------|-----------------|----------------|-----------------|----------------------------|
|                | top<br>+bend | fiber<br>-bend | bottom<br>+bend | fiber<br>-bend |                 |                            |
| HS20           | 1.79         | 18.41          | 1.79            | 18.41          | HS 35.83        | 64.5                       |
| 5C1T           | 3.61         | 32.60          | 3.61            | 32.60          | 0.00            | 432.6                      |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 1.300

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.60 | 8.30  | 8.30  | 0.74 | 1.80 |
| 22.7           | 21.20     | 0.460 | bott | 10.60 | 8.30  | 8.30  | 0.74 | 1.80 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.90         | 21.90    | 11.34        | 11.34 | 1840.1            | 1840.1           |

| Section Modulus      |               |                      |               | Plastic Section      |
|----------------------|---------------|----------------------|---------------|----------------------|
| Positive Bending Top | Bending Bott. | Negative Bending Top | Bending Bott. | Modulus - Z (Fy * Z) |
| 162.3                | 162.3         | 162.3                | 162.3         | 511.17               |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 1.300

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.220 | 0.01     | 0.01  | 46.59 | 23.30 |
| bott | 3.92 | 0.74 | 11.220 | 150.00   | 83.55 |       | 23.30 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.75 | 35.26 | 35.26 | 2.908 | 999999.000 | 92.602 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 511.17 | 109.1                   |
| bott | 22.62            |                   | 0.00 |        | 109.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 184.6     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 1.300

Dead Load Moment 3.5  
Superimposed Dead Load Moment 35.7

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 235.9C          | -206.0             | 206.0           | -235.9C            | 212.4                       | -229.5             | 182.4           | -259.5             |
| OPER        | 393.2C          | -343.3             | 343.3           | -393.2C            | 354.0                       | -382.5             | 304.0           | -432.4             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Load Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Load Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|-------------|---------------------|----------|-------------|--------------------|-------------|----------------|--------------|
| INV.      | HS20      | 128.61 L     | 98.93              | -6.50       | 0.0                 | 91.30    | 70.23       | 7.50               |             |                |              |
|           |           | -18.99 R     | -14.61             | 58.00       | 0.0                 | -14.03   | -10.79      | 35.00              | 0.00        |                |              |
| OPER      | 5C1T      | 109.28 R     | 84.06              | 110.50      | 0.0                 | 0.00     | 0.00        | 0.00               |             |                |              |
|           |           | -17.87 R     | -13.75             | 134.00      | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00        | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 1.65            | 12.09                     | 1.42                      | 13.66              | HS 28.37     | 51.1                 |
| 5C1T        | 3.24            | 21.40                     | 2.78                      | 24.20              | 0.00         | 333.9                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 1.300Dead Load Superimposed Dead Load  
Shear (-) Shear (+) Shear

0.2 0.0 1.9

Rat. Shear Capacity Available Capacity for LL+I  
Veh. VU (-) (+)INV. 110.8 -86.5 84.0  
OPER 184.6 -144.1 139.9

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -8.70                 | 17.15 | -6.69    | 13.19 | -8.43                | 14.75 | -6.48    | 11.35 |
| OPER      | 5C1T      | -8.58                 | 14.57 | -6.60    | 11.21 | 0.00                 | 0.00  | 0.00     | 0.00  |

## Rating Shear

| Veh. | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
|------|------------|------------|--------------|----------------------|
| HS20 | 9.94       | 4.90       | HS 97.92     | 176.3                |
| 5C1T | 16.80      | 9.60       | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 1.300

Dead Load Moment 3.5  
Superimposed Dead Load Moment 35.7

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 237.7      | 229.9           | -198.5 | 229.9        | -198.5 | 190.7                       | -237.7 | 190.7     | - |
| OPER 396.2      | 357.0           | -357.0 | 357.0        | -357.0 | 317.8                       | -396.2 | 317.8     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 128.61 L                | 98.93           | -6.50                   | 0.0       | 91.30                   | 70.23           | 7.50                 |        |
|           |            | -18.99 R                | -14.61          | 58.00                   | 0.0       | -14.03                  | -10.79          | 35.00                | 0.00   |
| OPER      | 5C1T       | 109.28 R                | 84.06           | 110.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -17.87 R                | -13.75          | 134.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.48            | 12.52           | 1.48               | 12.52              | HS 29.65     | 53.4                 |
| 5C1T        | 2.91            | 22.17           | 2.91               | 22.17              | 0.00         | 349.0                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 1.400

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.60 | 8.30  | 8.30  | 0.74 | 1.80 |
| 22.7           | 21.20     | 0.460 | bott | 10.60 | 8.30  | 8.30  | 0.74 | 1.80 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.90         | 21.90    | 11.34        | 11.34 | 1840.1            | 1840.1           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 162.3           | 162.3         | 162.3        | 162.3         | 511.17                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 1.400

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.220 | 0.01     | 0.01  | 46.59 | 23.30 |
| bott | 3.92 | 0.74 | 11.220 | 150.00   | 83.55 |       | 23.30 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.75 | 35.26 | 35.26 | 2.908      |
|      |       |       | 999999.000 |
|      |       |       | 92.602     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 511.17 | 109.1                   |
| bott | 22.62            |                   | 0.00 |        | 109.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 184.6     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 1.400

Dead Load Moment 3.8  
Superimposed Dead Load Moment 38.0

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 235.9C          | -206.0             | 206.0           | -235.9C            | 210.8                       | -231.0             | 180.9           | -261.0             |
| OPER        | 393.2C          | -343.3             | 343.3           | -393.2C            | 351.4                       | -385.0             | 301.5           | -435.0             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 128.91 L     | 99.16              | -4.00  | 0.0                 | 99.72    | 76.71       | 10.00              |        |                |              |
|           |           | -25.32 R     | -19.48             | 58.00  | 0.0                 | -18.71   | -14.39      | 35.00              | 0.00   |                |              |
| OPER      | 5C1T      | 115.86 R     | 89.12              | 109.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -23.83 R     | -18.33             | 134.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 1.64            | 9.12                      | 1.40                      | 10.31              | HS 28.06     | 50.5                 |
| 5C1T        | 3.03            | 16.16                     | 2.60                      | 18.26              | 0.00         | 312.2                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 1.400

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.0       | -0.1         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 110.8             | -85.2                  | 85.2                  |
| OPER      | 184.6             | -142.0                 | 142.0                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |      | Lane Live Load Shear |       |          |      |
|-----------|-----------|-----------------------|-------|----------|------|----------------------|-------|----------|------|
|           |           | w/imp.                |       | w/o imp. |      | w/imp.               |       | w/o imp. |      |
|           |           | (-)                   | (+)   | (-)      | (+)  | (-)                  | (+)   | (-)      | (+)  |
| INV.      | HS20      | -11.44                | 12.89 | -8.80    | 9.92 | -11.16               | 11.84 | -8.58    | 9.11 |
| OPER      | 5C1T      | -11.14                | 11.43 | -8.57    | 8.79 | 0.00                 | 0.00  | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 7.45       | 6.61       | HS 132.23    | 238.0                |
| 5C1T   | 12.75      | 12.43      | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 1.400

Dead Load Moment 3.8  
Superimposed Dead Load Moment 38.0

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 239.3      | 230.9           | -197.5 | 230.9        | -197.5 | 189.1                       | -239.3 | 189.1     | - |
| OPER 398.8      | 357.0           | -357.0 | 357.0        | -357.0 | 315.2                       | -398.8 | 315.2     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 128.91 L                | 99.16                | -4.00       | 0.0       | 99.72                   | 76.71                  | 10.00  |        |
|           |            | -25.32 R                | -19.48               | 58.00       | 0.0       | -18.71                  | -14.39                 | 35.00  | 0.00   |
| OPER      | 5C1T       | 115.86 R                | 89.12                | 109.00      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -23.83 R                | -18.33               | 134.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.47            | 9.45  | 1.47         | 9.45  | HS 29.34     | 52.8                 |
| 5C1T        | 2.72            | 16.74 | 2.72         | 16.74 | 0.00         | 326.5                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 1.500

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.60 | 8.30  | 8.30  | 0.74 | 1.80 |
| 22.7           | 21.20     | 0.460 | bott | 10.60 | 8.30  | 8.30  | 0.74 | 1.80 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.90         | 21.90    | 11.34        | 11.34 | 1840.1            | 1840.1           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 162.3           | 162.3         | 162.3        | 162.3         | 511.17                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 1.500

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.220 | 0.01     | 0.01  | 46.59 | 23.30 |
| bott | 3.92 | 0.74 | 11.220 | 150.00   | 83.55 |       | 23.30 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.69 | 35.26 | 35.26 | 2.908      |
|      |       |       | 999999.000 |
|      |       |       | 89.412     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 511.17 | 109.1                   |
| bott | 22.62            |                   | 13.80 |        | 107.3                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 184.6     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 1.500

Dead Load Moment 3.6  
Superimposed Dead Load Moment 35.6

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 235.9C          | -206.0             | 206.0           | -235.9C            | 212.5                       | -229.4             | 182.5           | -259.4             |
| OPER        | 393.2C          | -343.3             | 343.3           | -393.2C            | 354.1                       | -382.4             | 304.1           | -432.3             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 121.64 L     | 93.57              | -15.50 | 0.0                 | 99.42    | 76.48       | 12.50              |        |                |              |
|           |           | -31.65 R     | -24.34             | 58.00  | 0.0                 | -23.38   | -17.99      | 35.00              | 0.00   |                |              |
| OPER      | 5C1T      | 114.72 R     | 88.25              | 111.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -29.78 R     | -22.91             | 134.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | Rating Factor   |                    | Load Capacity (tons) |                    | Rating Value |
|-------------|-----------------|--------------------|----------------------|--------------------|--------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend      | bottom fiber -bend |              |
| HS20        | 1.75            | 7.25               | 1.50                 | 8.20               | HS 30.00     |
| 5C1T        | 3.09            | 12.84              | 2.65                 | 14.52              | 0.00 318.1   |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 1.500

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.2      | -2.0         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 110.8             | -83.9                  | 86.5         |
| OPER      | 184.6             | -139.9                 | 144.1        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -15.05                | 9.73 | -11.58   | 7.49 | -13.91               | 9.18 | -10.70   | 7.06 |
| OPER      | 5C1T      | -13.54                | 8.85 | -10.41   | 6.81 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 5.58       | 8.89       | HS 111.54    | 200.8                |
| 5C1T   | 10.34      | 16.28      | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 1.500

Dead Load Moment 3.6  
Superimposed Dead Load Moment 35.6

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 237.7      | 229.8           | -198.5 | 229.8        | -198.5 | 190.7                       | -237.7 | 190.7     | - |
| OPER 396.1      | 357.0           | -357.0 | 357.0        | -357.0 | 317.9                       | -396.1 | 317.9     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |        |       |      |
|-----------|------------|-------------------------|-------------------------|------------------------------|----------------------|--------|--------|-------|------|
| INV.      | HS20       | 121.64 L                | 93.57                   | -15.50                       | 0.0                  | 99.42  | 76.48  | 12.50 | 0.00 |
|           |            | -31.65 R                | -24.34                  | 58.00                        | 0.0                  | -23.38 | -17.99 | 35.00 | 0.00 |
| OPER      | 5C1T       | 114.72 R                | 88.25                   | 111.50                       | 0.0                  | 0.00   | 0.00   | 0.00  | 0.00 |
|           |            | -29.78 R                | -22.91                  | 134.00                       | 0.0                  | 0.00   | 0.00   | 0.00  | 0.00 |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.57            | 7.51            | 1.57               | 7.51               | HS 31.36     | 56.4                 |
| 5C1T        | 2.77            | 13.30           | 2.77               | 13.30              | 0.00         | 332.5                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 1.600

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.60 | 8.30  | 8.30  | 0.74 | 1.80 |
| 22.7           | 21.20     | 0.460 | bott | 10.60 | 8.30  | 8.30  | 0.74 | 1.80 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.90         | 21.90    | 11.34        | 11.34 | 1840.1            | 1840.1           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 162.3           | 162.3         | 162.3        | 162.3         | 511.17                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 1.600

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.220 | 0.01     | 0.01  | 46.59 | 23.30 |
| bott | 3.92 | 0.74 | 11.220 | 150.00   | 83.55 |       | 23.30 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.69 | 35.26 | 35.26 | 2.908      |
|      |       |       | 999999.000 |
|      |       |       | 89.412     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 511.17 | 109.1                   |
| bott | 22.62            |                   | 13.80 |        | 107.3                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 184.6     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 1.600

Dead Load Moment 2.9  
Superimposed Dead Load Moment 28.2

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 235.9C          | -206.0             | 206.0           | -235.9C            | 217.3                       | -224.6             | 187.3           | -254.5             |
| OPER        | 393.2C          | -343.3             | 343.3           | -393.2C            | 362.2                       | -374.3             | 312.2           | -424.2             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment  | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|---------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 115.62 L     | 88.94              | -13.00  | 0.0                 | 89.30    | 68.69       | 15.00              |        |                |              |
|           |           | -37.98 R     | -29.21             | 58.00   | 0.0                 | -28.06   | -21.58      | 35.00              | 0.00   |                |              |
| OPER      | 5C1T      | 105.10 L     | 80.85              | -123.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -35.74 R     | -27.49             | 134.00  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 1.88            | 5.91                      | 1.62                      | 6.70               | HS 32.40     | 58.3                 |
| 5C1T        | 3.45            | 10.47                     | 2.97                      | 11.87              | 0.00         | 356.5                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 1.600

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| -0.4      | -3.9                   |
|           | 0.0                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 110.8             | -82.6                  | 87.8                  |
| OPER      | 184.6             | -137.7                 | 146.3                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -18.18                | 6.12 | -13.99   | 4.71 | -16.65               | 6.78 | -12.80   | 5.21 |
| OPER      | 5C1T      | -15.79                | 6.42 | -12.15   | 4.94 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 4.55       | 12.95      | HS 90.90     | 163.6                |  |
| 5C1T   | 8.72       | 22.78      | 0.00         | 999.0                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 1.600

Dead Load Moment 2.9  
Superimposed Dead Load Moment 28.2

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 232.8      | 226.6           | -201.8 | 226.6        | -201.8 | 195.6                       | -232.8 | 195.6     | - |
| OPER 388.0      | 357.0           | -357.0 | 357.0        | -357.0 | 325.9                       | -388.0 | 325.9     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-------------------------|------------------------------|----------------------|--------|
| INV.      | HS20       | 115.62 L                | 88.94                   | -13.00                       | 0.0                  | 89.30  |
|           |            | -37.98 R                | -29.21                  | 58.00                        | 0.0                  | -28.06 |
| OPER      | 5C1T       | 105.10 L                | 80.85                   | -123.00                      | 0.0                  | 0.00   |
|           |            | -35.74 R                | -27.49                  | 134.00                       | 0.0                  | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                    | Rating Value    |                    | Load Capacity (tons) |
|-------------|-----------------|--------------------|-----------------|--------------------|----------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend |                      |
| HS20        | 1.69            | 6.13               | 1.69            | 6.13               | HS 33.83             |
| 5C1T        | 3.10            | 10.86              | 3.10            | 10.86              | 0.00 372.1           |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 1.700

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.60 | 8.30  | 8.30  | 0.74 | 1.80 |
| 22.7           | 21.20     | 0.460 | bott | 10.60 | 8.30  | 8.30  | 0.74 | 1.80 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.90         | 21.90    | 11.34        | 11.34 | 1840.1            | 1840.1           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 162.3           | 162.3         | 162.3        | 162.3         | 511.17                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 1.700

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.220 | 0.01     | 0.01  | 46.59 | 23.30 |
| bott | 3.92 | 0.74 | 11.220 | 150.00   | 83.55 |       | 23.30 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.69 | 35.26 | 35.26 | 2.908      |
|      |       |       | 999999.000 |
|      |       |       | 89.412     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 511.17 | 109.1                   |
| bott | 22.62            |                   | 13.80 |        | 107.3                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 184.6     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 1.700

Dead Load Moment 1.7  
Superimposed Dead Load Moment 16.0

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 235.9C             | -206.0                | 206.0              | -235.9C               | 225.3                       | -216.6                | 195.3              | -246.6                |
| OPER        | 393.2C             | -343.3                | 343.3              | -393.2C               | 375.5                       | -361.0                | 325.5              | -410.9                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment  | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|---------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 100.15 L     | 77.04              | -10.50  | 0.0                 | 72.40    | 55.69       | 17.50              |        |                |              |
|           |           | -44.31 R     | -34.08             | 58.00   | 0.0                 | -34.21   | -26.32      | 35.00              |        | 85.00          |              |
| OPER      | 5C1T      | 86.88 L      | 66.83              | -120.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -41.70 R     | -32.08             | 134.00  | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 2.25               | 4.89                         | 1.95            | 5.57                  | HS 39.00     | 70.2                 |
| 5C1T        | 4.32               | 8.66                         | 3.75            | 9.85                  | 0.00         | 449.6                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 1.700

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| -0.6      | -5.8                   |
|           | 0.0                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 110.8             | -81.4                  | 89.0                  |
| OPER      | 184.6             | -135.6                 | 148.4                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -23.28                | 3.02 | -17.90   | 2.32 | -19.33               | 4.66 | -14.87   | 3.59 |
| OPER      | 5C1T      | -18.59                | 4.35 | -14.30   | 3.35 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 3.50       | 19.09      | HS 69.93     | 125.9                |  |
| 5C1T   | 7.30       | 34.10      | 0.00         | 875.7                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 1.700

Dead Load Moment 1.7  
Superimposed Dead Load Moment 16.0

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 224.8      | 221.3           | -207.1 | 221.3        | -207.1 | 203.6                       | -224.8 | 203.6     | - |
| OPER 374.7      | 357.0           | -357.0 | 357.0        | -357.0 | 339.3                       | -374.7 | 339.3     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 100.15 L                | 77.04                | -10.50      | 0.0       | 72.40                   | 55.69                  | 17.50  |        |
|           |            | -44.31 R                | -34.08               | 58.00       | 0.0       | -34.21                  | -26.32                 | 35.00  | 85.00  |
| OPER      | 5C1T       | 86.88 L                 | 66.83                | -120.50     | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -41.70 R                | -32.08               | 134.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 2.03            | 5.07            | 2.03               | 5.07               | HS 40.65     | 73.2                 |
| 5C1T        | 3.90            | 8.99            | 3.90               | 8.99               | 0.00         | 468.6                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 1.800

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.60 | 8.30  | 8.30  | 0.74 | 1.80 |
| 22.7           | 21.20     | 0.460 | bott | 10.60 | 8.30  | 8.30  | 0.74 | 1.80 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.90         | 21.90    | 11.34        | 11.34 | 1840.1            | 1840.1           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 162.3           | 162.3         | 162.3        | 162.3         | 511.17                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 1.800

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.220 | 0.01     | 0.01  | 46.59 | 23.30 |
| bott | 3.92 | 0.74 | 11.220 | 150.00   | 83.55 |       | 23.30 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.69 | 35.26 | 35.26 | 2.908 | 999999.000 | 89.412 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 511.17 | 109.1                   |
| bott | 22.62            |                   | 13.80 |        | 107.3                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 184.6     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 1.800

Dead Load Moment 0.1  
Superimposed Dead Load Moment -1.0

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 235.9C          | -206.0             | 206.0           | -235.9C            | 236.4                       | -205.4             | 206.5           | -235.4             |
| OPER        | 393.2C          | -343.3             | 343.3           | -393.2C            | 394.1                       | -342.4             | 344.1           | -392.3             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 64.71 L      | 49.77              | -8.00  | 0.0                 | 48.01    | 36.93       | 20.00              |        |                |              |
|           |           | -50.64 R     | -38.95             | 58.00  | 0.0                 | -39.10   | -30.08      | 35.00              | 85.00  |                |              |
| OPER      | 5C1T      | 59.64 R      | 45.88              | 154.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -47.66 R     | -36.66             | 134.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber +bend | bottom fiber -bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|--------|--------------|----------------------|
| HS20        | 3.65            | 4.06               | 3.19   | 63.82        | 114.9                |
| 5C1T        | 6.61            | 7.18               | 5.77   | 0.00         | 692.4                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 1.800

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.7      | -7.7         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 110.8             | -80.1                  | 90.3                  |
| OPER      | 184.6             | -133.5                 | 150.5                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -28.19                | 0.97 | -21.68   | 0.75 | -21.93               | 2.85 | -16.87   | 2.19 |
| OPER      | 5C1T      | -21.69                | 2.57 | -16.68   | 1.98 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 2.84       | 31.69      | HS 56.85     | 102.3                |
| 5C1T   | 6.16       | 58.45      | 0.00         | 738.9                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
 INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
 Check Point I. D. 1.800

Dead Load Moment      Superimposed Dead Load Moment  
 0.1                      -1.0

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 213.7      | 213.8           | -214.5 | 213.8        | -214.5 | 214.7                       | -213.7 | 214.7     | - |
| OPER 356.1      | 357.0           | -357.0 | 357.0        | -357.0 | 357.9                       | -356.1 | 357.9     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 64.71 L                 | 49.77                | -8.00       | 0.0       | 48.01                   | 36.93                  | 20.00  |        |
|           |            | -50.64 R                | -38.95               | 58.00       | 0.0       | -39.10                  | -30.08                 | 35.00  | 85.00  |
| OPER      | 5C1T       | 59.64 R                 | 45.88                | 154.00      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -47.66 R                | -36.66               | 134.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | +bend        | -bend |              |                      |
| HS20        | 3.32            | 4.22            | 3.32         | 4.22  | HS 66.36     | 119.5                |
| 5C1T        | 6.00            | 7.47            | 6.00         | 7.47  | 0.00         | 720.0                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 1.900

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.60 | 8.30  | 8.30  | 0.74 | 1.80 |
| 22.7           | 21.20     | 0.460 | bott | 10.60 | 8.30  | 8.30  | 0.74 | 1.80 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.90         | 21.90    | 11.34        | 11.34 | 1840.1            | 1840.1           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 162.3           | 162.3         | 162.3        | 162.3         | 511.17                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 1.900

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.220 | 0.01     | 0.01  | 46.59 | 23.30 |
| bott | 3.92 | 0.74 | 11.220 | 150.00   | 83.55 |       | 23.30 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.69 | 35.26 | 35.26 | 2.908      |
|      |       |       | 999999.000 |
|      |       |       | 89.412     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 511.17 | 109.1                   |
| bott | 22.62            |                   | 13.80 |        | 107.3                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 184.6     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 1.900

Dead Load Moment      Superimposed Dead Load Moment  
-2.0                      -22.7

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 235.9C             | -206.0                | 206.0              | -235.9C               | 250.7                       | -191.1                | 220.8              | -221.1                |
| OPER        | 393.2C             | -343.3                | 343.3              | -393.2C               | 417.9                       | -318.6                | 367.9              | -368.5                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 13.00        | L                  | 10.00  | -5.50               | 0.0      | 23.86       | 18.36              | 22.50  |                |              |
|           |           | -62.58       | L                  | -48.14 | 16.00               | 0.0      | -57.86      | -44.51             | 35.00  | 10.00          |              |
| OPER      | 5C1T      | 30.74        | R                  | 23.65  | 156.50              | 0.0      | 0.00        | 0.00               | 0.00   |                |              |
|           |           | -55.33       | L                  | -42.56 | -98.00              | 0.0      | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 10.51              | 3.05                         | 9.25            | 3.53                  | HS 61.09     | 110.0                |
| 5C1T        | 13.59              | 5.76                         | 11.97           | 6.66                  | 0.00         | 690.9                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 1.900

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.9      | -9.6         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 110.8             | -78.9                  | 91.6                  |
| OPER      | 184.6             | -131.4                 | 152.6                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -32.68                | 0.65 | -25.14   | 0.50 | -24.39               | 1.35 | -18.76   | 1.04 |
| OPER      | 5C1T      | -24.61                | 1.05 | -18.93   | 0.81 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 2.41       | 67.60      | HS 48.27     | 86.9                 |
| 5C1T   | 5.34       | 145.78     | 0.00         | 640.9                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 1.900

Dead Load Moment      Superimposed Dead Load Moment  
-2.0                      -22.7

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 199.4      | 204.3           | -224.1 | 204.3        | -224.1 | 229.0                       | -199.4 | 229.0     | - |
| OPER 332.3      | 357.0           | -357.0 | 357.0        | -357.0 | 381.7                       | -332.3 | 381.7     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 13.00 L                 | 10.00                | -5.50       | 0.0       | 23.86                   | 18.36                  | 22.50  |        |
|           |            | -62.58 L                | -48.14               | 16.00       | 0.0       | -57.86                  | -44.51                 | 35.00  | 10.00  |
| OPER      | 5C1T       | 30.74 R                 | 23.65                | 156.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -55.33 L                | -42.56               | -98.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 9.60            | 3.19  | 9.60         | 3.19  | HS 63.72     | 114.7                |
| 5C1T        | 12.42           | 6.01  | 12.42        | 6.01  | 0.00         | 720.7                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 2.000

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Depth | Web Thk. |      | Dc    | b max | b min | t    | ry   |
|----------------|-------|----------|------|-------|-------|-------|------|------|
| H              | D     | tw       | top  | 10.60 | 8.30  | 8.30  | 0.74 | 1.80 |
| 22.7           | 21.20 | 0.460    | bott | 10.60 | 8.30  | 8.30  | 0.74 | 1.80 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.90         | 21.90    | 11.34        | 11.34 | 1840.1            | 1840.1           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 162.3           | 162.3         | 162.3        | 162.3         | 511.17                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 2.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.220 | 0.01     | 0.01  | 46.59 | 23.30 |
| bott | 3.92 | 0.74 | 11.220 | 150.00   | 83.55 |       | 23.30 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.69 | 35.26 | 35.26 | 2.908 | 999999.000 | 89.412 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 511.17 | 109.1                   |
| bott | 22.62            |                   | 13.80 |        | 107.3                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 184.6     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 2.000

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -4.5                | -49.2                            |

| Rating<br>Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|----------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|                | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.           | 195.0C             | -170.5                | 170.5              | -195.0C               | 227.3                       | -138.2                | 202.7              | -162.7                |
| OPER           | 325.0C             | -284.1                | 284.1              | -325.0C               | 378.8                       | -230.3                | 337.9              | -271.2                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Rat.<br>Veh. | Truck<br>w/imp. | Live Load<br>w/o imp. | Moment | Loc. of<br>Front<br>Wheel | Ax.<br>Dis. | Lane<br>w/imp. | Live Load<br>w/o imp. | Moment | Loc. of<br>Load 1 | Conc.<br>Load 2 |
|--------------|--------------|-----------------|-----------------------|--------|---------------------------|-------------|----------------|-----------------------|--------|-------------------|-----------------|
| INV.         | HS20         | 16.96 R         | 13.05                 | 83.00  | 0.0                       | 12.53       | 9.64           | 60.00                 |        |                   |                 |
|              |              | -103.87 L       | -79.90                | 4.50   | 0.0                       | -95.78      | -73.68         | 15.00                 |        | 35.00             |                 |
| OPER         | 5C1T         | 13.11 R         | 10.09                 | 285.00 | 0.0                       | 0.00        | 0.00           | 0.00                  |        |                   |                 |
|              |              | -76.69 L        | -58.99                | -94.00 | 0.0                       | 0.00        | 0.00           | 0.00                  |        | 0.00              |                 |

## Moment

| Rating<br>Veh. | top fiber<br>+bend | Rating<br>bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------------|---------------------------------|-----------------|-----------------------|-----------------|----------------------------|
| HS20           | 13.40              | 1.33                            | 11.95           | 1.57                  | HS 26.61        | 47.9                       |
| 5C1T           | 28.89              | 3.00                            | 25.77           | 3.54                  | 0.00            | 360.4                      |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 2.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.9      | -1.1      | -9.6                   | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 96.5              | -77.6                           | 67.6  |
| OPER      | 160.8             | -129.3                          | 112.7 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -32.68                | 34.97 | -25.14   | 26.90 | -24.39               | 26.43 | -18.76   | 20.33 |
| OPER      | 5C1T      | -24.61                | 27.16 | -18.93   | 20.89 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 2.12       | 1.93       | HS 38.68     | 69.6                 |
| 5C1T   | 4.74       | 4.15       | 0.00         | 498.2                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 2.000

Dead Load Moment      Superimposed Dead Load Moment  
-4.5                      -49.2

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 145.0      | 155.8           | -198.8 | 155.8        | -198.8 | 209.5                       | -145.0 | 209.5     | - |
| OPER 241.7      | 295.5           | -295.5 | 295.5        | -295.5 | 349.2                       | -241.7 | 349.2     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 16.96 R                 | 13.05                | 83.00       | 0.0       | 12.53                   | 9.64                   | 60.00  |        |
|           |            | -103.87 L               | -79.90               | 4.50        | 0.0       | -95.78                  | -73.68                 | 15.00  | 35.00  |
| OPER      | 5C1T       | 13.11 R                 | 10.09                | 285.00      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -76.69 L                | -58.99               | -94.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 12.35           | 1.40            | 12.35              | 1.40               | HS 27.92     | 50.3                 |
| 5C1T        | 26.64           | 3.15            | 26.64              | 3.15               | 0.00         | 378.2                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 2.000

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 2.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.69 | 28.67 | 28.67 | 1.726 | 999999.000 | 83.795 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 41.42 |        | 102.6                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 2.000

Dead Load Superimposed Dead Load  
Moment Moment  
-4.5 -49.2

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 195.0C             | -170.5                | 170.5              | -195.0C               | 227.3                       | -138.2                | 202.7              | -162.7                |
| OPER        | 325.0C             | -284.1                | 284.1              | -325.0C               | 378.8                       | -230.3                | 337.9              | -271.2                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.96 R      | 13.05              | 83.00  | 0.0                 | 12.53    | 9.64        | 60.00              |        |                |              |
|           |           | -103.87 L    | -79.90             | 4.50   | 0.0                 | -95.78   | -73.68      | 15.00              |        | 35.00          |              |
| OPER      | 5C1T      | 13.11 R      | 10.09              | 285.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -76.69 L     | -58.99             | -94.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|--------|--------------|----------------------|
| HS20        | 13.40              | 1.33                         | 11.95  | 1.57         | 26.61                |
| 5C1T        | 28.89              | 3.00                         | 25.77  | 3.54         | 0.00                 |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 2.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -1.1      | 0.9       | -11.6                  | 10.1      |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I |       |
|-----------|-------------------|-----------------------------|-------|
|           |                   | (-)                         | (+)   |
| INV.      | 96.5              | -77.6                       | 67.6  |
| OPER      | 160.8             | -129.3                      | 112.7 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -36.70                | 34.97 | -28.23   | 26.90 | -26.68               | 26.43 | -20.52   | 20.33 |
| OPER      | 5C1T      | -27.30                | 27.16 | -21.00   | 20.89 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 2.12       | 1.93       | HS 38.68     | 69.6                 |
| 5C1T   | 4.74       | 4.15       | 0.00         | 498.2                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 2.000

Dead Load Moment      Superimposed Dead Load Moment  
-4.5                      -49.2

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 145.0      | 155.8           | -198.8 | 155.8        | -198.8 | 209.5                       | -145.0 | 209.5     | - |
| OPER 241.7      | 295.5           | -295.5 | 295.5        | -295.5 | 349.2                       | -241.7 | 349.2     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 16.96 R                 | 13.05           | 83.00                   | 0.0       | 12.53                   | 9.64            | 60.00                |        |
|           |            | -103.87 L               | -79.90          | 4.50                    | 0.0       | -95.78                  | -73.68          | 15.00                | 35.00  |
| OPER      | 5C1T       | 13.11 R                 | 10.09           | 285.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -76.69 L                | -58.99          | -94.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 12.35           | 1.40  | 12.35        | 1.40  | HS 27.92     | 50.3                 |
| 5C1T        | 26.64           | 3.15  | 26.64        | 3.15  | 0.00         | 378.2                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 2.100

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 2.100

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.97 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 97.439     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 41.42 |        | 102.6                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 2.100

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -2.6                | -26.4                            |

| Rating<br>Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|----------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|                | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.           | 195.0C             | -170.5                | 170.5              | -195.0C               | 212.4                       | -153.0                | 187.9              | -177.6                |
| OPER           | 325.0C             | -284.1                | 284.1              | -325.0C               | 354.0                       | -255.1                | 313.1              | -296.0                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Rat.<br>Veh. | Truck<br>w/imp. | Live Load<br>w/o imp. | Moment | Loc. of<br>Front<br>Wheel | Ax.<br>Dis. | Lane<br>w/imp. | Live Load<br>w/o imp. | Moment | Loc. of<br>Load 1 | Conc.<br>Load 2 |
|--------------|--------------|-----------------|-----------------------|--------|---------------------------|-------------|----------------|-----------------------|--------|-------------------|-----------------|
| INV.         | HS20         | 14.60           | R                     | 11.23  | 55.50                     | 0.0         | 21.36          | 16.43                 | 27.50  |                   |                 |
|              |              | -67.25          | R                     | -51.73 | 34.00                     | 0.0         | -58.47         | -44.98                | 15.00  | 37.50             |                 |
| OPER         | 5C1T         | 21.63           | R                     | 16.64  | 252.50                    | 0.0         | 0.00           | 0.00                  | 0.00   |                   |                 |
|              |              | -55.94          | L                     | -43.03 | -3.50                     | 0.0         | 0.00           | 0.00                  | 0.00   | 0.00              |                 |

## Moment

| Rating<br>Veh. | top fiber<br>+bend | Rating<br>bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------------|---------------------------------|-----------------|-----------------------|-----------------|----------------------------|
| HS20           | 9.95               | 2.28                            | 8.80            | 2.64                  | HS 45.51        | 81.9                       |
| 5C1T           | 16.36              | 4.56                            | 14.47           | 5.29                  | 0.00            | 547.2                      |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 2.100

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.7       | 0.0          | 8.2       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 96.5              | -79.5                  | 68.9                  |
| OPER      | 160.8             | -132.5                 | 114.8                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -3.00                 | 30.29 | -2.31    | 23.30 | -3.00                | 23.89 | -2.31    | 18.38 |
| OPER      | 5C1T      | -3.34                 | 24.08 | -2.57    | 18.52 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 26.47      | 2.27       | HS 45.49     | 81.9                 |
| 5C1T   | 39.66      | 4.77       | 0.00         | 572.2                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 2.100

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -2.6                | -26.4                            |

| Rating<br>Veh.<br>ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                       | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend                  | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV.<br>159.9         | 165.7           | -188.9 | 165.7        | -188.9 | 194.7                       | -159.9 | 194.7     | - |
| OPER<br>266.5         | 295.5           | -295.5 | 295.5        | -295.5 | 324.5                       | -266.4 | 324.5     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Truck<br>Veh. | Live Load Moment<br>w/imp. | Moment<br>w/o imp. | Loc. of Ax.<br>Front<br>Wheel | Lane<br>Dis. | Live Load Moment<br>w/imp. | Moment<br>w/o imp. | Loc. of Conc.<br>Load 1 | Load 2 |
|--------------|---------------|----------------------------|--------------------|-------------------------------|--------------|----------------------------|--------------------|-------------------------|--------|
| INV.         | HS20          | 14.60 R                    | 11.23              | 55.50                         | 0.0          | 21.36                      | 16.43              | 27.50                   |        |
|              |               | -67.25 R                   | -51.73             | 34.00                         | 0.0          | -58.47                     | -44.98             | 15.00                   | 37.50  |
| OPER         | 5C1T          | 21.63 R                    | 16.64              | 252.50                        | 0.0          | 0.00                       | 0.00               | 0.00                    |        |
|              |               | -55.94 L                   | -43.03             | -3.50                         | 0.0          | 0.00                       | 0.00               | 0.00                    | 0.00   |

## Serviceability

| Rating<br>Veh. | Rating       |                | Factor          |                | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------|----------------|-----------------|----------------|-----------------|----------------------------|
|                | top<br>+bend | fiber<br>-bend | bottom<br>+bend | fiber<br>-bend |                 |                            |
| HS20           | 9.12         | 2.38           | 9.12            | 2.38           | HS 47.54        | 85.6                       |
| 5C1T           | 15.00        | 4.76           | 15.00           | 4.76           | 0.00            | 571.5                      |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 2.200

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 2.200

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.97 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 97.439     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 41.42 |        | 102.6                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
 INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
 Check Point I. D. 2.200

Dead Load Moment      Superimposed Dead Load Moment  
 -1.1                      -8.4

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 195.0C             | -170.5                | 170.5              | -195.0C               | 200.7                       | -164.8                | 176.1              | -189.3                |
| OPER        | 325.0C             | -284.1                | 284.1              | -325.0C               | 334.4                       | -274.7                | 293.6              | -315.5                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 57.94 R      | 44.57              | 58.00  | 0.0                 | 40.57    | 31.21       | 30.00              |        |                |              |
|           |           | -54.97 L     | -42.29             | -8.00  | 0.0                 | -37.06   | -28.51      | 15.00              |        | 47.50          |              |
| OPER      | 5C1T      | 46.10 R      | 35.46              | 255.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -44.31 L     | -34.08             | 1.50   | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 3.46               | 3.00                         | 3.04                               | 3.44         | HS 59.95 107.9       |
| 5C1T        | 7.25               | 6.20                         | 6.37                               | 7.12         | 0.00 743.8           |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 2.200

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear     | (-) Shear (+) Shear    |
| 0.5       | 0.0 6.3                |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 96.5              | -78.3                           | 70.1  |
| OPER      | 160.8             | -130.5                          | 116.9 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -3.00                 | 25.55 | -2.31    | 19.66 | -4.17                | 21.10 | -3.21    | 16.23 |
| OPER      | 5C1T      | -4.89                 | 20.78 | -3.76    | 15.98 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 18.76      | 2.74       | HS 54.89     | 98.8                 |
| 5C1T   | 26.70      | 5.62       | 0.00         | 675.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 2.200

Dead Load Moment      Superimposed Dead Load Moment  
-1.1                      -8.4

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 171.6      | 173.5           | -181.1 | 173.5        | -181.1 | 182.9                       | -171.6 | 183.0     | - |
| OPER 286.0      | 295.5           | -295.5 | 295.5        | -295.5 | 304.9                       | -286.0 | 304.9     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 57.94 R                 | 44.57           | 58.00                   | 0.0       | 40.57                   | 31.21           | 30.00                |        |
|           |            | -54.97 L                | -42.29          | -8.00                   | 0.0       | -37.06                  | -28.51          | 15.00                | 47.50  |
| OPER      | 5C1T       | 46.10 R                 | 35.46           | 255.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -44.31 L                | -34.08          | 1.50                    | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 3.16            | 3.12            | 3.16               | 3.12               | HS 62.43     | 112.4                |
| 5C1T        | 6.61            | 6.45            | 6.61               | 6.45               | 0.00         | 774.6                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 2.300

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 2.300

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.97 | 28.67 | 28.67 | 1.726 | 999999.000 | 97.439 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 41.42 |        | 102.6                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 2.300

Dead Load Moment 0.1  
Superimposed Dead Load Moment 4.9

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 195.0C          | -170.5             | 170.5           | -195.0C            | 192.0                       | -173.4             | 167.5           | -198.0             |
| OPER        | 325.0C          | -284.1             | 284.1           | -325.0C            | 320.0                       | -289.0             | 279.2           | -329.9             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment  | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|---------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 85.29 R      | 65.61              | 60.50   | 0.0                 | 61.51    | 47.32       | 32.50              |        |                |              |
|           |           | -45.64 L     | -35.10             | -8.00   | 0.0                 | -32.18   | -24.75      | 15.00              |        | 0.00           |              |
| OPER      | 5C1T      | 67.81 R      | 52.16              | 135.50  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -40.08 L     | -30.83             | -121.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 2.25            | 3.80                      | 1.96         | 4.34               | HS 39.28     | 70.7                 |
| 5C1T        | 4.72            | 7.21                      | 4.12         | 8.23               | 0.00         | 494.1                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 2.300

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| 0.4       | 0.0                    |
|           | 4.3                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 96.5              | -77.0                  | 71.4                  |
| OPER      | 160.8             | -128.4                 | 119.0                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -4.32                 | 20.69 | -3.32    | 15.92 | -6.43                | 18.16 | -4.95    | 13.97 |
| OPER      | 5C1T      | -6.69                 | 17.50 | -5.14    | 13.46 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 11.98      | 3.45       | HS 68.98     | 124.2                |
| 5C1T   | 19.20      | 6.80       | 0.00         | 815.5                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 2.300

Dead Load Moment 0.1  
Superimposed Dead Load Moment 4.9

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 180.2      | 179.3           | -175.3 | 179.3        | -175.3 | 174.3                       | -180.2 | 174.3     | - |
| OPER 300.4      | 295.5           | -295.5 | 295.5        | -295.5 | 290.5                       | -300.4 | 290.5     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 85.29 R                 | 65.61                | 60.50       | 0.0       | 61.51                   | 47.32                  | 32.50  |        |
|           |            | -45.64 L                | -35.10               | -8.00       | 0.0       | -32.18                  | -24.75                 | 15.00  | 0.00   |
| OPER      | 5C1T       | 67.81 R                 | 52.16                | 135.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -40.08 L                | -30.83               | -121.50     | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 2.04            | 3.95  | 2.04         | 3.95  | HS 40.87     | 73.6                 |
| 5C1T        | 4.28            | 7.49  | 4.28         | 7.49  | 0.00         | 514.2                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 2.400

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 2.400

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.97 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 97.439     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 41.42 |        | 102.6                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 2.400

Dead Load Moment 0.8  
Superimposed Dead Load Moment 13.3

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 195.0C          | -170.5             | 170.5           | -195.0C            | 186.5                       | -179.0             | 162.0           | -203.5             |
| OPER        | 325.0C          | -284.1             | 284.1           | -325.0C            | 310.8                       | -298.3             | 269.9           | -339.2             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment  | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|---------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 96.19 R      | 73.99              | 63.00   | 0.0                 | 74.53    | 57.33       | 35.00              |        |                |              |
|           |           | -36.30 L     | -27.92             | -8.00   | 0.0                 | -28.13   | -21.64      | 15.00              | 0.00   |                |              |
| OPER      | 5C1T      | 83.68 R      | 64.37              | 134.00  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -38.79 L     | -29.84             | -121.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 1.94            | 4.93                      | 1.68         | 5.61               | HS 33.68     | 60.6                 |
| 5C1T        | 3.71            | 7.69                      | 3.23         | 8.74               | 0.00         | 387.1                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 2.400

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear     | (-) Shear (+) Shear    |
| 0.2       | 0.0 2.4                |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 96.5              | -75.8                           | 72.6  |
| OPER      | 160.8             | -126.3                          | 121.0 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -8.89                 | 16.99 | -6.84    | 13.07 | -9.00                | 15.17 | -6.92    | 11.67 |
| OPER      | 5C1T      | -8.72                 | 14.88 | -6.71    | 11.45 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 8.42       | 4.27       | HS 85.47     | 153.8                |
| 5C1T   | 14.48      | 8.13       | 0.00         | 975.7                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 2.400

Dead Load Moment 0.8  
Superimposed Dead Load Moment 13.3

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 185.8      | 182.9           | -171.6 | 182.9        | -171.6 | 168.8                       | -185.8 | 168.8     | - |
| OPER 309.6      | 295.5           | -295.5 | 295.5        | -295.5 | 281.3                       | -309.6 | 281.3     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 96.19 R                 | 73.99                | 63.00       | 0.0       | 74.53                   | 57.33                  | 35.00  |        |
|           |            | -36.30 L                | -27.92               | -8.00       | 0.0       | -28.13                  | -21.64                 | 15.00  | 0.00   |
| OPER      | 5C1T       | 83.68 R                 | 64.37                | 134.00      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -38.79 L                | -29.84               | -121.50     | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.75            | 5.12  | 1.75         | 5.12  | HS 35.09     | 63.2                 |
| 5C1T        | 3.36            | 7.98  | 3.36         | 7.98  | 0.00         | 403.4                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 2.500

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 2.500

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.85 | 28.67 | 28.67 | 1.726 | 999999.000 | 91.546 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 19.05 |        | 106.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 2.500

Dead Load Moment 1.2  
Superimposed Dead Load Moment 17.0

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 195.0C          | -170.5             | 170.5           | -195.0C            | 184.1                       | -181.4             | 159.5           | -205.9             |
| OPER        | 325.0C          | -284.1             | 284.1           | -325.0C            | 306.8                       | -302.3             | 265.9           | -343.2             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment  | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|---------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 94.18 L      | 72.45              | 23.50   | 0.0                 | 80.17    | 61.67       | 37.50              |        |                |              |
|           |           | -26.96 L     | -20.74             | -8.00   | 0.0                 | -24.08   | -18.52      | 15.00              |        | 0.00           |              |
| OPER      | 5C1T      | 87.52 R      | 67.32              | 136.50  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -37.49 L     | -28.84             | -121.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | bottom fiber -bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|--------|--------------|----------------------|
| HS20        | 1.95            | 6.73               | 1.69   | 33.88        | 61.0                 |
| 5C1T        | 3.51            | 8.06               | 3.04   | 0.00         | 364.6                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 2.500Dead Load Superimposed Dead Load  
Shear (-) Shear (+) Shear

0.1 0.0 0.5

Rat. Shear Capacity Available Capacity for LL+I  
Veh. VU (-) (+)INV. 96.5 -74.6 73.9  
OPER 160.8 -124.3 123.1

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Rat.<br>Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |      |
|--------------|--------------|-----------------------|-------|----------|-------|----------------------|-------|----------|------|
|              |              | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |      |
|              |              | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)  |
| INV.         | HS20         | -13.06                | 13.30 | -10.04   | 10.23 | -11.79               | 12.23 | -9.07    | 9.40 |
| OPER         | 5C1T         | -10.96                | 12.31 | -8.43    | 9.47  | 0.00                 | 0.00  | 0.00     | 0.00 |

## Rating Shear

| Veh. | Rating<br>(-) | Factor<br>(+) | Rating<br>Value | Load<br>Capacity<br>(tons) |
|------|---------------|---------------|-----------------|----------------------------|
| HS20 | 5.71          | 5.55          | HS 111.04       | 199.9                      |
| 5C1T | 11.34         | 10.00         | 0.00            | 999.0                      |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 2.500

Dead Load Moment      Superimposed Dead Load Moment  
1.2                      17.0

| Rating Veh. ber | Moment Capacity |              | Available Capacity for LL+I |           |       |        |       |   |
|-----------------|-----------------|--------------|-----------------------------|-----------|-------|--------|-------|---|
|                 | top fiber       | bottom fiber | top fiber                   | bottom fi |       |        |       |   |
| bend            | +bend           | -bend        | +bend                       | -bend     | +bend | -bend  | +bend | - |
| INV. 188.2      | 184.6           | -170.0       | 184.6                       | -170.0    | 166.4 | -188.2 | 166.4 | - |
| OPER 313.7      | 295.5           | -295.5       | 295.5                       | -295.5    | 277.3 | -313.7 | 277.3 | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |        |       |      |
|-----------|------------|-------------------------|-------------------------|------------------------------|----------------------|--------|--------|-------|------|
| INV.      | HS20       | 94.18 L                 | 72.45                   | 23.50                        | 0.0                  | 80.17  | 61.67  | 37.50 |      |
|           |            | -26.96 L                | -20.74                  | -8.00                        | 0.0                  | -24.08 | -18.52 | 15.00 | 0.00 |
| OPER      | 5C1T       | 87.52 R                 | 67.32                   | 136.50                       | 0.0                  | 0.00   | 0.00   | 0.00  |      |
|           |            | -37.49 L                | -28.84                  | -121.50                      | 0.0                  | 0.00   | 0.00   | 0.00  | 0.00 |

## Serviceability

| Rating Veh. | Rating Factor |              | Load Capacity (tons) |              |
|-------------|---------------|--------------|----------------------|--------------|
|             | top fiber     | bottom fiber | top fiber            | bottom fiber |
| HS20        | 1.77          | 6.98         | 1.77                 | 6.98         |
| 5C1T        | 3.17          | 8.37         | 3.17                 | 8.37         |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 2.600

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 134.3                | 134.3                  | 134.3                | 134.3                  | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 2.600

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.85 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 91.546     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 19.05 |        | 106.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 2.600

Dead Load Moment 1.1  
Superimposed Dead Load Moment 15.8

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 195.0C             | -170.5                | 170.5              | -195.0C               | 184.9                       | -180.6                | 160.3              | -205.1                |
| OPER        | 325.0C             | -284.1                | 284.1              | -325.0C               | 308.1                       | -301.0                | 267.2              | -341.9                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 96.19 L      | 73.99              | 12.00  | 0.0                 | 76.11    | 58.54       | 40.00              |        |                |              |
|           |           | -30.08 R     | -23.14             | 83.00  | 0.0                 | -26.52   | -20.40      | 60.00              | 0.00   |                |              |
| OPER      | 5C1T      | 84.00 L      | 64.61              | -98.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -36.24 R     | -27.87             | 109.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 1.92               | 6.00                         | 1.67            | 6.82                  | HS 33.33     | 60.0                 |
| 5C1T        | 3.67               | 8.31                         | 3.18            | 9.44                  | 0.00         | 381.7                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 2.600

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.1      | -1.5         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 96.5              | -73.3                  | 75.1         |
| OPER      | 160.8             | -122.1                 | 125.2        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|-------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |       | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)   | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -16.73                | 9.14  | -12.87   | 7.03 | -14.74               | 9.42 | -11.34   | 7.24 |
| OPER      | 5C1T      | -13.46                | 10.03 | -10.36   | 7.72 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 4.38       | 7.98       | HS 87.59     | 157.7                |
| 5C1T   | 9.07       | 12.48      | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 2.600

Dead Load Moment 1.1  
Superimposed Dead Load Moment 15.8

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 187.4      | 184.0           | -170.5 | 184.0        | -170.5 | 167.1                       | -187.4 | 167.1     | - |
| OPER 312.4      | 295.5           | -295.5 | 295.5        | -295.5 | 278.6                       | -312.4 | 278.6     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |        |       |      |
|-----------|------------|-------------------------|-------------------------|------------------------------|----------------------|--------|--------|-------|------|
| INV.      | HS20       | 96.19 L                 | 73.99                   | 12.00                        | 0.0                  | 76.11  | 58.54  | 40.00 | 0.00 |
|           |            | -30.08 R                | -23.14                  | 83.00                        | 0.0                  | -26.52 | -20.40 | 60.00 | 0.00 |
| OPER      | 5C1T       | 84.00 L                 | 64.61                   | -98.00                       | 0.0                  | 0.00   | 0.00   | 0.00  | 0.00 |
|           |            | -36.24 R                | -27.87                  | 109.50                       | 0.0                  | 0.00   | 0.00   | 0.00  | 0.00 |

## Serviceability

| Rating Veh. | Rating Factor   |                    | Load Capacity (tons) |                      |
|-------------|-----------------|--------------------|----------------------|----------------------|
|             | top fiber +bend | bottom fiber -bend | Rating Value         | Load Capacity (tons) |
| HS20        | 1.74            | 6.23               | 34.75                | 62.5                 |
| 5C1T        | 3.32            | 8.62               | 0.00                 | 398.0                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 2.700

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 2.700

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.85 | 28.67 | 28.67 | 1.726 | 999999.000 | 91.546 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 19.05 |        | 106.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 2.700

Dead Load Moment 0.7  
Superimposed Dead Load Moment 9.7

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 195.0C          | -170.5             | 170.5           | -195.0C            | 188.7                       | -176.7             | 164.2           | -201.3             |
| OPER        | 325.0C          | -284.1             | 284.1           | -325.0C            | 314.6                       | -294.5             | 273.7           | -335.4             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 86.11 L      | 66.24              | 14.50  | 0.0                 | 64.58    | 49.68       | 42.50              |        |                |              |
|           |           | -37.92 R     | -29.17             | 83.00  | 0.0                 | -30.04   | -23.11      | 60.00              | 0.00   |                |              |
| OPER      | 5C1T      | 73.26 L      | 56.36              | -95.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -38.37 R     | -29.51             | 158.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 2.19            | 4.66                      | 1.91         | 5.31               | HS 38.14     | 68.6                 |
| 5C1T        | 4.29            | 7.68                      | 3.74         | 8.74               | 0.00         | 448.3                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 2.700

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.3      | -3.4         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 96.5              | -72.0                  | 76.4         |
| OPER      | 160.8             | -120.0                 | 127.3        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |            |              |              | Lane Live Load Shear |            |              |              |
|-----------|-----------|-----------------------|------------|--------------|--------------|----------------------|------------|--------------|--------------|
|           |           | (-) w/imp.            | (+) w/imp. | (-) w/o imp. | (+) w/o imp. | (-) w/imp.           | (+) w/imp. | (-) w/o imp. | (+) w/o imp. |
| INV.      | HS20      | -20.47                | 4.58       | -15.75       | 3.52         | -17.73               | 6.83       | -13.64       | 5.25         |
| OPER      | 5C1T      | -16.48                | 7.78       | -12.67       | 5.98         | 0.00                 | 0.00       | 0.00         | 0.00         |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 3.52       | 11.19      | HS 70.37     | 126.7                |  |
| 5C1T   | 7.29       | 16.37      | 0.00         | 874.3                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 2.700Dead Load Moment 0.7  
Superimposed Dead Load Moment 9.7

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 183.5      | 181.5           | -173.1 | 181.5        | -173.1 | 171.0                       | -183.5 | 171.0     | - |
| OPER 305.9      | 295.5           | -295.5 | 295.5        | -295.5 | 285.0                       | -305.9 | 285.0     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Live Load Moment w/o imp. | Loc. of Conc. Load 1 | Live Load Moment w/imp. | Loc. of Conc. Load 2 |
|-----------|------------|-------------------------|-------------------------|---------------------------|----------------------|-------------------------|----------------------|
| INV.      | HS20       | 86.11 L                 | 66.24                   | 14.50                     | 0.0                  | 64.58                   | 49.68                |
|           |            | -37.92 R                | -29.17                  | 83.00                     | 0.0                  | -30.04                  | -23.11               |
| OPER      | 5C1T       | 73.26 L                 | 56.36                   | -95.50                    | 0.0                  | 0.00                    | 0.00                 |
|           |            | -38.37 R                | -29.51                  | 158.00                    | 0.0                  | 0.00                    | 0.00                 |

## Serviceability

| Rating Veh. | Rating Factor   |                    | Load Capacity (tons) |                    |
|-------------|-----------------|--------------------|----------------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend      | bottom fiber -bend |
| HS20        | 1.99            | 4.84               | 1.99                 | 4.84               |
| 5C1T        | 3.89            | 7.97               | 3.89                 | 7.97               |

HS 39.72 71.5  
0.00 466.9

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 2.800

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 2.800

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.85 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 91.546     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 19.05 |        | 106.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 2.800

Dead Load Moment      Superimposed Dead Load Moment  
-0.1                      -1.1

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 195.0C             | -170.5                | 170.5              | -195.0C               | 195.7                       | -169.7                | 171.2              | -194.3                |
| OPER        | 325.0C             | -284.1                | 284.1              | -325.0C               | 326.2                       | -282.9                | 285.3              | -323.8                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 59.47 L      | 45.75              | 17.00  | 0.0                 | 45.30    | 34.85       | 45.00              |        |                |              |
|           |           | -45.76 R     | -35.20             | 83.00  | 0.0                 | -35.36   | -27.20      | 60.00              | 110.00 |                |              |
| OPER      | 5C1T      | 55.31 L      | 42.54              | -93.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -42.80 R     | -32.93             | 159.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 3.29               | 3.71                         | 2.88                               | 4.24         | HS 57.57 103.6       |
| 5C1T        | 5.90               | 6.61                         | 5.16                               | 7.56         | 0.00 619.1           |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 2.800

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.4      | -5.3         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 96.5              | -70.8                  | 77.6         |
| OPER      | 160.8             | -118.0                 | 129.4        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -25.30                | 3.60 | -19.46   | 2.77 | -20.69               | 4.54 | -15.92   | 3.49 |
| OPER      | 5C1T      | -19.65                | 5.62 | -15.11   | 4.33 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 2.80       | 17.11      | HS 55.96     | 100.7                |  |
| 5C1T   | 6.01       | 23.00      | 0.00         | 720.6                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 2.800

Dead Load Moment      Superimposed Dead Load Moment  
-0.1                      -1.1

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 176.6      | 176.8           | -177.8 | 176.8        | -177.8 | 178.0                       | -176.5 | 178.0     | - |
| OPER 294.3      | 295.5           | -295.5 | 295.5        | -295.5 | 296.7                       | -294.2 | 296.7     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 59.47 L                 | 45.75                | 17.00       | 0.0       | 45.30                   | 34.85                  | 45.00  |        |
|           |            | -45.76 R                | -35.20               | 83.00       | 0.0       | -35.36                  | -27.20                 | 60.00  | 110.00 |
| OPER      | 5C1T       | 55.31 L                 | 42.54                | -93.00      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -42.80 R                | -32.93               | 159.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 2.99            | 3.86  | 2.99         | 3.86  | HS 59.86     | 107.7                |
| 5C1T        | 5.36            | 6.87  | 5.36         | 6.88  | 0.00         | 643.7                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 2.900

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus  |                  |       |       | Plastic Section |
|------------------|------------------|-------|-------|-----------------|
| Positive Bending | Negative Bending |       |       | Modulus - Z     |
| Top              | Bott.            | Top   | Bott. | (Fy * Z)        |
| 134.3            | 134.3            | 134.3 | 134.3 | 422.49          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 2.900

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.85 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 91.546     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 19.05 |        | 106.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 2.900

Dead Load Superimposed Dead Load  
Moment Moment  
-1.3 -16.7

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 195.0C             | -170.5                | 170.5              | -195.0C               | 205.8                       | -159.6                | 181.3              | -184.2                |
| OPER        | 325.0C             | -284.1                | 284.1              | -325.0C               | 343.0                       | -266.1                | 302.1              | -307.0                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.51        | L                  | 12.70  | 19.50               | 0.0      | 25.44       | 19.57              | 47.50  |                |              |
|           |           | -59.02       | L                  | -45.40 | 41.00               | 0.0      | -53.29      | -40.99             | 60.00  | 37.50          |              |
| OPER      | 5C1T      | 31.28        | L                  | 24.06  | -3.50               | 0.0      | 0.00        | 0.00               | 0.00   |                |              |
|           |           | -49.74       | R                  | -38.26 | 161.50              | 0.0      | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 8.09               | 2.70                         | 7.12                               | 3.12         | 54.10                |
| 5C1T        | 10.97              | 5.35                         | 9.66                               | 6.17         | 0.00                 |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 2.900

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| -0.6      | -7.2                   |
|           | 0.0                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 96.5              | -69.5                           | 78.9  |
| OPER      | 160.8             | -115.9                          | 131.4 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -30.02                | 3.74 | -23.10   | 2.87 | -23.52               | 3.46 | -18.09   | 2.66 |
| OPER      | 5C1T      | -22.84                | 3.71 | -17.57   | 2.86 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 2.32       | 21.11      | HS 46.33     | 83.4                 |  |
| 5C1T   | 5.07       | 35.41      | 0.00         | 608.9                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 2.900

Dead Load Moment      Superimposed Dead Load Moment  
-1.3                      -16.7

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 166.5      | 170.1           | -184.5 | 170.1        | -184.5 | 188.1                       | -166.5 | 188.1     | - |
| OPER 277.4      | 295.5           | -295.5 | 295.5        | -295.5 | 313.5                       | -277.4 | 313.5     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 16.51 L                 | 12.70                | 19.50       | 0.0       | 25.44                   | 19.57                  | 47.50  |        |
|           |            | -59.02 L                | -45.40               | 41.00       | 0.0       | -53.29                  | -40.99                 | 60.00  | 37.50  |
| OPER      | 5C1T       | 31.28 L                 | 24.06                | -3.50       | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -49.74 R                | -38.26               | 161.50      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 7.39            | 2.82  | 7.39         | 2.82  | HS 56.41     | 101.5                |
| 5C1T        | 10.02           | 5.58  | 10.02        | 5.58  | 0.00         | 669.3                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 3.000

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 3.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.85 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 91.546     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 19.05 |        | 106.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 3.000

Dead Load Superimposed Dead Load  
Moment Moment  
-3.0 -37.1

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 195.0C             | -170.5                | 170.5              | -195.0C               | 219.0                       | -146.4                | 194.5              | -171.0                |
| OPER        | 325.0C             | -284.1                | 284.1              | -325.0C               | 365.0                       | -244.1                | 324.1              | -285.0                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 19.73        | L                  | 15.18  | -8.00               | 0.0      | 17.68       | 13.60              | 15.00  |                |              |
|           |           | -98.36       | L                  | -75.66 | 29.50               | 0.0      | -89.13      | -68.56             | 60.00  | 40.00          |              |
| OPER      | 5C1T      | 15.20        | L                  | 11.69  | -208.50             | 0.0      | 0.00        | 0.00               | 0.00   |                |              |
|           |           | -61.48       | L                  | -47.30 | -69.00              | 0.0      | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 11.10              | 1.49                         | 9.85            | 1.74                  | HS 29.78     | 53.6                 |
| 5C1T        | 24.02              | 3.97                         | 21.33           | 4.64                  | 0.00         | 476.3                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 3.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.6      | -0.7      | -7.2                   | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 96.5              | -68.3                           | 68.1  |
| OPER      | 160.8             | -113.8                          | 113.4 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -30.02                | 34.53 | -23.10   | 26.56 | -23.52               | 26.28 | -18.09   | 20.22 |
| OPER      | 5C1T      | -22.84                | 26.23 | -17.57   | 20.18 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.98       | 1.97       | HS 39.42     | 71.0                 |
| 5C1T   | 4.39       | 4.32       | 0.00         | 519.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 3.000

Dead Load Moment      Superimposed Dead Load Moment  
-3.0                      -37.1

| Rating Veh.<br>ber | Moment Capacity |              | Available Capacity for LL+I |           |       |        |       |   |
|--------------------|-----------------|--------------|-----------------------------|-----------|-------|--------|-------|---|
|                    | top fiber       | bottom fiber | top fiber                   | bottom fi |       |        |       |   |
|                    | +bend           | -bend        | +bend                       | -bend     | +bend | -bend  | +bend | - |
| bend               |                 |              |                             |           |       |        |       |   |
| INV.               | 161.3           | -193.3       | 161.3                       | -193.3    | 201.3 | -153.3 | 201.3 | - |
| 153.3              |                 |              |                             |           |       |        |       |   |
| OPER               | 295.5           | -295.5       | 295.5                       | -295.5    | 335.5 | -255.4 | 335.5 | - |
| 255.4              |                 |              |                             |           |       |        |       |   |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 19.73 L                 | 15.18                | -8.00       | 0.0       | 17.68                   | 13.60                  | 15.00  |        |
|           |            | -98.36 L                | -75.66               | 29.50       | 0.0       | -89.13                  | -68.56                 | 60.00  | 40.00  |
| OPER      | 5C1T       | 15.20 L                 | 11.69                | -208.50     | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -61.48 L                | -47.30               | -69.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor |              | Load Capacity |              | Rating Value | Load Capacity (tons) |
|-------------|---------------|--------------|---------------|--------------|--------------|----------------------|
|             | top fiber     | bottom fiber | top fiber     | bottom fiber |              |                      |
|             | +bend         | -bend        | +bend         | -bend        |              |                      |
| HS20        | 10.20         | 1.56         | 10.20         | 1.56         | HS 31.16     | 56.1                 |
| 5C1T        | 22.08         | 4.15         | 22.08         | 4.15         | 0.00         | 498.5                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 3.000

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 134.3                | 134.3                  | 134.3                | 134.3                  | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 3.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.84 | 28.67 | 28.67 | 1.726 | 999999.000 | 91.257 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 19.05 |        | 106.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 3.000

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -3.0                | -37.1                            |

| Rating<br>Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|----------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|                | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.           | 195.0C             | -170.5                | 170.5              | -195.0C               | 219.0                       | -146.4                | 194.5              | -171.0                |
| OPER           | 325.0C             | -284.1                | 284.1              | -325.0C               | 365.0                       | -244.1                | 324.1              | -285.0                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Rat.<br>Veh. | Truck<br>w/imp. | Live Load<br>w/o imp. | Moment | Loc. of<br>Front<br>Wheel | Ax.<br>Dis. | Lane<br>w/imp. | Live Load<br>w/o imp. | Moment | Loc. of<br>Load 1 | Conc.<br>Load 2 |
|--------------|--------------|-----------------|-----------------------|--------|---------------------------|-------------|----------------|-----------------------|--------|-------------------|-----------------|
| INV.         | HS20         | 19.73           | L                     | 15.18  | -8.00                     | 0.0         | 17.68          | 13.60                 | 15.00  |                   |                 |
|              |              | -98.36          | L                     | -75.66 | 29.50                     | 0.0         | -89.13         | -68.56                | 60.00  | 40.00             |                 |
| OPER         | 5C1T         | 15.20           | L                     | 11.69  | -208.50                   | 0.0         | 0.00           | 0.00                  | 0.00   |                   |                 |
|              |              | -61.48          | L                     | -47.30 | -69.00                    | 0.0         | 0.00           | 0.00                  | 0.00   | 0.00              |                 |

## Moment

| Rating<br>Veh. | top fiber<br>+bend | Rating<br>bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------------|---------------------------------|-----------------|-----------------------|-----------------|----------------------------|
| HS20           | 11.10              | 1.49                            | 9.85            | 1.74                  | HS 29.78        | 53.6                       |
| 5C1T           | 24.02              | 3.97                            | 21.33           | 4.64                  | 0.00            | 476.3                      |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 3.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.7      | 0.8       | -9.1                   | 9.5       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I |       |
|-----------|-------------------|-----------------------------|-------|
|           |                   | (-)                         | (+)   |
| INV.      | 96.5              | -68.3                       | 68.1  |
| OPER      | 160.8             | -113.8                      | 113.4 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -34.45                | 34.53 | -26.50   | 26.56 | -26.10               | 26.28 | -20.08   | 20.22 |
| OPER      | 5C1T      | -25.91                | 26.23 | -19.93   | 20.18 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.98       | 1.97       | HS 39.42     | 71.0                 |
| 5C1T   | 4.39       | 4.32       | 0.00         | 519.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 3.000

Dead Load Moment      Superimposed Dead Load Moment  
-3.0                      -37.1

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 153.3      | 161.3           | -193.3 | 161.3        | -193.3 | 201.3                       | -153.3 | 201.3     | - |
| OPER 255.4      | 295.5           | -295.5 | 295.5        | -295.5 | 335.5                       | -255.4 | 335.5     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 19.73 L                 | 15.18           | -8.00                   | 0.0       | 17.68                   | 13.60           | 15.00                |        |
|           |            | -98.36 L                | -75.66          | 29.50                   | 0.0       | -89.13                  | -68.56          | 60.00                | 40.00  |
| OPER      | 5C1T       | 15.20 L                 | 11.69           | -208.50                 | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -61.48 L                | -47.30          | -69.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 10.20           | 1.56            | 10.20              | 1.56               | HS 31.16     | 56.1                 |
| 5C1T        | 22.08           | 4.15            | 22.08              | 4.15               | 0.00         | 498.5                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 3.100

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Depth | Web Thk. |      | Dc    | b max | b min | t    | ry   |
|----------------|-------|----------|------|-------|-------|-------|------|------|
| H              | D     | tw       | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00 | 0.400    | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 3.100

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.84 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 91.257     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 19.05 |        | 106.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 3.100

Dead Load Superimposed Dead Load  
Moment Moment  
-1.2 -15.8

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 195.0C          | -170.5             | 170.5           | -195.0C            | 205.2                       | -160.2             | 180.7           | -184.8             |
| OPER        | 325.0C          | -284.1             | 284.1           | -325.0C            | 342.0                       | -267.1             | 301.1           | -308.0             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.08 R      | 12.37              | 80.50  | 0.0                 | 25.91    | 19.93       | 52.50              |        |                |              |
|           |           | -58.52 R     | -45.01             | 59.00  | 0.0                 | -52.81   | -40.63      | 40.00              |        | 62.50          |              |
| OPER      | 5C1T      | 30.41 R      | 23.39              | 190.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -47.12 L     | -36.24             | 24.00  | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 7.92            | 2.74                      | 6.97         | 3.16               | HS 54.77     | 98.6                 |
| 5C1T        | 11.25           | 5.67                      | 9.90         | 6.54               | 0.00         | 680.2                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 3.100

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| 0.6       | 0.0                    |
|           | 7.6                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 96.5              | -79.1                  | 69.3                  |
| OPER      | 160.8             | -131.8                 | 115.5                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -2.98                 | 30.12 | -2.29    | 23.17 | -3.23                | 23.71 | -2.48    | 18.24 |
| OPER      | 5C1T      | -3.64                 | 23.41 | -2.80    | 18.01 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 24.50      | 2.30       | HS 46.02     | 82.8                 |
| 5C1T   | 36.27      | 4.93       | 0.00         | 592.2                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 3.100

Dead Load Moment      Superimposed Dead Load Moment  
-1.2                      -15.8

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 167.1      | 170.5           | -184.1 | 170.5        | -184.1 | 187.5                       | -167.1 | 187.5     | - |
| OPER 278.4      | 295.5           | -295.5 | 295.5        | -295.5 | 312.5                       | -278.4 | 312.5     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 16.08 R                 | 12.37                | 80.50       | 0.0       | 25.91                   | 19.93                  | 52.50  |        |
|           |            | -58.52 R                | -45.01               | 59.00       | 0.0       | -52.81                  | -40.63                 | 40.00  | 62.50  |
| OPER      | 5C1T       | 30.41 R                 | 23.39                | 190.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -47.12 L                | -36.24               | 24.00       | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 7.24            | 2.86  | 7.24         | 2.86  | HS 57.10     | 102.8                |
| 5C1T        | 10.27           | 5.91  | 10.27        | 5.91  | 0.00         | 709.1                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 3.200

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 3.200

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.84 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 91.257     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 19.05 |        | 106.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 3.200

Dead Load Moment 0.1  
Superimposed Dead Load Moment 0.7

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 195.0C          | -170.5             | 170.5           | -195.0C            | 194.5                       | -170.9             | 170.0           | -195.5             |
| OPER        | 325.0C          | -284.1             | 284.1           | -325.0C            | 324.2                       | -284.9             | 283.3           | -325.8             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 59.32 R      | 45.63              | 83.00  | 0.0                 | 44.91    | 34.55       | 55.00              |        |                |              |
|           |           | -45.18 L     | -34.76             | 17.00  | 0.0                 | -32.95   | -25.35      | 40.00              | 72.50  |                |              |
| OPER      | 5C1T      | 56.12 R      | 43.17              | 193.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -40.00 L     | -30.77             | 28.00  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber +bend | bottom fiber -bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|--------|--------------|----------------------|
| HS20        | 3.28            | 3.78               | 2.87   | 57.31        | 103.2                |
| 5C1T        | 5.78            | 7.12               | 5.05   | 0.00         | 605.8                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 3.200

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.5       | 0.0          | 5.6       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 96.5              | -77.9                  | 70.5                  |
| OPER      | 160.8             | -129.8                 | 117.6                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -2.98                 | 25.40 | -2.29    | 19.54 | -4.47                | 20.91 | -3.43    | 16.08 |
| OPER      | 5C1T      | -5.31                 | 20.32 | -4.09    | 15.63 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 17.44      | 2.78       | HS 55.54     | 100.0                |  |
| 5C1T   | 24.43      | 5.79       | 0.00         | 694.3                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 3.200

Dead Load Moment 0.1  
Superimposed Dead Load Moment 0.7

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 177.8      | 177.6           | -177.0 | 177.6        | -177.0 | 176.8                       | -177.8 | 176.8     | - |
| OPER 296.3      | 295.5           | -295.5 | 295.5        | -295.5 | 294.7                       | -296.3 | 294.7     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Live Load Moment w/o imp. | Loc. of Conc. Load 1 | Live Load Moment w/imp. | Loc. of Conc. Load 2 |
|-----------|------------|-------------------------|-------------------------|---------------------------|----------------------|-------------------------|----------------------|
| INV.      | HS20       | 59.32 R                 | 45.63                   | 83.00                     | 0.0                  | 44.91                   | 34.55                |
|           |            | -45.18 L                | -34.76                  | 17.00                     | 0.0                  | -32.95                  | -25.35               |
| OPER      | 5C1T       | 56.12 R                 | 43.17                   | 193.00                    | 0.0                  | 0.00                    | 0.00                 |
|           |            | -40.00 L                | -30.77                  | 28.00                     | 0.0                  | 0.00                    | 0.00                 |

## Serviceability

| Rating Veh. | Rating Factor   |                    | Load Capacity (tons) |                    |
|-------------|-----------------|--------------------|----------------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend      | bottom fiber -bend |
| HS20        | 2.98            | 3.93               | 2.98                 | 3.93               |
| 5C1T        | 5.25            | 7.41               | 5.25                 | 7.41               |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 3.300

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 3.300

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.84 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 91.257     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 19.05 |        | 106.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 3.300

Dead Load Moment 1.1  
Superimposed Dead Load Moment 12.4

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 195.0C          | -170.5             | 170.5           | -195.0C            | 186.9                       | -178.5             | 162.4           | -203.1             |
| OPER        | 325.0C          | -284.1             | 284.1           | -325.0C            | 311.5                       | -297.5             | 270.7           | -338.4             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment  | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|---------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 86.39 R      | 66.46              | 85.50   | 0.0                 | 65.33    | 50.25       | 57.50              |        |                |              |
|           |           | -37.51 L     | -28.85             | 17.00   | 0.0                 | -29.00   | -22.31      | 40.00              | 0.00   |                |              |
| OPER      | 5C1T      | 76.00 R      | 58.46              | 108.50  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -36.11 L     | -27.77             | -145.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 2.16            | 4.76                      | 1.88                      | 5.41               | HS 37.59     | 67.7                 |
| 5C1T        | 4.10            | 8.24                      | 3.56                      | 9.37               | 0.00         | 427.4                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 3.300

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.3       | 0.0          | 3.7       |

| Rat. | Shear Capacity | Available Capacity for LL+I |
|------|----------------|-----------------------------|
| Veh. | VU             | (-) (+)                     |
| INV. | 96.5           | -76.6 71.8                  |
| OPER | 160.8          | -127.7 119.6                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. | Rat. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|------|------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|      |      | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
| Typ. | Veh. | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV. | HS20 | -4.41                 | 20.57 | -3.39    | 15.83 | -6.74                | 17.96 | -5.18    | 13.81 |
| OPER | 5C1T | -7.28                 | 17.15 | -5.60    | 13.20 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 11.37      | 3.49       | HS 69.79     | 125.6                |
| 5C1T   | 17.55      | 6.97       | 0.00         | 837.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 3.300

Dead Load Moment 1.1  
Superimposed Dead Load Moment 12.4

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 185.3      | 182.7           | -171.9 | 182.7        | -171.9 | 169.2                       | -185.3 | 169.2     | - |
| OPER 308.9      | 295.5           | -295.5 | 295.5        | -295.5 | 282.0                       | -308.9 | 282.0     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 86.39 R                 | 66.46                | 85.50       | 0.0       | 65.33                   | 50.25                  | 57.50  |        |
|           |            | -37.51 L                | -28.85               | 17.00       | 0.0       | -29.00                  | -22.31                 | 40.00  | 0.00   |
| OPER      | 5C1T       | 76.00 R                 | 58.46                | 108.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -36.11 L                | -27.77               | -145.00     | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.96            | 4.94            | 1.96               | 4.94               | HS 39.17     | 70.5                 |
| 5C1T        | 3.71            | 8.56            | 3.71               | 8.56               | 0.00         | 445.3                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 3.400

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 3.400

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.84 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 91.257     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 19.05 |        | 106.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 3.400

Dead Load Moment 1.6  
Superimposed Dead Load Moment 19.3

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 195.0C          | -170.5             | 170.5           | -195.0C            | 182.4                       | -183.0             | 157.9           | -207.5             |
| OPER        | 325.0C          | -284.1             | 284.1           | -325.0C            | 304.1                       | -305.0             | 263.2           | -345.9             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment  | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|---------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 96.95 R      | 74.57              | 88.00   | 0.0                 | 77.59    | 59.68       | 60.00              |        |                |              |
|           |           | -29.83 L     | -22.95             | 17.00   | 0.0                 | -25.60   | -19.69      | 40.00              | 0.00   |                |              |
| OPER      | 5C1T      | 87.92 R      | 67.63              | 111.00  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -33.69 L     | -25.91             | -143.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 1.88            | 6.13                      | 1.63                      | 6.96               | HS 32.58     | 58.6                 |
| 5C1T        | 3.46            | 9.06                      | 2.99                      | 10.27              | 0.00         | 359.2                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 3.400Dead Load Superimposed Dead Load  
Shear (-) Shear (+) Shear

0.1 0.0 1.8

Rat. Shear Capacity Available Capacity for LL+I  
Veh. VU (-) (+)INV. 96.5 -75.4 73.0  
OPER 160.8 -125.6 121.7

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -8.97                 | 16.77 | -6.90    | 12.90 | -9.31                | 14.97 | -7.16    | 11.51 |
| OPER      | 5C1T      | -9.46                 | 14.06 | -7.28    | 10.81 | 0.00                 | 0.00  | 0.00     | 0.00  |

## Rating Shear

| Veh. | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
|------|------------|------------|--------------|----------------------|
| HS20 | 8.10       | 4.35       | HS 87.08     | 156.7                |
| 5C1T | 13.28      | 8.66       | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 3.400Dead Load Moment 1.6  
Superimposed Dead Load Moment 19.3

| Rating Veh. ber | Moment Capacity top fiber |        | Moment Capacity bottom fiber |        | Available Capacity for LL+I |        |           |   |
|-----------------|---------------------------|--------|------------------------------|--------|-----------------------------|--------|-----------|---|
|                 | +bend                     | -bend  | +bend                        | -bend  | top fiber                   | -bend  | bottom fi |   |
| INV. 189.8      | 185.6                     | -168.9 | 185.6                        | -168.9 | 164.7                       | -189.8 | 164.7     | - |
| OPER 316.4      | 295.5                     | -295.5 | 295.5                        | -295.5 | 274.5                       | -316.4 | 274.6     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |        |       |      |
|-----------|------------|-------------------------|-------------------------|------------------------------|----------------------|--------|--------|-------|------|
| INV.      | HS20       | 96.95 R                 | 74.57                   | 88.00                        | 0.0                  | 77.59  | 59.68  | 60.00 |      |
|           |            | -29.83 L                | -22.95                  | 17.00                        | 0.0                  | -25.60 | -19.69 | 40.00 | 0.00 |
| OPER      | 5C1T       | 87.92 R                 | 67.63                   | 111.00                       | 0.0                  | 0.00   | 0.00   | 0.00  |      |
|           |            | -33.69 L                | -25.91                  | -143.50                      | 0.0                  | 0.00   | 0.00   | 0.00  | 0.00 |

## Serviceability

| Rating Veh. | Rating Factor top fiber |       | Rating Factor bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-------------------------|-------|----------------------------|-------|--------------|----------------------|
|             | +bend                   | -bend | +bend                      | -bend |              |                      |
| HS20        | 1.70                    | 6.36  | 1.70                       | 6.36  | HS 33.98     | 61.2                 |
| 5C1T        | 3.12                    | 9.39  | 3.12                       | 9.39  | 0.00         | 374.7                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 3.500

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 3.500

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.84 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 91.257     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 29.22 |        | 104.5                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
 INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
 Check Point I. D. 3.500

Dead Load Moment 1.8  
 Superimposed Dead Load Moment 21.5

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 195.0C          | -170.5             | 170.5           | -195.0C            | 181.1                       | -184.4             | 156.5           | -208.9             |
| OPER        | 325.0C          | -284.1             | 284.1           | -325.0C            | 301.8                       | -307.3             | 260.9           | -348.2             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment  | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|---------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 94.67 R      | 72.82              | 76.50   | 0.0                 | 82.42    | 63.40       | 62.50              |        |                |              |
|           |           | -22.44 R     | -17.26             | 108.00  | 0.0                 | -22.28   | -17.14      | 85.00              | 0.00   |                |              |
| OPER      | 5C1T      | 90.74 L      | 69.80              | -123.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -33.67 R     | -25.90             | 267.50  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | Rating Factor   |                    |                 |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|-----------------|--------------------|--------------|----------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.91            | 8.22               | 1.65            | 9.31               | HS 33.07     | 59.5                 |
| 5C1T        | 3.33            | 9.13               | 2.88            | 10.34              | 0.00         | 345.0                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 3.500

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.0       | -0.1         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 96.5              | -74.1                  | 74.3         |
| OPER      | 160.8             | -123.6                 | 123.8        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |      |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |      |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)  |
| INV.      | HS20      | -13.12                | 13.12 | -10.09   | 10.09 | -12.11               | 12.03 | -9.31    | 9.26 |
| OPER      | 5C1T      | -11.76                | 11.58 | -9.05    | 8.91  | 0.00                 | 0.00  | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 5.65       | 5.66       | HS 113.01    | 203.4                |
| 5C1T   | 10.51      | 10.69      | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 3.500

Dead Load Moment      Superimposed Dead Load Moment  
1.8                      21.5

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 191.2      | 186.6           | -168.0 | 186.6        | -168.0 | 163.3                       | -191.2 | 163.4     | - |
| OPER 318.7      | 295.5           | -295.5 | 295.5        | -295.5 | 272.2                       | -318.7 | 272.3     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 94.67 R                 | 72.82                | 76.50       | 0.0       | 82.42                   | 63.40                  | 62.50  |        |
|           |            | -22.44 R                | -17.26               | 108.00      | 0.0       | -22.28                  | -17.14                 | 85.00  | 0.00   |
| OPER      | 5C1T       | 90.74 L                 | 69.80                | -123.50     | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -33.67 R                | -25.90               | 267.50      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.73            | 8.52  | 1.73         | 8.52  | HS 34.51     | 62.1                 |
| 5C1T        | 3.00            | 9.47  | 3.00         | 9.47  | 0.00         | 360.1                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 3.600

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 3.600

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.89 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 93.730     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 29.22 |        | 104.5                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 3.600

Dead Load Moment 1.5  
Superimposed Dead Load Moment 18.7

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 195.0C          | -170.5             | 170.5           | -195.0C            | 182.9                       | -182.6             | 158.4           | -207.1             |
| OPER        | 325.0C          | -284.1             | 284.1           | -325.0C            | 304.8                       | -304.3             | 263.9           | -345.2             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment  | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|---------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 97.01 L      | 74.62              | 37.00   | 0.0                 | 77.55    | 59.65       | 65.00              |        |                |              |
|           |           | -30.22 R     | -23.24             | 108.00  | 0.0                 | -26.06   | -20.04      | 85.00              | 0.00   |                |              |
| OPER      | 5C1T      | 87.59 L      | 67.37              | -121.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -35.29 R     | -27.15             | 268.50  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | Rating Factor   |                    |                 |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|-----------------|--------------------|--------------|----------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend |              |                      |
| HS20        | 1.88            | 6.04               | 1.63            | 6.85               | HS 32.65     | 58.8                 |
| 5C1T        | 3.48            | 8.62               | 3.01            | 9.78               | 0.00         | 361.6                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 3.600

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.2      | -2.1         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 96.5              | -72.9                  | 75.6         |
| OPER      | 160.8             | -121.4                 | 125.9        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -16.78                | 8.97 | -12.90   | 6.90 | -15.04               | 9.24 | -11.57   | 7.11 |
| OPER      | 5C1T      | -14.25                | 9.26 | -10.96   | 7.13 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 4.34       | 8.18       | HS 86.85     | 156.3                |  |
| 5C1T   | 8.52       | 13.59      | 0.00         | 999.0                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 3.600

Dead Load Moment      Superimposed Dead Load Moment  
1.5                      18.7

| Rating Veh. ber | Moment Capacity top fiber |        | Moment Capacity bottom fiber |        | Available Capacity for LL+I |        |           |   |
|-----------------|---------------------------|--------|------------------------------|--------|-----------------------------|--------|-----------|---|
|                 | +bend                     | -bend  | +bend                        | -bend  | top fiber                   | -bend  | bottom fi |   |
| INV. 189.4      | 185.3                     | -169.2 | 185.4                        | -169.2 | 165.2                       | -189.4 | 165.2     | - |
| OPER 315.7      | 295.5                     | -295.5 | 295.5                        | -295.5 | 275.3                       | -315.6 | 275.3     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 97.01 L                 | 74.62           | 37.00                   | 0.0       | 77.55                   | 59.65           | 65.00                |        |
|           |            | -30.22 R                | -23.24          | 108.00                  | 0.0       | -26.06                  | -20.04          | 85.00                | 0.00   |
| OPER      | 5C1T       | 87.59 L                 | 67.37           | -121.00                 | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -35.29 R                | -27.15          | 268.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor top fiber |       | Rating Factor bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-------------------------|-------|----------------------------|-------|--------------|----------------------|
|             | +bend                   | -bend | +bend                      | -bend |              |                      |
| HS20        | 1.70                    | 6.27  | 1.70                       | 6.27  | HS 34.05     | 61.3                 |
| 5C1T        | 3.14                    | 8.94  | 3.14                       | 8.94  | 0.00         | 377.2                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 3.700

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 3.700

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.89 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 93.730     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 29.22 |        | 104.5                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 3.700

Dead Load Moment      Superimposed Dead Load Moment  
0.9                      11.1

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 195.0C             | -170.5                | 170.5              | -195.0C               | 187.8                       | -177.6                | 163.3              | -202.2                |
| OPER        | 325.0C             | -284.1                | 284.1              | -325.0C               | 313.0                       | -296.1                | 272.1              | -337.0                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 86.48 L      | 66.52              | 39.50  | 0.0                 | 65.25    | 50.19       | 67.50              |        |                |              |
|           |           | -38.00 R     | -29.23             | 108.00 | 0.0                 | -29.84   | -22.95      | 85.00              | 0.00   |                |              |
| OPER      | 5C1T      | 74.96 L      | 57.66              | -70.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -38.37 R     | -29.52             | 270.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 2.17               | 4.68                         | 1.89            | 5.32                  | HS 37.76     | 68.0                 |
| 5C1T        | 4.18               | 7.72                         | 3.63            | 8.78                  | 0.00         | 435.7                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 3.700

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.3      | -4.0         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 96.5              | -71.6                  | 76.8                  |
| OPER      | 160.8             | -119.4                 | 128.0                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |            |              |              | Lane Live Load Shear |            |              |              |
|-----------|-----------|-----------------------|------------|--------------|--------------|----------------------|------------|--------------|--------------|
|           |           | (-) w/imp.            | (+) w/imp. | (-) w/o imp. | (+) w/o imp. | (-) w/imp.           | (+) w/imp. | (-) w/o imp. | (+) w/o imp. |
| INV.      | HS20      | -20.56                | 4.42       | -15.82       | 3.40         | -18.03               | 6.66       | -13.87       | 5.13         |
| OPER      | 5C1T      | -17.31                | 7.08       | -13.32       | 5.45         | 0.00                 | 0.00       | 0.00         | 0.00         |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 3.48       | 11.52      | HS 69.66     | 125.4                |  |
| 5C1T   | 6.89       | 18.07      | 0.00         | 827.3                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 3.700Dead Load Moment 0.9  
Superimposed Dead Load Moment 11.1

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
|                 | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 184.5      | 182.1           | -172.5 | 182.1        | -172.5 | 170.1                       | -184.5 | 170.1     | - |
| OPER 307.4      | 295.5           | -295.5 | 295.5        | -295.5 | 283.5                       | -307.4 | 283.5     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 86.48 L                 | 66.52           | 39.50                   | 0.0       | 65.25                   | 50.19           | 67.50                |        |
|           |            | -38.00 R                | -29.23          | 108.00                  | 0.0       | -29.84                  | -22.95          | 85.00                | 0.00   |
| OPER      | 5C1T       | 74.96 L                 | 57.66           | -70.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -38.37 R                | -29.52          | 270.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.97            | 4.85            | 1.97               | 4.85               | HS 39.34     | 70.8                 |
| 5C1T        | 3.78            | 8.01            | 3.78               | 8.01               | 0.00         | 453.8                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 3.800

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus  |                  |       |       | Plastic Section |
|------------------|------------------|-------|-------|-----------------|
| Positive Bending | Negative Bending |       |       | Modulus - Z     |
| Top              | Bott.            | Top   | Bott. | (Fy * Z)        |
| 134.3            | 134.3            | 134.3 | 134.3 | 422.49          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 3.800

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.89 | 28.67 | 28.67 | 1.726 | 999999.000 | 93.730 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 29.22 |        | 104.5                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 3.800

Dead Load Moment      Superimposed Dead Load Moment  
-0.1                      -1.3

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 195.0C             | -170.5                | 170.5              | -195.0C               | 195.8                       | -169.6                | 171.3              | -194.1                |
| OPER        | 325.0C             | -284.1                | 284.1              | -325.0C               | 326.4                       | -282.7                | 285.5              | -323.6                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 59.44 L      | 45.73              | 42.00  | 0.0                 | 45.26    | 34.82       | 70.00              |        |                |              |
|           |           | -45.78 R     | -35.22             | 108.00 | 0.0                 | -35.45   | -27.27      | 85.00              |        | 135.00         |              |
| OPER      | 5C1T      | 55.11 L      | 42.39              | -68.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -42.90 R     | -33.00             | 184.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 3.30               | 3.70                         | 2.88                               | 4.24         | HS 57.64             |
| 5C1T        | 5.92               | 6.59                         | 5.18                               | 7.54         | 0.00                 |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 3.800

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.5      | -5.9         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 96.5              | -70.4                  | 78.0         |
| OPER      | 160.8             | -117.3                 | 130.1        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -25.39                | 2.93 | -19.53   | 2.26 | -20.98               | 4.39 | -16.14   | 3.38 |
| OPER      | 5C1T      | -20.47                | 5.11 | -15.74   | 3.93 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 2.77       | 17.78      | HS 55.43     | 99.8                 |
| 5C1T   | 5.73       | 25.47      | 0.00         | 687.7                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 3.800

Dead Load Moment      Superimposed Dead Load Moment  
-0.1                      -1.3

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 176.4      | 176.7           | -177.8 | 176.7        | -177.9 | 178.1                       | -176.4 | 178.1     | - |
| OPER 294.0      | 295.5           | -295.5 | 295.5        | -295.5 | 296.9                       | -294.0 | 296.9     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 59.44 L                 | 45.73                | 42.00       | 0.0       | 45.26                   | 34.82                  | 70.00  |        |
|           |            | -45.78 R                | -35.22               | 108.00      | 0.0       | -35.45                  | -27.27                 | 85.00  | 135.00 |
| OPER      | 5C1T       | 55.11 L                 | 42.39                | -68.00      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -42.90 R                | -33.00               | 184.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 3.00            | 3.85            | 3.00               | 3.85               | HS 59.93     | 107.9                |
| 5C1T        | 5.39            | 6.85            | 5.39               | 6.85               | 0.00         | 646.5                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 3.900

|               |                             |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Allowable stress (fs) (psi) |           |         |         |
| RATIO/Inv.    | 0.00                        | 0.00      | 0.00    | 0.00    |
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

|                |           |       |      |       |       |       |      |      |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

|                         |                  |                       |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

|               |          |              |       |                   |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

|                  |                  |             |       |                 |
|------------------|------------------|-------------|-------|-----------------|
| Section Modulus  |                  |             |       | Plastic Section |
| Positive Bending | Negative Bending | Modulus - Z |       |                 |
| Top              | Bott.            | Top         | Bott. | (Fy * Z)        |
| 134.3            | 134.3            | 134.3       | 134.3 | 422.49          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 3.900

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.89 | 28.67 | 28.67 | 1.726 | 999999.000 | 93.730 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 29.22 |        | 104.5                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 3.900

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -1.6                | -18.4                            |

| Rating<br>Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|----------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|                | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.           | 195.0C             | -170.5                | 170.5              | -195.0C               | 207.0                       | -158.5                | 182.5              | -183.0                |
| OPER           | 325.0C             | -284.1                | 284.1              | -325.0C               | 345.0                       | -264.1                | 304.1              | -305.0                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Rat.<br>Veh. | Truck<br>w/imp. | Live Load<br>w/o imp. | Moment | Loc. of<br>Front<br>Wheel | Ax.<br>Dis. | Lane<br>w/imp. | Live Load<br>w/o imp. | Moment | Loc. of<br>Load 1 | Conc.<br>Load 2 |
|--------------|--------------|-----------------|-----------------------|--------|---------------------------|-------------|----------------|-----------------------|--------|-------------------|-----------------|
| INV.         | HS20         | 16.22 L         | 12.48                 | 44.50  | 0.0                       | 25.08       | 19.29          | 72.50                 |        |                   |                 |
|              |              | -59.02 L        | -45.40                | 66.00  | 0.0                       | -54.12      | -41.63         | 85.00                 |        | 62.50             |                 |
| OPER         | 5C1T         | 29.54 L         | 22.72                 | 21.50  | 0.0                       | 0.00        | 0.00           | 0.00                  |        |                   |                 |
|              |              | -50.59 R        | -38.92                | 186.50 | 0.0                       | 0.00        | 0.00           | 0.00                  |        | 0.00              |                 |

## Moment

| Rating<br>Veh. | top fiber<br>+bend | Rating<br>bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------------|---------------------------------|-----------------|-----------------------|-----------------|----------------------------|
| HS20           | 8.26               | 2.68                            | 7.28            | 3.10                  | HS 53.70        | 96.7                       |
| 5C1T           | 11.68              | 5.22                            | 10.30           | 6.03                  | 0.00            | 626.4                      |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 3.900

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.6      | -7.8         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 96.5              | -69.1                  | 79.3         |
| OPER      | 160.8             | -115.2                 | 132.1        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -30.11                | 3.07 | -23.16   | 2.36 | -23.79               | 3.13 | -18.30   | 2.41 |
| OPER      | 5C1T      | -23.56                | 3.39 | -18.12   | 2.61 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 2.30       | 25.35      | HS 45.92     | 82.7                 |  |
| 5C1T   | 4.89       | 38.98      | 0.00         | 586.8                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 3.900

Dead Load Moment      Superimposed Dead Load Moment  
-1.6                      -18.4

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 165.3      | 169.3           | -185.3 | 169.3        | -185.3 | 189.3                       | -165.3 | 189.3     | - |
| OPER 275.5      | 295.5           | -295.5 | 295.5        | -295.5 | 315.4                       | -275.5 | 315.5     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 16.22 L                 | 12.48                | 44.50       | 0.0       | 25.08                   | 19.29                  | 72.50  |        |
|           |            | -59.02 L                | -45.40               | 66.00       | 0.0       | -54.12                  | -41.63                 | 85.00  | 62.50  |
| OPER      | 5C1T       | 29.54 L                 | 22.72                | 21.50       | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -50.59 R                | -38.92               | 186.50      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 7.55            | 2.80  | 7.55         | 2.80  | HS 56.01     | 100.8                |
| 5C1T        | 10.68           | 5.45  | 10.68        | 5.45  | 0.00         | 653.4                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 4.000

|               |                             |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Allowable stress (fs) (psi) |           |         |         |
| RATIO/Inv.    | 0.00                        | 0.00      | 0.00    | 0.00    |
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

|                |           |       |      |       |       |       |      |      |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

|                         |                  |                       |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

|               |          |              |       |                   |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

|                  |                  |             |       |                 |
|------------------|------------------|-------------|-------|-----------------|
| Section Modulus  |                  |             |       | Plastic Section |
| Positive Bending | Negative Bending | Modulus - Z |       |                 |
| Top              | Bott.            | Top         | Bott. | (Fy * Z)        |
| 134.3            | 134.3            | 134.3       | 134.3 | 422.49          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 4.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.89 | 28.67 | 28.67 | 1.726 | 999999.000 | 93.730 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 29.22 |        | 104.5                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 4.000

Dead Load Superimposed Dead Load  
Moment Moment  
-3.4 -40.3

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 195.0C             | -170.5                | 170.5              | -195.0C               | 221.2                       | -144.2                | 196.7              | -168.8                |
| OPER        | 325.0C             | -284.1                | 284.1              | -325.0C               | 368.7                       | -240.4                | 327.8              | -281.3                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.45 R      | 12.66              | 133.00 | 0.0                 | 16.33    | 12.56       | 110.00             |        |                |              |
|           |           | -98.56 L     | -75.82             | 54.50  | 0.0                 | -90.67   | -69.74      | 85.00              |        | 65.00          |              |
| OPER      | 5C1T      | 12.72 R      | 9.79               | 335.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -64.60 R     | -49.69             | 193.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 13.45              | 1.46                         | 11.96           | 1.71                  | HS 29.27     | 52.7                 |
| 5C1T        | 28.98              | 3.72                         | 25.77           | 4.35                  | 0.00         | 446.5                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 4.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.6      | -0.8      | -7.8                   | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 96.5              | -67.9                           | 68.0  |
| OPER      | 160.8             | -113.1                          | 113.3 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -30.11                | 34.53 | -23.16   | 26.56 | -23.79               | 26.35 | -18.30   | 20.27 |
| OPER      | 5C1T      | -23.56                | 26.31 | -18.12   | 20.24 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.97       | 1.97       | HS 39.33     | 70.8                 |
| 5C1T   | 4.28       | 4.30       | 0.00         | 513.7                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 4.000

Dead Load Moment      Superimposed Dead Load Moment  
-3.4                      -40.3

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 151.0      | 159.8           | -194.8 | 159.8        | -194.8 | 203.5                       | -151.0 | 203.5     | - |
| OPER 251.7      | 295.5           | -295.5 | 295.5        | -295.5 | 339.2                       | -251.7 | 339.2     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|------------------|-----------------|-------------------------|-----------|------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 16.45 R          | 12.66           | 133.00                  | 0.0       | 16.33            | 12.56           | 110.00               |        |
|           |            | -98.56 L         | -75.82          | 54.50                   | 0.0       | -90.67           | -69.74          | 85.00                | 65.00  |
| OPER      | 5C1T       | 12.72 R          | 9.79            | 335.00                  | 0.0       | 0.00             | 0.00            | 0.00                 |        |
|           |            | -64.60 R         | -49.69          | 193.00                  | 0.0       | 0.00             | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 12.37           | 1.53            | 12.37              | 1.53               | HS 30.65     | 55.2                 |
| 5C1T        | 26.66           | 3.90            | 26.66              | 3.90               | 0.00         | 467.6                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 4.000

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 4.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.89 | 28.67 | 28.67 | 1.726 | 999999.000 | 93.730 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 29.22 |        | 104.5                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 4.000

Dead Load Superimposed Dead Load  
Moment Moment  
-3.4 -40.3

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 195.0C             | -170.5                | 170.5              | -195.0C               | 221.2                       | -144.2                | 196.7              | -168.8                |
| OPER        | 325.0C             | -284.1                | 284.1              | -325.0C               | 368.7                       | -240.4                | 327.8              | -281.3                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.45 R      | 12.66              | 133.00 | 0.0                 | 16.33    | 12.56       | 110.00             |        |                |              |
|           |           | -98.56 L     | -75.82             | 54.50  | 0.0                 | -90.67   | -69.74      | 85.00              | 65.00  |                |              |
| OPER      | 5C1T      | 12.72 R      | 9.79               | 335.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -64.60 R     | -49.69             | 193.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 13.45              | 1.46                         | 11.96                              | 1.71         | HS 29.27 52.7        |
| 5C1T        | 28.98              | 3.72                         | 25.77                              | 4.35         | 0.00 446.5           |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 4.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.8      | 0.8       | -9.7                   | 9.6       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 96.5              | -67.9                           | 68.0  |
| OPER      | 160.8             | -113.1                          | 113.3 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -34.52                | 34.53 | -26.56   | 26.56 | -26.36               | 26.35 | -20.28   | 20.27 |
| OPER      | 5C1T      | -26.43                | 26.31 | -20.33   | 20.24 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.97       | 1.97       | HS 39.33     | 70.8                 |
| 5C1T   | 4.28       | 4.30       | 0.00         | 513.7                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 4.000

Dead Load Moment      Superimposed Dead Load Moment  
-3.4                      -40.3

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 151.0      | 159.8           | -194.8 | 159.8        | -194.8 | 203.5                       | -151.0 | 203.5     | - |
| OPER 251.7      | 295.5           | -295.5 | 295.5        | -295.5 | 339.2                       | -251.7 | 339.2     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|------------------|-----------------|-------------------------|-----------|------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 16.45 R          | 12.66           | 133.00                  | 0.0       | 16.33            | 12.56           | 110.00               |        |
|           |            | -98.56 L         | -75.82          | 54.50                   | 0.0       | -90.67           | -69.74          | 85.00                | 65.00  |
| OPER      | 5C1T       | 12.72 R          | 9.79            | 335.00                  | 0.0       | 0.00             | 0.00            | 0.00                 |        |
|           |            | -64.60 R         | -49.69          | 193.00                  | 0.0       | 0.00             | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 12.37           | 1.53            | 12.37              | 1.53               | HS 30.65     | 55.2                 |
| 5C1T        | 26.66           | 3.90            | 26.66              | 3.90               | 0.00         | 467.6                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 4.100

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 4.100

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.89 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 93.847     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 29.22 |        | 104.5                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 4.100

Dead Load Superimposed Dead Load  
Moment Moment  
-1.6 -18.7

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 195.0C             | -170.5                | 170.5              | -195.0C               | 207.2                       | -158.3                | 182.6              | -182.8                |
| OPER        | 325.0C             | -284.1                | 284.1              | -325.0C               | 345.3                       | -263.8                | 304.4              | -304.7                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.15 R      | 12.42              | 105.50 | 0.0                 | 25.36    | 19.51       | 77.50              |        |                |              |
|           |           | -58.94 R     | -45.34             | 84.00  | 0.0                 | -54.17   | -41.67      | 65.00              |        | 87.50          |              |
| OPER      | 5C1T      | 29.04 R      | 22.33              | 215.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -50.88 L     | -39.14             | -36.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|--------|--------------|----------------------|
| HS20        | 8.17               | 2.69                         | 7.20   | 53.72        | 96.7                 |
| 5C1T        | 11.89              | 5.18                         | 10.48  | 0.00         | 622.2                |

## SHEAR RATING REPORT

Rating Types and Vehicles  
 INV. OPER POST SPEC  
 Structure I. D. HAM500  
 Member I. D. S01  
 Check Point I. D. 4.100  
 HS20 5C1T

Dead Load Superimposed Dead Load  
 Shear (-) Shear (+) Shear  
 0.6 0.0 7.7

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 96.5              | -79.2                  | 69.2                  |
| OPER      | 160.8             | -132.0                 | 115.3                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -2.98                 | 30.12 | -2.29    | 23.17 | -3.19                | 23.78 | -2.46    | 18.29 |
| OPER      | 5C1T      | -3.53                 | 23.47 | -2.71    | 18.06 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 24.80      | 2.30       | HS 45.95     | 82.7                 |
| 5C1T   | 37.42      | 4.91       | 0.00         | 589.6                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 4.100

Dead Load Moment      Superimposed Dead Load Moment  
-1.6                      -18.7

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 165.1      | 169.2           | -185.4 | 169.2        | -185.4 | 189.4                       | -165.1 | 189.4     | - |
| OPER 275.2      | 295.5           | -295.5 | 295.5        | -295.5 | 315.7                       | -275.2 | 315.7     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 16.15 R                 | 12.42                | 105.50      | 0.0       | 25.36                   | 19.51                  | 77.50  |        |
|           |            | -58.94 R                | -45.34               | 84.00       | 0.0       | -54.17                  | -41.67                 | 65.00  | 87.50  |
| OPER      | 5C1T       | 29.04 R                 | 22.33                | 215.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -50.88 L                | -39.14               | -36.50      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 7.47            | 2.80  | 7.47         | 2.80  | HS 56.03     | 100.9                |
| 5C1T        | 10.87           | 5.41  | 10.87        | 5.41  | 0.00         | 649.0                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 4.200

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus  |                  |       |       | Plastic Section |
|------------------|------------------|-------|-------|-----------------|
| Positive Bending | Negative Bending |       |       | Modulus - Z     |
| Top              | Bott.            | Top   | Bott. | (Fy * Z)        |
| 134.3            | 134.3            | 134.3 | 134.3 | 422.49          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 4.200

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.89 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 93.847     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 29.22 |        | 104.5                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 4.200

Dead Load Moment      Superimposed Dead Load Moment  
-0.2                      -1.8

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 195.0C             | -170.5                | 170.5              | -195.0C               | 196.2                       | -169.3                | 171.6              | -193.8                |
| OPER        | 325.0C             | -284.1                | 284.1              | -325.0C               | 327.0                       | -282.1                | 286.1              | -323.0                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 59.38 R      | 45.68              | 108.00 | 0.0                 | 44.46    | 34.20       | 80.00              |        |                |              |
|           |           | -45.72 L     | -35.17             | 42.00  | 0.0                 | -35.58   | -27.37      | 65.00              |        | 15.00          |              |
| OPER      | 5C1T      | 54.43 R      | 41.87              | 218.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -43.29 L     | -33.30             | -34.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 3.30               | 3.70                         | 2.89            | 4.24                  | HS 57.81     | 104.1                |
| 5C1T        | 6.01               | 6.52                         | 5.26            | 7.46                  | 0.00         | 630.6                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 4.200

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.5       | 0.0          | 5.8       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 96.5              | -78.0                  | 70.4         |
| OPER      | 160.8             | -130.0                 | 117.4        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -2.98                 | 25.40 | -2.29    | 19.54 | -4.44                | 20.97 | -3.41    | 16.13 |
| OPER      | 5C1T      | -5.23                 | 20.38 | -4.02    | 15.68 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 17.58      | 2.77       | HS 55.46     | 99.8                 |
| 5C1T   | 24.87      | 5.76       | 0.00         | 691.1                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 4.200

Dead Load Moment      Superimposed Dead Load Moment  
-0.2                      -1.8

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 176.1      | 176.5           | -178.1 | 176.5        | -178.1 | 178.5                       | -176.1 | 178.5     | - |
| OPER 293.5      | 295.5           | -295.5 | 295.5        | -295.5 | 297.4                       | -293.5 | 297.4     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 59.38 R                 | 45.68                | 108.00      | 0.0       | 44.46                   | 34.20                  | 80.00  |        |
|           |            | -45.72 L                | -35.17               | 42.00       | 0.0       | -35.58                  | -27.37                 | 65.00  | 15.00  |
| OPER      | 5C1T       | 54.43 R                 | 41.87                | 218.00      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -43.29 L                | -33.30               | -34.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 3.01            | 3.85  | 3.01         | 3.85  | HS 60.10     | 108.2                |
| 5C1T        | 5.46            | 6.78  | 5.46         | 6.78  | 0.00         | 655.7                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 4.300

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 4.300

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.89 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 93.847     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 29.22 |        | 104.5                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 4.300

Dead Load Moment 0.8  
Superimposed Dead Load Moment 10.4

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 195.0C          | -170.5             | 170.5           | -195.0C            | 188.3                       | -177.2             | 163.8           | -201.7             |
| OPER        | 325.0C          | -284.1             | 284.1           | -325.0C            | 313.8                       | -295.3             | 273.0           | -336.1             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment  | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|---------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 86.43 R      | 66.49              | 110.50  | 0.0                 | 64.95    | 49.96       | 82.50              |        |                |              |
|           |           | -37.95 L     | -29.19             | 42.00   | 0.0                 | -29.98   | -23.06      | 65.00              | 0.00   |                |              |
| OPER      | 5C1T      | 74.47 R      | 57.28              | 133.50  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -38.77 L     | -29.82             | -120.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 2.18            | 4.67                      | 1.89                      | 5.31               | HS 37.90     | 68.2                 |
| 5C1T        | 4.21            | 7.62                      | 3.66                      | 8.67               | 0.00         | 439.8                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 4.300

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear     | (-) Shear (+) Shear    |
| 0.3       | 0.0 3.9                |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 96.5              | -76.7                           | 71.7  |
| OPER      | 160.8             | -127.9                          | 119.5 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -4.41                 | 20.57 | -3.40    | 15.82 | -6.71                | 18.02 | -5.16    | 13.86 |
| OPER      | 5C1T      | -7.18                 | 17.22 | -5.52    | 13.25 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 11.44      | 3.48       | HS 69.70     | 125.5                |
| 5C1T   | 17.81      | 6.94       | 0.00         | 832.5                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 4.300

Dead Load Moment 0.8  
Superimposed Dead Load Moment 10.4

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 184.0      | 181.7           | -172.8 | 181.7        | -172.8 | 170.6                       | -184.0 | 170.6     | - |
| OPER 306.6      | 295.5           | -295.5 | 295.5        | -295.5 | 284.3                       | -306.6 | 284.3     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Live Load Moment w/o imp. | Loc. of Conc. Load 1 | Live Load Moment w/imp. | Loc. of Conc. Load 2 |
|-----------|------------|-------------------------|-------------------------|---------------------------|----------------------|-------------------------|----------------------|
| INV.      | HS20       | 86.43 R                 | 66.49                   | 110.50                    | 0.0                  | 64.95                   | 49.96                |
|           |            | -37.95 L                | -29.19                  | 42.00                     | 0.0                  | -29.98                  | -23.06               |
| OPER      | 5C1T       | 74.47 R                 | 57.28                   | 133.50                    | 0.0                  | 0.00                    | 0.00                 |
|           |            | -38.77 L                | -29.82                  | -120.00                   | 0.0                  | 0.00                    | 0.00                 |

## Serviceability

| Rating Veh. | Rating Factor   |                    | Load Capacity (tons) |                    |
|-------------|-----------------|--------------------|----------------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend      | bottom fiber -bend |
| HS20        | 1.97            | 4.85               | 1.97                 | 4.85               |
| 5C1T        | 3.82            | 7.91               | 3.82                 | 7.91               |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 4.400

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus      |               |                      |               | Plastic Section Modulus - Z |
|----------------------|---------------|----------------------|---------------|-----------------------------|
| Positive Bending Top | Bending Bott. | Negative Bending Top | Bending Bott. | (Fy * Z)                    |
| 134.3                | 134.3         | 134.3                | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 4.400

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.89 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 93.847     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 29.22 |        | 104.5                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 4.400

Dead Load Moment 1.4  
Superimposed Dead Load Moment 17.7

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 195.0C          | -170.5             | 170.5           | -195.0C            | 183.5                       | -181.9             | 159.0           | -206.5             |
| OPER        | 325.0C          | -284.1             | 284.1           | -325.0C            | 305.9                       | -303.2             | 265.0           | -344.1             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment  | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|---------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 96.95 R      | 74.58              | 113.00  | 0.0                 | 77.27    | 59.44       | 85.00              |        |                |              |
|           |           | -30.18 L     | -23.22             | 42.00   | 0.0                 | -26.38   | -20.29      | 65.00              | 0.00   |                |              |
| OPER      | 5C1T      | 86.94 R      | 66.87              | 271.00  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -35.67 L     | -27.44             | -118.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 1.89            | 6.03                      | 1.64                      | 6.84               | HS 32.80     | 59.0                 |
| 5C1T        | 3.52            | 8.50                      | 3.05                      | 9.65               | 0.00         | 365.8                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 4.400

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.2       | 0.0          | 2.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 96.5              | -75.5                  | 72.9                  |
| OPER      | 160.8             | -125.8                 | 121.5                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -8.97                 | 16.78 | -6.90    | 12.91 | -9.28                | 15.04 | -7.14    | 11.57 |
| OPER      | 5C1T      | -9.34                 | 14.16 | -7.19    | 10.89 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 8.13       | 4.35       | HS 86.92     | 156.5                |
| 5C1T   | 13.47      | 8.59       | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 4.400

Dead Load Moment 1.4  
Superimposed Dead Load Moment 17.7

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 188.7      | 184.9           | -169.6 | 184.9        | -169.6 | 165.8                       | -188.7 | 165.8     | - |
| OPER 314.6      | 295.5           | -295.5 | 295.5        | -295.5 | 276.4                       | -314.6 | 276.4     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 96.95 R                 | 74.58                | 113.00      | 0.0       | 77.27                   | 59.44                  | 85.00  |        |
|           |            | -30.18 L                | -23.22               | 42.00       | 0.0       | -26.38                  | -20.29                 | 65.00  | 0.00   |
| OPER      | 5C1T       | 86.94 R                 | 66.87                | 271.00      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -35.67 L                | -27.44               | -118.50     | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.71            | 6.25  | 1.71         | 6.25  | HS 34.21     | 61.6                 |
| 5C1T        | 3.18            | 8.82  | 3.18         | 8.82  | 0.00         | 381.5                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 4.500

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.35 | 8.24  | 8.24  | 0.62 | 1.77 |
| 22.2           | 21.00     | 0.400 | bott | 10.65 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.97        | 11.26 | 1463.2            | 1463.2           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 133.4           | 129.9         | 133.4        | 129.9         | 426.63                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 4.500

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 25.88 |
| bott | 4.12 | 0.62 | 13.400 | 150.00   | 84.62 |       | 26.62 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.89 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 96.683     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 426.63 | 109.1                   |
| bott | 22.62            |                   | 27.93 |        | 104.7                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 4.500

Dead Load Moment 1.6  
Superimposed Dead Load Moment 20.3

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 196.9C          | -169.3             | 164.9           | -196.9C            | 183.8                       | -182.4             | 151.8           | -210.0             |
| OPER        | 328.2C          | -282.2             | 274.8           | -328.2C            | 306.3                       | -304.1             | 253.0           | -350.0             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 94.63 R      | 72.79              | 101.50 | 0.0                 | 82.17    | 63.21       | 87.50              |        |                |              |
|           |           | -22.43 R     | -17.26             | 133.00 | 0.0                 | -22.79   | -17.53      | 110.00             | 0.00   |                |              |
| OPER      | 5C1T      | 89.88 R      | 69.14              | 273.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -34.36 L     | -26.43             | -71.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 1.94            | 8.01                      | 1.60         | 9.22               | HS 32.08     | 57.7                 |
| 5C1T        | 3.41            | 8.85                      | 2.81         | 10.19              | 0.00         | 337.7                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 4.500

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.0       | 0.0          | 0.1       |

| Rat. | Shear Capacity | Available Capacity for LL+I |
|------|----------------|-----------------------------|
| Veh. | VU             | (-) (+)                     |
| INV. | 96.5           | -74.2 74.2                  |
| OPER | 160.8          | -123.7 123.6                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. | Rat. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |      |
|------|------|-----------------------|-------|----------|-------|----------------------|-------|----------|------|
|      |      | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |      |
| Typ. | Veh. | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)  |
| INV. | HS20 | -13.12                | 13.12 | -10.10   | 10.10 | -12.08               | 12.10 | -9.29    | 9.31 |
| OPER | 5C1T | -11.64                | 11.66 | -8.95    | 8.97  | 0.00                 | 0.00  | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 5.66       | 5.65       | HS 113.01    | 203.4                |
| 5C1T   | 10.64      | 10.60      | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 4.500Dead Load Moment 1.6  
Superimposed Dead Load Moment 20.3

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 184.6      | 184.8           | -167.4 | 180.2        | -162.7 | 163.0                       | -189.2 | 158.4     | - |
| OPER 307.7      | 293.5           | -293.5 | 285.8        | -285.8 | 271.6                       | -315.4 | 264.0     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 94.63 R                 | 72.79           | 101.50                  | 0.0       | 82.17                   | 63.21           | 87.50                |        |
|           |            | -22.43 R                | -17.26          | 133.00                  | 0.0       | -22.79                  | -17.53          | 110.00               | 0.00   |
| OPER      | 5C1T       | 89.88 R                 | 69.14           | 273.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -34.36 L                | -26.43          | -71.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.72            | 8.30            | 1.67               | 8.10               | HS 33.47     | 60.3                 |
| 5C1T        | 3.02            | 9.18            | 2.94               | 8.95               | 0.00         | 352.4                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 4.600

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus  |                  |       |       | Plastic Section |
|------------------|------------------|-------|-------|-----------------|
| Positive Bending | Negative Bending |       |       | Modulus - Z     |
| Top              | Bott.            | Top   | Bott. | (Fy * Z)        |
| 134.3            | 134.3            | 134.3 | 134.3 | 422.49          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 4.600

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.89 | 28.67 | 28.67 | 1.726 | 999999.000 | 93.522 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 27.93 |        | 104.7                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 4.600

Dead Load Moment 1.4  
Superimposed Dead Load Moment 17.9

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 195.0C          | -170.5             | 170.5           | -195.0C            | 183.4                       | -182.0             | 158.9           | -206.6             |
| OPER        | 325.0C          | -284.1             | 284.1           | -325.0C            | 305.7                       | -303.4             | 264.8           | -344.3             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 96.96 L      | 74.59              | 62.00  | 0.0                 | 77.37    | 59.52       | 90.00              |        |                |              |
|           |           | -30.21 R     | -23.24             | 133.00 | 0.0                 | -26.38   | -20.29      | 110.00             | 0.00   |                |              |
| OPER      | 5C1T      | 86.75 L      | 66.73              | 39.00  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -35.44 R     | -27.26             | 206.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 1.89            | 6.03                      | 1.64                      | 6.84               | HS 32.77     | 59.0                 |
| 5C1T        | 3.52            | 8.56                      | 3.05                      | 9.72               | 0.00         | 366.3                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 4.600

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| -0.2      | -1.9                   |
|           | 0.0                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 96.5              | -73.0                           | 75.4  |
| OPER      | 160.8             | -121.6                          | 125.7 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -16.78                | 8.97 | -12.91   | 6.90 | -15.01               | 9.30 | -11.55   | 7.16 |
| OPER      | 5C1T      | -14.10                | 9.40 | -10.85   | 7.23 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 4.35       | 8.11       | HS 86.97     | 156.6                |
| 5C1T   | 8.62       | 13.38      | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 4.600Dead Load Moment 1.4  
Superimposed Dead Load Moment 17.9

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
|                 | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 188.9      | 185.0           | -169.6 | 185.0        | -169.6 | 165.7                       | -188.9 | 165.7     | - |
| OPER 314.8      | 295.5           | -295.5 | 295.5        | -295.5 | 276.2                       | -314.8 | 276.2     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 96.96 L                 | 74.59           | 62.00                   | 0.0       | 77.37                   | 59.52           | 90.00                |        |
|           |            | -30.21 R                | -23.24          | 133.00                  | 0.0       | -26.38                  | -20.29          | 110.00               | 0.00   |
| OPER      | 5C1T       | 86.75 L                 | 66.73           | 39.00                   | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -35.44 R                | -27.26          | 206.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.71            | 6.25            | 1.71               | 6.25               | HS 34.18     | 61.5                 |
| 5C1T        | 3.18            | 8.88            | 3.18               | 8.88               | 0.00         | 382.0                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 4.700

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 4.700

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.89 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 93.522     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 27.93 |        | 104.7                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 4.700

Dead Load Moment      Superimposed Dead Load Moment  
0.8                      10.7

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 195.0C          | -170.5             | 170.5           | -195.0C            | 188.1                       | -177.4             | 163.5           | -201.9             |
| OPER        | 325.0C          | -284.1             | 284.1           | -325.0C            | 313.4                       | -295.6             | 272.6           | -336.5             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 86.45 L      | 66.50              | 64.50  | 0.0                 | 65.15    | 50.11       | 92.50              |        |                |              |
|           |           | -37.99 R     | -29.22             | 133.00 | 0.0                 | -29.98   | -23.06      | 110.00             |        | 0.00           |              |
| OPER      | 5C1T      | 74.82 L      | 57.56              | 41.50  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -38.36 R     | -29.51             | 295.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 2.18            | 4.67                      | 1.89         | 5.32               | HS 37.84     | 68.1                 |
| 5C1T        | 4.19            | 7.71                      | 3.64         | 8.77               | 0.00         | 437.1                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 4.700

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| -0.3      | -3.8                   |
|           | 0.0                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 96.5              | -71.7                           | 76.7  |
| OPER      | 160.8             | -119.5                          | 127.8 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |              |      | Lane Live Load Shear |      |              |      |
|-----------|-----------|-----------------------|------|--------------|------|----------------------|------|--------------|------|
|           |           | w/imp. (-)            | (+)  | w/o imp. (-) | (+)  | w/imp. (-)           | (+)  | w/o imp. (-) | (+)  |
| INV.      | HS20      | -20.57                | 4.41 | -15.82       | 3.40 | -18.00               | 6.73 | -13.85       | 5.18 |
| OPER      | 5C1T      | -17.15                | 7.25 | -13.19       | 5.58 | 0.00                 | 0.00 | 0.00         | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 3.49       | 11.39      | HS 69.75     | 125.5                |  |
| 5C1T   | 6.97       | 17.62      | 0.00         | 836.3                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 4.700Dead Load Moment 0.8  
Superimposed Dead Load Moment 10.7

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 184.2      | 181.9           | -172.7 | 181.9        | -172.7 | 170.3                       | -184.2 | 170.4     | - |
| OPER 307.0      | 295.5           | -295.5 | 295.5        | -295.5 | 283.9                       | -307.0 | 283.9     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |        |        |      |
|-----------|------------|-------------------------|-------------------------|------------------------------|----------------------|--------|--------|--------|------|
| INV.      | HS20       | 86.45 L                 | 66.50                   | 64.50                        | 0.0                  | 65.15  | 50.11  | 92.50  |      |
|           |            | -37.99 R                | -29.22                  | 133.00                       | 0.0                  | -29.98 | -23.06 | 110.00 | 0.00 |
| OPER      | 5C1T       | 74.82 L                 | 57.56                   | 41.50                        | 0.0                  | 0.00   | 0.00   | 0.00   |      |
|           |            | -38.36 R                | -29.51                  | 295.00                       | 0.0                  | 0.00   | 0.00   | 0.00   | 0.00 |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.97            | 4.85            | 1.97               | 4.85               | HS 39.41     | 70.9                 |
| 5C1T        | 3.80            | 8.00            | 3.80               | 8.00               | 0.00         | 455.3                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 4.800

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 4.800

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.89 | 28.67 | 28.67 | 1.726 | 999999.000 | 93.522 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 27.93 |        | 104.7                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 4.800

Dead Load Moment      Superimposed Dead Load Moment  
-0.1                      -1.2

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 195.0C             | -170.5                | 170.5              | -195.0C               | 195.8                       | -169.6                | 171.3              | -194.2                |
| OPER        | 325.0C             | -284.1                | 284.1              | -325.0C               | 326.4                       | -282.7                | 285.5              | -323.6                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 59.40 L      | 45.69              | 67.00  | 0.0                 | 45.26    | 34.82       | 95.00              |        |                |              |
|           |           | -45.77 R     | -35.20             | 133.00 | 0.0                 | -35.43   | -27.25      | 110.00             |        | 160.00         |              |
| OPER      | 5C1T      | 55.12 L      | 42.40              | -43.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -42.83 R     | -32.95             | 209.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 3.30               | 3.71                         | 2.88                               | 4.24         | HS 57.67             |
| 5C1T        | 5.92               | 6.60                         | 5.18                               | 7.56         | 0.00                 |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 4.800

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.5      | -5.7         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 96.5              | -70.5                  | 77.9         |
| OPER      | 160.8             | -117.5                 | 129.9        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -25.40                | 2.98 | -19.54   | 2.29 | -20.95               | 4.46 | -16.11   | 3.43 |
| OPER      | 5C1T      | -20.29                | 5.30 | -15.61   | 4.08 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 2.78       | 17.48      | HS 55.50     | 99.9                 |
| 5C1T   | 5.79       | 24.49      | 0.00         | 694.9                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 4.800

Dead Load Moment      Superimposed Dead Load Moment  
-0.1                      -1.2

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 176.5      | 176.7           | -177.8 | 176.7        | -177.8 | 178.1                       | -176.5 | 178.1     | - |
| OPER 294.1      | 295.5           | -295.5 | 295.5        | -295.5 | 296.8                       | -294.1 | 296.8     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 59.40 L                 | 45.69                | 67.00       | 0.0       | 45.26                   | 34.82                  | 95.00  |        |
|           |            | -45.77 R                | -35.20               | 133.00      | 0.0       | -35.43                  | -27.25                 | 110.00 | 160.00 |
| OPER      | 5C1T       | 55.12 L                 | 42.40                | -43.00      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -42.83 R                | -32.95               | 209.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 3.00            | 3.86            | 3.00               | 3.86               | HS 59.96     | 107.9                |
| 5C1T        | 5.39            | 6.87            | 5.39               | 6.87               | 0.00         | 646.3                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 4.900

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 4.900

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.89 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 93.522     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 27.93 |        | 104.7                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 4.900

Dead Load Moment      Superimposed Dead Load Moment  
-1.5                      -18.0

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 195.0C             | -170.5                | 170.5              | -195.0C               | 206.7                       | -158.8                | 182.1              | -183.3                |
| OPER        | 325.0C             | -284.1                | 284.1              | -325.0C               | 344.5                       | -264.6                | 303.6              | -305.5                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.17 L      | 12.44              | 69.50  | 0.0                 | 25.27    | 19.44       | 97.50              |        |                |              |
|           |           | -59.01 L     | -45.39             | 91.00  | 0.0                 | -54.07   | -41.59      | 110.00             | 87.50  |                |              |
| OPER      | 5C1T      | 30.01 L      | 23.08              | -40.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -50.28 R     | -38.68             | 211.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 8.18               | 2.69                         | 7.21            | 3.11                  | HS 53.82     | 96.9                 |
| 5C1T        | 11.48              | 5.26                         | 10.12           | 6.08                  | 0.00         | 631.5                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 4.900

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.6      | -7.7         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 96.5              | -69.2                  | 79.2         |
| OPER      | 160.8             | -115.4                 | 131.9        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -30.11                | 3.11 | -23.17   | 2.39 | -23.76               | 3.21 | -18.28   | 2.47 |
| OPER      | 5C1T      | -23.37                | 3.61 | -17.98   | 2.77 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 2.30       | 24.65      | HS 45.98     | 82.8                 |
| 5C1T   | 4.94       | 36.58      | 0.00         | 592.6                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 4.900

Dead Load Moment      Superimposed Dead Load Moment  
-1.5                      -18.0

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 165.6      | 169.5           | -185.1 | 169.5        | -185.1 | 189.0                       | -165.6 | 189.0     | - |
| OPER 276.0      | 295.5           | -295.5 | 295.5        | -295.5 | 314.9                       | -276.0 | 314.9     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 16.17 L                 | 12.44           | 69.50                   | 0.0       | 25.27                   | 19.44           | 97.50                |        |
|           |            | -59.01 L                | -45.39          | 91.00                   | 0.0       | -54.07                  | -41.59          | 110.00               | 87.50  |
| OPER      | 5C1T       | 30.01 L                 | 23.08           | -40.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -50.28 R                | -38.68          | 211.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 7.48            | 2.81            | 7.48               | 2.81               | HS 56.13     | 101.0                |
| 5C1T        | 10.49           | 5.49            | 10.49              | 5.49               | 0.00         | 658.7                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 5.000

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 5.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.89 | 28.67 | 28.67 | 1.726 | 999999.000 | 93.522 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 27.93 |        | 104.7                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 5.000

Dead Load Moment      Superimposed Dead Load Moment  
-3.3                      -39.5

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 195.0C             | -170.5                | 170.5              | -195.0C               | 220.6                       | -144.8                | 196.1              | -169.4                |
| OPER        | 325.0C             | -284.1                | 284.1              | -325.0C               | 367.7                       | -241.4                | 326.8              | -282.3                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.43 R      | 12.64              | 158.00 | 0.0                 | 16.70    | 12.84       | 135.00             |        |                |              |
|           |           | -98.59 L     | -75.84             | 79.50  | 0.0                 | -90.53   | -69.64      | 110.00             |        | 90.00          |              |
| OPER      | 5C1T      | 12.73 R      | 9.79               | 360.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -64.03 R     | -49.26             | 218.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 13.21              | 1.47                         | 11.74           | 1.72                  | HS 29.38     | 52.9                 |
| 5C1T        | 28.89              | 3.77                         | 25.68           | 4.41                  | 0.00         | 452.3                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 5.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.6      | -0.8      | -7.7                   | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 96.5              | -68.0                           | 68.0  |
| OPER      | 160.8             | -113.3                          | 113.3 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -30.11                | 34.53 | -23.17   | 26.56 | -23.76               | 26.34 | -18.28   | 20.26 |
| OPER      | 5C1T      | -23.37                | 26.26 | -17.98   | 20.20 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.97       | 1.97       | HS 39.38     | 70.9                 |
| 5C1T   | 4.32       | 4.32       | 0.00         | 517.8                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 5.000

Dead Load Moment      Superimposed Dead Load Moment  
-3.3                      -39.5

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 151.6      | 160.2           | -194.4 | 160.2        | -194.4 | 202.9                       | -151.6 | 202.9     | - |
| OPER 252.7      | 295.5           | -295.5 | 295.5        | -295.5 | 338.2                       | -252.7 | 338.2     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 16.43 R                 | 12.64           | 158.00                  | 0.0       | 16.70                   | 12.84           | 135.00               |        |
|           |            | -98.59 L                | -75.84          | 79.50                   | 0.0       | -90.53                  | -69.64          | 110.00               | 90.00  |
| OPER      | 5C1T       | 12.73 R                 | 9.79            | 360.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -64.03 R                | -49.26          | 218.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 12.15           | 1.54            | 12.15              | 1.54               | HS 30.76     | 55.4                 |
| 5C1T        | 26.57           | 3.95            | 26.57              | 3.95               | 0.00         | 473.6                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 5.000

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 5.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.89 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 93.507     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 27.93 |        | 104.7                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 5.000

Dead Load Superimposed Dead Load  
Moment Moment  
-3.3 -39.5

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 195.0C             | -170.5                | 170.5              | -195.0C               | 220.6                       | -144.8                | 196.1              | -169.4                |
| OPER        | 325.0C             | -284.1                | 284.1              | -325.0C               | 367.7                       | -241.4                | 326.8              | -282.3                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live w/imp. | Load Moment w/o imp. | Loc. of Front Wheel | Ax. Dis. | Lane Live w/imp. | Load Moment w/o imp. | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|-------------------|----------------------|---------------------|----------|------------------|----------------------|----------------|--------------|
| INV.      | HS20      | 16.43 R           | 12.64                | 158.00              | 0.0      | 16.70            | 12.84                | 135.00         |              |
|           |           | -98.59 L          | -75.84               | 79.50               | 0.0      | -90.53           | -69.64               | 110.00         | 90.00        |
| OPER      | 5C1T      | 12.73 R           | 9.79                 | 360.00              | 0.0      | 0.00             | 0.00                 | 0.00           |              |
|           |           | -64.03 R          | -49.26               | 218.00              | 0.0      | 0.00             | 0.00                 | 0.00           | 0.00         |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 13.21              | 1.47                         | 11.74                              | 1.72         | HS 29.38             |
| 5C1T        | 28.89              | 3.77                         | 25.68                              | 4.41         | 0.00                 |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 5.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.8      | 0.8       | -9.6                   | 9.6       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I |       |
|-----------|-------------------|-----------------------------|-------|
|           |                   | (-)                         | (+)   |
| INV.      | 96.5              | -68.0                       | 68.0  |
| OPER      | 160.8             | -113.3                      | 113.3 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -34.53                | 34.53 | -26.56   | 26.56 | -26.33               | 26.34 | -20.25   | 20.26 |
| OPER      | 5C1T      | -26.23                | 26.26 | -20.18   | 20.20 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.97       | 1.97       | HS 39.38     | 70.9                 |
| 5C1T   | 4.32       | 4.32       | 0.00         | 517.8                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 5.000

Dead Load Moment      Superimposed Dead Load Moment  
-3.3                      -39.5

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 151.6      | 160.2           | -194.4 | 160.2        | -194.4 | 202.9                       | -151.6 | 202.9     | - |
| OPER 252.7      | 295.5           | -295.5 | 295.5        | -295.5 | 338.2                       | -252.7 | 338.2     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|------------------|-----------------|-------------------------|-----------|------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 16.43 R          | 12.64           | 158.00                  | 0.0       | 16.70            | 12.84           | 135.00               |        |
|           |            | -98.59 L         | -75.84          | 79.50                   | 0.0       | -90.53           | -69.64          | 110.00               | 90.00  |
| OPER      | 5C1T       | 12.73 R          | 9.79            | 360.00                  | 0.0       | 0.00             | 0.00            | 0.00                 |        |
|           |            | -64.03 R         | -49.26          | 218.00                  | 0.0       | 0.00             | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 12.15           | 1.54            | 12.15              | 1.54               | HS 30.76     | 55.4                 |
| 5C1T        | 26.57           | 3.95            | 26.57              | 3.95               | 0.00         | 473.6                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 5.100

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 5.100

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.89 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 93.507     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 27.93 |        | 104.7                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 5.100

Dead Load Moment      Superimposed Dead Load Moment  
-1.5                      -17.9

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 195.0C             | -170.5                | 170.5              | -195.0C               | 206.6                       | -158.8                | 182.1              | -183.4                |
| OPER        | 325.0C             | -284.1                | 284.1              | -325.0C               | 344.4                       | -264.7                | 303.5              | -305.6                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.17 R      | 12.44              | 130.50 | 0.0                 | 25.70    | 19.77       | 102.50             |        |                |              |
|           |           | -59.01 R     | -45.39             | 109.00 | 0.0                 | -54.06   | -41.58      | 90.00              | 112.50 |                |              |
| OPER      | 5C1T      | 29.99 R      | 23.07              | 240.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -50.24 L     | -38.65             | -11.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 8.04               | 2.69                         | 7.09            | 3.11                  | HS 53.83     | 96.9                 |
| 5C1T        | 11.48              | 5.27                         | 10.12           | 6.08                  | 0.00         | 632.2                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 5.100

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.6       | 0.0          | 7.7       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 96.5              | -79.2                  | 69.2                  |
| OPER      | 160.8             | -132.0                 | 115.4                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -2.98                 | 30.12 | -2.29    | 23.17 | -3.21                | 23.77 | -2.47    | 18.29 |
| OPER      | 5C1T      | -3.58                 | 23.41 | -2.76    | 18.01 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 24.66      | 2.30       | HS 45.97     | 82.8                 |
| 5C1T   | 36.82      | 4.93       | 0.00         | 591.4                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 5.100

Dead Load Moment      Superimposed Dead Load Moment  
-1.5                      -17.9

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 165.6      | 169.5           | -185.0 | 169.5        | -185.0 | 188.9                       | -165.6 | 188.9     | - |
| OPER 276.1      | 295.5           | -295.5 | 295.5        | -295.5 | 314.9                       | -276.1 | 314.9     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 16.17 R                 | 12.44                | 130.50      | 0.0       | 25.70                   | 19.77                  | 102.50 |        |
|           |            | -59.01 R                | -45.39               | 109.00      | 0.0       | -54.06                  | -41.58                 | 90.00  | 112.50 |
| OPER      | 5C1T       | 29.99 R                 | 23.07                | 240.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -50.24 L                | -38.65               | -11.50      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 7.35            | 2.81  | 7.35         | 2.81  | HS 56.14     | 101.1                |
| 5C1T        | 10.50           | 5.49  | 10.50        | 5.49  | 0.00         | 659.4                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 5.200

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus  |                  |       |       | Plastic Section |
|------------------|------------------|-------|-------|-----------------|
| Positive Bending | Negative Bending |       |       | Modulus - Z     |
| Top              | Bott.            | Top   | Bott. | (Fy * Z)        |
| 134.3            | 134.3            | 134.3 | 134.3 | 422.49          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 5.200

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.89 | 28.67 | 28.67 | 1.726 | 999999.000 | 93.507 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 27.93 |        | 104.7                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 5.200

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -0.1                | -1.1                             |

| Rating<br>Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|----------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|                | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.           | 195.0C             | -170.5                | 170.5              | -195.0C               | 195.7                       | -169.7                | 171.2              | -194.3                |
| OPER           | 325.0C             | -284.1                | 284.1              | -325.0C               | 326.2                       | -282.9                | 285.3              | -323.8                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Rat.<br>Veh. | Truck<br>w/imp. | Live Load<br>w/o imp. | Moment | Loc. of<br>Front<br>Wheel | Ax.<br>Dis. | Lane<br>w/imp. | Live Load<br>w/o imp. | Moment | Loc. of<br>Load 1 | Conc.<br>Load 2 |
|--------------|--------------|-----------------|-----------------------|--------|---------------------------|-------------|----------------|-----------------------|--------|-------------------|-----------------|
| INV.         | HS20         | 59.40 R         | 45.69                 | 133.00 | 0.0                       | 44.76       | 34.43          | 105.00                |        |                   |                 |
|              |              | -45.76 L        | -35.20                | 67.00  | 0.0                       | -35.35      | -27.19         | 90.00                 |        | 40.00             |                 |
| OPER         | 5C1T         | 55.12 R         | 42.40                 | 243.00 | 0.0                       | 0.00        | 0.00           | 0.00                  |        |                   |                 |
|              |              | -42.64 L        | -32.80                | -9.00  | 0.0                       | 0.00        | 0.00           | 0.00                  |        | 0.00              |                 |

## Moment

| Rating<br>Veh. | top fiber<br>+bend | Rating<br>bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------------|---------------------------------|-----------------|-----------------------|-----------------|----------------------------|
| HS20           | 3.30               | 3.71                            | 2.88            | 4.24                  | HS 57.64        | 103.8                      |
| 5C1T           | 5.92               | 6.63                            | 5.18            | 7.59                  | 0.00            | 621.2                      |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 5.200

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.5       | 0.0          | 5.8       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 96.5              | -77.9                  | 70.5         |
| OPER      | 160.8             | -129.9                 | 117.4        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -2.98                 | 25.40 | -2.29    | 19.54 | -4.46                | 20.96 | -3.43    | 16.12 |
| OPER      | 5C1T      | -5.28                 | 20.33 | -4.06    | 15.64 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 17.49      | 2.78       | HS 55.49     | 99.9                 |
| 5C1T   | 24.59      | 5.78       | 0.00         | 693.3                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 5.200

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -0.1                | -1.1                             |

| Rating<br>Veh.<br>ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                       | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
|                       | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| bend                  |                 |        |              |        |                             |        |           |   |
| INV.                  | 176.8           | -177.8 | 176.8        | -177.8 | 178.0                       | -176.5 | 178.0     | - |
| 176.5                 |                 |        |              |        |                             |        |           |   |
| OPER                  | 295.5           | -295.5 | 295.5        | -295.5 | 296.7                       | -294.2 | 296.7     | - |
| 294.2                 |                 |        |              |        |                             |        |           |   |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Truck<br>Veh. | Live Load Moment<br>w/imp. | Moment<br>w/o imp. | Loc. of Ax.<br>Front<br>Wheel | Lane<br>Dis. | Live Load Moment<br>w/imp. | Moment<br>w/o imp. | Loc. of Conc.<br>Load 1 | Load 2 |
|--------------|---------------|----------------------------|--------------------|-------------------------------|--------------|----------------------------|--------------------|-------------------------|--------|
| INV.         | HS20          | 59.40 R                    | 45.69              | 133.00                        | 0.0          | 44.76                      | 34.43              | 105.00                  |        |
|              |               | -45.76 L                   | -35.20             | 67.00                         | 0.0          | -35.35                     | -27.19             | 90.00                   | 40.00  |
| OPER         | 5C1T          | 55.12 R                    | 42.40              | 243.00                        | 0.0          | 0.00                       | 0.00               | 0.00                    |        |
|              |               | -42.64 L                   | -32.80             | -9.00                         | 0.0          | 0.00                       | 0.00               | 0.00                    | 0.00   |

## Serviceability

| Rating<br>Veh. | Rating       |                | Factor          |                | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------|----------------|-----------------|----------------|-----------------|----------------------------|
|                | top<br>+bend | fiber<br>-bend | bottom<br>+bend | fiber<br>-bend |                 |                            |
| HS20           | 3.00         | 3.86           | 3.00            | 3.86           | HS 59.94        | 107.9                      |
| 5C1T           | 5.38         | 6.90           | 5.38            | 6.90           | 0.00            | 645.9                      |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 5.300

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 5.300

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.89 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 93.507     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 27.93 |        | 104.7                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 5.300

Dead Load Moment      Superimposed Dead Load Moment  
0.9                      10.9

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 195.0C             | -170.5                | 170.5              | -195.0C               | 187.9                       | -177.5                | 163.4              | -202.0                |
| OPER        | 325.0C             | -284.1                | 284.1              | -325.0C               | 313.2                       | -295.8                | 272.4              | -336.7                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 86.45 R      | 66.50              | 135.50 | 0.0                 | 65.20    | 50.15       | 107.50             |        |                |              |
|           |           | -37.99 L     | -29.22             | 67.00  | 0.0                 | -29.91   | -23.01      | 90.00              |        | 0.00           |              |
| OPER      | 5C1T      | 74.83 R      | 57.56              | 158.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -38.21 L     | -29.39             | -95.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 2.17               | 4.67                         | 1.89                               | 5.32         | HS 37.81             |
| 5C1T        | 4.19               | 7.74                         | 3.64                               | 8.81         | 0.00 436.7           |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 5.300

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.3       | 0.0          | 3.8       |

| Rat. | Shear Capacity | Available Capacity for LL+I |
|------|----------------|-----------------------------|
| Veh. | VU             | (-) (+)                     |
| INV. | 96.5           | -76.7 71.7                  |
| OPER | 160.8          | -127.8 119.5                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. | Rat. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|------|------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|      |      | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
| Typ. | Veh. | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV. | HS20 | -4.41                 | 20.57 | -3.40    | 15.82 | -6.73                | 18.01 | -5.18    | 13.86 |
| OPER | 5C1T | -7.23                 | 17.18 | -5.56    | 13.22 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |        | Shear  |          |          |
|--------|--------|--------|----------|----------|
| Veh.   | Rating | Factor | Rating   | Load     |
|        | (-)    | (+)    | Value    | Capacity |
|        |        |        |          | (tons)   |
| HS20   | 11.40  | 3.49   | HS 69.73 | 125.5    |
| 5C1T   | 17.67  | 6.95   | 0.00     | 834.6    |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 5.300

Dead Load Moment 0.9  
Superimposed Dead Load Moment 10.9

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 184.3      | 182.0           | -172.6 | 182.0        | -172.6 | 170.2                       | -184.3 | 170.2     | - |
| OPER 307.2      | 295.5           | -295.5 | 295.5        | -295.5 | 283.7                       | -307.2 | 283.7     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |        |        |      |
|-----------|------------|-------------------------|-------------------------|------------------------------|----------------------|--------|--------|--------|------|
| INV.      | HS20       | 86.45 R                 | 66.50                   | 135.50                       | 0.0                  | 65.20  | 50.15  | 107.50 |      |
|           |            | -37.99 L                | -29.22                  | 67.00                        | 0.0                  | -29.91 | -23.01 | 90.00  | 0.00 |
| OPER      | 5C1T       | 74.83 R                 | 57.56                   | 158.50                       | 0.0                  | 0.00   | 0.00   | 0.00   |      |
|           |            | -38.21 L                | -29.39                  | -95.00                       | 0.0                  | 0.00   | 0.00   | 0.00   | 0.00 |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.97            | 4.85  | 1.97         | 4.85  | HS 39.38     | 70.9                 |
| 5C1T        | 3.79            | 8.04  | 3.79         | 8.04  | 0.00         | 455.0                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 5.400

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 5.400

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.89 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 93.507     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 27.93 |        | 104.7                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 5.400

Dead Load Moment 1.4  
Superimposed Dead Load Moment 18.1

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 195.0C          | -170.5             | 170.5           | -195.0C            | 183.3                       | -182.2             | 158.7           | -206.7             |
| OPER        | 325.0C          | -284.1             | 284.1           | -325.0C            | 305.4                       | -303.7             | 264.5           | -344.5             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 96.96 R      | 74.59              | 138.00 | 0.0                 | 77.46    | 59.59       | 110.00             |        |                |              |
|           |           | -30.21 L     | -23.24             | 67.00  | 0.0                 | -26.32   | -20.25      | 90.00              | 0.00   |                |              |
| OPER      | 5C1T      | 86.95 R      | 66.88              | 296.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -35.20 L     | -27.07             | -93.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber +bend | bottom fiber -bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|--------|--------------|----------------------|
| HS20        | 1.89            | 6.03               | 1.64   | 32.74        | 58.9                 |
| 5C1T        | 3.51            | 8.63               | 3.04   | 0.00         | 365.1                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 5.400

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.2       | 0.0          | 1.9       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 96.5              | -75.5                  | 73.0                  |
| OPER      | 160.8             | -125.8                 | 121.6                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -8.97                 | 16.78 | -6.90    | 12.91 | -9.30                | 15.03 | -7.16    | 11.56 |
| OPER      | 5C1T      | -9.38                 | 14.13 | -7.22    | 10.87 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 8.11       | 4.35       | HS 86.95     | 156.5                |
| 5C1T   | 13.40      | 8.61       | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 5.400Dead Load Moment 1.4  
Superimposed Dead Load Moment 18.1

| Rating Veh. ber | Moment Capacity top fiber |        | Moment Capacity bottom fiber |        | Available Capacity for LL+I |        |           |   |
|-----------------|---------------------------|--------|------------------------------|--------|-----------------------------|--------|-----------|---|
|                 | +bend                     | -bend  | +bend                        | -bend  | top fiber                   | -bend  | bottom fi |   |
| INV. 189.0      | 185.1                     | -169.5 | 185.1                        | -169.5 | 165.5                       | -189.0 | 165.5     | - |
| OPER 315.0      | 295.5                     | -295.5 | 295.5                        | -295.5 | 275.9                       | -315.0 | 275.9     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |        |        |      |
|-----------|------------|-------------------------|-------------------------|------------------------------|----------------------|--------|--------|--------|------|
| INV.      | HS20       | 96.96 R                 | 74.59                   | 138.00                       | 0.0                  | 77.46  | 59.59  | 110.00 |      |
|           |            | -30.21 L                | -23.24                  | 67.00                        | 0.0                  | -26.32 | -20.25 | 90.00  | 0.00 |
| OPER      | 5C1T       | 86.95 R                 | 66.88                   | 296.00                       | 0.0                  | 0.00   | 0.00   | 0.00   |      |
|           |            | -35.20 L                | -27.07                  | -93.50                       | 0.0                  | 0.00   | 0.00   | 0.00   | 0.00 |

## Serviceability

| Rating Veh. | Rating Factor top fiber |       | Rating Factor bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-------------------------|-------|----------------------------|-------|--------------|----------------------|
|             | +bend                   | -bend | +bend                      | -bend |              |                      |
| HS20        | 1.71                    | 6.26  | 1.71                       | 6.26  | HS 34.14     | 61.5                 |
| 5C1T        | 3.17                    | 8.95  | 3.17                       | 8.95  | 0.00         | 380.8                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 5.500

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.35 | 8.24  | 8.24  | 0.62 | 1.77 |
| 22.2           | 21.00     | 0.400 | bott | 10.65 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.97        | 11.26 | 1463.2            | 1463.2           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 133.4           | 129.9         | 133.4        | 129.9         | 426.63                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 5.500

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 25.88 |
| bott | 4.12 | 0.62 | 13.400 | 150.00   | 84.62 |       | 26.62 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.89 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 96.667     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 426.63 | 109.1                   |
| bott | 22.62            |                   | 28.37 |        | 104.7                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 5.500

Dead Load Moment 1.6  
Superimposed Dead Load Moment 20.6

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 196.9C          | -169.3             | 164.9           | -196.9C            | 183.6                       | -182.6             | 151.6           | -210.2             |
| OPER        | 328.2C          | -282.2             | 274.8           | -328.2C            | 306.0                       | -304.4             | 252.6           | -350.4             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 94.63        | L                  | 72.79  | 98.50               | 0.0      | 82.30       | 63.31              | 112.50 |                |              |
|           |           | -22.43       | L                  | -17.26 | 67.00               | 0.0      | -22.73      | -17.49             | 90.00  | 0.00           |              |
| OPER      | 5C1T      | 89.91        | L                  | 69.16  | -73.50              | 0.0      | 0.00        | 0.00               | 0.00   |                |              |
|           |           | -34.24       | L                  | -26.34 | 40.50               | 0.0      | 0.00        | 0.00               | 0.00   | 0.00           | 0.00         |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 1.94            | 8.03                      | 1.60         | 9.25               | HS 32.04     | 57.7                 |
| 5C1T        | 3.40            | 8.89                      | 2.81         | 10.23              | 0.00         | 337.2                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 5.500

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.0       | 0.0          | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 96.5              | -74.2                  | 74.2         |
| OPER      | 160.8             | -123.7                 | 123.7        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |      |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |      |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)  |
| INV.      | HS20      | -13.12                | 13.12 | -10.10   | 10.10 | -12.10               | 12.09 | -9.31    | 9.30 |
| OPER      | 5C1T      | -11.66                | 11.65 | -8.97    | 8.96  | 0.00                 | 0.00  | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 5.66       | 5.65       | HS 113.06    | 203.5                |
| 5C1T   | 10.61      | 10.62      | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 5.500

Dead Load Moment 1.6  
Superimposed Dead Load Moment 20.6

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 184.8      | 185.0           | -167.2 | 180.4        | -162.6 | 162.8                       | -189.4 | 158.2     | - |
| OPER 308.0      | 293.5           | -293.5 | 285.8        | -285.8 | 271.3                       | -315.7 | 263.6     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 94.63 L                 | 72.79                | 98.50       | 0.0       | 82.30                   | 63.31                  | 112.50 |        |
|           |            | -22.43 L                | -17.26               | 67.00       | 0.0       | -22.73                  | -17.49                 | 90.00  | 0.00   |
| OPER      | 5C1T       | 89.91 L                 | 69.16                | -73.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -34.24 L                | -26.34               | 40.50       | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.72            | 8.33  | 1.67         | 8.13  | HS 33.43     | 60.2                 |
| 5C1T        | 3.02            | 9.22  | 2.93         | 8.99  | 0.00         | 351.8                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 5.600

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 5.600

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.89 | 28.67 | 28.67 | 1.726 | 999999.000 | 93.617 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 28.37 |        | 104.6                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 5.600

Dead Load Moment 1.4  
Superimposed Dead Load Moment 18.1

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 195.0C          | -170.5             | 170.5           | -195.0C            | 183.3                       | -182.2             | 158.8           | -206.7             |
| OPER        | 325.0C          | -284.1             | 284.1           | -325.0C            | 305.5                       | -303.6             | 264.6           | -344.5             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 96.96 L      | 74.58              | 87.00  | 0.0                 | 77.45    | 59.58       | 115.00             |        |                |              |
|           |           | -30.19 R     | -23.23             | 158.00 | 0.0                 | -26.33   | -20.26      | 135.00             | 0.00   |                |              |
| OPER      | 5C1T      | 86.98 L      | 66.91              | -71.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -35.33 R     | -27.18             | 318.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | Rating Factor   |                    |                 |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|-----------------|--------------------|--------------|----------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend |              |                      |
| HS20        | 1.89            | 6.03               | 1.64            | 6.85               | HS 32.75     | 58.9                 |
| 5C1T        | 3.51            | 8.59               | 3.04            | 9.75               | 0.00         | 365.1                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 5.600

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.2      | -2.0         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 96.5              | -72.9                  | 75.5         |
| OPER      | 160.8             | -121.6                 | 125.8        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -16.78                | 8.97 | -12.91   | 6.90 | -15.03               | 9.29 | -11.56   | 7.15 |
| OPER      | 5C1T      | -14.15                | 9.37 | -10.88   | 7.21 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 4.35       | 8.12       | HS 86.93     | 156.5                |
| 5C1T   | 8.59       | 13.43      | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 5.600

Dead Load Moment 1.4  
Superimposed Dead Load Moment 18.1

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 189.0      | 185.1           | -169.5 | 185.1        | -169.5 | 165.6                       | -189.0 | 165.6     | - |
| OPER 315.0      | 295.5           | -295.5 | 295.5        | -295.5 | 276.0                       | -315.0 | 276.0     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 96.96 L                 | 74.58                | 87.00       | 0.0       | 77.45                   | 59.58                  | 115.00 |        |
|           |            | -30.19 R                | -23.23               | 158.00      | 0.0       | -26.33                  | -20.26                 | 135.00 | 0.00   |
| OPER      | 5C1T       | 86.98 L                 | 66.91                | -71.00      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -35.33 R                | -27.18               | 318.50      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.71            | 6.26  | 1.71         | 6.26  | HS 34.16     | 61.5                 |
| 5C1T        | 3.17            | 8.91  | 3.17         | 8.91  | 0.00         | 380.7                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 5.700

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 5.700

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.89 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 93.617     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 28.37 |        | 104.6                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 5.700

Dead Load Moment 0.8  
Superimposed Dead Load Moment 10.8

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 195.0C          | -170.5             | 170.5           | -195.0C            | 188.0                       | -177.4             | 163.5           | -202.0             |
| OPER        | 325.0C          | -284.1             | 284.1           | -325.0C            | 313.4                       | -295.7             | 272.5           | -336.6             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 86.44 L      | 66.49              | 89.50  | 0.0                 | 65.17    | 50.13       | 117.50             |        |                |              |
|           |           | -37.96 R     | -29.20             | 158.00 | 0.0                 | -29.94   | -23.03      | 135.00             | 0.00   |                |              |
| OPER      | 5C1T      | 74.77 L      | 57.51              | 66.50  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -38.37 R     | -29.51             | 320.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 2.17            | 4.67                      | 1.89                      | 5.32               | HS 37.83     | 68.1                 |
| 5C1T        | 4.19            | 7.71                      | 3.64                      | 8.77               | 0.00         | 437.3                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 5.700

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.3      | -3.9         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 96.5              | -71.7                  | 76.7         |
| OPER      | 160.8             | -119.5                 | 127.9        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |            |              |              | Lane Live Load Shear |            |              |              |
|-----------|-----------|-----------------------|------------|--------------|--------------|----------------------|------------|--------------|--------------|
|           |           | w/imp. (-)            | (+) w/imp. | w/o imp. (-) | (+) w/o imp. | w/imp. (-)           | (+) w/imp. | w/o imp. (-) | (+) w/o imp. |
| INV.      | HS20      | -20.57                | 4.41       | -15.82       | 3.40         | -18.02               | 6.72       | -13.86       | 5.17         |
| OPER      | 5C1T      | -17.20                | 7.22       | -13.23       | 5.55         | 0.00                 | 0.00       | 0.00         | 0.00         |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 3.49       | 11.41      | HS 69.71     | 125.5                |  |
| 5C1T   | 6.95       | 17.71      | 0.00         | 833.4                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 5.700

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| 0.8                 | 10.8                             |

| Rating<br>Veh.<br>ber | Moment Capacity |              | Available Capacity for LL+I |           |           |           |           |           |
|-----------------------|-----------------|--------------|-----------------------------|-----------|-----------|-----------|-----------|-----------|
|                       | top fiber       | bottom fiber | top fiber                   | bottom fi | top fiber | bottom fi | top fiber | bottom fi |
| bend                  | +bend           | -bend        | +bend                       | -bend     | +bend     | -bend     | +bend     | -         |
| INV.                  | 181.9           | -172.6       | 181.9                       | -172.6    | 170.3     | -184.2    | 170.3     | -         |
| 184.3                 |                 |              |                             |           |           |           |           |           |
| OPER                  | 295.5           | -295.5       | 295.5                       | -295.5    | 283.8     | -307.1    | 283.9     | -         |
| 307.1                 |                 |              |                             |           |           |           |           |           |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Truck<br>Veh. | Live Load Moment<br>w/imp. | Loc. of Ax.<br>w/o imp. | Front<br>Wheel | Lane Dis. | Live Load Moment<br>w/imp. | Loc. of Conc.<br>w/o imp. | Load 1 | Load 2 |
|--------------|---------------|----------------------------|-------------------------|----------------|-----------|----------------------------|---------------------------|--------|--------|
| INV.         | HS20          | 86.44 L                    | 66.49                   | 89.50          | 0.0       | 65.17                      | 50.13                     | 117.50 |        |
|              |               | -37.96 R                   | -29.20                  | 158.00         | 0.0       | -29.94                     | -23.03                    | 135.00 | 0.00   |
| OPER         | 5C1T          | 74.77 L                    | 57.51                   | 66.50          | 0.0       | 0.00                       | 0.00                      | 0.00   |        |
|              |               | -38.37 R                   | -29.51                  | 320.00         | 0.0       | 0.00                       | 0.00                      | 0.00   | 0.00   |

## Serviceability

| Rating<br>Veh. | Rating    |              | Factor    |              | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|-----------|--------------|-----------|--------------|-----------------|----------------------------|
|                | top fiber | bottom fiber | top fiber | bottom fiber |                 |                            |
|                | +bend     | -bend        | +bend     | -bend        |                 |                            |
| HS20           | 1.97      | 4.85         | 1.97      | 4.85         | HS 39.41        | 70.9                       |
| 5C1T           | 3.80      | 8.00         | 3.80      | 8.00         | 0.00            | 455.6                      |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 5.800

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 5.800

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.89 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 93.617     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 28.37 |        | 104.6                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 5.800

Dead Load Moment      Superimposed Dead Load Moment  
-0.1                      -1.3

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 195.0C             | -170.5                | 170.5              | -195.0C               | 195.9                       | -169.6                | 171.3              | -194.1                |
| OPER        | 325.0C             | -284.1                | 284.1              | -325.0C               | 326.4                       | -282.7                | 285.5              | -323.6                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 59.39 L      | 45.69              | 92.00  | 0.0                 | 45.23    | 34.79       | 120.00             |        |                |              |
|           |           | -45.74 R     | -35.18             | 158.00 | 0.0                 | -35.41   | -27.24      | 135.00             | 185.00 |                |              |
| OPER      | 5C1T      | 55.09 L      | 42.38              | -18.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -42.83 R     | -32.95             | 234.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 3.30               | 3.71                         | 2.88            | 4.24                  | HS 57.69     | 103.8                |
| 5C1T        | 5.93               | 6.60                         | 5.18            | 7.55                  | 0.00         | 621.9                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 5.800

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.5      | -5.8         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 96.5              | -70.5                  | 78.0         |
| OPER      | 160.8             | -117.4                 | 129.9        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -25.40                | 2.98 | -19.54   | 2.29 | -20.97               | 4.45 | -16.13   | 3.42 |
| OPER      | 5C1T      | -20.35                | 5.27 | -15.65   | 4.05 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 2.77       | 17.52      | HS 55.48     | 99.9                 |
| 5C1T   | 5.77       | 24.66      | 0.00         | 692.5                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 5.800

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -0.1                | -1.3                             |

| Rating<br>Veh.<br>ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                       | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend                  | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV.<br>176.4         | 176.7           | -177.9 | 176.7        | -177.9 | 178.1                       | -176.4 | 178.1     | - |
| OPER<br>294.0         | 295.5           | -295.5 | 295.5        | -295.5 | 296.9                       | -294.0 | 296.9     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Truck<br>Veh. | Live Load Moment<br>w/imp. | Loc. of Ax.<br>w/o imp. | Front<br>Wheel | Lane Dis. | Live Load Moment<br>w/imp. | Loc. of Conc.<br>w/o imp. | Load 1 | Load 2 |
|--------------|---------------|----------------------------|-------------------------|----------------|-----------|----------------------------|---------------------------|--------|--------|
| INV.         | HS20          | 59.39 L                    | 45.69                   | 92.00          | 0.0       | 45.23                      | 34.79                     | 120.00 |        |
|              |               | -45.74 R                   | -35.18                  | 158.00         | 0.0       | -35.41                     | -27.24                    | 135.00 | 185.00 |
| OPER         | 5C1T          | 55.09 L                    | 42.38                   | -18.00         | 0.0       | 0.00                       | 0.00                      | 0.00   |        |
|              |               | -42.83 R                   | -32.95                  | 234.00         | 0.0       | 0.00                       | 0.00                      | 0.00   | 0.00   |

## Serviceability

| Rating<br>Veh. | Rating       |                | Factor          |                | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------|----------------|-----------------|----------------|-----------------|----------------------------|
|                | top<br>+bend | fiber<br>-bend | bottom<br>+bend | fiber<br>-bend |                 |                            |
| HS20           | 3.00         | 3.86           | 3.00            | 3.86           | HS 59.99        | 108.0                      |
| 5C1T           | 5.39         | 6.86           | 5.39            | 6.86           | 0.00            | 646.7                      |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 5.900

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 5.900

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.89 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 93.617     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 28.37 |        | 104.6                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 5.900

|                     |                                  |
|---------------------|----------------------------------|
| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
| -1.5                | -18.1                            |

| Rating<br>Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|----------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|                | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.           | 195.0C             | -170.5                | 170.5              | -195.0C               | 206.8                       | -158.7                | 182.3              | -183.2                |
| OPER           | 325.0C             | -284.1                | 284.1              | -325.0C               | 344.6                       | -264.4                | 303.8              | -305.3                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Rat.<br>Veh. | Truck<br>w/imp. | Live Load<br>w/o imp. | Moment<br>w/o imp. | Loc. of<br>Front<br>Wheel | Ax.<br>Dis. | Lane<br>w/imp. | Live Load<br>w/o imp. | Moment<br>w/o imp. | Loc. of<br>Load 1 | Conc.<br>Load 2 |
|--------------|--------------|-----------------|-----------------------|--------------------|---------------------------|-------------|----------------|-----------------------|--------------------|-------------------|-----------------|
| INV.         | HS20         | 16.15 L         | 12.43                 | 94.50              | 0.0                       | 25.22       | 19.40          | 122.50                |                    |                   |                 |
|              |              | -58.97 L        | -45.36                | 116.00             | 0.0                       | -54.11      | -41.62         | 135.00                | 112.50             |                   |                 |
| OPER         | 5C1T         | 29.90 L         | 23.00                 | -15.50             | 0.0                       | 0.00        | 0.00           | 0.00                  |                    |                   |                 |
|              |              | -50.42 R        | -38.78                | 236.50             | 0.0                       | 0.00        | 0.00           | 0.00                  | 0.00               | 0.00              |                 |

## Moment

| Rating<br>Veh. | top fiber<br>+bend | Rating<br>bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------------|---------------------------------|-----------------|-----------------------|-----------------|----------------------------|
| HS20           | 8.20               | 2.69                            | 7.23            | 3.11                  | HS 53.81        | 96.9                       |
| 5C1T           | 11.52              | 5.24                            | 10.16           | 6.06                  | 0.00            | 629.4                      |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 5.900

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.6      | -7.7         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 96.5              | -69.2                  | 79.2         |
| OPER      | 160.8             | -115.3                 | 132.0        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -30.12                | 3.11 | -23.17   | 2.39 | -23.78               | 3.21 | -18.29   | 2.47 |
| OPER      | 5C1T      | -23.42                | 3.57 | -18.02   | 2.75 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 2.30       | 24.70      | HS 45.96     | 82.7                 |
| 5C1T   | 4.93       | 36.99      | 0.00         | 590.9                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 5.900

Dead Load Moment      Superimposed Dead Load Moment  
-1.5                      -18.1

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 165.5      | 169.4           | -185.1 | 169.4        | -185.1 | 189.1                       | -165.5 | 189.1     | - |
| OPER 275.8      | 295.5           | -295.5 | 295.5        | -295.5 | 315.1                       | -275.8 | 315.1     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 16.15 L                 | 12.43                | 94.50       | 0.0       | 25.22                   | 19.40                  | 122.50 |        |
|           |            | -58.97 L                | -45.36               | 116.00      | 0.0       | -54.11                  | -41.62                 | 135.00 | 112.50 |
| OPER      | 5C1T       | 29.90 L                 | 23.00                | -15.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -50.42 R                | -38.78               | 236.50      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 7.50            | 2.81  | 7.50         | 2.81  | HS 56.12     | 101.0                |
| 5C1T        | 10.54           | 5.47  | 10.54        | 5.47  | 0.00         | 656.5                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 6.000

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | 0.00                        | 0.00      | 0.00    | 0.00    |
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 6.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.89 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 93.617     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 28.37 |        | 104.6                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 6.000

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -3.3                | -39.8                            |

| Rating<br>Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|----------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|                | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.           | 195.0C             | -170.5                | 170.5              | -195.0C               | 220.8                       | -144.6                | 196.3              | -169.2                |
| OPER           | 325.0C             | -284.1                | 284.1              | -325.0C               | 368.1                       | -241.0                | 327.2              | -281.9                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Rat.<br>Veh. | Truck<br>w/imp. | Live Load<br>w/o imp. | Moment  | Loc. of<br>Front<br>Wheel | Ax.<br>Dis. | Lane<br>w/imp. | Live Load<br>w/o imp. | Moment | Loc. of<br>Load 1 | Conc.<br>Load 2 |
|--------------|--------------|-----------------|-----------------------|---------|---------------------------|-------------|----------------|-----------------------|--------|-------------------|-----------------|
| INV.         | HS20         | 16.45 L         | 12.65                 | 67.00   | 0.0                       | 16.64       | 12.80          | 90.00                 |        |                   |                 |
|              |              | -98.58 R        | -75.83                | 145.50  | 0.0                       | -90.62      | -69.71         | 115.00                | 135.00 |                   |                 |
| OPER         | 5C1T         | 12.72 L         | 9.78                  | -135.00 | 0.0                       | 0.00        | 0.00           | 0.00                  |        |                   |                 |
|              |              | -64.28 R        | -49.44                | 243.00  | 0.0                       | 0.00        | 0.00           | 0.00                  | 0.00   |                   |                 |

## Moment

| Rating<br>Veh. | top fiber<br>+bend | Rating<br>bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------------|---------------------------------|-----------------|-----------------------|-----------------|----------------------------|
| HS20           | 13.27              | 1.47                            | 11.80           | 1.72                  | HS 29.34        | 52.8                       |
| 5C1T           | 28.94              | 3.75                            | 25.73           | 4.39                  | 0.00            | 450.0                      |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 6.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.6      | -0.8      | -7.7                   | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 96.5              | -68.0                  | 68.0         |
| OPER      | 160.8             | -113.3                 | 113.3        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -30.12                | 34.53 | -23.17   | 26.56 | -23.78               | 26.35 | -18.29   | 20.27 |
| OPER      | 5C1T      | -23.42                | 26.27 | -18.02   | 20.21 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.97       | 1.97       | HS 39.37     | 70.9                 |
| 5C1T   | 4.31       | 4.31       | 0.00         | 517.4                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 6.000

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -3.3                | -39.8                            |

| Rating<br>Veh.<br>ber | Moment Capacity |              | Available Capacity for LL+I |           |       |        |       |   |
|-----------------------|-----------------|--------------|-----------------------------|-----------|-------|--------|-------|---|
|                       | top fiber       | bottom fiber | top fiber                   | bottom fi |       |        |       |   |
| bend                  | +bend           | -bend        | +bend                       | -bend     | +bend | -bend  | +bend | - |
| INV.                  | 160.1           | -194.5       | 160.1                       | -194.5    | 203.1 | -151.4 | 203.1 | - |
| 151.4                 |                 |              |                             |           |       |        |       |   |
| OPER                  | 295.5           | -295.5       | 295.5                       | -295.5    | 338.5 | -252.4 | 338.5 | - |
| 252.4                 |                 |              |                             |           |       |        |       |   |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Truck<br>Veh. | Live Load Moment<br>w/imp. | Moment<br>w/o imp. | Loc. of Ax.<br>Front<br>Wheel | Lane<br>Dis. | Live Load Moment<br>w/imp. | Moment<br>w/o imp. | Loc. of Conc.<br>Load 1 | Load 2 |
|--------------|---------------|----------------------------|--------------------|-------------------------------|--------------|----------------------------|--------------------|-------------------------|--------|
| INV.         | HS20          | 16.45 L                    | 12.65              | 67.00                         | 0.0          | 16.64                      | 12.80              | 90.00                   |        |
|              |               | -98.58 R                   | -75.83             | 145.50                        | 0.0          | -90.62                     | -69.71             | 115.00                  | 135.00 |
| OPER         | 5C1T          | 12.72 L                    | 9.78               | -135.00                       | 0.0          | 0.00                       | 0.00               | 0.00                    |        |
|              |               | -64.28 R                   | -49.44             | 243.00                        | 0.0          | 0.00                       | 0.00               | 0.00                    | 0.00   |

## Serviceability

| Rating<br>Veh. | Rating    |              | Factor    |              | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|-----------|--------------|-----------|--------------|-----------------|----------------------------|
|                | top fiber | bottom fiber | top fiber | bottom fiber |                 |                            |
|                | +bend     | -bend        | +bend     | -bend        |                 |                            |
| HS20           | 12.21     | 1.54         | 12.21     | 1.54         | HS 30.73        | 55.3                       |
| 5C1T           | 26.62     | 3.93         | 26.62     | 3.93         | 0.00            | 471.2                      |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 6.000

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 6.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.89 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 93.611     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 28.37 |        | 104.6                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 6.000

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -3.3                | -39.8                            |

| Rating<br>Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|----------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|                | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.           | 195.0C             | -170.5                | 170.5              | -195.0C               | 220.8                       | -144.6                | 196.3              | -169.2                |
| OPER           | 325.0C             | -284.1                | 284.1              | -325.0C               | 368.1                       | -241.0                | 327.2              | -281.9                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Rat.<br>Veh. | Truck Live<br>w/imp. | Load Moment<br>w/o imp. | Loc. of<br>Front<br>Wheel | Ax.<br>Dis. | Lane Live<br>w/imp. | Load Moment<br>w/o imp. | Loc. of<br>Load 1 | Conc.<br>Load 2 |
|--------------|--------------|----------------------|-------------------------|---------------------------|-------------|---------------------|-------------------------|-------------------|-----------------|
| INV.         | HS20         | 16.45 L              | 12.65                   | 67.00                     | 0.0         | 16.64               | 12.80                   | 90.00             |                 |
|              |              | -98.58 R             | -75.83                  | 145.50                    | 0.0         | -90.62              | -69.71                  | 115.00            | 135.00          |
| OPER         | 5C1T         | 12.72 L              | 9.78                    | -135.00                   | 0.0         | 0.00                | 0.00                    | 0.00              |                 |
|              |              | -64.28 R             | -49.44                  | 243.00                    | 0.0         | 0.00                | 0.00                    | 0.00              | 0.00            |

## Moment

| Rating<br>Veh. | top fiber<br>+bend | Rating<br>bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------------|---------------------------------|-----------------|-----------------------|-----------------|----------------------------|
| HS20           | 13.27              | 1.47                            | 11.80           | 1.72                  | HS 29.34        | 52.8                       |
| 5C1T           | 28.94              | 3.75                            | 25.73           | 4.39                  | 0.00            | 450.0                      |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 6.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.8      | 0.8       | -9.6                   | 9.6       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I |       |
|-----------|-------------------|-----------------------------|-------|
|           |                   | (-)                         | (+)   |
| INV.      | 96.5              | -68.0                       | 68.0  |
| OPER      | 160.8             | -113.3                      | 113.3 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -34.53                | 34.53 | -26.56   | 26.56 | -26.35               | 26.35 | -20.27   | 20.27 |
| OPER      | 5C1T      | -26.27                | 26.27 | -20.21   | 20.21 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.97       | 1.97       | HS 39.37     | 70.9                 |
| 5C1T   | 4.31       | 4.31       | 0.00         | 517.4                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 6.000

Dead Load Moment      Superimposed Dead Load Moment  
-3.3                      -39.8

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 151.4      | 160.1           | -194.5 | 160.1        | -194.5 | 203.1                       | -151.4 | 203.1     | - |
| OPER 252.4      | 295.5           | -295.5 | 295.5        | -295.5 | 338.5                       | -252.4 | 338.5     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 16.45 L                 | 12.65                | 67.00       | 0.0       | 16.64                   | 12.80                  | 90.00  |        |
|           |            | -98.58 R                | -75.83               | 145.50      | 0.0       | -90.62                  | -69.71                 | 115.00 | 135.00 |
| OPER      | 5C1T       | 12.72 L                 | 9.78                 | -135.00     | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -64.28 R                | -49.44               | 243.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 12.21           | 1.54  | 12.21        | 1.54  | HS 30.73     | 55.3                 |
| 5C1T        | 26.62           | 3.93  | 26.62        | 3.93  | 0.00         | 471.2                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 6.100

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 6.100

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.89 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 93.611     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 28.37 |        | 104.6                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 6.100

Dead Load Superimposed Dead Load  
Moment Moment  
-1.5 -18.1

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 195.0C             | -170.5                | 170.5              | -195.0C               | 206.8                       | -158.7                | 182.3              | -183.2                |
| OPER        | 325.0C             | -284.1                | 284.1              | -325.0C               | 344.6                       | -264.4                | 303.8              | -305.3                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.21 R      | 12.47              | 155.50 | 0.0                 | 25.66    | 19.74       | 127.50             |        |                |              |
|           |           | -59.02 R     | -45.40             | 134.00 | 0.0                 | -54.12   | -41.63      | 115.00             | 137.50 |                |              |
| OPER      | 5C1T      | 29.93 R      | 23.02              | 265.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -50.47 L     | -38.83             | 13.50  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 8.06               | 2.69                         | 7.10                               | 3.10         | HS 53.77 96.8        |
| 5C1T        | 11.52              | 5.24                         | 10.15                              | 6.05         | 0.00 628.7           |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 6.100

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| 0.6       | 0.0                    |
|           | 7.7                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 96.5              | -79.2                  | 69.2                  |
| OPER      | 160.8             | -132.0                 | 115.3                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |            |              |              | Lane Live Load Shear |            |              |              |
|-----------|-----------|-----------------------|------------|--------------|--------------|----------------------|------------|--------------|--------------|
|           |           | w/imp. (-)            | w/imp. (+) | w/o imp. (-) | w/o imp. (+) | w/imp. (-)           | w/imp. (+) | w/o imp. (-) | w/o imp. (+) |
| INV.      | HS20      | -2.98                 | 30.12      | -2.29        | 23.17        | -3.20                | 23.78      | -2.46        | 18.29        |
| OPER      | 5C1T      | -3.57                 | 23.42      | -2.74        | 18.02        | 0.00                 | 0.00       | 0.00         | 0.00         |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 24.72      | 2.30       | HS 45.96     | 82.7                 |
| 5C1T   | 37.00      | 4.93       | 0.00         | 591.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 6.100

Dead Load Moment      Superimposed Dead Load Moment  
-1.5                      -18.1

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 165.5      | 169.4           | -185.1 | 169.4        | -185.1 | 189.1                       | -165.5 | 189.1     | - |
| OPER 275.8      | 295.5           | -295.5 | 295.5        | -295.5 | 315.1                       | -275.8 | 315.1     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 16.21 R                 | 12.47                | 155.50      | 0.0       | 25.66                   | 19.74                  | 127.50 |        |
|           |            | -59.02 R                | -45.40               | 134.00      | 0.0       | -54.12                  | -41.63                 | 115.00 | 137.50 |
| OPER      | 5C1T       | 29.93 R                 | 23.02                | 265.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -50.47 L                | -38.83               | 13.50       | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 7.37            | 2.80  | 7.37         | 2.80  | HS 56.08     | 100.9                |
| 5C1T        | 10.53           | 5.46  | 10.53        | 5.47  | 0.00         | 655.7                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 6.200

|               |                             |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Allowable stress (fs) (psi) |           |         |         |
| RATIO/Inv.    | 0.00                        | 0.00      | 0.00    | 0.00    |
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

|                |           |       |      |       |       |       |      |      |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

|                         |                  |                       |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

|               |          |              |       |                   |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

|                  |                  |             |       |                 |
|------------------|------------------|-------------|-------|-----------------|
| Section Modulus  |                  |             |       | Plastic Section |
| Positive Bending | Negative Bending | Modulus - Z |       |                 |
| Top              | Bott.            | Top         | Bott. | (Fy * Z)        |
| 134.3            | 134.3            | 134.3       | 134.3 | 422.49          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 6.200

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.89 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 93.611     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 28.37 |        | 104.6                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 6.200

Dead Load Moment      Superimposed Dead Load Moment  
-0.1                      -1.3

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 195.0C             | -170.5                | 170.5              | -195.0C               | 195.8                       | -169.6                | 171.3              | -194.1                |
| OPER        | 325.0C             | -284.1                | 284.1              | -325.0C               | 326.4                       | -282.7                | 285.5              | -323.6                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 59.44 R      | 45.73              | 158.00 | 0.0                 | 44.75    | 34.42       | 130.00             |        |                |              |
|           |           | -45.78 L     | -35.22             | 92.00  | 0.0                 | -35.45   | -27.27      | 115.00             |        | 65.00          |              |
| OPER      | 5C1T      | 55.14 R      | 42.41              | 268.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -42.88 L     | -32.98             | 16.00  | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 3.30               | 3.70                         | 2.88                               | 4.24         | 57.64                |
| 5C1T        | 5.92               | 6.59                         | 5.18                               | 7.55         | 0.00                 |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 6.200

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| 0.5       | 0.0                    |
|           | 5.8                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 96.5              | -78.0                  | 70.4                  |
| OPER      | 160.8             | -129.9                 | 117.4                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -2.98                 | 25.40 | -2.29    | 19.54 | -4.45                | 20.97 | -3.42    | 16.13 |
| OPER      | 5C1T      | -5.27                 | 20.35 | -4.05    | 15.65 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 17.52      | 2.77       | HS 55.48     | 99.9                 |
| 5C1T   | 24.67      | 5.77       | 0.00         | 692.5                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 6.200

Dead Load Moment      Superimposed Dead Load Moment  
-0.1                      -1.3

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 176.4      | 176.7           | -177.8 | 176.7        | -177.9 | 178.1                       | -176.4 | 178.1     | - |
| OPER 294.0      | 295.5           | -295.5 | 295.5        | -295.5 | 296.9                       | -294.0 | 296.9     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 59.44 R                 | 45.73           | 158.00                  | 0.0       | 44.75                   | 34.42           | 130.00               |        |
|           |            | -45.78 L                | -35.22          | 92.00                   | 0.0       | -35.45                  | -27.27          | 115.00               | 65.00  |
| OPER      | 5C1T       | 55.14 R                 | 42.41           | 268.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -42.88 L                | -32.98          | 16.00                   | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 3.00            | 3.85            | 3.00               | 3.85               | HS 59.93     | 107.9                |
| 5C1T        | 5.38            | 6.86            | 5.39               | 6.86               | 0.00         | 646.1                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 6.300

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Depth | Web Thk. |      | Dc    | b max | b min | t    | ry   |
|----------------|-------|----------|------|-------|-------|-------|------|------|
| H              | D     | tw       | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00 | 0.400    | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 6.300

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.89 | 28.67 | 28.67 | 1.726 | 999999.000 | 93.611 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 28.37 |        | 104.6                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 6.300

Dead Load Moment 0.8  
Superimposed Dead Load Moment 10.8

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 195.0C          | -170.5             | 170.5           | -195.0C            | 188.0                       | -177.4             | 163.5           | -202.0             |
| OPER        | 325.0C          | -284.1             | 284.1           | -325.0C            | 313.4                       | -295.7             | 272.5           | -336.6             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 86.49 R      | 66.53              | 160.50 | 0.0                 | 65.21    | 50.16       | 132.50             |        |                |              |
|           |           | -38.00 L     | -29.23             | 92.00  | 0.0                 | -29.98   | -23.06      | 115.00             | 0.00   |                |              |
| OPER      | 5C1T      | 74.83 R      | 57.56              | 183.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -38.41 L     | -29.55             | -70.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 2.17            | 4.67                      | 1.89         | 5.31               | HS 37.80     | 68.0                 |
| 5C1T        | 4.19            | 7.70                      | 3.64         | 8.76               | 0.00         | 436.9                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 6.300

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.3       | 0.0          | 3.9       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 96.5              | -76.7                  | 71.7         |
| OPER      | 160.8             | -127.9                 | 119.5        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -4.41                 | 20.57 | -3.40    | 15.82 | -6.72                | 18.02 | -5.17    | 13.86 |
| OPER      | 5C1T      | -7.22                 | 17.20 | -5.55    | 13.23 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 11.41      | 3.49       | HS 69.71     | 125.5                |
| 5C1T   | 17.71      | 6.95       | 0.00         | 833.4                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 6.300

Dead Load Moment 0.8  
Superimposed Dead Load Moment 10.8

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 184.3      | 181.9           | -172.6 | 181.9        | -172.6 | 170.3                       | -184.3 | 170.3     | - |
| OPER 307.1      | 295.5           | -295.5 | 295.5        | -295.5 | 283.8                       | -307.1 | 283.8     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |        |        |      |
|-----------|------------|-------------------------|-------------------------|------------------------------|----------------------|--------|--------|--------|------|
| INV.      | HS20       | 86.49 R                 | 66.53                   | 160.50                       | 0.0                  | 65.21  | 50.16  | 132.50 |      |
|           |            | -38.00 L                | -29.23                  | 92.00                        | 0.0                  | -29.98 | -23.06 | 115.00 | 0.00 |
| OPER      | 5C1T       | 74.83 R                 | 57.56                   | 183.50                       | 0.0                  | 0.00   | 0.00   | 0.00   |      |
|           |            | -38.41 L                | -29.55                  | -70.00                       | 0.0                  | 0.00   | 0.00   | 0.00   | 0.00 |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.97            | 4.85  | 1.97         | 4.85  | HS 39.38     | 70.9                 |
| 5C1T        | 3.79            | 7.99  | 3.79         | 7.99  | 0.00         | 455.1                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 6.400

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 6.400

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.89 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 93.611     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 28.37 |        | 104.6                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 6.400

Dead Load Moment 1.4  
Superimposed Dead Load Moment 18.1

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 195.0C          | -170.5             | 170.5           | -195.0C            | 183.3                       | -182.2             | 158.8           | -206.7             |
| OPER        | 325.0C          | -284.1             | 284.1           | -325.0C            | 305.5                       | -303.6             | 264.6           | -344.5             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 97.01 R      | 74.63              | 163.00 | 0.0                 | 77.50    | 59.62       | 135.00             |        |                |              |
|           |           | -30.23 L     | -23.25             | 92.00  | 0.0                 | -26.37   | -20.28      | 115.00             | 0.00   |                |              |
| OPER      | 5C1T      | 87.04 R      | 66.95              | 321.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -35.36 L     | -27.20             | -68.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 1.89            | 6.03                      | 1.64                      | 6.84               | HS 32.73     | 58.9                 |
| 5C1T        | 3.51            | 8.59                      | 3.04                      | 9.74               | 0.00         | 364.8                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 6.400

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.2       | 0.0          | 2.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 96.5              | -75.5                  | 72.9         |
| OPER      | 160.8             | -125.8                 | 121.6        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -8.97                 | 16.78 | -6.90    | 12.91 | -9.30                | 15.03 | -7.15    | 11.56 |
| OPER      | 5C1T      | -9.37                 | 14.15 | -7.21    | 10.88 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 8.12       | 4.35       | HS 86.93     | 156.5                |
| 5C1T   | 13.43      | 8.59       | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 6.400

Dead Load Moment 1.4  
Superimposed Dead Load Moment 18.1

| Rating Veh. ber | Moment Capacity top fiber |        | Moment Capacity bottom fiber |        | Available Capacity for LL+I |        |           |   |
|-----------------|---------------------------|--------|------------------------------|--------|-----------------------------|--------|-----------|---|
|                 | +bend                     | -bend  | +bend                        | -bend  | top fiber                   | -bend  | bottom fi |   |
| INV. 189.0      | 185.1                     | -169.5 | 185.1                        | -169.5 | 165.6                       | -189.0 | 165.6     | - |
| OPER 315.0      | 295.5                     | -295.5 | 295.5                        | -295.5 | 275.9                       | -315.0 | 276.0     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Live Load Moment w/o imp. | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-------------------------|---------------------------|-----------|-------------------------|----------------------|--------|
| INV.      | HS20       | 97.01 R                 | 74.63                   | 163.00                    | 0.0       | 77.50                   | 59.62                | 135.00 |
|           |            | -30.23 L                | -23.25                  | 92.00                     | 0.0       | -26.37                  | -20.28               | 115.00 |
| OPER      | 5C1T       | 87.04 R                 | 66.95                   | 321.00                    | 0.0       | 0.00                    | 0.00                 | 0.00   |
|           |            | -35.36 L                | -27.20                  | -68.50                    | 0.0       | 0.00                    | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | Factor bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|------------------------|---------------------------|---------------------------|---------------------------|--------------|----------------------|
| HS20        | 1.71                   | 6.25                      | 1.71                      | 6.25                      | HS 34.13     | 61.4                 |
| 5C1T        | 3.17                   | 8.91                      | 3.17                      | 8.91                      | 0.00         | 380.5                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 6.500

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 6.500

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.88 | 28.67 | 28.67 | 1.726 | 999999.000 | 93.430 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 27.64 |        | 104.7                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 6.500

Dead Load Moment 1.6  
Superimposed Dead Load Moment 20.6

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 195.0C          | -170.5             | 170.5           | -195.0C            | 181.7                       | -183.8             | 157.1           | -208.3             |
| OPER        | 325.0C          | -284.1             | 284.1           | -325.0C            | 302.8                       | -306.3             | 261.9           | -347.2             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 94.69 L      | 72.84              | 123.50 | 0.0                 | 82.36    | 63.35       | 137.50             |        |                |              |
|           |           | -22.45 L     | -17.27             | 92.00  | 0.0                 | -22.75   | -17.50      | 115.00             |        | 0.00           |              |
| OPER      | 5C1T      | 89.98 R      | 69.21              | 323.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -34.26 R     | -26.36             | 209.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | bottom fiber -bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|--------|--------------|----------------------|
| HS20        | 1.92            | 8.08               | 1.66   | 33.19        | 59.7                 |
| 5C1T        | 3.37            | 8.94               | 2.91   | 0.00         | 349.3                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 6.500

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.0       | 0.0          | 0.1       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 96.5              | -74.2                  | 74.2         |
| OPER      | 160.8             | -123.7                 | 123.6        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |      |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |      |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)  |
| INV.      | HS20      | -13.12                | 13.12 | -10.10   | 10.10 | -12.09               | 12.10 | -9.30    | 9.31 |
| OPER      | 5C1T      | -11.65                | 11.66 | -8.96    | 8.97  | 0.00                 | 0.00  | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 5.66       | 5.65       | HS 113.03    | 203.5                |
| 5C1T   | 10.62      | 10.60      | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 6.500

Dead Load Moment      Superimposed Dead Load Moment  
1.6                      20.6

| Rating Veh. ber | Moment Capacity |              | Available Capacity for LL+I |           |       |        |       |   |
|-----------------|-----------------|--------------|-----------------------------|-----------|-------|--------|-------|---|
|                 | top fiber       | bottom fiber | top fiber                   | bottom fi |       |        |       |   |
| bend            | +bend           | -bend        | +bend                       | -bend     | +bend | -bend  | +bend | - |
| INV. 190.6      | 186.2           | -168.4       | 186.2                       | -168.4    | 163.9 | -190.6 | 164.0 | - |
| OPER 317.7      | 295.5           | -295.5       | 295.5                       | -295.5    | 273.2 | -317.7 | 273.3 | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 94.69 L                 | 72.84                | 123.50      | 0.0       | 82.36                   | 63.35                  | 137.50 |        |
|           |            | -22.45 L                | -17.27               | 92.00       | 0.0       | -22.75                  | -17.50                 | 115.00 | 0.00   |
| OPER      | 5C1T       | 89.98 R                 | 69.21                | 323.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -34.26 R                | -26.36               | 209.50      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor |              | Load Capacity |           |
|-------------|---------------|--------------|---------------|-----------|
|             | top fiber     | bottom fiber | top fiber     | bottom fi |
| HS20        | 1.73          | 8.38         | 1.73          | 8.38      |
| 5C1T        | 3.04          | 9.27         | 3.04          | 9.27      |

Rating Value      Load Capacity (tons)

HS 34.63      62.3

0.00      364.4

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 6.600

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 6.600

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.88 | 28.67 | 28.67 | 1.726 | 999999.000 | 93.430 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 27.64 |        | 104.7                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 6.600

Dead Load Moment 1.5  
Superimposed Dead Load Moment 18.1

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 195.0C          | -170.5             | 170.5           | -195.0C            | 183.2                       | -182.2             | 158.7           | -206.7             |
| OPER        | 325.0C          | -284.1             | 284.1           | -325.0C            | 305.4                       | -303.7             | 264.5           | -344.6             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 97.01 L      | 74.62              | 112.00 | 0.0                 | 77.51    | 59.62       | 140.00             |        |                |              |
|           |           | -30.21 R     | -23.24             | 183.00 | 0.0                 | -26.33   | -20.25      | 160.00             | 0.00   |                |              |
| OPER      | 5C1T      | 87.00 L      | 66.92              | -46.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -35.21 R     | -27.09             | 343.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 1.89            | 6.03                      | 1.64                      | 6.84               | HS 32.72     | 58.9                 |
| 5C1T        | 3.51            | 8.62                      | 3.04                      | 9.79               | 0.00         | 364.9                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 6.600

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| -0.2      | -1.9                   |
|           | 0.0                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 96.5              | -73.0                           | 75.5  |
| OPER      | 160.8             | -121.6                          | 125.8 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -16.78                | 8.97 | -12.91   | 6.90 | -15.03               | 9.30 | -11.56   | 7.16 |
| OPER      | 5C1T      | -14.13                | 9.38 | -10.87   | 7.22 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |                      |
|--------|------------|------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value         |
| HS20   | 4.35       | 8.11       | HS 86.95             |
| 5C1T   | 8.60       | 13.40      | 0.00                 |
|        |            |            | Load Capacity (tons) |
|        |            |            | 156.5                |
|        |            |            | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 6.600

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| 1.5                 | 18.1                             |

| Rating<br>Veh.<br>ber | Moment Capacity |              | Available Capacity for LL+I |           | top fiber |           | bottom fi |           |
|-----------------------|-----------------|--------------|-----------------------------|-----------|-----------|-----------|-----------|-----------|
|                       | top fiber       | bottom fiber | top fiber                   | bottom fi | top fiber | bottom fi | top fiber | bottom fi |
|                       | +bend           | -bend        | +bend                       | -bend     | +bend     | -bend     | +bend     | -bend     |
| INV.                  | 185.1           | -169.4       | 185.1                       | -169.4    | 165.5     | -189.0    | 165.5     | -         |
| 189.0                 |                 |              |                             |           |           |           |           |           |
| OPER                  | 295.5           | -295.5       | 295.5                       | -295.5    | 275.9     | -315.0    | 275.9     | -         |
| 315.1                 |                 |              |                             |           |           |           |           |           |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Truck<br>Veh. | Live Load Moment<br>w/imp. | Loc. of Ax.<br>w/o imp. | Front<br>Wheel | Lane<br>Dis. | Live Load Moment<br>w/imp. | Loc. of Conc.<br>w/o imp. | Load 1 | Load 2 |
|--------------|---------------|----------------------------|-------------------------|----------------|--------------|----------------------------|---------------------------|--------|--------|
| INV.         | HS20          | 97.01 L                    | 74.62                   | 112.00         | 0.0          | 77.51                      | 59.62                     | 140.00 |        |
|              |               | -30.21 R                   | -23.24                  | 183.00         | 0.0          | -26.33                     | -20.25                    | 160.00 | 0.00   |
| OPER         | 5C1T          | 87.00 L                    | 66.92                   | -46.00         | 0.0          | 0.00                       | 0.00                      | 0.00   |        |
|              |               | -35.21 R                   | -27.09                  | 343.50         | 0.0          | 0.00                       | 0.00                      | 0.00   | 0.00   |

## Serviceability

| Rating<br>Veh. | Rating    |              | Factor    |              | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|-----------|--------------|-----------|--------------|-----------------|----------------------------|
|                | top fiber | bottom fiber | top fiber | bottom fiber |                 |                            |
|                | +bend     | -bend        | +bend     | -bend        |                 |                            |
| HS20           | 1.71      | 6.26         | 1.71      | 6.26         | HS              | 34.13                      |
| 5C1T           | 3.17      | 8.95         | 3.17      | 8.95         |                 | 61.4                       |
|                |           |              |           |              |                 | 380.5                      |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 6.700

|               |                             |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Allowable stress (fs) (psi) |           |         |         |
| RATIO/Inv.    | 0.00                        | 0.00      | 0.00    | 0.00    |
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

|                |           |       |      |       |       |       |      |      |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

|                         |                  |                       |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

|               |          |              |       |                   |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

|                  |                  |             |       |                 |
|------------------|------------------|-------------|-------|-----------------|
| Section Modulus  |                  |             |       | Plastic Section |
| Positive Bending | Negative Bending | Modulus - Z |       |                 |
| Top              | Bott.            | Top         | Bott. | (Fy * Z)        |
| 134.3            | 134.3            | 134.3       | 134.3 | 422.49          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 6.700

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.88 | 28.67 | 28.67 | 1.726 | 999999.000 | 93.430 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 27.64 |        | 104.7                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 6.700

Dead Load Moment      Superimposed Dead Load Moment  
0.9                      10.9

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 195.0C             | -170.5                | 170.5              | -195.0C               | 187.9                       | -177.5                | 163.4              | -202.1                |
| OPER        | 325.0C             | -284.1                | 284.1              | -325.0C               | 313.2                       | -295.9                | 272.3              | -336.8                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 86.48 L      | 66.52              | 114.50 | 0.0                 | 65.23    | 50.18       | 142.50             |        |                |              |
|           |           | -37.98 R     | -29.22             | 183.00 | 0.0                 | -29.91   | -23.01      | 160.00             |        | 0.00           |              |
| OPER      | 5C1T      | 74.89 L      | 57.60              | 91.50  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -38.21 R     | -29.40             | 345.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 2.17               | 4.67                         | 1.89            | 5.32                  | HS 37.79     | 68.0                 |
| 5C1T        | 4.18               | 7.74                         | 3.64            | 8.81                  | 0.00         | 436.4                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 6.700

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| -0.3      | -3.8                   |
|           | 0.0                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 96.5              | -71.7                           | 76.7  |
| OPER      | 160.8             | -119.5                          | 127.8 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |              |      | Lane Live Load Shear |      |              |      |
|-----------|-----------|-----------------------|------|--------------|------|----------------------|------|--------------|------|
|           |           | w/imp. (-)            | (+)  | w/o imp. (-) | (+)  | w/imp. (-)           | (+)  | w/o imp. (-) | (+)  |
| INV.      | HS20      | -20.57                | 4.41 | -15.82       | 3.40 | -18.01               | 6.73 | -13.86       | 5.18 |
| OPER      | 5C1T      | -17.19                | 7.23 | -13.22       | 5.57 | 0.00                 | 0.00 | 0.00         | 0.00 |

| Rating |            | Shear      |                      |
|--------|------------|------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value         |
| HS20   | 3.49       | 11.40      | HS 69.73             |
| 5C1T   | 6.95       | 17.67      | 0.00                 |
|        |            |            | Load Capacity (tons) |
|        |            |            | 125.5                |
|        |            |            | 834.5                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 6.700Dead Load Moment 0.9  
Superimposed Dead Load Moment 10.9

| Rating Veh. ber | Moment Capacity top fiber |        | Moment Capacity bottom fiber |        | Available Capacity for LL+I |                 |                 |                 |
|-----------------|---------------------------|--------|------------------------------|--------|-----------------------------|-----------------|-----------------|-----------------|
|                 | +bend                     | -bend  | +bend                        | -bend  | top fiber +bend             | top fiber -bend | bottom fi +bend | bottom fi -bend |
| INV. 184.3      | 182.0                     | -172.6 | 182.0                        | -172.6 | 170.2                       | -184.3          | 170.2           | -               |
| OPER 307.2      | 295.5                     | -295.5 | 295.5                        | -295.5 | 283.7                       | -307.2          | 283.7           | -               |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Live Load Moment w/o imp. | Loc. of Conc. Load 1 | Live Load Moment w/imp. | Loc. of Conc. Load 2 |
|-----------|------------|-------------------------|-------------------------|---------------------------|----------------------|-------------------------|----------------------|
| INV.      | HS20       | 86.48 L                 | 66.52                   | 114.50                    | 0.0                  | 65.23                   | 50.18                |
|           |            | -37.98 R                | -29.22                  | 183.00                    | 0.0                  | -29.91                  | -23.01               |
| OPER      | 5C1T       | 74.89 L                 | 57.60                   | 91.50                     | 0.0                  | 0.00                    | 0.00                 |
|           |            | -38.21 R                | -29.40                  | 345.00                    | 0.0                  | 0.00                    | 0.00                 |

## Serviceability

| Rating Veh. | Rating top fiber +bend | Rating top fiber -bend | Factor bottom fiber +bend | Factor bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|------------------------|------------------------|---------------------------|---------------------------|--------------|----------------------|
| HS20        | 1.97                   | 4.85                   | 1.97                      | 4.85                      | HS 39.36     | 70.9                 |
| 5C1T        | 3.79                   | 8.04                   | 3.79                      | 8.04                      | 0.00         | 454.6                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 6.800

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 134.3                | 134.3                  | 134.3                | 134.3                  | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 6.800

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.88 | 28.67 | 28.67 | 1.726 | 999999.000 | 93.430 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 27.64 |        | 104.7                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 6.800

Dead Load Moment      Superimposed Dead Load Moment  
-0.1                      -1.1

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 195.0C             | -170.5                | 170.5              | -195.0C               | 195.7                       | -169.7                | 171.2              | -194.3                |
| OPER        | 325.0C             | -284.1                | 284.1              | -325.0C               | 326.2                       | -282.9                | 285.3              | -323.8                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 59.43 L      | 45.72              | 117.00 | 0.0                 | 45.29    | 34.84       | 145.00             |        |                |              |
|           |           | -45.75 R     | -35.19             | 183.00 | 0.0                 | -35.34   | -27.19      | 160.00             |        | 210.00         |              |
| OPER      | 5C1T      | 55.16 L      | 42.43              | 7.00   | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -42.64 R     | -32.80             | 259.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|--------|--------------|----------------------|
| HS20        | 3.29               | 3.71                         | 2.88   | 57.61        | 103.7                |
| 5C1T        | 5.91               | 6.64                         | 5.17   | 0.00         | 620.7                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 6.800

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.5      | -5.8         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 96.5              | -70.5                  | 77.9         |
| OPER      | 160.8             | -117.4                 | 129.9        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -25.40                | 2.98 | -19.54   | 2.29 | -20.96               | 4.46 | -16.13   | 3.43 |
| OPER      | 5C1T      | -20.33                | 5.29 | -15.64   | 4.07 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 2.77       | 17.49      | HS 55.49     | 99.9                 |
| 5C1T   | 5.78       | 24.58      | 0.00         | 693.3                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 6.800

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -0.1                | -1.1                             |

| Rating<br>Veh.<br>ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                       | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend                  | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV.<br>176.6         | 176.8           | -177.8 | 176.8        | -177.8 | 178.0                       | -176.6 | 178.0     | - |
| OPER<br>294.3         | 295.5           | -295.5 | 295.5        | -295.5 | 296.7                       | -294.3 | 296.7     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Truck<br>Veh. | Live Load Moment<br>w/imp. | Loc. of Ax.<br>w/o imp. | Front<br>Wheel | Lane Dis. | Live Load Moment<br>w/imp. | Loc. of Conc.<br>w/o imp. | Load 1 | Load 2 |
|--------------|---------------|----------------------------|-------------------------|----------------|-----------|----------------------------|---------------------------|--------|--------|
| INV.         | HS20          | 59.43 L                    | 45.72                   | 117.00         | 0.0       | 45.29                      | 34.84                     | 145.00 |        |
|              |               | -45.75 R                   | -35.19                  | 183.00         | 0.0       | -35.34                     | -27.19                    | 160.00 | 210.00 |
| OPER         | 5C1T          | 55.16 L                    | 42.43                   | 7.00           | 0.0       | 0.00                       | 0.00                      | 0.00   |        |
|              |               | -42.64 R                   | -32.80                  | 259.00         | 0.0       | 0.00                       | 0.00                      | 0.00   | 0.00   |

## Serviceability

| Rating<br>Veh. | Rating       |                | Factor          |                | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------|----------------|-----------------|----------------|-----------------|----------------------------|
|                | top<br>+bend | fiber<br>-bend | bottom<br>+bend | fiber<br>-bend |                 |                            |
| HS20           | 2.99         | 3.86           | 2.99            | 3.86           | HS 59.90        | 107.8                      |
| 5C1T           | 5.38         | 6.90           | 5.38            | 6.90           | 0.00            | 645.5                      |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 6.900

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus      |               |                      |               | Plastic Section Modulus - Z |
|----------------------|---------------|----------------------|---------------|-----------------------------|
| Positive Bending Top | Bending Bott. | Negative Bending Top | Bending Bott. | (Fy * Z)                    |
| 134.3                | 134.3         | 134.3                | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 6.900

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.88 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 93.430     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 27.64 |        | 104.7                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 6.900

Dead Load Moment      Superimposed Dead Load Moment  
-1.5                      -17.9

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 195.0C             | -170.5                | 170.5              | -195.0C               | 206.6                       | -158.8                | 182.1              | -183.4                |
| OPER        | 325.0C             | -284.1                | 284.1              | -325.0C               | 344.4                       | -264.7                | 303.5              | -305.6                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.20 L      | 12.46              | 119.50 | 0.0                 | 25.28    | 19.45       | 147.50             |        |                |              |
|           |           | -58.99 L     | -45.37             | 141.00 | 0.0                 | -53.98   | -41.52      | 160.00             | 137.50 |                |              |
| OPER      | 5C1T      | 30.01 L      | 23.09              | 9.50   | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -50.22 R     | -38.63             | 261.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 8.17               | 2.69                         | 7.20 3.11                          | HS 53.86     | 96.9                 |
| 5C1T        | 11.47              | 5.27                         | 10.11 6.09                         | 0.00         | 632.6                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 6.900

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.6      | -7.7         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 96.5              | -69.2                  | 79.2         |
| OPER      | 160.8             | -115.4                 | 132.0        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -30.12                | 3.11 | -23.17   | 2.39 | -23.77               | 3.21 | -18.29   | 2.47 |
| OPER      | 5C1T      | -23.41                | 3.59 | -18.01   | 2.76 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 2.30       | 24.63      | HS 45.97     | 82.8                 |  |
| 5C1T   | 4.93       | 36.78      | 0.00         | 591.4                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 6.900

Dead Load Moment      Superimposed Dead Load Moment  
-1.5                      -17.9

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 165.7      | 169.5           | -185.0 | 169.5        | -185.0 | 188.9                       | -165.7 | 188.9     | - |
| OPER 276.1      | 295.5           | -295.5 | 295.5        | -295.5 | 314.8                       | -276.1 | 314.8     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 16.20 L                 | 12.46                | 119.50      | 0.0       | 25.28                   | 19.45                  | 147.50 |        |
|           |            | -58.99 L                | -45.37               | 141.00      | 0.0       | -53.98                  | -41.52                 | 160.00 | 137.50 |
| OPER      | 5C1T       | 30.01 L                 | 23.09                | 9.50        | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -50.22 R                | -38.63               | 261.50      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 7.47            | 2.81  | 7.47         | 2.81  | HS 56.17     | 101.1                |
| 5C1T        | 10.49           | 5.50  | 10.49        | 5.50  | 0.00         | 659.8                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 7.000

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 7.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.88 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 93.430     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 27.64 |        | 104.7                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 7.000

Dead Load Moment      Superimposed Dead Load Moment  
-3.3                      -39.4

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 195.0C             | -170.5                | 170.5              | -195.0C               | 220.6                       | -144.8                | 196.1              | -169.4                |
| OPER        | 325.0C             | -284.1                | 284.1              | -325.0C               | 367.7                       | -241.4                | 326.8              | -282.3                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.45 R      | 12.65              | 208.00 | 0.0                 | 16.72    | 12.86       | 185.00             |        |                |              |
|           |           | -98.56 L     | -75.81             | 129.50 | 0.0                 | -90.48   | -69.60      | 160.00             |        | 140.00         |              |
| OPER      | 5C1T      | 12.84 R      | 9.88               | 408.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -64.04 R     | -49.26             | 266.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 13.19              | 1.47                         | 11.73           | 1.72                  | HS 29.39     | 52.9                 |
| 5C1T        | 28.64              | 3.77                         | 25.45           | 4.41                  | 0.00         | 452.4                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 7.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.6      | -0.8      | -7.7                   | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 96.5              | -68.0                           | 68.0  |
| OPER      | 160.8             | -113.3                          | 113.3 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -30.12                | 34.53 | -23.17   | 26.56 | -23.77               | 26.33 | -18.29   | 20.25 |
| OPER      | 5C1T      | -23.41                | 26.23 | -18.01   | 20.18 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.97       | 1.97       | HS 39.38     | 70.9                 |
| 5C1T   | 4.32       | 4.32       | 0.00         | 517.8                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 7.000

Dead Load Moment      Superimposed Dead Load Moment  
-3.3                      -39.4

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 151.7      | 160.2           | -194.4 | 160.2        | -194.4 | 202.9                       | -151.7 | 202.9     | - |
| OPER 252.8      | 295.5           | -295.5 | 295.5        | -295.5 | 338.2                       | -252.8 | 338.2     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 16.45 R                 | 12.65                | 208.00      | 0.0       | 16.72                   | 12.86                  | 185.00 |        |
|           |            | -98.56 L                | -75.81               | 129.50      | 0.0       | -90.48                  | -69.60                 | 160.00 | 140.00 |
| OPER      | 5C1T       | 12.84 R                 | 9.88                 | 408.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -64.04 R                | -49.26               | 266.50      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 12.14           | 1.54  | 12.14        | 1.54  | HS 30.77     | 55.4                 |
| 5C1T        | 26.34           | 3.95  | 26.34        | 3.95  | 0.00         | 473.7                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 7.000

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 7.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.88 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 93.430     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 27.64 |        | 104.7                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 7.000

Dead Load Moment      Superimposed Dead Load Moment  
-3.3                      -39.4

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 195.0C             | -170.5                | 170.5              | -195.0C               | 220.6                       | -144.8                | 196.1              | -169.4                |
| OPER        | 325.0C             | -284.1                | 284.1              | -325.0C               | 367.7                       | -241.4                | 326.8              | -282.3                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.45 R      | 12.65              | 208.00 | 0.0                 | 16.72    | 12.86       | 185.00             |        |                |              |
|           |           | -98.56 L     | -75.81             | 129.50 | 0.0                 | -90.48   | -69.60      | 160.00             |        | 140.00         |              |
| OPER      | 5C1T      | 12.84 R      | 9.88               | 408.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -64.04 R     | -49.26             | 266.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 13.19              | 1.47                         | 11.73                              | 1.72         | HS 29.39             |
| 5C1T        | 28.64              | 3.77                         | 25.45                              | 4.41         | 0.00 452.4           |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 7.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.8      | 0.8       | -9.6                   | 9.6       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I |       |
|-----------|-------------------|-----------------------------|-------|
|           |                   | (-)                         | (+)   |
| INV.      | 96.5              | -68.0                       | 68.0  |
| OPER      | 160.8             | -113.3                      | 113.3 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -34.53                | 34.53 | -26.56   | 26.56 | -26.34               | 26.33 | -20.26   | 20.25 |
| OPER      | 5C1T      | -26.26                | 26.23 | -20.20   | 20.18 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.97       | 1.97       | HS 39.38     | 70.9                 |
| 5C1T   | 4.32       | 4.32       | 0.00         | 517.8                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 7.000

Dead Load Moment      Superimposed Dead Load Moment  
-3.3                      -39.4

| Rating Veh. ber | Moment Capacity top fiber |        | bottom fiber |        | Available Capacity for LL+I |        |       |       |
|-----------------|---------------------------|--------|--------------|--------|-----------------------------|--------|-------|-------|
|                 | +bend                     | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend | -bend |
| INV. 151.7      | 160.2                     | -194.4 | 160.2        | -194.4 | 202.9                       | -151.7 | 202.9 | -     |
| OPER 252.8      | 295.5                     | -295.5 | 295.5        | -295.5 | 338.2                       | -252.8 | 338.2 | -     |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 16.45 R                 | 12.65                | 208.00      | 0.0       | 16.72                   | 12.86                  | 185.00 |        |
|           |            | -98.56 L                | -75.81               | 129.50      | 0.0       | -90.48                  | -69.60                 | 160.00 | 140.00 |
| OPER      | 5C1T       | 12.84 R                 | 9.88                 | 408.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -64.04 R                | -49.26               | 266.50      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor top fiber |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-------------------------|-------|--------------|-------|--------------|----------------------|
|             | +bend                   | -bend | +bend        | -bend |              |                      |
| HS20        | 12.14                   | 1.54  | 12.14        | 1.54  | HS 30.77     | 55.4                 |
| 5C1T        | 26.34                   | 3.95  | 26.34        | 3.95  | 0.00         | 473.7                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 7.100

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 134.3                | 134.3                  | 134.3                | 134.3                  | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 7.100

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.88 | 28.67 | 28.67 | 1.726 | 999999.000 | 93.446 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 27.64 |        | 104.7                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 7.100

Dead Load Superimposed Dead Load  
Moment Moment  
-1.5 -17.9

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 195.0C             | -170.5                | 170.5              | -195.0C               | 206.7                       | -158.8                | 182.1              | -183.3                |
| OPER        | 325.0C             | -284.1                | 284.1              | -325.0C               | 344.4                       | -264.7                | 303.5              | -305.6                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.20 R      | 12.46              | 180.50 | 0.0                 | 25.70    | 19.77       | 152.50             |        |                |              |
|           |           | -58.98 R     | -45.37             | 159.00 | 0.0                 | -54.03   | -41.56      | 140.00             |        | 162.50         |              |
| OPER      | 5C1T      | 30.03 R      | 23.10              | 290.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -50.25 L     | -38.66             | 38.50  | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|--------|--------------|----------------------|
| HS20        | 8.04               | 2.69                         | 7.09   | 53.85        | 96.9                 |
| 5C1T        | 11.47              | 5.27                         | 10.11  | 0.00         | 632.0                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 7.100

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.6       | 0.0          | 7.6       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 96.5              | -79.2                  | 69.2                  |
| OPER      | 160.8             | -131.9                 | 115.4                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -2.98                 | 30.12 | -2.30    | 23.17 | -3.22                | 23.76 | -2.48    | 18.28 |
| OPER      | 5C1T      | -3.62                 | 23.37 | -2.78    | 17.98 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 24.58      | 2.30       | HS 45.98     | 82.8                 |
| 5C1T   | 36.50      | 4.94       | 0.00         | 592.5                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 7.100

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -1.5                | -17.9                            |

| Rating<br>Veh.<br>ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                       | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend                  | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV.<br>165.6         | 169.5           | -185.1 | 169.5        | -185.1 | 188.9                       | -165.6 | 188.9     | - |
| OPER<br>276.0         | 295.5           | -295.5 | 295.5        | -295.5 | 314.9                       | -276.0 | 314.9     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Truck<br>Veh. | Live Load Moment<br>w/imp. | Moment<br>w/o imp. | Loc. of Ax.<br>Front<br>Wheel | Lane<br>Dis. | Live Load Moment<br>w/imp. | Moment<br>w/o imp. | Loc. of Conc.<br>Load 1 | Load 2 |
|--------------|---------------|----------------------------|--------------------|-------------------------------|--------------|----------------------------|--------------------|-------------------------|--------|
| INV.         | HS20          | 16.20 R                    | 12.46              | 180.50                        | 0.0          | 25.70                      | 19.77              | 152.50                  |        |
|              |               | -58.98 R                   | -45.37             | 159.00                        | 0.0          | -54.03                     | -41.56             | 140.00                  | 162.50 |
| OPER         | 5C1T          | 30.03 R                    | 23.10              | 290.50                        | 0.0          | 0.00                       | 0.00               | 0.00                    |        |
|              |               | -50.25 L                   | -38.66             | 38.50                         | 0.0          | 0.00                       | 0.00               | 0.00                    | 0.00   |

## Serviceability

| Rating<br>Veh. | Rating       |                | Factor          |                | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------|----------------|-----------------|----------------|-----------------|----------------------------|
|                | top<br>+bend | fiber<br>-bend | bottom<br>+bend | fiber<br>-bend |                 |                            |
| HS20           | 7.35         | 2.81           | 7.35            | 2.81           | HS 56.16        | 101.1                      |
| 5C1T           | 10.48        | 5.49           | 10.49           | 5.49           | 0.00            | 659.1                      |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 7.200

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus  |                  |       |       | Plastic Section |
|------------------|------------------|-------|-------|-----------------|
| Positive Bending | Negative Bending |       |       | Modulus - Z     |
| Top              | Bott.            | Top   | Bott. | (Fy * Z)        |
| 134.3            | 134.3            | 134.3 | 134.3 | 422.49          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 7.200

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.88 | 28.67 | 28.67 | 1.726 | 999999.000 | 93.446 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 27.64 |        | 104.7                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 7.200

Dead Load Moment      Superimposed Dead Load Moment  
-0.1                      -1.2

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 195.0C             | -170.5                | 170.5              | -195.0C               | 195.8                       | -169.7                | 171.3              | -194.2                |
| OPER        | 325.0C             | -284.1                | 284.1              | -325.0C               | 326.3                       | -282.8                | 285.5              | -323.6                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 59.43 R      | 45.72              | 183.00 | 0.0                 | 44.76    | 34.43       | 155.00             |        |                |              |
|           |           | -45.75 L     | -35.19             | 117.00 | 0.0                 | -35.40   | -27.23      | 140.00             | 90.00  |                |              |
| OPER      | 5C1T      | 55.14 R      | 42.41              | 293.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -42.82 L     | -32.94             | 41.00  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 3.30               | 3.71                         | 2.88                               | 4.24         | 57.64                |
| 5C1T        | 5.92               | 6.60                         | 5.18                               | 7.56         | 0.00                 |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 7.200

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.5       | 0.0          | 5.7       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 96.5              | -77.9                  | 70.5         |
| OPER      | 160.8             | -129.9                 | 117.5        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -2.98                 | 25.40 | -2.30    | 19.54 | -4.46                | 20.95 | -3.43    | 16.12 |
| OPER      | 5C1T      | -5.31                 | 20.29 | -4.09    | 15.61 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 17.47      | 2.78       | HS 55.50     | 99.9                 |
| 5C1T   | 24.45      | 5.79       | 0.00         | 694.7                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 7.200

Dead Load Moment      Superimposed Dead Load Moment  
-0.1                      -1.2

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 176.5      | 176.7           | -177.8 | 176.7        | -177.8 | 178.1                       | -176.5 | 178.1     | - |
| OPER 294.1      | 295.5           | -295.5 | 295.5        | -295.5 | 296.8                       | -294.1 | 296.8     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 59.43 R                 | 45.72           | 183.00                  | 0.0       | 44.76                   | 34.43           | 155.00               |        |
|           |            | -45.75 L                | -35.19          | 117.00                  | 0.0       | -35.40                  | -27.23          | 140.00               | 90.00  |
| OPER      | 5C1T       | 55.14 R                 | 42.41           | 293.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -42.82 L                | -32.94          | 41.00                   | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 3.00            | 3.86  | 3.00         | 3.86  | HS 59.93     | 107.9                |
| 5C1T        | 5.38            | 6.87  | 5.38         | 6.87  | 0.00         | 646.0                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 7.300

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus      |                       |                      |               | Plastic Section Modulus - Z |
|----------------------|-----------------------|----------------------|---------------|-----------------------------|
| Positive Bending Top | Section Modulus Bott. | Negative Bending Top | Bending Bott. | (Fy * Z)                    |
| 134.3                | 134.3                 | 134.3                | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 7.300

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.88 | 28.67 | 28.67 | 1.726 | 999999.000 | 93.446 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 27.64 |        | 104.7                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 7.300

Dead Load Moment 0.8  
Superimposed Dead Load Moment 10.7

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 195.0C          | -170.5             | 170.5           | -195.0C            | 188.1                       | -177.4             | 163.5           | -201.9             |
| OPER        | 325.0C          | -284.1             | 284.1           | -325.0C            | 313.4                       | -295.7             | 272.5           | -336.6             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 86.48 R      | 66.52              | 185.50 | 0.0                 | 65.18    | 50.14       | 157.50             |        |                |              |
|           |           | -37.98 L     | -29.22             | 117.00 | 0.0                 | -29.97   | -23.06      | 140.00             |        | 0.00           |              |
| OPER      | 5C1T      | 74.86 R      | 57.58              | 208.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -38.36 L     | -29.51             | -45.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | bottom fiber -bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|--------|--------------|----------------------|
| HS20        | 2.17            | 4.67               | 1.89   | 37.82        | 68.1                 |
| 5C1T        | 4.19            | 7.71               | 3.64   | 0.00         | 436.9                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 7.300

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.3       | 0.0          | 3.8       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 96.5              | -76.7                           | 71.7  |
| OPER      | 160.8             | -127.8                          | 119.5 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -4.41                 | 20.57 | -3.40    | 15.82 | -6.73                | 18.00 | -5.18    | 13.85 |
| OPER      | 5C1T      | -7.26                 | 17.16 | -5.58    | 13.20 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 11.39      | 3.49       | HS 69.74     | 125.5                |
| 5C1T   | 17.61      | 6.97       | 0.00         | 836.2                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 7.300

Dead Load Moment      Superimposed Dead Load Moment  
0.8                      10.7

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 184.2      | 181.9           | -172.7 | 181.9        | -172.7 | 170.3                       | -184.2 | 170.3     | - |
| OPER 307.0      | 295.5           | -295.5 | 295.5        | -295.5 | 283.9                       | -307.0 | 283.9     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 86.48 R                 | 66.52                | 185.50      | 0.0       | 65.18                   | 50.14                  | 157.50 |        |
|           |            | -37.98 L                | -29.22               | 117.00      | 0.0       | -29.97                  | -23.06                 | 140.00 | 0.00   |
| OPER      | 5C1T       | 74.86 R                 | 57.58                | 208.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -38.36 L                | -29.51               | -45.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.97            | 4.85            | 1.97               | 4.85               | HS 39.39     | 70.9                 |
| 5C1T        | 3.79            | 8.00            | 3.79               | 8.00               | 0.00         | 455.1                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 7.400

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 7.400

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.88 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 93.446     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 27.64 |        | 104.7                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 7.400

Dead Load Moment 1.4  
Superimposed Dead Load Moment 17.9

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 195.0C          | -170.5             | 170.5           | -195.0C            | 183.4                       | -182.0             | 158.9           | -206.6             |
| OPER        | 325.0C          | -284.1             | 284.1           | -325.0C            | 305.7                       | -303.4             | 264.8           | -344.3             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 97.01 R      | 74.62              | 188.00 | 0.0                 | 77.42    | 59.55       | 160.00             |        |                |              |
|           |           | -30.21 L     | -23.24             | 117.00 | 0.0                 | -26.39   | -20.30      | 140.00             | 0.00   |                |              |
| OPER      | 5C1T      | 86.80 R      | 66.77              | 211.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -35.46 L     | -27.28             | 43.50  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 1.89            | 6.03                      | 1.64                      | 6.84               | HS 32.76     | 59.0                 |
| 5C1T        | 3.52            | 8.56                      | 3.05                      | 9.71               | 0.00         | 366.1                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 7.400

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| 0.2       | 0.0                    |
|           | 1.9                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 96.5              | -75.4                  | 73.0                  |
| OPER      | 160.8             | -125.7                 | 121.6                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -8.97                 | 16.78 | -6.90    | 12.91 | -9.31                | 15.01 | -7.16    | 11.55 |
| OPER      | 5C1T      | -9.40                 | 14.11 | -7.23    | 10.85 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 8.11       | 4.35       | HS 86.97     | 156.5                |
| 5C1T   | 13.38      | 8.62       | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 7.400

Dead Load Moment Superimposed Dead Load Moment

1.4 17.9

| Rating Veh. ber | Moment Capacity top fiber |        | bottom fiber |        | Available Capacity for LL+I |        |       |       |
|-----------------|---------------------------|--------|--------------|--------|-----------------------------|--------|-------|-------|
|                 | +bend                     | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend | -bend |
| INV. 188.9      | 185.0                     | -169.6 | 185.0        | -169.6 | 165.7                       | -188.9 | 165.7 | -     |
| OPER 314.8      | 295.5                     | -295.5 | 295.5        | -295.5 | 276.2                       | -314.8 | 276.2 | -     |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 97.01 R                 | 74.62           | 188.00                  | 0.0       | 77.42                   | 59.55           | 160.00               |        |
|           |            | -30.21 L                | -23.24          | 117.00                  | 0.0       | -26.39                  | -20.30          | 140.00               | 0.00   |
| OPER      | 5C1T       | 86.80 R                 | 66.77           | 211.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -35.46 L                | -27.28          | 43.50                   | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating top fiber |       | Factor bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|------------------|-------|---------------------|-------|--------------|----------------------|
|             | +bend            | -bend | +bend               | -bend |              |                      |
| HS20        | 1.71             | 6.25  | 1.71                | 6.25  | HS 34.16     | 61.5                 |
| 5C1T        | 3.18             | 8.88  | 3.18                | 8.88  | 0.00         | 381.8                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 7.500

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 7.500

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.88 | 28.67 | 28.67 | 1.726 | 999999.000 | 93.446 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 29.33 |        | 104.5                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 7.500

Dead Load Moment 1.6  
Superimposed Dead Load Moment 20.3

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 195.0C          | -170.5             | 170.5           | -195.0C            | 181.9                       | -183.6             | 157.3           | -208.1             |
| OPER        | 325.0C          | -284.1             | 284.1           | -325.0C            | 303.1                       | -306.0             | 262.2           | -346.9             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 94.69 R      | 72.84              | 176.50 | 0.0                 | 82.23    | 63.25       | 162.50             |        |                |              |
|           |           | -22.47 R     | -17.29             | 208.00 | 0.0                 | -22.83   | -17.56      | 185.00             |        | 0.00           |              |
| OPER      | 5C1T      | 89.95 L      | 69.19              | -23.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -34.42 R     | -26.48             | 321.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 1.92            | 8.04                      | 1.66                      | 9.11               | HS 33.23     | 59.8                 |
| 5C1T        | 3.37            | 8.89                      | 2.91                      | 10.08              | 0.00         | 349.8                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 7.500Dead Load Superimposed Dead Load  
Shear (-) Shear (+) Shear

0.0 0.0 0.0

Rat. Shear Capacity Available Capacity for LL+I  
Veh. VU (-) (+)INV. 96.5 -74.2 74.2  
OPER 160.8 -123.7 123.7

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Rat.<br>Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |      |
|--------------|--------------|-----------------------|-------|----------|-------|----------------------|-------|----------|------|
|              |              | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |      |
|              |              | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)  |
| INV.         | HS20         | -13.12                | 13.13 | -10.10   | 10.10 | -12.10               | 12.08 | -9.31    | 9.29 |
| OPER         | 5C1T         | -11.66                | 11.64 | -8.97    | 8.95  | 0.00                 | 0.00  | 0.00     | 0.00 |

## Rating Shear

| Veh. | Rating<br>(-) | Factor<br>(+) | Rating<br>Value | Load<br>Capacity<br>(tons) |
|------|---------------|---------------|-----------------|----------------------------|
| HS20 | 5.65          | 5.65          | HS 113.07       | 203.5                      |
| 5C1T | 10.60         | 10.63         | 0.00            | 999.0                      |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 7.500

Dead Load Moment 1.6  
Superimposed Dead Load Moment 20.3

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 190.4      | 186.0           | -168.5 | 186.0        | -168.5 | 164.2                       | -190.4 | 164.2     | - |
| OPER 317.3      | 295.5           | -295.5 | 295.5        | -295.5 | 273.6                       | -317.3 | 273.6     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 94.69 R                 | 72.84                | 176.50      | 0.0       | 82.23                   | 63.25                  | 162.50 |        |
|           |            | -22.47 R                | -17.29               | 208.00      | 0.0       | -22.83                  | -17.56                 | 185.00 | 0.00   |
| OPER      | 5C1T       | 89.95 L                 | 69.19                | -23.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -34.42 R                | -26.48               | 321.50      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.73            | 8.34  | 1.73         | 8.34  | HS 34.67     | 62.4                 |
| 5C1T        | 3.04            | 9.22  | 3.04         | 9.22  | 0.00         | 365.0                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 7.600

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus      |               |                      |               | Plastic Section Modulus - Z |
|----------------------|---------------|----------------------|---------------|-----------------------------|
| Positive Bending Top | Bending Bott. | Negative Bending Top | Bending Bott. | (Fy * Z)                    |
| 134.3                | 134.3         | 134.3                | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 7.600

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.89 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 93.868     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 29.33 |        | 104.5                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 7.600

Dead Load Moment 1.4  
Superimposed Dead Load Moment 17.7

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 195.0C          | -170.5             | 170.5           | -195.0C            | 183.5                       | -181.9             | 159.0           | -206.5             |
| OPER        | 325.0C          | -284.1             | 284.1           | -325.0C            | 305.9                       | -303.2             | 265.0           | -344.1             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 97.02 L      | 74.63              | 137.00 | 0.0                 | 77.34    | 59.49       | 165.00             |        |                |              |
|           |           | -30.26 R     | -23.27             | 208.00 | 0.0                 | -26.45   | -20.35      | 185.00             | 0.00   |                |              |
| OPER      | 5C1T      | 87.01 L      | 66.93              | -21.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -35.74 R     | -27.49             | 368.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 1.89            | 6.01                      | 1.64                      | 6.82               | HS 32.78     | 59.0                 |
| 5C1T        | 3.52            | 8.48                      | 3.05                      | 9.63               | 0.00         | 365.5                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 7.600

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.2      | -2.0         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 96.5              | -72.9                           | 75.5  |
| OPER      | 160.8             | -121.5                          | 125.8 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -16.78                | 8.97 | -12.91   | 6.90 | -15.04               | 9.28 | -11.57   | 7.14 |
| OPER      | 5C1T      | -14.16                | 9.34 | -10.89   | 7.19 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 4.35       | 8.13       | HS 86.91     | 156.4                |
| 5C1T   | 8.59       | 13.47      | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 7.600

Dead Load Moment      Superimposed Dead Load Moment  
1.4                      17.7

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
|                 | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 188.7      | 184.9           | -169.6 | 184.9        | -169.6 | 165.8                       | -188.7 | 165.8     | - |
| OPER 314.6      | 295.5           | -295.5 | 295.5        | -295.5 | 276.4                       | -314.6 | 276.4     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |        |        |      |
|-----------|------------|-------------------------|-------------------------|------------------------------|----------------------|--------|--------|--------|------|
| INV.      | HS20       | 97.02 L                 | 74.63                   | 137.00                       | 0.0                  | 77.34  | 59.49  | 165.00 |      |
|           |            | -30.26 R                | -23.27                  | 208.00                       | 0.0                  | -26.45 | -20.35 | 185.00 | 0.00 |
| OPER      | 5C1T       | 87.01 L                 | 66.93                   | -21.00                       | 0.0                  | 0.00   | 0.00   | 0.00   |      |
|           |            | -35.74 R                | -27.49                  | 368.50                       | 0.0                  | 0.00   | 0.00   | 0.00   | 0.00 |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.71            | 6.24            | 1.71               | 6.24               | HS 34.18     | 61.5                 |
| 5C1T        | 3.18            | 8.80            | 3.18               | 8.80               | 0.00         | 381.2                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 7.700

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus      |               |                      |               | Plastic Section Modulus - Z |
|----------------------|---------------|----------------------|---------------|-----------------------------|
| Positive Bending Top | Bending Bott. | Negative Bending Top | Bending Bott. | (Fy * Z)                    |
| 134.3                | 134.3         | 134.3                | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 7.700

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.89 | 28.67 | 28.67 | 1.726 | 999999.000 | 93.868 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 29.33 |        | 104.5                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 7.700

Dead Load Moment      Superimposed Dead Load Moment  
0.8                      10.3

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 195.0C             | -170.5                | 170.5              | -195.0C               | 188.3                       | -177.1                | 163.8              | -201.7                |
| OPER        | 325.0C             | -284.1                | 284.1              | -325.0C               | 313.8                       | -295.2                | 273.0              | -336.1                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 86.50 L      | 66.54              | 139.50 | 0.0                 | 65.01    | 50.01       | 167.50             |        |                |              |
|           |           | -38.04 R     | -29.26             | 208.00 | 0.0                 | -30.07   | -23.13      | 185.00             |        | 0.00           |              |
| OPER      | 5C1T      | 74.56 L      | 57.35              | 116.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -38.87 R     | -29.90             | 370.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 2.18               | 4.66                         | 1.89            | 5.30                  | HS 37.87     | 68.2                 |
| 5C1T        | 4.21               | 7.60                         | 3.66            | 8.65                  | 0.00         | 439.3                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 7.700

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.3      | -3.9         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 96.5              | -71.7                  | 76.7         |
| OPER      | 160.8             | -119.5                 | 127.9        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -20.57                | 4.42 | -15.82   | 3.40 | -18.02               | 6.71 | -13.86   | 5.16 |
| OPER      | 5C1T      | -17.22                | 7.18 | -13.24   | 5.52 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 3.48       | 11.43      | HS 69.70     | 125.5                |  |
| 5C1T   | 6.94       | 17.81      | 0.00         | 832.6                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 7.700

Dead Load Moment 0.8  
Superimposed Dead Load Moment 10.3

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 184.0      | 181.7           | -172.8 | 181.7        | -172.8 | 170.6                       | -184.0 | 170.6     | - |
| OPER 306.6      | 295.5           | -295.5 | 295.5        | -295.5 | 284.3                       | -306.6 | 284.3     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |        |        |      |
|-----------|------------|-------------------------|-------------------------|------------------------------|----------------------|--------|--------|--------|------|
| INV.      | HS20       | 86.50 L                 | 66.54                   | 139.50                       | 0.0                  | 65.01  | 50.01  | 167.50 |      |
|           |            | -38.04 R                | -29.26                  | 208.00                       | 0.0                  | -30.07 | -23.13 | 185.00 | 0.00 |
| OPER      | 5C1T       | 74.56 L                 | 57.35                   | 116.50                       | 0.0                  | 0.00   | 0.00   | 0.00   |      |
|           |            | -38.87 R                | -29.90                  | 370.00                       | 0.0                  | 0.00   | 0.00   | 0.00   | 0.00 |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.97            | 4.84  | 1.97         | 4.84  | HS 39.44     | 71.0                 |
| 5C1T        | 3.81            | 7.89  | 3.81         | 7.89  | 0.00         | 457.6                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 7.800

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 7.800

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.89 | 28.67 | 28.67 | 1.726 | 999999.000 | 93.868 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 29.33 |        | 104.5                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 7.800

Dead Load Moment      Superimposed Dead Load Moment  
-0.2                      -1.8

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 195.0C             | -170.5                | 170.5              | -195.0C               | 196.2                       | -169.3                | 171.6              | -193.8                |
| OPER        | 325.0C             | -284.1                | 284.1              | -325.0C               | 327.0                       | -282.1                | 286.1              | -323.0                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 59.46 L      | 45.74              | 142.00 | 0.0                 | 45.02    | 34.63       | 170.00             |        |                |              |
|           |           | -45.82 R     | -35.25             | 208.00 | 0.0                 | -35.69   | -27.46      | 185.00             | 235.00 |                |              |
| OPER      | 5C1T      | 54.50 L      | 41.92              | 32.00  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -43.41 R     | -33.39             | 284.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | Rating Factor      |                       |                    |                       | Rating Value | Load Capacity (tons) |
|-------------|--------------------|-----------------------|--------------------|-----------------------|--------------|----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |              |                      |
| HS20        | 3.30               | 3.69                  | 2.89               | 4.23                  | HS 57.74     | 103.9                |
| 5C1T        | 6.00               | 6.50                  | 5.25               | 7.44                  | 0.00         | 629.9                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 7.800

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.5      | -5.8         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 96.5              | -70.4                  | 78.0         |
| OPER      | 160.8             | -117.4                 | 130.0        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -25.40                | 2.98 | -19.54   | 2.29 | -20.97               | 4.44 | -16.13   | 3.41 |
| OPER      | 5C1T      | -20.38                | 5.23 | -15.68   | 4.02 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 2.77       | 17.57      | HS 55.46     | 99.8                 |
| 5C1T   | 5.76       | 24.87      | 0.00         | 691.2                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 7.800

Dead Load Moment      Superimposed Dead Load Moment  
-0.2                      -1.8

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 176.1      | 176.5           | -178.1 | 176.5        | -178.1 | 178.5                       | -176.1 | 178.5     | - |
| OPER 293.5      | 295.5           | -295.5 | 295.5        | -295.5 | 297.4                       | -293.5 | 297.4     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 59.46 L                 | 45.74                | 142.00      | 0.0       | 45.02                   | 34.63                  | 170.00 |        |
|           |            | -45.82 R                | -35.25               | 208.00      | 0.0       | -35.69                  | -27.46                 | 185.00 | 235.00 |
| OPER      | 5C1T       | 54.50 L                 | 41.92                | 32.00       | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -43.41 R                | -33.39               | 284.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 3.00            | 3.84            | 3.00               | 3.84               | HS 60.03     | 108.1                |
| 5C1T        | 5.46            | 6.76            | 5.46               | 6.76               | 0.00         | 654.9                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 7.900

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 7.900

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.89 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 93.868     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 29.33 |        | 104.5                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 7.900

Dead Load Moment      Superimposed Dead Load Moment  
-1.6                      -18.7

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 195.0C             | -170.5                | 170.5              | -195.0C               | 207.2                       | -158.3                | 182.6              | -182.8                |
| OPER        | 325.0C             | -284.1                | 284.1              | -325.0C               | 345.3                       | -263.8                | 304.4              | -304.7                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.23 L      | 12.48              | 144.50 | 0.0                 | 24.95    | 19.20       | 172.50             |        |                |              |
|           |           | -59.05 L     | -45.42             | 166.00 | 0.0                 | -54.19   | -41.69      | 185.00             |        | 162.50         |              |
| OPER      | 5C1T      | 29.07 L      | 22.36              | 34.50  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -51.04 R     | -39.26             | 286.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 8.30               | 2.68                         | 7.32 3.10                          | HS 53.61     | 96.5                 |
| 5C1T        | 11.88              | 5.17                         | 10.47 5.97                         | 0.00         | 620.3                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 7.900

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.6      | -7.7         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 96.5              | -69.2                  | 79.2         |
| OPER      | 160.8             | -115.3                 | 132.0        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -30.12                | 3.11 | -23.17   | 2.39 | -23.78               | 3.19 | -18.29   | 2.46 |
| OPER      | 5C1T      | -23.47                | 3.53 | -18.05   | 2.71 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 2.30       | 24.82      | HS 45.95     | 82.7                 |  |
| 5C1T   | 4.91       | 37.44      | 0.00         | 589.7                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 7.900

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -1.6                | -18.7                            |

| Rating<br>Veh.<br>ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                       | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend                  | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV.<br>165.1         | 169.2           | -185.4 | 169.2        | -185.4 | 189.4                       | -165.1 | 189.4     | - |
| OPER<br>275.2         | 295.5           | -295.5 | 295.5        | -295.5 | 315.7                       | -275.2 | 315.7     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Truck<br>Veh. | Live Load Moment<br>w/imp. | Loc. of Ax.<br>w/o imp. | Front<br>Wheel | Lane Dis. | Live Load Moment<br>w/imp. | Loc. of Conc.<br>w/o imp. | Load 1 | Load 2 |
|--------------|---------------|----------------------------|-------------------------|----------------|-----------|----------------------------|---------------------------|--------|--------|
| INV.         | HS20          | 16.23 L                    | 12.48                   | 144.50         | 0.0       | 24.95                      | 19.20                     | 172.50 |        |
|              |               | -59.05 L                   | -45.42                  | 166.00         | 0.0       | -54.19                     | -41.69                    | 185.00 | 162.50 |
| OPER         | 5C1T          | 29.07 L                    | 22.36                   | 34.50          | 0.0       | 0.00                       | 0.00                      | 0.00   |        |
|              |               | -51.04 R                   | -39.26                  | 286.50         | 0.0       | 0.00                       | 0.00                      | 0.00   | 0.00   |

## Serviceability

| Rating<br>Veh. | Rating       |                | Factor          |                | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------|----------------|-----------------|----------------|-----------------|----------------------------|
|                | top<br>+bend | fiber<br>-bend | bottom<br>+bend | fiber<br>-bend |                 |                            |
| HS20           | 7.59         | 2.80           | 7.59            | 2.80           | HS 55.92        | 100.7                      |
| 5C1T           | 10.86        | 5.39           | 10.86           | 5.39           | 0.00            | 647.0                      |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 8.000

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 8.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.89 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 93.868     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 29.33 |        | 104.5                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 8.000

Dead Load Moment      Superimposed Dead Load Moment  
-3.4                      -40.4

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 195.0C             | -170.5                | 170.5              | -195.0C               | 221.2                       | -144.2                | 196.7              | -168.7                |
| OPER        | 325.0C             | -284.1                | 284.1              | -325.0C               | 368.7                       | -240.3                | 327.9              | -281.2                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.42 L      | 12.63              | 117.00 | 0.0                 | 16.31    | 12.54       | 140.00             |        |                |              |
|           |           | -98.61 L     | -75.85             | 154.50 | 0.0                 | -90.73   | -69.79      | 185.00             |        | 165.00         |              |
| OPER      | 5C1T      | 12.69 L      | 9.76               | -85.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -64.79 R     | -49.84             | 291.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 13.48              | 1.46                         | 11.98                              | 1.71         | HS 29.25 52.6        |
| 5C1T        | 29.06              | 3.71                         | 25.84                              | 4.34         | 0.00 445.2           |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 8.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.6      | -0.8      | -7.7                   | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 96.5              | -67.9                           | 67.9  |
| OPER      | 160.8             | -113.2                          | 113.1 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -30.12                | 34.52 | -23.17   | 26.56 | -23.78               | 26.36 | -18.29   | 20.28 |
| OPER      | 5C1T      | -23.47                | 26.43 | -18.05   | 20.33 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.97       | 1.97       | HS 39.33     | 70.8                 |
| 5C1T   | 4.30       | 4.28       | 0.00         | 513.7                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 8.000

Dead Load Moment      Superimposed Dead Load Moment  
-3.4                      -40.4

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 151.0      | 159.8           | -194.8 | 159.8        | -194.8 | 203.5                       | -151.0 | 203.5     | - |
| OPER 251.7      | 295.5           | -295.5 | 295.5        | -295.5 | 339.2                       | -251.7 | 339.2     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 16.42 L                 | 12.63           | 117.00                  | 0.0       | 16.31                   | 12.54           | 140.00               |        |
|           |            | -98.61 L                | -75.85          | 154.50                  | 0.0       | -90.73                  | -69.79          | 185.00               | 165.00 |
| OPER      | 5C1T       | 12.69 L                 | 9.76            | -85.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -64.79 R                | -49.84          | 291.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 12.40           | 1.53  | 12.40        | 1.53  | HS 30.63     | 55.1                 |
| 5C1T        | 26.73           | 3.88  | 26.73        | 3.88  | 0.00         | 466.2                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 8.000

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 134.3                | 134.3                  | 134.3                | 134.3                  | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 8.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.89 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 93.770     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 29.33 |        | 104.5                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 8.000

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -3.4                | -40.4                            |

| Rating<br>Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|----------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|                | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.           | 195.0C             | -170.5                | 170.5              | -195.0C               | 221.2                       | -144.2                | 196.7              | -168.7                |
| OPER           | 325.0C             | -284.1                | 284.1              | -325.0C               | 368.7                       | -240.3                | 327.9              | -281.2                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Rat.<br>Veh. | Truck Live<br>w/imp. | Load Moment<br>w/o imp. | Loc. of<br>Front<br>Wheel | Ax.<br>Dis. | Lane Live<br>w/imp. | Load Moment<br>w/o imp. | Loc. of<br>Load 1 | Conc.<br>Load 2 |
|--------------|--------------|----------------------|-------------------------|---------------------------|-------------|---------------------|-------------------------|-------------------|-----------------|
| INV.         | HS20         | 16.42 L              | 12.63                   | 117.00                    | 0.0         | 16.31               | 12.54                   | 140.00            |                 |
|              |              | -98.61 L             | -75.85                  | 154.50                    | 0.0         | -90.73              | -69.79                  | 185.00            | 165.00          |
| OPER         | 5C1T         | 12.69 L              | 9.76                    | -85.00                    | 0.0         | 0.00                | 0.00                    | 0.00              |                 |
|              |              | -64.79 R             | -49.84                  | 291.50                    | 0.0         | 0.00                | 0.00                    | 0.00              | 0.00            |

## Moment

| Rating<br>Veh. | top fiber<br>+bend | Rating<br>bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------------|---------------------------------|-----------------|-----------------------|-----------------|----------------------------|
| HS20           | 13.48              | 1.46                            | 11.98           | 1.71                  | HS 29.25        | 52.6                       |
| 5C1T           | 29.06              | 3.71                            | 25.84           | 4.34                  | 0.00            | 445.2                      |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 8.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.8      | 0.8       | -9.6                   | 9.7       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I |       |
|-----------|-------------------|-----------------------------|-------|
|           |                   | (-)                         | (+)   |
| INV.      | 96.5              | -67.9                       | 67.9  |
| OPER      | 160.8             | -113.2                      | 113.1 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -34.53                | 34.52 | -26.56   | 26.56 | -26.35               | 26.36 | -20.27   | 20.28 |
| OPER      | 5C1T      | -26.30                | 26.43 | -20.23   | 20.33 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.97       | 1.97       | HS 39.33     | 70.8                 |
| 5C1T   | 4.30       | 4.28       | 0.00         | 513.7                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 8.000

Dead Load Moment      Superimposed Dead Load Moment  
-3.4                      -40.4

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 151.0      | 159.8           | -194.8 | 159.8        | -194.8 | 203.5                       | -151.0 | 203.5     | - |
| OPER 251.7      | 295.5           | -295.5 | 295.5        | -295.5 | 339.2                       | -251.7 | 339.2     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 16.42 L                 | 12.63           | 117.00                  | 0.0       | 16.31                   | 12.54           | 140.00               |        |
|           |            | -98.61 L                | -75.85          | 154.50                  | 0.0       | -90.73                  | -69.79          | 185.00               | 165.00 |
| OPER      | 5C1T       | 12.69 L                 | 9.76            | -85.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -64.79 R                | -49.84          | 291.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 12.40           | 1.53  | 12.40        | 1.53  | HS 30.63     | 55.1                 |
| 5C1T        | 26.73           | 3.88  | 26.73        | 3.88  | 0.00         | 466.2                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 8.100

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 8.100

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.89 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 93.770     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 29.33 |        | 104.5                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
 INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
 Check Point I. D. 8.100

Dead Load Moment      Superimposed Dead Load Moment  
 -1.6                      -18.5

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 195.0C             | -170.5                | 170.5              | -195.0C               | 207.0                       | -158.4                | 182.5              | -183.0                |
| OPER        | 325.0C             | -284.1                | 284.1              | -325.0C               | 345.0                       | -264.1                | 304.1              | -305.0                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.08 R      | 12.37              | 205.50 | 0.0                 | 25.48    | 19.60       | 177.50             |        |                |              |
|           |           | -58.97 R     | -45.36             | 184.00 | 0.0                 | -54.22   | -41.71      | 165.00             | 187.50 |                |              |
| OPER      | 5C1T      | 29.49 R      | 22.68              | 228.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -50.52 L     | -38.86             | 63.50  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 8.12               | 2.69                         | 7.16                               | 3.10         | 96.7                 |
| 5C1T        | 11.70              | 5.23                         | 10.31                              | 6.04         | 627.3                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 8.100

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| 0.6       | 0.0                    |
|           | 7.8                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 96.5              | -79.3                  | 69.1         |
| OPER      | 160.8             | -132.1                 | 115.2        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -2.93                 | 30.11 | -2.26    | 23.16 | -3.13                | 23.79 | -2.41    | 18.30 |
| OPER      | 5C1T      | -3.39                 | 23.56 | -2.61    | 18.12 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 25.36      | 2.30       | HS 45.92     | 82.7                 |
| 5C1T   | 38.98      | 4.89       | 0.00         | 586.8                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 8.100

Dead Load Moment      Superimposed Dead Load Moment  
-1.6                      -18.5

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 165.3      | 169.3           | -185.3 | 169.3        | -185.3 | 189.3                       | -165.3 | 189.3     | - |
| OPER 275.5      | 295.5           | -295.5 | 295.5        | -295.5 | 315.5                       | -275.4 | 315.5     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 16.08 R                 | 12.37                | 205.50      | 0.0       | 25.48                   | 19.60                  | 177.50 |        |
|           |            | -58.97 R                | -45.36               | 184.00      | 0.0       | -54.22                  | -41.71                 | 165.00 | 187.50 |
| OPER      | 5C1T       | 29.49 R                 | 22.68                | 228.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -50.52 L                | -38.86               | 63.50       | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 7.43            | 2.80            | 7.43               | 2.80               | HS 56.05     | 100.9                |
| 5C1T        | 10.70           | 5.45            | 10.70              | 5.45               | 0.00         | 654.3                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 8.200

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus      |               |                      |               | Plastic Section Modulus - Z |
|----------------------|---------------|----------------------|---------------|-----------------------------|
| Positive Bending Top | Bending Bott. | Negative Bending Top | Bending Bott. | (Fy * Z)                    |
| 134.3                | 134.3         | 134.3                | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 8.200

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.89 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 93.770     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 29.33 |        | 104.5                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
 INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
 Check Point I. D. 8.200

Dead Load Moment      Superimposed Dead Load Moment  
 -0.1                      -1.3

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 195.0C             | -170.5                | 170.5              | -195.0C               | 195.9                       | -169.6                | 171.3              | -194.1                |
| OPER        | 325.0C             | -284.1                | 284.1              | -325.0C               | 326.5                       | -282.6                | 285.6              | -323.5                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 59.31 R      | 45.63              | 208.00 | 0.0                 | 44.67    | 34.37       | 180.00             |        |                |              |
|           |           | -45.71 L     | -35.16             | 142.00 | 0.0                 | -35.39   | -27.22      | 165.00             | 115.00 |                |              |
| OPER      | 5C1T      | 55.00 R      | 42.31              | 318.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -42.82 L     | -32.94             | 66.00  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 3.30               | 3.71                         | 2.89            | 4.25                  | HS 57.77     | 104.0                |
| 5C1T        | 5.93               | 6.60                         | 5.19            | 7.56                  | 0.00         | 623.0                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 8.200

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| 0.5       | 0.0                    |
|           | 5.9                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 96.5              | -78.0                  | 70.4                  |
| OPER      | 160.8             | -130.1                 | 117.3                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -2.93                 | 25.39 | -2.26    | 19.53 | -4.39                | 20.98 | -3.38    | 16.14 |
| OPER      | 5C1T      | -5.11                 | 20.47 | -3.93    | 15.74 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 17.79      | 2.77       | HS 55.43     | 99.8                 |
| 5C1T   | 25.47      | 5.73       | 0.00         | 687.7                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 8.200

Dead Load Moment      Superimposed Dead Load Moment  
-0.1                      -1.3

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 176.4      | 176.7           | -177.9 | 176.7        | -177.9 | 178.2                       | -176.4 | 178.2     | - |
| OPER 294.0      | 295.5           | -295.5 | 295.5        | -295.5 | 296.9                       | -294.0 | 296.9     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 59.31 R                 | 45.63                | 208.00      | 0.0       | 44.67                   | 34.37                  | 180.00 |        |
|           |            | -45.71 L                | -35.16               | 142.00      | 0.0       | -35.39                  | -27.22                 | 165.00 | 115.00 |
| OPER      | 5C1T       | 55.00 R                 | 42.31                | 318.00      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -42.82 L                | -32.94               | 66.00       | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 3.00            | 3.86  | 3.00         | 3.86  | HS 60.07     | 108.1                |
| 5C1T        | 5.40            | 6.87  | 5.40         | 6.87  | 0.00         | 647.8                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 8.300

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 8.300

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.89 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 93.770     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 29.33 |        | 104.5                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 8.300

Dead Load Moment 0.9  
Superimposed Dead Load Moment 11.0

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 195.0C          | -170.5             | 170.5           | -195.0C            | 187.8                       | -177.6             | 163.3           | -202.1             |
| OPER        | 325.0C          | -284.1             | 284.1           | -325.0C            | 313.1                       | -296.0             | 272.2           | -336.9             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 86.35 R      | 66.42              | 210.50 | 0.0                 | 65.14    | 50.10       | 182.50             |        |                |              |
|           |           | -37.93 L     | -29.18             | 142.00 | 0.0                 | -29.76   | -22.90      | 165.00             | 0.00   |                |              |
| OPER      | 5C1T      | 74.81 R      | 57.54              | 320.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -38.29 L     | -29.45             | -20.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | Rating Factor   |                    |                 |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|-----------------|--------------------|--------------|----------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 2.17            | 4.68               | 1.89            | 5.33               | HS 37.83     | 68.1                 |
| 5C1T        | 4.18            | 7.73               | 3.64            | 8.80               | 0.00         | 436.6                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 8.300

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear     | (-) Shear (+) Shear    |
| 0.3       | 0.0 4.0                |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 96.5              | -76.8                           | 71.6  |
| OPER      | 160.8             | -128.0                          | 119.4 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -4.42                 | 20.56 | -3.40    | 15.82 | -6.66                | 18.03 | -5.13    | 13.87 |
| OPER      | 5C1T      | -7.08                 | 17.31 | -5.45    | 13.32 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 11.52      | 3.48       | HS 69.66     | 125.4                |
| 5C1T   | 18.07      | 6.89       | 0.00         | 827.3                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 8.300Dead Load Moment 0.9  
Superimposed Dead Load Moment 11.0

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 184.4      | 182.0           | -172.5 | 182.1        | -172.5 | 170.1                       | -184.4 | 170.1     | - |
| OPER 307.4      | 295.5           | -295.5 | 295.5        | -295.5 | 283.5                       | -307.4 | 283.5     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 86.35 R                 | 66.42           | 210.50                  | 0.0       | 65.14                   | 50.10           | 182.50               |        |
|           |            | -37.93 L                | -29.18          | 142.00                  | 0.0       | -29.76                  | -22.90          | 165.00               | 0.00   |
| OPER      | 5C1T       | 74.81 R                 | 57.54           | 320.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -38.29 L                | -29.45          | -20.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.97            | 4.86  | 1.97         | 4.86  | HS 39.40     | 70.9                 |
| 5C1T        | 3.79            | 8.03  | 3.79         | 8.03  | 0.00         | 454.8                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 8.400

|               |                             |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Allowable stress (fs) (psi) |           |         |         |
| RATIO/Inv.    | 0.00                        | 0.00      | 0.00    |         |
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

|                |           |       |      |       |       |       |      |      |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
| H              | D         | tw    | top  | 10.35 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

|                         |                  |                       |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

|               |          |              |       |                   |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.30    | 10.97        | 11.11 | 1492.8            | 1492.8           |

|                  |                  |             |       |                 |
|------------------|------------------|-------------|-------|-----------------|
| Section Modulus  |                  |             |       | Plastic Section |
| Positive Bending | Negative Bending | Modulus - Z |       |                 |
| Top              | Bott.            | Top         | Bott. | (Fy * Z)        |
| 133.4            | 129.9            | 133.4       | 129.9 | 422.49          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 8.400

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 25.88 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.89 | 28.67 | 28.67 | 1.726 | 999999.000 | 96.939 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 29.33 |        | 104.5                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 8.400

Dead Load Moment 1.5  
Superimposed Dead Load Moment 18.6

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 195.0C          | -169.3             | 164.9           | -195.0C            | 182.9                       | -181.4             | 152.8           | -207.1             |
| OPER        | 325.0C          | -282.2             | 274.8           | -325.0C            | 304.9                       | -302.3             | 254.7           | -345.1             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 96.86 R      | 74.51              | 213.00 | 0.0                 | 77.41    | 59.55       | 185.00             |        |                |              |
|           |           | -30.15 L     | -23.20             | 142.00 | 0.0                 | -25.99   | -19.99      | 165.00             | 0.00   |                |              |
| OPER      | 5C1T      | 87.44 R      | 67.26              | 371.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -35.21 L     | -27.09             | -18.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 1.89            | 6.02                      | 1.58         | 6.87               | HS 31.55     | 56.8                 |
| 5C1T        | 3.49            | 8.59                      | 2.91         | 9.80               | 0.00         | 349.5                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 8.400Dead Load Superimposed Dead Load  
Shear (-) Shear (+) Shear

0.2 0.0 2.1

Rat. Shear Capacity Available Capacity for LL+I  
Veh. VU (-) (+)INV. 96.5 -75.6 72.9  
OPER 160.8 -125.9 121.4

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Rat.<br>Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|--------------|--------------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|              |              | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|              |              | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.         | HS20         | -8.97                 | 16.78 | -6.90    | 12.90 | -9.24                | 15.04 | -7.10    | 11.57 |
| OPER         | 5C1T         | -9.26                 | 14.25 | -7.12    | 10.96 | 0.00                 | 0.00  | 0.00     | 0.00  |

## Rating Shear

| Veh. | Rating<br>(-) | Factor<br>(+) | Rating<br>Value | Load<br>Capacity<br>(tons) |
|------|---------------|---------------|-----------------|----------------------------|
| HS20 | 8.18          | 4.34          | HS 86.86        | 156.3                      |
| 5C1T | 13.60         | 8.52          | 0.00            | 999.0                      |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 8.400

Dead Load Moment 1.5  
Superimposed Dead Load Moment 18.6

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 183.6      | 184.2           | -168.1 | 179.5        | -163.4 | 164.0                       | -188.2 | 159.4     | - |
| OPER 305.9      | 293.5           | -293.5 | 285.8        | -285.8 | 273.4                       | -313.6 | 265.7     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 96.86 R                 | 74.51                | 213.00      | 0.0       | 77.41                   | 59.55                  | 185.00 |        |
|           |            | -30.15 L                | -23.20               | 142.00      | 0.0       | -25.99                  | -19.99                 | 165.00 | 0.00   |
| OPER      | 5C1T       | 87.44 R                 | 67.26                | 371.00      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -35.21 L                | -27.09               | -18.50      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.69            | 6.24  | 1.65         | 6.09  | HS 32.92     | 59.2                 |
| 5C1T        | 3.13            | 8.91  | 3.04         | 8.69  | 0.00         | 364.6                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 8.500

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.35 | 8.24  | 8.24  | 0.62 | 1.77 |
| 22.2           | 21.00     | 0.400 | bott | 10.65 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.97        | 11.26 | 1463.2            | 1463.2           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 133.4           | 129.9         | 133.4        | 129.9         | 426.63                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 8.500

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 25.88 |
| bott | 4.12 | 0.62 | 13.400 | 150.00   | 84.62 |       | 26.62 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.84 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 94.367     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 426.63 | 109.1                   |
| bott | 22.62            |                   | 19.12 |        | 106.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 8.500

Dead Load Moment 1.7  
Superimposed Dead Load Moment 21.4

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 196.9C          | -169.3             | 164.9           | -196.9C            | 183.0                       | -183.2             | 151.0           | -210.8             |
| OPER        | 328.2C          | -282.2             | 274.8           | -328.2C            | 305.0                       | -305.4             | 251.7           | -351.3             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 94.50 L      | 72.69              | 173.50 | 0.0                 | 82.27    | 63.28       | 187.50             |        |                |              |
|           |           | -22.38 L     | -17.21             | 142.00 | 0.0                 | -22.22   | -17.09      | 165.00             |        | 0.00           |              |
| OPER      | 5C1T      | 90.57 R      | 69.67              | 373.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -33.59 L     | -25.84             | -17.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 1.94            | 8.19                      | 1.60         | 9.42               | HS 31.96     | 57.5                 |
| 5C1T        | 3.37            | 9.09                      | 2.78         | 10.46              | 0.00         | 333.4                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 8.500

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.0       | 0.0          | 0.2       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 96.5              | -74.3                  | 74.1                  |
| OPER      | 160.8             | -123.9                 | 123.5                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |      |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |      |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)  |
| INV.      | HS20      | -13.12                | 13.12 | -10.09   | 10.09 | -12.03               | 12.11 | -9.26    | 9.31 |
| OPER      | 5C1T      | -11.58                | 11.76 | -8.90    | 9.05  | 0.00                 | 0.00  | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 5.66       | 5.65       | HS 112.96    | 203.3                |
| 5C1T   | 10.70      | 10.50      | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 8.500Dead Load Moment 1.7  
Superimposed Dead Load Moment 21.4

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 185.4      | 185.4           | -166.8 | 180.8        | -162.2 | 162.2                       | -190.0 | 157.6     | - |
| OPER 309.0      | 293.5           | -293.5 | 285.8        | -285.8 | 270.3                       | -316.7 | 262.6     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 94.50 L                 | 72.69           | 173.50                  | 0.0       | 82.27                   | 63.28           | 187.50               |        |
|           |            | -22.38 L                | -17.21          | 142.00                  | 0.0       | -22.22                  | -17.09          | 165.00               | 0.00   |
| OPER      | 5C1T       | 90.57 R                 | 69.67           | 373.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -33.59 L                | -25.84          | -17.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.72            | 8.49            | 1.67               | 8.28               | HS 33.35     | 60.0                 |
| 5C1T        | 2.98            | 9.43            | 2.90               | 9.20               | 0.00         | 348.0                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 8.600

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.35 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.97        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 133.4           | 129.9         | 133.4        | 129.9         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 8.600

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 25.88 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.84 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 94.367     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 19.12 |        | 106.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 8.600

Dead Load Moment      Superimposed Dead Load Moment  
1.6                      19.3

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 195.0C             | -169.3                | 164.9              | -195.0C               | 182.5                       | -181.8                | 152.4              | -207.5                |
| OPER        | 325.0C             | -282.2                | 274.8              | -325.0C               | 304.1                       | -303.1                | 254.0              | -345.9                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 96.80 L      | 74.46              | 162.00 | 0.0                 | 77.45    | 59.58       | 190.00             |        |                |              |
|           |           | -29.79 R     | -22.92             | 233.00 | 0.0                 | -25.55   | -19.66      | 210.00             |        | 0.00           |              |
| OPER      | 5C1T      | 87.75 L      | 67.50              | 139.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -33.62 R     | -25.86             | 393.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 1.88               | 6.10                         | 1.57                               | 6.97         | HS 31.48             |
| 5C1T        | 3.47               | 9.02                         | 2.89                               | 10.29        | 0.00                 |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 8.600

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.1      | -1.8         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 96.5              | -73.0                           | 75.4  |
| OPER      | 160.8             | -121.7                          | 125.6 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -16.77                | 8.96 | -12.90   | 6.90 | -14.97               | 9.31 | -11.51   | 7.16 |
| OPER      | 5C1T      | -14.06                | 9.46 | -10.81   | 7.27 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 4.35       | 8.10       | HS 87.08     | 156.7                |
| 5C1T   | 8.66       | 13.28      | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 8.600

Dead Load Moment 1.6  
Superimposed Dead Load Moment 19.3

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 184.0      | 184.4           | -167.8 | 179.8        | -163.1 | 163.6                       | -188.6 | 159.0     | - |
| OPER 306.7      | 293.5           | -293.5 | 285.8        | -285.8 | 272.6                       | -314.4 | 264.9     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 96.80 L                 | 74.46                | 162.00      | 0.0       | 77.45                   | 59.58                  | 190.00 |        |
|           |            | -29.79 R                | -22.92               | 233.00      | 0.0       | -25.55                  | -19.66                 | 210.00 | 0.00   |
| OPER      | 5C1T       | 87.75 L                 | 67.50                | 139.00      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -33.62 R                | -25.86               | 393.50      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.69            | 6.33            | 1.64               | 6.18               | HS 32.84     | 59.1                 |
| 5C1T        | 3.11            | 9.35            | 3.02               | 9.12               | 0.00         | 362.3                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 8.700

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 8.700

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.84 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 91.282     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 19.12 |        | 106.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 8.700

Dead Load Moment 1.0  
Superimposed Dead Load Moment 12.4

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 195.0C          | -170.5             | 170.5           | -195.0C            | 187.0                       | -178.5             | 162.4           | -203.0             |
| OPER        | 325.0C          | -284.1             | 284.1           | -325.0C            | 311.6                       | -297.5             | 270.7           | -338.4             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 86.27 L      | 66.36              | 164.50 | 0.0                 | 65.22    | 50.17       | 192.50             |        |                |              |
|           |           | -37.46 R     | -28.82             | 233.00 | 0.0                 | -28.95   | -22.27      | 210.00             |        | 0.00           |              |
| OPER      | 5C1T      | 75.86 L      | 58.36              | 141.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -36.05 R     | -27.73             | 395.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | bottom fiber -bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|--------|--------------|----------------------|
| HS20        | 2.17            | 4.76               | 1.88   | 37.66        | 67.8                 |
| 5C1T        | 4.11            | 8.25               | 3.57   | 0.00         | 428.2                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 8.700

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.3      | -3.7         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 96.5              | -71.8                  | 76.6         |
| OPER      | 160.8             | -119.7                 | 127.7        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |            |              |              | Lane Live Load Shear |            |              |              |
|-----------|-----------|-----------------------|------------|--------------|--------------|----------------------|------------|--------------|--------------|
|           |           | (-) w/imp.            | (+) w/imp. | (-) w/o imp. | (+) w/o imp. | (-) w/imp.           | (+) w/imp. | (-) w/o imp. | (+) w/o imp. |
| INV.      | HS20      | -20.57                | 4.41       | -15.82       | 3.39         | -17.96               | 6.74       | -13.81       | 5.18         |
| OPER      | 5C1T      | -17.15                | 7.27       | -13.19       | 5.60         | 0.00                 | 0.00       | 0.00         | 0.00         |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 3.49       | 11.37      | HS 69.79     | 125.6                |  |
| 5C1T   | 6.98       | 17.56      | 0.00         | 837.1                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 8.700

Dead Load Moment 1.0  
Superimposed Dead Load Moment 12.4

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 185.3      | 182.6           | -171.9 | 182.6        | -171.9 | 169.2                       | -185.3 | 169.2     | - |
| OPER 308.9      | 295.5           | -295.5 | 295.5        | -295.5 | 282.1                       | -308.9 | 282.1     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 86.27 L                 | 66.36                | 164.50      | 0.0       | 65.22                   | 50.17                  | 192.50 |        |
|           |            | -37.46 R                | -28.82               | 233.00      | 0.0       | -28.95                  | -22.27                 | 210.00 | 0.00   |
| OPER      | 5C1T       | 75.86 L                 | 58.36                | 141.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -36.05 R                | -27.73               | 395.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.96            | 4.95  | 1.96         | 4.95  | HS 39.24     | 70.6                 |
| 5C1T        | 3.72            | 8.57  | 3.72         | 8.57  | 0.00         | 446.2                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 8.800

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus  |                  |       |       | Plastic Section |
|------------------|------------------|-------|-------|-----------------|
| Positive Bending | Negative Bending |       |       | Modulus - Z     |
| Top              | Bott.            | Top   | Bott. | (Fy * Z)        |
| 134.3            | 134.3            | 134.3 | 134.3 | 422.49          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 8.800

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.84 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 91.282     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 19.12 |        | 106.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 8.800

Dead Load Moment 0.1  
Superimposed Dead Load Moment 0.6

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 195.0C          | -170.5             | 170.5           | -195.0C            | 194.5                       | -170.9             | 170.0           | -195.4             |
| OPER        | 325.0C          | -284.1             | 284.1           | -325.0C            | 324.2                       | -284.8             | 283.4           | -325.7             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 59.21 L      | 45.54              | 167.00 | 0.0                 | 45.36    | 34.89       | 195.00             |        |                |              |
|           |           | -45.14 R     | -34.72             | 233.00 | 0.0                 | -32.95   | -25.34      | 210.00             | 177.50 |                |              |
| OPER      | 5C1T      | 56.03 L      | 43.10              | 57.00  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -39.95 R     | -30.73             | 222.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | bottom fiber -bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|--------|--------------|----------------------|
| HS20        | 3.29            | 3.79               | 2.87   | 57.43        | 103.4                |
| 5C1T        | 5.79            | 7.13               | 5.06   | 0.00         | 606.8                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 8.800

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| -0.5      | -5.6                   |
|           | 0.0                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 96.5              | -70.5                           | 77.9  |
| OPER      | 160.8             | -117.6                          | 129.8 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -25.40                | 2.98 | -19.54   | 2.29 | -20.90               | 4.46 | -16.08   | 3.43 |
| OPER      | 5C1T      | -20.32                | 5.31 | -15.63   | 4.08 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 2.78       | 17.44      | HS 55.55     | 100.0                |  |
| 5C1T   | 5.79       | 24.44      | 0.00         | 694.3                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 8.800

Dead Load Moment 0.1  
Superimposed Dead Load Moment 0.6

| Rating Veh.<br>ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|--------------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                    | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend               | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV.<br>177.7      | 177.6           | -177.0 | 177.6        | -177.0 | 176.8                       | -177.7 | 176.8     | - |
| OPER<br>296.2      | 295.5           | -295.5 | 295.5        | -295.5 | 294.7                       | -296.2 | 294.7     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 59.21 L                 | 45.54                | 167.00      | 0.0       | 45.36                   | 34.89                  | 195.00 |        |
|           |            | -45.14 R                | -34.72               | 233.00      | 0.0       | -32.95                  | -25.34                 | 210.00 | 177.50 |
| OPER      | 5C1T       | 56.03 L                 | 43.10                | 57.00       | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -39.95 R                | -30.73               | 222.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 2.99            | 3.94            | 2.99               | 3.94               | HS 59.73     | 107.5                |
| 5C1T        | 5.26            | 7.41            | 5.26               | 7.41               | 0.00         | 631.2                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 8.900

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 8.900

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.84 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 91.282     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 19.12 |        | 106.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 8.900

Dead Load Moment      Superimposed Dead Load Moment  
-1.2                      -15.8

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 195.0C             | -170.5                | 170.5              | -195.0C               | 205.2                       | -160.2                | 180.7              | -184.8                |
| OPER        | 325.0C             | -284.1                | 284.1              | -325.0C               | 342.1                       | -267.0                | 301.2              | -307.9                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 15.95 L      | 12.27              | 169.50 | 0.0                 | 25.46    | 19.59       | 197.50             |        |                |              |
|           |           | -58.50 L     | -45.00             | 191.00 | 0.0                 | -52.89   | -40.69      | 210.00             | 187.50 |                |              |
| OPER      | 5C1T      | 30.37 L      | 23.36              | 59.50  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -47.11 R     | -36.24             | 226.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 8.06               | 2.74                         | 7.10                               | 3.16         | HS 54.77 98.6        |
| 5C1T        | 11.26              | 5.67                         | 9.92                               | 6.54         | 0.00 680.2           |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 8.900

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.6      | -7.6         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 96.5              | -69.3                           | 79.1  |
| OPER      | 160.8             | -115.5                          | 131.8 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -30.12                | 3.11 | -23.17   | 2.39 | -23.71               | 3.23 | -18.24   | 2.48 |
| OPER      | 5C1T      | -23.41                | 3.63 | -18.00   | 2.79 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 2.30       | 24.52      | HS 46.02     | 82.8                 |
| 5C1T   | 4.93       | 36.30      | 0.00         | 592.2                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 8.900

Dead Load Moment      Superimposed Dead Load Moment  
-1.2                      -15.8

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 167.0      | 170.4           | -184.1 | 170.5        | -184.1 | 187.5                       | -167.0 | 187.5     | - |
| OPER 278.4      | 295.5           | -295.5 | 295.5        | -295.5 | 312.5                       | -278.4 | 312.5     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 15.95 L                 | 12.27                | 169.50      | 0.0       | 25.46                   | 19.59                  | 197.50 |        |
|           |            | -58.50 L                | -45.00               | 191.00      | 0.0       | -52.89                  | -40.69                 | 210.00 | 187.50 |
| OPER      | 5C1T       | 30.37 L                 | 23.36                | 59.50       | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -47.11 R                | -36.24               | 226.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 7.36            | 2.86  | 7.36         | 2.86  | HS 57.10     | 102.8                |
| 5C1T        | 10.29           | 5.91  | 10.29        | 5.91  | 0.00         | 709.2                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 9.000

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Depth | Web Thk. |      | Dc    | b max | b min | t    | ry   |
|----------------|-------|----------|------|-------|-------|-------|------|------|
| H              | D     | tw       | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00 | 0.400    | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 9.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.84 | 28.67 | 28.67 | 1.726 | 999999.000 | 91.282 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 19.12 |        | 106.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 9.000

Dead Load Moment      Superimposed Dead Load Moment  
-3.0                      -37.1

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 195.0C             | -170.5                | 170.5              | -195.0C               | 219.0                       | -146.4                | 194.5              | -171.0                |
| OPER        | 325.0C             | -284.1                | 284.1              | -325.0C               | 365.1                       | -244.0                | 324.2              | -284.9                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 19.72 R      | 15.17              | 258.00 | 0.0                 | 17.68    | 13.60       | 235.00             |        |                |              |
|           |           | -98.42 R     | -75.71             | 220.50 | 0.0                 | -89.22   | -68.63      | 190.00             |        | 210.00         |              |
| OPER      | 5C1T      | 15.19 R      | 11.68              | 458.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -61.73 R     | -47.48             | 318.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 11.11              | 1.49                         | 9.86                               | 1.74         | HS 29.75 53.6        |
| 5C1T        | 24.04              | 3.95                         | 21.34                              | 4.62         | 0.00 474.4           |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 9.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.6      | -0.8      | -7.6                   | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I |       |
|-----------|-------------------|-----------------------------|-------|
|           |                   | (-)                         | (+)   |
| INV.      | 96.5              | -68.1                       | 68.3  |
| OPER      | 160.8             | -113.4                      | 113.8 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -30.12                | 34.45 | -23.17   | 26.50 | -23.71               | 26.10 | -18.24   | 20.08 |
| OPER      | 5C1T      | -23.41                | 25.91 | -18.00   | 19.93 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.97       | 1.98       | HS 39.43     | 71.0                 |
| 5C1T   | 4.32       | 4.39       | 0.00         | 519.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 9.000

Dead Load Moment      Superimposed Dead Load Moment  
-3.0                      -37.1

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 153.2      | 161.2           | -193.3 | 161.3        | -193.3 | 201.3                       | -153.2 | 201.3     | - |
| OPER 255.4      | 295.5           | -295.5 | 295.5        | -295.5 | 335.5                       | -255.4 | 335.5     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 19.72 R                 | 15.17                | 258.00      | 0.0       | 17.68                   | 13.60                  | 235.00 |        |
|           |            | -98.42 R                | -75.71               | 220.50      | 0.0       | -89.22                  | -68.63                 | 190.00 | 210.00 |
| OPER      | 5C1T       | 15.19 R                 | 11.68                | 458.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -61.73 R                | -47.48               | 318.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 10.21           | 1.56            | 10.21              | 1.56               | HS 31.14     | 56.1                 |
| 5C1T        | 22.09           | 4.14            | 22.09              | 4.14               | 0.00         | 496.5                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 9.000

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 9.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.84 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 91.282     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 19.12 |        | 106.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 9.000

Dead Load Superimposed Dead Load  
Moment Moment  
-3.0 -37.1

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 195.0C             | -170.5                | 170.5              | -195.0C               | 219.0                       | -146.4                | 194.5              | -171.0                |
| OPER        | 325.0C             | -284.1                | 284.1              | -325.0C               | 365.1                       | -244.0                | 324.2              | -284.9                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 19.72 R      | 15.17              | 258.00 | 0.0                 | 17.68    | 13.60       | 235.00             |        |                |              |
|           |           | -98.42 R     | -75.71             | 220.50 | 0.0                 | -89.22   | -68.63      | 190.00             | 210.00 |                |              |
| OPER      | 5C1T      | 15.19 R      | 11.68              | 458.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -61.73 R     | -47.48             | 318.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 11.11              | 1.49                         | 9.86                               | 1.74         | HS 29.75 53.6        |
| 5C1T        | 24.04              | 3.95                         | 21.34                              | 4.62         | 0.00 474.4           |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 9.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.8      | 0.7       | -9.5                   | 9.1       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I |       |
|-----------|-------------------|-----------------------------|-------|
|           |                   | (-)                         | (+)   |
| INV.      | 96.5              | -68.1                       | 68.3  |
| OPER      | 160.8             | -113.4                      | 113.8 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -34.53                | 34.45 | -26.56   | 26.50 | -26.28               | 26.10 | -20.22   | 20.08 |
| OPER      | 5C1T      | -26.23                | 25.91 | -20.18   | 19.93 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.97       | 1.98       | HS 39.43     | 71.0                 |
| 5C1T   | 4.32       | 4.39       | 0.00         | 519.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 9.000

Dead Load Moment      Superimposed Dead Load Moment  
-3.0                      -37.1

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 153.2      | 161.2           | -193.3 | 161.3        | -193.3 | 201.3                       | -153.2 | 201.3     | - |
| OPER 255.4      | 295.5           | -295.5 | 295.5        | -295.5 | 335.5                       | -255.4 | 335.5     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|------------------|-----------------|-------------------------|-----------|------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 19.72 R          | 15.17           | 258.00                  | 0.0       | 17.68            | 13.60           | 235.00               |        |
|           |            | -98.42 R         | -75.71          | 220.50                  | 0.0       | -89.22           | -68.63          | 190.00               | 210.00 |
| OPER      | 5C1T       | 15.19 R          | 11.68           | 458.50                  | 0.0       | 0.00             | 0.00            | 0.00                 |        |
|           |            | -61.73 R         | -47.48          | 318.00                  | 0.0       | 0.00             | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 10.21           | 1.56            | 10.21              | 1.56               | HS 31.14     | 56.1                 |
| 5C1T        | 22.09           | 4.14            | 22.09              | 4.14               | 0.00         | 496.5                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 9.100

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 9.100

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.85 | 28.67 | 28.67 | 1.726 | 999999.000 | 91.564 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 19.12 |        | 106.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 9.100

Dead Load Moment      Superimposed Dead Load Moment  
-1.3                      -16.7

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 195.0C             | -170.5                | 170.5              | -195.0C               | 205.8                       | -159.6                | 181.3              | -184.2                |
| OPER        | 325.0C             | -284.1                | 284.1              | -325.0C               | 343.1                       | -266.0                | 302.2              | -306.9                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.55 R      | 12.73              | 230.50 | 0.0                 | 25.89    | 19.91       | 202.50             |        |                |              |
|           |           | -59.12 R     | -45.48             | 209.00 | 0.0                 | -53.40   | -41.08      | 190.00             |        | 212.50         |              |
| OPER      | 5C1T      | 31.31 R      | 24.08              | 253.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -49.87 L     | -38.36             | 88.50  | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 7.95               | 2.70                         | 7.00                               | 3.12         | HS 54.00 97.2        |
| 5C1T        | 10.96              | 5.33                         | 9.65                               | 6.15         | 0.00 640.1           |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 9.100

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.6       | 0.0          | 7.2       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 96.5              | -78.9                  | 69.5         |
| OPER      | 160.8             | -131.4                 | 115.9        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -3.59                 | 30.02 | -2.77    | 23.10 | -3.46                | 23.52 | -2.66    | 18.09 |
| OPER      | 5C1T      | -3.71                 | 22.84 | -2.86    | 17.57 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 21.94      | 2.32       | HS 46.33     | 83.4                 |
| 5C1T   | 35.41      | 5.07       | 0.00         | 608.9                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 9.100

Dead Load Moment      Superimposed Dead Load Moment  
-1.3                      -16.7

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 166.4      | 170.1           | -184.5 | 170.1        | -184.5 | 188.1                       | -166.4 | 188.1     | - |
| OPER 277.4      | 295.5           | -295.5 | 295.5        | -295.5 | 313.5                       | -277.4 | 313.5     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 16.55 R                 | 12.73                | 230.50      | 0.0       | 25.89                   | 19.91                  | 202.50 |        |
|           |            | -59.12 R                | -45.48               | 209.00      | 0.0       | -53.40                  | -41.08                 | 190.00 | 212.50 |
| OPER      | 5C1T       | 31.31 R                 | 24.08                | 253.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -49.87 L                | -38.36               | 88.50       | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 7.27            | 2.82  | 7.27         | 2.82  | HS 56.30     | 101.3                |
| 5C1T        | 10.01           | 5.56  | 10.01        | 5.56  | 0.00         | 667.4                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 9.200

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 9.200

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.85 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 91.564     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 19.12 |        | 106.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 9.200

Dead Load Moment      Superimposed Dead Load Moment  
-0.1                      -1.1

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 195.0C             | -170.5                | 170.5              | -195.0C               | 195.7                       | -169.7                | 171.2              | -194.3                |
| OPER        | 325.0C             | -284.1                | 284.1              | -325.0C               | 326.2                       | -282.9                | 285.3              | -323.8                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 59.51 R      | 45.77              | 233.00 | 0.0                 | 44.81    | 34.47       | 205.00             |        |                |              |
|           |           | -45.85 L     | -35.27             | 167.00 | 0.0                 | -35.45   | -27.27      | 190.00             |        | 140.00         |              |
| OPER      | 5C1T      | 55.34 R      | 42.57              | 343.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -42.90 L     | -33.00             | 91.00  | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 3.29               | 3.70                         | 2.88            | 4.24                  | HS 57.54     | 103.6                |
| 5C1T        | 5.89               | 6.59                         | 5.16            | 7.55                  | 0.00         | 618.8                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 9.200

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.4       | 0.0          | 5.3       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 96.5              | -77.6                  | 70.8                  |
| OPER      | 160.8             | -129.4                 | 118.0                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -3.59                 | 25.30 | -2.77    | 19.46 | -4.54                | 20.69 | -3.49    | 15.92 |
| OPER      | 5C1T      | -5.63                 | 19.64 | -4.33    | 15.11 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 17.10      | 2.80       | HS 55.96     | 100.7                |
| 5C1T   | 23.00      | 6.01       | 0.00         | 720.7                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 9.200

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -0.1                | -1.1                             |

| Rating<br>Veh.<br>ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                       | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
|                       | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| bend                  |                 |        |              |        |                             |        |           |   |
| INV.                  | 176.8           | -177.8 | 176.8        | -177.8 | 178.0                       | -176.5 | 178.0     | - |
| 176.5                 |                 |        |              |        |                             |        |           |   |
| OPER                  | 295.5           | -295.5 | 295.5        | -295.5 | 296.7                       | -294.2 | 296.7     | - |
| 294.2                 |                 |        |              |        |                             |        |           |   |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Truck<br>Veh. | Live Load Moment<br>w/imp. | Loc. of Ax.<br>w/o imp. | Front<br>Wheel | Lane<br>Dis. | Live Load Moment<br>w/imp. | Loc. of Conc.<br>w/o imp. | Load 1 | Load 2 |
|--------------|---------------|----------------------------|-------------------------|----------------|--------------|----------------------------|---------------------------|--------|--------|
| INV.         | HS20          | 59.51 R                    | 45.77                   | 233.00         | 0.0          | 44.81                      | 34.47                     | 205.00 |        |
|              |               | -45.85 L                   | -35.27                  | 167.00         | 0.0          | -35.45                     | -27.27                    | 190.00 | 140.00 |
| OPER         | 5C1T          | 55.34 R                    | 42.57                   | 343.00         | 0.0          | 0.00                       | 0.00                      | 0.00   |        |
|              |               | -42.90 L                   | -33.00                  | 91.00          | 0.0          | 0.00                       | 0.00                      | 0.00   | 0.00   |

## Serviceability

| Rating<br>Veh. | Rating       |                | Factor          |                | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------|----------------|-----------------|----------------|-----------------|----------------------------|
|                | top<br>+bend | fiber<br>-bend | bottom<br>+bend | fiber<br>-bend |                 |                            |
| HS20           | 2.99         | 3.85           | 2.99            | 3.85           | HS 59.83        | 107.7                      |
| 5C1T           | 5.36         | 6.86           | 5.36            | 6.86           | 0.00            | 643.4                      |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 9.300

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 9.300

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.85 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 91.564     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 19.12 |        | 106.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 9.300

Dead Load Moment 0.7  
Superimposed Dead Load Moment 9.7

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 195.0C          | -170.5             | 170.5           | -195.0C            | 188.7                       | -176.7             | 164.2           | -201.2             |
| OPER        | 325.0C          | -284.1             | 284.1           | -325.0C            | 314.6                       | -294.5             | 273.7           | -335.4             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 86.13 R      | 66.26              | 235.50 | 0.0                 | 64.61    | 49.70       | 207.50             |        |                |              |
|           |           | -37.99 L     | -29.22             | 167.00 | 0.0                 | -30.11   | -23.17      | 190.00             |        | 0.00           |              |
| OPER      | 5C1T      | 73.29 R      | 56.38              | 345.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -38.44 L     | -29.57             | 92.00  | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | bottom fiber -bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|--------|--------------|----------------------|
| HS20        | 2.19            | 4.65               | 1.91   | 38.13        | 68.6                 |
| 5C1T        | 4.29            | 7.66               | 3.73   | 0.00         | 448.1                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 9.300

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.3       | 0.0          | 3.4       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 96.5              | -76.4                  | 72.0         |
| OPER      | 160.8             | -127.3                 | 120.0        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -4.58                 | 20.47 | -3.53    | 15.75 | -6.83                | 17.73 | -5.25    | 13.64 |
| OPER      | 5C1T      | -7.78                 | 16.48 | -5.98    | 12.67 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 11.18      | 3.52       | HS 70.38     | 126.7                |
| 5C1T   | 16.37      | 7.29       | 0.00         | 874.4                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 9.300

Dead Load Moment 0.7  
Superimposed Dead Load Moment 9.7

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 183.5      | 181.4           | -173.1 | 181.4        | -173.1 | 171.0                       | -183.5 | 171.0     | - |
| OPER 305.9      | 295.5           | -295.5 | 295.5        | -295.5 | 285.1                       | -305.9 | 285.1     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |        |        |      |
|-----------|------------|-------------------------|-------------------------|------------------------------|----------------------|--------|--------|--------|------|
| INV.      | HS20       | 86.13 R                 | 66.26                   | 235.50                       | 0.0                  | 64.61  | 49.70  | 207.50 |      |
|           |            | -37.99 L                | -29.22                  | 167.00                       | 0.0                  | -30.11 | -23.17 | 190.00 | 0.00 |
| OPER      | 5C1T       | 73.29 R                 | 56.38                   | 345.50                       | 0.0                  | 0.00   | 0.00   | 0.00   |      |
|           |            | -38.44 L                | -29.57                  | 92.00                        | 0.0                  | 0.00   | 0.00   | 0.00   | 0.00 |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.99            | 4.83            | 1.99               | 4.83               | HS 39.71     | 71.5                 |
| 5C1T        | 3.89            | 7.96            | 3.89               | 7.96               | 0.00         | 466.7                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 9.400

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 9.400

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.85 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 91.564     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 19.12 |        | 106.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 9.400

Dead Load Moment 1.1  
Superimposed Dead Load Moment 15.7

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 195.0C          | -170.5             | 170.5           | -195.0C            | 184.9                       | -180.6             | 160.3           | -205.1             |
| OPER        | 325.0C          | -284.1             | 284.1           | -325.0C            | 308.1                       | -301.0             | 267.2           | -341.9             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 96.21 R      | 74.01              | 238.00 | 0.0                 | 76.12    | 58.56       | 210.00             |        |                |              |
|           |           | -30.14 L     | -23.18             | 167.00 | 0.0                 | -26.58   | -20.45      | 190.00             |        | 0.00           |              |
| OPER      | 5C1T      | 84.02 R      | 64.63              | 348.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -36.31 L     | -27.93             | 140.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | bottom fiber -bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|--------|--------------|----------------------|
| HS20        | 1.92            | 5.99               | 1.67   | HS 33.33     | 60.0                 |
| 5C1T        | 3.67            | 8.29               | 3.18   | 0.00         | 381.6                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 9.400Dead Load Superimposed Dead Load  
Shear (-) Shear (+) Shear

0.1 0.0 1.5

Rat. Shear Capacity Available Capacity for LL+I  
Veh. VU (-) (+)INV. 96.5 -75.1 73.3  
OPER 160.8 -125.2 122.1

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -9.15                 | 16.73 | -7.03    | 12.87 | -9.42                | 14.74 | -7.24    | 11.34 |
| OPER      | 5C1T      | -10.04                | 13.46 | -7.72    | 10.36 | 0.00                 | 0.00  | 0.00     | 0.00  |

## Rating Shear

| Veh. | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
|------|------------|------------|--------------|----------------------|
| HS20 | 7.98       | 4.38       | HS 87.58     | 157.6                |
| 5C1T | 12.48      | 9.07       | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 9.400

Dead Load Moment 1.1  
Superimposed Dead Load Moment 15.7

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
|                 | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 187.4      | 184.0           | -170.5 | 184.0        | -170.5 | 167.1                       | -187.4 | 167.1     | - |
| OPER 312.4      | 295.5           | -295.5 | 295.5        | -295.5 | 278.6                       | -312.4 | 278.6     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|------------------|-----------------|-------------------------|-----------|------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 96.21 R          | 74.01           | 238.00                  | 0.0       | 76.12            | 58.56           | 210.00               |        |
|           |            | -30.14 L         | -23.18          | 167.00                  | 0.0       | -26.58           | -20.45          | 190.00               | 0.00   |
| OPER      | 5C1T       | 84.02 R          | 64.63           | 348.00                  | 0.0       | 0.00             | 0.00            | 0.00                 |        |
|           |            | -36.31 L         | -27.93          | 140.50                  | 0.0       | 0.00             | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.74            | 6.22            | 1.74               | 6.22               | HS 34.75     | 62.5                 |
| 5C1T        | 3.32            | 8.60            | 3.32               | 8.60               | 0.00         | 397.9                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 9.500

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 9.500

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.85 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 91.564     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 41.32 |        | 102.6                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 9.500

Dead Load Moment 1.2  
Superimposed Dead Load Moment 17.0

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 195.0C          | -170.5             | 170.5           | -195.0C            | 184.1                       | -181.4             | 159.5           | -205.9             |
| OPER        | 325.0C          | -284.1             | 284.1           | -325.0C            | 306.8                       | -302.3             | 265.9           | -343.2             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 94.19 L      | 72.45              | 198.50 | 0.0                 | 80.19    | 61.68       | 212.50             |        |                |              |
|           |           | -26.96 R     | -20.74             | 258.00 | 0.0                 | -24.10   | -18.54      | 235.00             | 0.00   |                |              |
| OPER      | 5C1T      | 87.53 L      | 67.33              | 113.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -37.54 R     | -28.88             | 371.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | Rating Factor   |                    |                 |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|-----------------|--------------------|--------------|----------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend |              |                      |
| HS20        | 1.95            | 6.73               | 1.69            | 7.64               | HS 33.88     | 61.0                 |
| 5C1T        | 3.51            | 8.05               | 3.04            | 9.14               | 0.00         | 364.5                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 9.500

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.1      | -0.5         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 96.5              | -73.9                  | 74.5         |
| OPER      | 160.8             | -123.2                 | 124.2        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |      |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |      |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)  |
| INV.      | HS20      | -13.30                | 13.06 | -10.23   | 10.04 | -12.23               | 11.80 | -9.41    | 9.07 |
| OPER      | 5C1T      | -12.31                | 10.96 | -9.47    | 8.43  | 0.00                 | 0.00  | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 5.55       | 5.71       | HS 111.09    | 200.0                |
| 5C1T   | 10.01      | 11.34      | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 9.500Dead Load Moment 1.2  
Superimposed Dead Load Moment 17.0

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 188.2      | 184.6           | -170.0 | 184.6        | -170.0 | 166.4                       | -188.2 | 166.4     | - |
| OPER 313.7      | 295.5           | -295.5 | 295.5        | -295.5 | 277.3                       | -313.7 | 277.3     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Live Load Moment w/o imp. | Loc. of Conc. Load 1 | Live Load Moment w/imp. | Loc. of Conc. Load 2 |
|-----------|------------|-------------------------|-------------------------|---------------------------|----------------------|-------------------------|----------------------|
| INV.      | HS20       | 94.19 L                 | 72.45                   | 198.50                    | 0.0                  | 80.19                   | 61.68                |
|           |            | -26.96 R                | -20.74                  | 258.00                    | 0.0                  | -24.10                  | -18.54               |
| OPER      | 5C1T       | 87.53 L                 | 67.33                   | 113.50                    | 0.0                  | 0.00                    | 0.00                 |
|           |            | -37.54 R                | -28.88                  | 371.50                    | 0.0                  | 0.00                    | 0.00                 |

## Serviceability

| Rating Veh. | Rating Factor   |                    | Load Capacity (tons) |                    |
|-------------|-----------------|--------------------|----------------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend      | bottom fiber -bend |
| HS20        | 1.77            | 6.98               | 1.77                 | 6.98               |
| 5C1T        | 3.17            | 8.35               | 3.17                 | 8.35               |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 9.600

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 134.3                | 134.3                  | 134.3                | 134.3                  | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 9.600

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.96 | 28.67 | 28.67 | 1.726 | 999999.000 | 97.410 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 41.32 |        | 102.6                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 9.600

Dead Load Moment 0.8  
Superimposed Dead Load Moment 13.3

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 195.0C          | -170.5             | 170.5           | -195.0C            | 186.5                       | -179.0             | 162.0           | -203.5             |
| OPER        | 325.0C          | -284.1             | 284.1           | -325.0C            | 310.8                       | -298.3             | 270.0           | -339.1             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 96.18 L      | 73.99              | 187.00 | 0.0                 | 74.54    | 57.34       | 215.00             |        |                |              |
|           |           | -36.30 R     | -27.92             | 258.00 | 0.0                 | -28.14   | -21.65      | 235.00             |        | 0.00           |              |
| OPER      | 5C1T      | 83.69 L      | 64.38              | 116.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -38.82 R     | -29.86             | 371.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | bottom fiber -bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|--------|--------------|----------------------|
| HS20        | 1.94            | 4.93               | 1.68   | HS 33.68     | 60.6                 |
| 5C1T        | 3.71            | 7.68               | 3.23   | 0.00         | 387.1                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 9.600

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.2      | -2.4         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 96.5              | -72.6                  | 75.8         |
| OPER      | 160.8             | -121.0                 | 126.3        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -16.99                | 8.89 | -13.07   | 6.84 | -15.17               | 9.00 | -11.67   | 6.92 |
| OPER      | 5C1T      | -14.50                | 8.73 | -11.16   | 6.71 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 4.27       | 8.42       | HS 85.46     | 153.8                |
| 5C1T   | 8.35       | 14.48      | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 9.600

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| 0.8                 | 13.3                             |

| Rating<br>Veh.<br>ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                       | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend                  | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV.<br>185.8         | 182.9           | -171.6 | 182.9        | -171.6 | 168.8                       | -185.8 | 168.8     | - |
| OPER<br>309.6         | 295.5           | -295.5 | 295.5        | -295.5 | 281.3                       | -309.6 | 281.3     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Truck<br>Veh. | Live Load Moment<br>w/imp. | Loc. of Ax.<br>w/o imp. | Front<br>Wheel | Lane Dis. | Live Load Moment<br>w/imp. | Loc. of Conc.<br>w/o imp. | Load 1 | Load 2 |
|--------------|---------------|----------------------------|-------------------------|----------------|-----------|----------------------------|---------------------------|--------|--------|
| INV.         | HS20          | 96.18 L                    | 73.99                   | 187.00         | 0.0       | 74.54                      | 57.34                     | 215.00 |        |
|              |               | -36.30 R                   | -27.92                  | 258.00         | 0.0       | -28.14                     | -21.65                    | 235.00 | 0.00   |
| OPER         | 5C1T          | 83.69 L                    | 64.38                   | 116.00         | 0.0       | 0.00                       | 0.00                      | 0.00   |        |
|              |               | -38.82 R                   | -29.86                  | 371.50         | 0.0       | 0.00                       | 0.00                      | 0.00   | 0.00   |

## Serviceability

| Rating<br>Veh. | Rating       |                | Factor          |                | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------|----------------|-----------------|----------------|-----------------|----------------------------|
|                | top<br>+bend | fiber<br>-bend | bottom<br>+bend | fiber<br>-bend |                 |                            |
| HS20           | 1.75         | 5.12           | 1.75            | 5.12           | HS 35.10        | 63.2                       |
| 5C1T           | 3.36         | 7.98           | 3.36            | 7.98           | 0.00            | 403.4                      |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 9.700

|               |                             |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Allowable stress (fs) (psi) |           |         |         |
| RATIO/Inv.    | 0.00                        | 0.00      | 0.00    | 0.00    |
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

|                |           |       |      |       |       |       |      |      |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

|                         |                  |                       |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

|               |          |              |       |                   |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

|                  |                  |             |       |                 |
|------------------|------------------|-------------|-------|-----------------|
| Section Modulus  |                  |             |       | Plastic Section |
| Positive Bending | Negative Bending | Modulus - Z |       |                 |
| Top              | Bott.            | Top         | Bott. | (Fy * Z)        |
| 134.3            | 134.3            | 134.3       | 134.3 | 422.49          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 9.700

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.96 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 97.410     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 41.32 |        | 102.6                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 9.700

Dead Load Moment 0.1  
Superimposed Dead Load Moment 4.9

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 195.0C          | -170.5             | 170.5           | -195.0C            | 192.0                       | -173.4             | 167.5           | -198.0             |
| OPER        | 325.0C          | -284.1             | 284.1           | -325.0C            | 320.1                       | -289.0             | 279.2           | -329.9             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 85.29 L      | 65.61              | 189.50 | 0.0                 | 61.51    | 47.32       | 217.50             |        |                |              |
|           |           | -45.64 R     | -35.11             | 258.00 | 0.0                 | -32.19   | -24.76      | 235.00             | 0.00   |                |              |
| OPER      | 5C1T      | 67.81 L      | 52.16              | 114.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -40.09 R     | -30.84             | 371.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | Rating Factor   |                    |                 |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|-----------------|--------------------|--------------|----------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend |              |                      |
| HS20        | 2.25            | 3.80               | 1.96            | 4.34               | HS 39.28     | 70.7                 |
| 5C1T        | 4.72            | 7.21               | 4.12            | 8.23               | 0.00         | 494.0                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 9.700

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.4      | -4.3         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 96.5              | -71.4                  | 77.0         |
| OPER      | 160.8             | -119.0                 | 128.4        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -20.70                | 4.32 | -15.92   | 3.32 | -18.16               | 6.43 | -13.97   | 4.95 |
| OPER      | 5C1T      | -17.51                | 6.69 | -13.47   | 5.15 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 3.45       | 11.97      | HS 68.97     | 124.1                |  |
| 5C1T   | 6.80       | 19.19      | 0.00         | 815.4                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 9.700

Dead Load Moment 0.1  
Superimposed Dead Load Moment 4.9

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 180.2      | 179.3           | -175.3 | 179.3        | -175.3 | 174.3                       | -180.2 | 174.3     | - |
| OPER 300.4      | 295.5           | -295.5 | 295.5        | -295.5 | 290.5                       | -300.4 | 290.5     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 85.29 L                 | 65.61                | 189.50      | 0.0       | 61.51                   | 47.32                  | 217.50 |        |
|           |            | -45.64 R                | -35.11               | 258.00      | 0.0       | -32.19                  | -24.76                 | 235.00 | 0.00   |
| OPER      | 5C1T       | 67.81 L                 | 52.16                | 114.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -40.09 R                | -30.84               | 371.50      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 2.04            | 3.95  | 2.04         | 3.95  | HS 40.88     | 73.6                 |
| 5C1T        | 4.28            | 7.49  | 4.28         | 7.49  | 0.00         | 514.1                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 9.800

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 9.800

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.96 | 28.67 | 28.67 | 1.726 | 999999.000 | 97.410 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 41.32 |        | 102.6                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 9.800

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -1.1                | -8.4                             |

| Rating<br>Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|----------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|                | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.           | 195.0C             | -170.5                | 170.5              | -195.0C               | 200.7                       | -164.8                | 176.1              | -189.3                |
| OPER           | 325.0C             | -284.1                | 284.1              | -325.0C               | 334.4                       | -274.7                | 293.6              | -315.5                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Rat.<br>Veh. | Truck<br>w/imp. | Live Load<br>w/o imp. | Moment<br>w/o imp. | Loc. of<br>Front<br>Wheel | Ax.<br>Dis. | Lane<br>w/imp. | Live Load<br>w/o imp. | Moment<br>w/o imp. | Loc. of<br>Load 1 | Conc.<br>Load 2 |
|--------------|--------------|-----------------|-----------------------|--------------------|---------------------------|-------------|----------------|-----------------------|--------------------|-------------------|-----------------|
| INV.         | HS20         | 57.94 L         | 44.57                 | 192.00             | 0.0                       | 41.09       | 31.61          | 220.00                |                    |                   |                 |
|              |              | -54.97 R        | -42.29                | 258.00             | 0.0                       | -37.07      | -28.51         | 235.00                |                    | 202.50            |                 |
| OPER         | 5C1T         | 46.10 L         | 35.46                 | -5.00              | 0.0                       | 0.00        | 0.00           | 0.00                  |                    |                   |                 |
|              |              | -44.32 R        | -34.09                | 247.50             | 0.0                       | 0.00        | 0.00           | 0.00                  |                    | 0.00              |                 |

## Moment

| Rating<br>Veh. | top fiber<br>+bend | Rating<br>bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------------|---------------------------------|-----------------|-----------------------|-----------------|----------------------------|
| HS20           | 3.46               | 3.00                            | 3.04            | 3.44                  | HS 59.95        | 107.9                      |
| 5C1T           | 7.25               | 6.20                            | 6.37            | 7.12                  | 0.00            | 743.6                      |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 9.800

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.5      | -6.2         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 96.5              | -70.1                  | 78.3                  |
| OPER      | 160.8             | -116.9                 | 130.5                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -25.56                | 3.01 | -19.66   | 2.32 | -21.10               | 4.17 | -16.23   | 3.21 |
| OPER      | 5C1T      | -20.78                | 4.89 | -15.99   | 3.76 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 2.74       | 18.75      | HS 54.88     | 98.8                 |
| 5C1T   | 5.62       | 26.67      | 0.00         | 674.9                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 9.800

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -1.1                | -8.4                             |

| Rating<br>Veh.<br>ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                       | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend                  | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV.<br>171.6         | 173.5           | -181.1 | 173.5        | -181.1 | 182.9                       | -171.6 | 183.0     | - |
| OPER<br>286.0         | 295.5           | -295.5 | 295.5        | -295.5 | 304.9                       | -286.0 | 304.9     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Truck<br>Veh. | Live Load Moment<br>w/imp. | Moment<br>w/o imp. | Loc. of Ax.<br>Front<br>Wheel | Lane<br>Dis. | Live Load Moment<br>w/imp. | Moment<br>w/o imp. | Loc. of Conc.<br>Load 1 | Load 2 |
|--------------|---------------|----------------------------|--------------------|-------------------------------|--------------|----------------------------|--------------------|-------------------------|--------|
| INV.         | HS20          | 57.94 L                    | 44.57              | 192.00                        | 0.0          | 41.09                      | 31.61              | 220.00                  |        |
|              |               | -54.97 R                   | -42.29             | 258.00                        | 0.0          | -37.07                     | -28.51             | 235.00                  | 202.50 |
| OPER         | 5C1T          | 46.10 L                    | 35.46              | -5.00                         | 0.0          | 0.00                       | 0.00               | 0.00                    |        |
|              |               | -44.32 R                   | -34.09             | 247.50                        | 0.0          | 0.00                       | 0.00               | 0.00                    | 0.00   |

## Serviceability

| Rating<br>Veh. | Rating       |                | Factor          |                | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------|----------------|-----------------|----------------|-----------------|----------------------------|
|                | top<br>+bend | fiber<br>-bend | bottom<br>+bend | fiber<br>-bend |                 |                            |
| HS20           | 3.16         | 3.12           | 3.16            | 3.12           | HS 62.43        | 112.4                      |
| 5C1T           | 6.61         | 6.45           | 6.61            | 6.45           | 0.00            | 774.4                      |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 9.900

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00     | 0.400 | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 9.900

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.96 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 97.410     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 41.32 |        | 102.6                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 9.900

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -2.6                | -26.4                            |

| Rating<br>Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|----------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|                | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.           | 195.0C             | -170.5                | 170.5              | -195.0C               | 212.4                       | -153.1                | 187.9              | -177.6                |
| OPER           | 325.0C             | -284.1                | 284.1              | -325.0C               | 354.0                       | -255.1                | 313.1              | -296.0                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Rat.<br>Veh. | Truck<br>w/imp. | Live Load<br>w/o imp. | Moment | Loc. of<br>Front<br>Wheel | Ax.<br>Dis. | Lane<br>w/imp. | Live Load<br>w/o imp. | Moment | Loc. of<br>Load 1 | Conc.<br>Load 2 |
|--------------|--------------|-----------------|-----------------------|--------|---------------------------|-------------|----------------|-----------------------|--------|-------------------|-----------------|
| INV.         | HS20         | 14.59 L         | 11.22                 | 194.50 | 0.0                       | 20.93       | 16.10          | 222.50                |        |                   |                 |
|              |              | -67.25 L        | -51.73                | 216.00 | 0.0                       | -58.45      | -44.96         | 235.00                |        | 212.50            |                 |
| OPER         | 5C1T         | 21.65 L         | 16.66                 | -2.50  | 0.0                       | 0.00        | 0.00           | 0.00                  |        |                   |                 |
|              |              | -55.95 R        | -43.04                | 253.50 | 0.0                       | 0.00        | 0.00           | 0.00                  |        | 0.00              |                 |

## Moment

| Rating<br>Veh. | top fiber<br>+bend | Rating<br>bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------------|---------------------------------|-----------------|-----------------------|-----------------|----------------------------|
| HS20           | 10.15              | 2.28                            | 8.97            | 2.64                  | HS 45.52        | 81.9                       |
| 5C1T           | 16.35              | 4.56                            | 14.46           | 5.29                  | 0.00            | 547.1                      |

## SHEAR RATING REPORT

Rating Types and Vehicles  
 INV. OPER POST SPEC

Structure I. D. HAM500

Member I. D. S01  
 Check Point I. D. 9.900

HS20 5C1T

Dead Load Superimposed Dead Load  
 Shear (-) Shear (+) Shear

-0.7 -8.2 0.0

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 96.5              | -68.9                  | 79.5                  |
| OPER      | 160.8             | -114.8                 | 132.5                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -30.29                | 3.14 | -23.30   | 2.42 | -23.89               | 3.01 | -18.38   | 2.32 |
| OPER      | 5C1T      | -24.08                | 3.35 | -18.52   | 2.58 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 2.27       | 25.31      | HS 45.48     | 81.9                 |
| 5C1T   | 4.77       | 39.57      | 0.00         | 572.1                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 9.900

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -2.6                | -26.4                            |

| Rating<br>Veh.<br>ber | Moment Capacity |              |           |           | Available Capacity for LL+I |           |           |           |
|-----------------------|-----------------|--------------|-----------|-----------|-----------------------------|-----------|-----------|-----------|
|                       | top fiber       | bottom fiber | top fiber | bottom fi | top fiber                   | bottom fi | top fiber | bottom fi |
|                       | +bend           | -bend        | +bend     | -bend     | +bend                       | -bend     | +bend     | -         |
| INV.                  | 165.7           | -188.9       | 165.7     | -188.9    | 194.7                       | -159.9    | 194.7     | -         |
| 159.9                 |                 |              |           |           |                             |           |           |           |
| OPER                  | 295.5           | -295.5       | 295.5     | -295.5    | 324.5                       | -266.5    | 324.5     | -         |
| 266.5                 |                 |              |           |           |                             |           |           |           |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Truck<br>Veh. | Live Load Moment<br>w/imp. | Moment<br>w/o imp. | Loc. of Ax.<br>Front<br>Wheel | Lane<br>Dis. | Live Load Moment<br>w/imp. | Moment<br>w/o imp. | Loc. of Conc.<br>Load 1 | Load 2 |
|--------------|---------------|----------------------------|--------------------|-------------------------------|--------------|----------------------------|--------------------|-------------------------|--------|
| INV.         | HS20          | 14.59 L                    | 11.22              | 194.50                        | 0.0          | 20.93                      | 16.10              | 222.50                  |        |
|              |               | -67.25 L                   | -51.73             | 216.00                        | 0.0          | -58.45                     | -44.96             | 235.00                  | 212.50 |
| OPER         | 5C1T          | 21.65 L                    | 16.66              | -2.50                         | 0.0          | 0.00                       | 0.00               | 0.00                    |        |
|              |               | -55.95 R                   | -43.04             | 253.50                        | 0.0          | 0.00                       | 0.00               | 0.00                    | 0.00   |

## Serviceability

| Rating<br>Veh. | Rating    |              | Factor    |              | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|-----------|--------------|-----------|--------------|-----------------|----------------------------|
|                | top fiber | bottom fiber | top fiber | bottom fiber |                 |                            |
|                | +bend     | -bend        | +bend     | -bend        |                 |                            |
| HS20           | 9.30      | 2.38         | 9.30      | 2.38         | HS 47.54        | 85.6                       |
| 5C1T           | 14.99     | 4.76         | 14.99     | 4.76         | 0.00            | 571.5                      |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 10.000

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Depth | Web Thk. |      | Dc    | b max | b min | t    | ry   |
|----------------|-------|----------|------|-------|-------|-------|------|------|
| H              | D     | tw       | top  | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |
| 22.2           | 21.00 | 0.400    | bott | 10.50 | 8.24  | 8.24  | 0.62 | 1.76 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.50         | 18.50    | 11.12        | 11.11 | 1492.8            | 1492.8           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 134.3           | 134.3         | 134.3        | 134.3         | 422.49                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 10.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 52.50 | 26.25 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 85.19 |       | 26.25 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.96 | 28.67 | 28.67 | 1.726      |
|      |       |       | 999999.000 |
|      |       |       | 97.410     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 422.49 | 109.1                   |
| bott | 22.62            |                   | 41.32 |        | 102.6                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 160.8     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 10.000

Dead Load Superimposed Dead Load  
Moment Moment  
-4.5 -49.2

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 235.9C             | -170.5                | 170.5              | -235.9C               | 268.2                       | -138.2                | 202.7              | -203.7                |
| OPER        | 393.2C             | -284.1                | 284.1              | -393.2C               | 447.0                       | -230.3                | 337.9              | -339.5                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live w/imp. | Load Moment w/o imp. | Loc. of Front Wheel | Ax. Dis. | Lane Live w/imp. | Load Moment w/o imp. | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|-------------------|----------------------|---------------------|----------|------------------|----------------------|----------------|--------------|
| INV.      | HS20      | 16.99 L           | 13.07                | 167.00              | 0.0      | 12.57            | 9.67                 | 190.00         |              |
|           |           | -103.15 R         | -79.35               | 246.50              | 0.0      | -95.79           | -73.68               | 235.00         | 215.00       |
| OPER      | 5C1T      | 13.15 L           | 10.12                | -35.00              | 0.0      | 0.00             | 0.00                 | 0.00           |              |
|           |           | -76.71 R          | -59.00               | 344.00              | 0.0      | 0.00             | 0.00                 | 0.00           | 0.00         |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 15.78              | 1.34                         | 11.93                              | 1.98         | 26.80                |
| 5C1T        | 33.98              | 3.00                         | 25.69                              | 4.43         | 0.00                 |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 10.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.7      | -0.9      | -8.2                   | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 110.8             | -67.6                           | 77.6  |
| OPER      | 184.6             | -112.7                          | 129.3 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -30.29                | 36.70 | -23.30   | 28.23 | -23.89               | 26.68 | -18.38   | 20.52 |
| OPER      | 5C1T      | -24.08                | 27.30 | -18.52   | 21.00 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.95       | 2.12       | HS 38.99     | 70.2                 |
| 5C1T   | 4.17       | 4.74       | 0.00         | 500.9                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 10.000

Dead Load Moment      Superimposed Dead Load Moment  
-4.5                      -49.2

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 145.0      | 155.8           | -198.8 | 155.8        | -198.8 | 209.5                       | -145.0 | 209.5     | - |
| OPER 241.7      | 295.5           | -295.5 | 295.5        | -295.5 | 349.2                       | -241.7 | 349.2     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 16.99 L                 | 13.07                | 167.00      | 0.0       | 12.57                   | 9.67                   | 190.00 |        |
|           |            | -103.15 R               | -79.35               | 246.50      | 0.0       | -95.79                  | -73.68                 | 235.00 | 215.00 |
| OPER      | 5C1T       | 13.15 L                 | 10.12                | -35.00      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -76.71 R                | -59.00               | 344.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 12.33           | 1.41            | 12.33              | 1.41               | HS 28.12     | 50.6                 |
| 5C1T        | 26.55           | 3.15            | 26.55              | 3.15               | 0.00         | 378.1                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 10.000

|               |                             |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Allowable stress (fs) (psi) |           |         |         |
| RATIO/Inv.    | 0.00                        | 0.00      | 0.00    | 0.00    |
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

|                |           |       |      |       |       |       |      |      |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
| H              | D         | tw    | top  | 10.60 | 8.30  | 8.30  | 0.74 | 1.80 |
| 22.7           | 21.20     | 0.460 | bott | 10.60 | 8.30  | 8.30  | 0.74 | 1.80 |

## Hybrid Section Properties:

|                         |                  |                       |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

|               |          |              |       |                   |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.90         | 21.90    | 11.34        | 11.34 | 1840.1            | 1840.1           |

|                  |                  |             |       |                 |
|------------------|------------------|-------------|-------|-----------------|
| Section Modulus  |                  |             |       | Plastic Section |
| Positive Bending | Negative Bending | Modulus - Z |       |                 |
| Top              | Bott.            | Top         | Bott. | (Fy * Z)        |
| 134.3            | 134.3            | 134.3       | 134.3 | 511.17          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 10.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.220 | 0.01     | 0.01  | 46.59 | 23.30 |
| bott | 3.92 | 0.74 | 11.220 | 150.00   | 83.55 |       | 23.30 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |         |
|------|-------|-------|-------|------------|---------|
|      | top   | bott  |       | top        | bott    |
| 1.69 | 35.26 | 35.26 | 2.908 | 999999.000 | 108.025 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 511.17 | 109.1                   |
| bott | 22.62            |                   | 13.81 |        | 107.3                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 184.6     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 10.000

Dead Load Superimposed Dead Load  
Moment Moment  
-4.5 -49.2

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 235.9C             | -170.5                | 170.5              | -235.9C               | 268.2                       | -138.2                | 202.7              | -203.7                |
| OPER        | 393.2C             | -284.1                | 284.1              | -393.2C               | 447.0                       | -230.3                | 337.9              | -339.5                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live w/imp. | Load Moment w/o imp. | Loc. of Front Wheel | Ax. Dis. | Lane Live w/imp. | Load Moment w/o imp. | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|-------------------|----------------------|---------------------|----------|------------------|----------------------|----------------|--------------|
| INV.      | HS20      | 16.99 L           | 13.07                | 167.00              | 0.0      | 12.57            | 9.67                 | 190.00         |              |
|           |           | -103.15 R         | -79.35               | 246.50              | 0.0      | -95.79           | -73.68               | 235.00         | 215.00       |
| OPER      | 5C1T      | 13.15 L           | 10.12                | -35.00              | 0.0      | 0.00             | 0.00                 | 0.00           |              |
|           |           | -76.71 R          | -59.00               | 344.00              | 0.0      | 0.00             | 0.00                 | 0.00           | 0.00         |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 15.78              | 1.34                         | 11.93           | 1.98                  | HS 26.80     | 48.2                 |
| 5C1T        | 33.98              | 3.00                         | 25.69           | 4.43                  | 0.00         | 360.4                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 10.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.9      | 1.1       | -10.1                  | 11.6      |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 110.8             | -67.6                           | 77.6  |
| OPER      | 184.6             | -112.7                          | 129.3 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -34.70                | 36.70 | -26.69   | 28.23 | -26.43               | 26.68 | -20.33   | 20.52 |
| OPER      | 5C1T      | -27.01                | 27.30 | -20.78   | 21.00 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.95       | 2.12       | HS 38.99     | 70.2                 |
| 5C1T   | 4.17       | 4.74       | 0.00         | 500.9                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 10.000

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -4.5                | -49.2                            |

| Rating<br>Veh.<br>ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                       | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend                  | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV.<br>145.0         | 155.8           | -198.8 | 155.8        | -198.8 | 209.5                       | -145.0 | 209.5     | - |
| OPER<br>241.7         | 295.5           | -295.5 | 295.5        | -295.5 | 349.2                       | -241.7 | 349.2     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Truck<br>Veh. | Live Load Moment<br>w/imp. | Loc. of Ax.<br>w/o imp. | Front<br>Wheel | Lane Dis. | Live Load Moment<br>w/imp. | Loc. of Conc.<br>w/o imp. | Load 1 | Load 2 |
|--------------|---------------|----------------------------|-------------------------|----------------|-----------|----------------------------|---------------------------|--------|--------|
| INV.         | HS20          | 16.99 L                    | 13.07                   | 167.00         | 0.0       | 12.57                      | 9.67                      | 190.00 |        |
|              |               | -103.15 R                  | -79.35                  | 246.50         | 0.0       | -95.79                     | -73.68                    | 235.00 | 215.00 |
| OPER         | 5C1T          | 13.15 L                    | 10.12                   | -35.00         | 0.0       | 0.00                       | 0.00                      | 0.00   |        |
|              |               | -76.71 R                   | -59.00                  | 344.00         | 0.0       | 0.00                       | 0.00                      | 0.00   | 0.00   |

## Serviceability

| Rating<br>Veh. | Rating       |                | Factor          |                | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------|----------------|-----------------|----------------|-----------------|----------------------------|
|                | top<br>+bend | fiber<br>-bend | bottom<br>+bend | fiber<br>-bend |                 |                            |
| HS20           | 12.33        | 1.41           | 12.33           | 1.41           | HS 28.12        | 50.6                       |
| 5C1T           | 26.55        | 3.15           | 26.55           | 3.15           | 0.00            | 378.1                      |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 10.100

|               |                             |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Allowable stress (fs) (psi) |           |         |         |
| RATIO/Inv.    | 0.00                        | 0.00      | 0.00    | 0.00    |
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

|                |           |       |      |       |       |       |      |      |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
| H              | D         | tw    | top  | 10.60 | 8.30  | 8.30  | 0.74 | 1.80 |
| 22.7           | 21.20     | 0.460 | bott | 10.60 | 8.30  | 8.30  | 0.74 | 1.80 |

## Hybrid Section Properties:

|                         |                  |                       |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

|               |          |              |       |                   |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.90         | 21.90    | 11.34        | 11.34 | 1840.1            | 1840.1           |

|                  |                  |             |       |                 |
|------------------|------------------|-------------|-------|-----------------|
| Section Modulus  |                  |             |       | Plastic Section |
| Positive Bending | Negative Bending | Modulus - Z |       |                 |
| Top              | Bott.            | Top         | Bott. | (Fy * Z)        |
| 162.3            | 162.3            | 162.3       | 162.3 | 511.17          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 10.100

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.220 | 0.01     | 0.01  | 46.59 | 23.30 |
| bott | 3.92 | 0.74 | 11.220 | 150.00   | 83.55 |       | 23.30 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.69 | 35.26 | 35.26 | 2.908      |
|      |       |       | 999999.000 |
|      |       |       | 89.410     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 511.17 | 109.1                   |
| bott | 22.62            |                   | 13.81 |        | 107.3                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 184.6     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 10.100

Dead Load Moment      Superimposed Dead Load Moment  
-2.0                      -22.7

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 235.9C             | -206.0                | 206.0              | -235.9C               | 250.7                       | -191.1                | 220.8              | -221.1                |
| OPER        | 393.2C             | -343.3                | 343.3              | -393.2C               | 417.9                       | -318.6                | 367.9              | -368.5                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 13.01 R      | 10.01              | 255.50 | 0.0                 | 24.31    | 18.70       | 227.50             |        |                |              |
|           |           | -62.59 R     | -48.15             | 234.00 | 0.0                 | -57.89   | -44.53      | 215.00             |        | 240.00         |              |
| OPER      | 5C1T      | 30.77 L      | 23.67              | 93.50  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -55.34 R     | -42.57             | 348.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 10.31              | 3.05                         | 9.08                               | 3.53         | HS 61.08 109.9       |
| 5C1T        | 13.58              | 5.76                         | 11.96                              | 6.66         | 0.00 690.8           |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 10.100

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.9       | 0.0          | 9.6       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 110.8             | -91.6                  | 78.9                  |
| OPER      | 184.6             | -152.6                 | 131.4                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -0.65                 | 32.68 | -0.50    | 25.14 | -1.35                | 24.39 | -1.04    | 18.76 |
| OPER      | 5C1T      | -1.05                 | 24.61 | -0.81    | 18.93 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 67.57      | 2.41       | HS 48.27     | 86.9                 |
| 5C1T   | 145.56     | 5.34       | 0.00         | 641.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 10.100

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -2.0                | -22.7                            |

| Rating<br>Veh.<br>ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                       | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend                  | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV.<br>199.4         | 204.3           | -224.1 | 204.3        | -224.1 | 229.0                       | -199.4 | 229.0     | - |
| OPER<br>332.3         | 357.0           | -357.0 | 357.0        | -357.0 | 381.7                       | -332.3 | 381.7     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Truck<br>Veh. | Live Load Moment<br>w/imp. | Loc. of Ax.<br>w/o imp. | Front<br>Wheel | Lane Dis. | Live Load Moment<br>w/imp. | Loc. of Conc.<br>w/o imp. | Load 1 | Load 2 |
|--------------|---------------|----------------------------|-------------------------|----------------|-----------|----------------------------|---------------------------|--------|--------|
| INV.         | HS20          | 13.01 R                    | 10.01                   | 255.50         | 0.0       | 24.31                      | 18.70                     | 227.50 |        |
|              |               | -62.59 R                   | -48.15                  | 234.00         | 0.0       | -57.89                     | -44.53                    | 215.00 | 240.00 |
| OPER         | 5C1T          | 30.77 L                    | 23.67                   | 93.50          | 0.0       | 0.00                       | 0.00                      | 0.00   |        |
|              |               | -55.34 R                   | -42.57                  | 348.00         | 0.0       | 0.00                       | 0.00                      | 0.00   | 0.00   |

## Serviceability

| Rating<br>Veh. | Rating Factor      |       | bottom fiber |       | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------------|-------|--------------|-------|-----------------|----------------------------|
|                | top fiber<br>+bend | -bend | +bend        | -bend |                 |                            |
| HS20           | 9.42               | 3.19  | 9.42         | 3.19  | HS 63.71        | 114.7                      |
| 5C1T           | 12.40              | 6.01  | 12.40        | 6.01  | 0.00            | 720.6                      |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 10.200

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.60 | 8.30  | 8.30  | 0.74 | 1.80 |
| 22.7           | 21.20     | 0.460 | bott | 10.60 | 8.30  | 8.30  | 0.74 | 1.80 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.90         | 21.90    | 11.34        | 11.34 | 1840.1            | 1840.1           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 162.3           | 162.3         | 162.3        | 162.3         | 511.17                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 10.200

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.220 | 0.01     | 0.01  | 46.59 | 23.30 |
| bott | 3.92 | 0.74 | 11.220 | 150.00   | 83.55 |       | 23.30 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.69 | 35.26 | 35.26 | 2.908 | 999999.000 | 89.410 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 511.17 | 109.1                   |
| bott | 22.62            |                   | 13.81 |        | 107.3                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 184.6     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 10.200

Dead Load Moment      Superimposed Dead Load Moment  
0.1                      -1.0

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 235.9C          | -206.0             | 206.0           | -235.9C            | 236.4                       | -205.4             | 206.5           | -235.4             |
| OPER        | 393.2C          | -343.3             | 343.3           | -393.2C            | 394.1                       | -342.4             | 344.1           | -392.4             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 64.71 R      | 49.78              | 258.00 | 0.0                 | 48.02    | 36.94       | 230.00             |        |                |              |
|           |           | -50.64 L     | -38.95             | 192.00 | 0.0                 | -39.11   | -30.08      | 215.00             |        | 165.00         |              |
| OPER      | 5C1T      | 59.66 L      | 45.89              | 96.00  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -47.67 L     | -36.67             | 116.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 3.65            | 4.06                      | 3.19                      | 4.65               | HS 63.81     | 114.9                |
| 5C1T        | 6.61            | 7.18                      | 5.77                      | 8.23               | 0.00         | 692.1                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 10.200

|                 |                        |
|-----------------|------------------------|
| Dead Load       | Superimposed Dead Load |
| Shear (-) Shear | (+) Shear              |
| 0.7             | 0.0 7.7                |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 110.8             | -90.3                  | 80.1         |
| OPER      | 184.6             | -150.5                 | 133.5        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -0.97                 | 28.18 | -0.75    | 21.68 | -2.85                | 21.93 | -2.19    | 16.87 |
| OPER      | 5C1T      | -2.58                 | 21.69 | -1.98    | 16.68 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 31.69      | 2.84       | HS 56.86     | 102.3                |
| 5C1T   | 58.42      | 6.16       | 0.00         | 738.9                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 10.200

Dead Load Moment Superimposed Dead Load Moment

0.1 -1.0

| Rating Veh. ber | Moment Capacity top fiber |        | bottom fiber |        | Available Capacity for LL+I |        |       |       |
|-----------------|---------------------------|--------|--------------|--------|-----------------------------|--------|-------|-------|
|                 | +bend                     | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend | -bend |
| INV. 213.7      | 213.8                     | -214.5 | 213.8        | -214.5 | 214.7                       | -213.7 | 214.7 | -     |
| OPER 356.1      | 357.0                     | -357.0 | 357.0        | -357.0 | 357.8                       | -356.1 | 357.8 | -     |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 64.71 R                 | 49.78           | 258.00                  | 0.0       | 48.02                   | 36.94           | 230.00               |        |
|           |            | -50.64 L                | -38.95          | 192.00                  | 0.0       | -39.11                  | -30.08          | 215.00               | 165.00 |
| OPER      | 5C1T       | 59.66 L                 | 45.89           | 96.00                   | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -47.67 L                | -36.67          | 116.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor top fiber |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-------------------------|-------|--------------|-------|--------------|----------------------|
|             | +bend                   | -bend | +bend        | -bend |              |                      |
| HS20        | 3.32                    | 4.22  | 3.32         | 4.22  | HS 66.36     | 119.4                |
| 5C1T        | 6.00                    | 7.47  | 6.00         | 7.47  | 0.00         | 719.8                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 10.300

|               |                             |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Allowable stress (fs) (psi) |           |         |         |
| RATIO/Inv.    | 0.00                        | 0.00      | 0.00    | 0.00    |
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

|                |           |       |      |       |       |       |      |      |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
| H              | D         | tw    | top  | 10.60 | 8.30  | 8.30  | 0.74 | 1.80 |
| 22.7           | 21.20     | 0.460 | bott | 10.60 | 8.30  | 8.30  | 0.74 | 1.80 |

## Hybrid Section Properties:

|                         |                  |                       |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

|               |          |              |       |                   |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.90         | 21.90    | 11.34        | 11.34 | 1840.1            | 1840.1           |

|                  |                  |             |       |                 |
|------------------|------------------|-------------|-------|-----------------|
| Section Modulus  |                  |             |       | Plastic Section |
| Positive Bending | Negative Bending | Modulus - Z |       |                 |
| Top              | Bott.            | Top         | Bott. | (Fy * Z)        |
| 162.3            | 162.3            | 162.3       | 162.3 | 511.17          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 10.300

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.220 | 0.01     | 0.01  | 46.59 | 23.30 |
| bott | 3.92 | 0.74 | 11.220 | 150.00   | 83.55 |       | 23.30 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.69 | 35.26 | 35.26 | 2.908 | 999999.000 | 89.410 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 511.17 | 109.1                   |
| bott | 22.62            |                   | 13.81 |        | 107.3                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 184.6     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 10.300

Dead Load Moment      Superimposed Dead Load Moment  
1.7                      16.0

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 235.9C          | -206.0             | 206.0           | -235.9C            | 225.3                       | -216.6             | 195.3           | -246.6             |
| OPER        | 393.2C          | -343.3             | 343.3           | -393.2C            | 375.5                       | -361.0             | 325.5           | -410.9             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 100.16 R     | 77.04              | 260.50 | 0.0                 | 72.41    | 55.70       | 232.50             |        |                |              |
|           |           | -44.31 L     | -34.09             | 192.00 | 0.0                 | -34.22   | -26.32      | 215.00             | 165.00 |                |              |
| OPER      | 5C1T      | 86.91 R      | 66.85              | 370.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -41.71 L     | -32.08             | 116.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | Rating Factor   |                    |                 |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|-----------------|--------------------|--------------|----------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 2.25            | 4.89               | 1.95            | 5.56               | HS 39.00     | 70.2                 |
| 5C1T        | 4.32            | 8.65               | 3.75            | 9.85               | 0.00         | 449.5                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 10.300

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.6       | 0.0          | 5.8       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 110.8             | -89.0                  | 81.4                  |
| OPER      | 184.6             | -148.4                 | 135.6                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -3.02                 | 23.28 | -2.32    | 17.90 | -4.66                | 19.33 | -3.59    | 14.87 |
| OPER      | 5C1T      | -4.35                 | 18.59 | -3.35    | 14.30 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 19.09      | 3.50       | HS 69.93     | 125.9                |
| 5C1T   | 34.09      | 7.30       | 0.00         | 875.7                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 10.300Dead Load Moment 1.7  
Superimposed Dead Load Moment 16.0

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 224.8      | 221.3           | -207.1 | 221.3        | -207.1 | 203.6                       | -224.8 | 203.6     | - |
| OPER 374.7      | 357.0           | -357.0 | 357.0        | -357.0 | 339.3                       | -374.7 | 339.3     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 100.16 R                | 77.04           | 260.50                  | 0.0       | 72.41                   | 55.70           | 232.50               |        |
|           |            | -44.31 L                | -34.09          | 192.00                  | 0.0       | -34.22                  | -26.32          | 215.00               | 165.00 |
| OPER      | 5C1T       | 86.91 R                 | 66.85           | 370.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -41.71 L                | -32.08          | 116.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 2.03            | 5.07  | 2.03         | 5.07  | HS 40.65     | 73.2                 |
| 5C1T        | 3.90            | 8.98  | 3.90         | 8.98  | 0.00         | 468.5                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 10.400

|               |                             |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Allowable stress (fs) (psi) |           |         |         |
| RATIO/Inv.    | 0.00                        | 0.00      | 0.00    | 0.00    |
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

|                |           |       |      |       |       |       |      |      |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
| H              | D         | tw    | top  | 10.60 | 8.30  | 8.30  | 0.74 | 1.80 |
| 22.7           | 21.20     | 0.460 | bott | 10.60 | 8.30  | 8.30  | 0.74 | 1.80 |

## Hybrid Section Properties:

|                         |                  |                       |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

|               |          |              |       |                   |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.90         | 21.90    | 11.34        | 11.34 | 1840.1            | 1840.1           |

|                  |                  |             |       |                 |
|------------------|------------------|-------------|-------|-----------------|
| Section Modulus  |                  |             |       | Plastic Section |
| Positive Bending | Negative Bending | Modulus - Z |       |                 |
| Top              | Bott.            | Top         | Bott. | (Fy * Z)        |
| 162.3            | 162.3            | 162.3       | 162.3 | 511.17          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 10.400

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.220 | 0.01     | 0.01  | 46.59 | 23.30 |
| bott | 3.92 | 0.74 | 11.220 | 150.00   | 83.55 |       | 23.30 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.69 | 35.26 | 35.26 | 2.908 | 999999.000 | 89.410 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 511.17 | 109.1                   |
| bott | 22.62            |                   | 13.81 |        | 107.3                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 184.6     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 10.400

Dead Load Moment      Superimposed Dead Load Moment  
2.9                      28.2

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 235.9C             | -206.0                | 206.0              | -235.9C               | 217.3                       | -224.6                | 187.3              | -254.6                |
| OPER        | 393.2C             | -343.3                | 343.3              | -393.2C               | 362.2                       | -374.3                | 312.2              | -424.3                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 115.63 R     | 88.94              | 263.00 | 0.0                 | 89.31    | 68.70       | 235.00             |        |                |              |
|           |           | -37.98 L     | -29.22             | 192.00 | 0.0                 | -28.07   | -21.59      | 215.00             |        | 0.00           |              |
| OPER      | 5C1T      | 105.13 R     | 80.87              | 373.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -35.75 L     | -27.50             | 116.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 1.88               | 5.91                         | 1.62                               | 6.70         | HS 32.40             |
| 5C1T        | 3.44               | 10.47                        | 2.97                               | 11.87        | 0.00 356.4           |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 10.400

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear     | (-) Shear (+) Shear    |
| 0.4       | 0.0 3.9                |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 110.8             | -87.8                  | 82.6                  |
| OPER      | 184.6             | -146.3                 | 137.7                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -6.12                 | 18.18 | -4.71    | 13.99 | -6.78                | 16.65 | -5.21    | 12.80 |
| OPER      | 5C1T      | -6.42                 | 15.79 | -4.94    | 12.15 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 12.95      | 4.55       | HS 90.90     | 163.6                |  |
| 5C1T   | 22.77      | 8.72       | 0.00         | 999.0                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 10.400

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| 2.9                 | 28.2                             |

| Rating<br>Veh.<br>ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                       | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend                  | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV.<br>232.8         | 226.6           | -201.8 | 226.6        | -201.8 | 195.6                       | -232.8 | 195.6     | - |
| OPER<br>388.0         | 357.0           | -357.0 | 357.0        | -357.0 | 325.9                       | -388.0 | 325.9     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Truck<br>Veh. | Live Load Moment<br>w/imp. | Loc. of Ax.<br>w/o imp. | Front<br>Wheel | Lane Dis. | Live Load Moment<br>w/imp. | Loc. of Conc.<br>w/o imp. | Load 1 | Load 2 |
|--------------|---------------|----------------------------|-------------------------|----------------|-----------|----------------------------|---------------------------|--------|--------|
| INV.         | HS20          | 115.63 R                   | 88.94                   | 263.00         | 0.0       | 89.31                      | 68.70                     | 235.00 |        |
|              |               | -37.98 L                   | -29.22                  | 192.00         | 0.0       | -28.07                     | -21.59                    | 215.00 | 0.00   |
| OPER         | 5C1T          | 105.13 R                   | 80.87                   | 373.00         | 0.0       | 0.00                       | 0.00                      | 0.00   |        |
|              |               | -35.75 L                   | -27.50                  | 116.00         | 0.0       | 0.00                       | 0.00                      | 0.00   | 0.00   |

## Serviceability

| Rating<br>Veh. | Rating       |                | Factor          |                | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------|----------------|-----------------|----------------|-----------------|----------------------------|
|                | top<br>+bend | fiber<br>-bend | bottom<br>+bend | fiber<br>-bend |                 |                            |
| HS20           | 1.69         | 6.13           | 1.69            | 6.13           | HS 33.83        | 60.9                       |
| 5C1T           | 3.10         | 10.85          | 3.10            | 10.85          | 0.00            | 372.0                      |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 10.500

|               |                             |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Allowable stress (fs) (psi) |           |         |         |
| RATIO/Inv.    | 0.00                        | 0.00      | 0.00    | 0.00    |
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

|                |           |       |      |       |       |       |      |      |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
| H              | D         | tw    | top  | 10.60 | 8.30  | 8.30  | 0.74 | 1.80 |
| 22.7           | 21.20     | 0.460 | bott | 10.60 | 8.30  | 8.30  | 0.74 | 1.80 |

## Hybrid Section Properties:

|                         |                  |                       |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

|               |          |              |       |                   |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.90         | 21.90    | 11.34        | 11.34 | 1840.1            | 1840.1           |

|                  |                  |             |       |                 |
|------------------|------------------|-------------|-------|-----------------|
| Section Modulus  |                  |             |       | Plastic Section |
| Positive Bending | Negative Bending | Modulus - Z |       |                 |
| Top              | Bott.            | Top         | Bott. | (Fy * Z)        |
| 162.3            | 162.3            | 162.3       | 162.3 | 511.17          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 10.500

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.220 | 0.01     | 0.01  | 46.59 | 23.30 |
| bott | 3.92 | 0.74 | 11.220 | 150.00   | 83.55 |       | 23.30 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.69 | 35.26 | 35.26 | 2.908      |
|      |       |       | 999999.000 |
|      |       |       | 89.410     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 511.17 | 109.1                   |
| bott | 22.62            |                   | 0.00 |        | 109.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 184.6     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 10.500

Dead Load Moment      Superimposed Dead Load Moment  
3.6                      35.6

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 235.9C             | -206.0                | 206.0              | -235.9C               | 212.4                       | -229.4                | 182.5              | -259.4                |
| OPER        | 393.2C             | -343.3                | 343.3              | -393.2C               | 354.1                       | -382.4                | 304.1              | -432.3                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 121.64       | R                  | 93.57  | 265.50              | 0.0      | 99.43       | 76.48              | 237.50 |                |              |
|           |           | -31.65       | L                  | -24.35 | 192.00              | 0.0      | -23.39      | -17.99             | 215.00 | 0.00           |              |
| OPER      | 5C1T      | 114.74       | L                  | 88.26  | 138.50              | 0.0      | 0.00        | 0.00               | 0.00   |                |              |
|           |           | -29.79       | L                  | -22.92 | 116.00              | 0.0      | 0.00        | 0.00               | 0.00   | 0.00           | 0.00         |

## Moment

| Rating Veh. | Rating Factor      |                       |                    |                       | Rating Value | Load Capacity (tons) |
|-------------|--------------------|-----------------------|--------------------|-----------------------|--------------|----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |              |                      |
| HS20        | 1.75               | 7.25                  | 1.50               | 8.20                  | HS 30.00     | 54.0                 |
| 5C1T        | 3.09               | 12.84                 | 2.65               | 14.51                 | 0.00         | 318.1                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 10.500

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.2       | 0.0          | 2.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 110.8             | -86.5                  | 83.9                  |
| OPER      | 184.6             | -144.2                 | 139.8                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -9.73                 | 15.05 | -7.49    | 11.58 | -9.18                | 13.91 | -7.06    | 10.70 |
| OPER      | 5C1T      | -8.85                 | 13.54 | -6.81    | 10.41 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 8.89       | 5.57       | HS 111.49    | 200.7                |
| 5C1T   | 16.29      | 10.33      | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 10.500Dead Load Moment 3.6  
Superimposed Dead Load Moment 35.6

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 237.7      | 229.8           | -198.5 | 229.8        | -198.5 | 190.7                       | -237.7 | 190.7     | - |
| OPER 396.1      | 357.0           | -357.0 | 357.0        | -357.0 | 317.9                       | -396.1 | 317.9     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Live Load Moment w/o imp. | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-------------------------|---------------------------|-----------|-------------------------|----------------------|--------|
| INV.      | HS20       | 121.64 R                | 93.57                   | 265.50                    | 0.0       | 99.43                   | 76.48                | 237.50 |
|           |            | -31.65 L                | -24.35                  | 192.00                    | 0.0       | -23.39                  | -17.99               | 215.00 |
| OPER      | 5C1T       | 114.74 L                | 88.26                   | 138.50                    | 0.0       | 0.00                    | 0.00                 | 0.00   |
|           |            | -29.79 L                | -22.92                  | 116.00                    | 0.0       | 0.00                    | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.57            | 7.51  | 1.57         | 7.51  | HS 31.36     | 56.4                 |
| 5C1T        | 2.77            | 13.30 | 2.77         | 13.30 | 0.00         | 332.4                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 10.600

|               |                             |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Allowable stress (fs) (psi) |           |         |         |
| RATIO/Inv.    | 0.00                        | 0.00      | 0.00    | 0.00    |
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

|                |           |       |      |       |       |       |      |      |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
| H              | D         | tw    | top  | 10.60 | 8.30  | 8.30  | 0.74 | 1.80 |
| 22.7           | 21.20     | 0.460 | bott | 10.60 | 8.30  | 8.30  | 0.74 | 1.80 |

## Hybrid Section Properties:

|                         |                  |                       |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

|               |          |              |       |                   |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.90         | 21.90    | 11.34        | 11.34 | 1840.1            | 1840.1           |

|                  |                  |             |       |                 |
|------------------|------------------|-------------|-------|-----------------|
| Section Modulus  |                  |             |       | Plastic Section |
| Positive Bending | Negative Bending | Modulus - Z |       |                 |
| Top              | Bott.            | Top         | Bott. | (Fy * Z)        |
| 162.3            | 162.3            | 162.3       | 162.3 | 511.17          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 10.600

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.220 | 0.01     | 0.01  | 46.59 | 23.30 |
| bott | 3.92 | 0.74 | 11.220 | 150.00   | 83.55 |       | 23.30 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.75 | 35.26 | 35.26 | 2.908      |
|      |       |       | 999999.000 |
|      |       |       | 92.602     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 511.17 | 109.1                   |
| bott | 22.62            |                   | 0.00 |        | 109.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 184.6     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 10.600

Dead Load Moment 3.8  
Superimposed Dead Load Moment 38.0

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 235.9C          | -206.0             | 206.0           | -235.9C            | 210.8                       | -231.0             | 180.9           | -261.0             |
| OPER        | 393.2C          | -343.3             | 343.3           | -393.2C            | 351.4                       | -385.1             | 301.5           | -435.0             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 128.91 R     | 99.16              | 254.00 | 0.0                 | 99.72    | 76.71       | 240.00             |        |                |              |
|           |           | -25.32 L     | -19.48             | 192.00 | 0.0                 | -18.71   | -14.39      | 215.00             | 0.00   |                |              |
| OPER      | 5C1T      | 115.87 L     | 89.13              | 141.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -23.83 L     | -18.33             | 116.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 1.64            | 9.12                      | 1.40                      | 10.31              | HS 28.06     | 50.5                 |
| 5C1T        | 3.03            | 16.16                     | 2.60                      | 18.25              | 0.00         | 312.2                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 10.600

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.0       | 0.0          | 0.1       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 110.8             | -85.2                  | 85.2                  |
| OPER      | 184.6             | -142.0                 | 142.0                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |      | Lane Live Load Shear |       |          |      |
|-----------|-----------|-----------------------|-------|----------|------|----------------------|-------|----------|------|
|           |           | w/imp.                |       | w/o imp. |      | w/imp.               |       | w/o imp. |      |
|           |           | (-)                   | (+)   | (-)      | (+)  | (-)                  | (+)   | (-)      | (+)  |
| INV.      | HS20      | -12.89                | 11.44 | -9.92    | 8.80 | -11.84               | 11.16 | -9.11    | 8.58 |
| OPER      | 5C1T      | -11.43                | 11.14 | -8.79    | 8.57 | 0.00                 | 0.00  | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 6.61       | 7.45       | HS 132.22    | 238.0                |
| 5C1T   | 12.43      | 12.75      | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 10.600

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| 3.8                 | 38.0                             |

| Rating<br>Veh.<br>ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                       | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend                  | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV.<br>239.3         | 230.9           | -197.5 | 230.9        | -197.5 | 189.1                       | -239.3 | 189.1     | - |
| OPER<br>398.8         | 357.0           | -357.0 | 357.0        | -357.0 | 315.2                       | -398.8 | 315.2     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Truck<br>Veh. | Live Load Moment<br>w/imp. | Loc. of Ax.<br>w/o imp. | Front<br>Wheel | Lane<br>Dis. | Live Load Moment<br>w/imp. | Loc. of Conc.<br>w/o imp. | Load 1 | Load 2 |
|--------------|---------------|----------------------------|-------------------------|----------------|--------------|----------------------------|---------------------------|--------|--------|
| INV.         | HS20          | 128.91 R                   | 99.16                   | 254.00         | 0.0          | 99.72                      | 76.71                     | 240.00 |        |
|              |               | -25.32 L                   | -19.48                  | 192.00         | 0.0          | -18.71                     | -14.39                    | 215.00 | 0.00   |
| OPER         | 5C1T          | 115.87 L                   | 89.13                   | 141.00         | 0.0          | 0.00                       | 0.00                      | 0.00   |        |
|              |               | -23.83 L                   | -18.33                  | 116.00         | 0.0          | 0.00                       | 0.00                      | 0.00   | 0.00   |

## Serviceability

| Rating<br>Veh. | Rating       |                | Factor          |                | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------|----------------|-----------------|----------------|-----------------|----------------------------|
|                | top<br>+bend | fiber<br>-bend | bottom<br>+bend | fiber<br>-bend |                 |                            |
| HS20           | 1.47         | 9.45           | 1.47            | 9.45           | HS 29.34        | 52.8                       |
| 5C1T           | 2.72         | 16.73          | 2.72            | 16.73          | 0.00            | 326.4                      |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 10.700

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.60 | 8.30  | 8.30  | 0.74 | 1.80 |
| 22.7           | 21.20     | 0.460 | bott | 10.60 | 8.30  | 8.30  | 0.74 | 1.80 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.90         | 21.90    | 11.34        | 11.34 | 1840.1            | 1840.1           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 162.3           | 162.3         | 162.3        | 162.3         | 511.17                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 10.700

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.220 | 0.01     | 0.01  | 46.59 | 23.30 |
| bott | 3.92 | 0.74 | 11.220 | 150.00   | 83.55 |       | 23.30 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.75 | 35.26 | 35.26 | 2.908      |
|      |       |       | 999999.000 |
|      |       |       | 92.602     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 511.17 | 109.1                   |
| bott | 22.62            |                   | 0.00 |        | 109.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 184.6     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 10.700

Dead Load Superimposed Dead Load  
Moment Moment  
3.5 35.7

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 235.9C             | -206.0                | 206.0              | -235.9C               | 212.4                       | -229.5                | 182.4              | -259.5                |
| OPER        | 393.2C             | -343.3                | 343.3              | -393.2C               | 354.0                       | -382.5                | 304.0              | -432.4                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 128.62 R     | 98.94              | 256.50 | 0.0                 | 91.30    | 70.23       | 242.50             |        |                |              |
|           |           | -18.99 L     | -14.61             | 192.00 | 0.0                 | -14.03   | -10.79      | 215.00             |        | 0.00           |              |
| OPER      | 5C1T      | 109.29 L     | 84.07              | 139.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -17.88 L     | -13.75             | 116.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 1.65               | 12.08                        | 1.42                               | 13.66        | HS 28.37             |
| 5C1T        | 3.24               | 21.40                        | 2.78                               | 24.19        | 0.00                 |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 10.700

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.2      | -1.9         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 110.8             | -84.0                  | 86.5                  |
| OPER      | 184.6             | -139.9                 | 144.1                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -17.15                | 8.70 | -13.19   | 6.69 | -14.75               | 8.43 | -11.35   | 6.48 |
| OPER      | 5C1T      | -14.57                | 8.58 | -11.21   | 6.60 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 4.90       | 9.94       | HS 97.92     | 176.3                |
| 5C1T   | 9.60       | 16.79      | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 10.700Dead Load Moment 3.5  
Superimposed Dead Load Moment 35.7

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 237.7      | 229.9           | -198.5 | 229.9        | -198.5 | 190.7                       | -237.7 | 190.7     | - |
| OPER 396.2      | 357.0           | -357.0 | 357.0        | -357.0 | 317.8                       | -396.2 | 317.8     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 128.62 R                | 98.94           | 256.50                  | 0.0       | 91.30                   | 70.23           | 242.50               |        |
|           |            | -18.99 L                | -14.61          | 192.00                  | 0.0       | -14.03                  | -10.79          | 215.00               | 0.00   |
| OPER      | 5C1T       | 109.29 L                | 84.07           | 139.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -17.88 L                | -13.75          | 116.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.48            | 12.52           | 1.48               | 12.52              | HS 29.65     | 53.4                 |
| 5C1T        | 2.91            | 22.17           | 2.91               | 22.17              | 0.00         | 348.9                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 10.800

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.60 | 8.30  | 8.30  | 0.74 | 1.80 |
| 22.7           | 21.20     | 0.460 | bott | 10.60 | 8.30  | 8.30  | 0.74 | 1.80 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.90         | 21.90    | 11.34        | 11.34 | 1840.1            | 1840.1           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 162.3           | 162.3         | 162.3        | 162.3         | 511.17                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 10.800

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.220 | 0.01     | 0.01  | 46.59 | 23.30 |
| bott | 3.92 | 0.74 | 11.220 | 150.00   | 83.55 |       | 23.30 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.75 | 35.26 | 35.26 | 2.908 | 999999.000 | 92.602 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 511.17 | 109.1                   |
| bott | 22.62            |                   | 0.00 |        | 109.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 184.6     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 10.800

Dead Load Moment      Superimposed Dead Load Moment  
2.8                      28.6

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 235.9C             | -206.0                | 206.0              | -235.9C               | 217.1                       | -224.8                | 187.1              | -254.8                |
| OPER        | 393.2C             | -343.3                | 343.3              | -393.2C               | 361.8                       | -374.7                | 311.9              | -424.6                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 109.04 R     | 83.87              | 259.00 | 0.0                 | 71.51    | 55.01       | 245.00             |        |                |              |
|           |           | -12.66 L     | -9.74              | 192.00 | 0.0                 | -9.36    | -7.20       | 215.00             | 0.00   |                |              |
| OPER      | 5C1T      | 90.32 L      | 69.48              | 142.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -11.92 L     | -9.17              | 116.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 1.99               | 17.76                        | 1.72                               | 20.12        | HS 34.32             |
| 5C1T        | 4.01               | 31.44                        | 3.45                               | 35.63        | 0.00 414.3           |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 10.800

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.4      | -3.8         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 110.8             | -82.7                  | 87.7                  |
| OPER      | 184.6             | -137.8                 | 146.2                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -21.81                | 5.86 | -16.77   | 4.51 | -17.89               | 5.75 | -13.76   | 4.43 |
| OPER      | 5C1T      | -18.06                | 5.83 | -13.90   | 4.48 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 3.79       | 14.97      | HS 75.85     | 136.5                |  |
| 5C1T   | 7.63       | 25.09      | 0.00         | 915.7                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 10.800

Dead Load Moment      Superimposed Dead Load Moment  
2.8                      28.6

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 233.0      | 226.7           | -201.6 | 226.7        | -201.6 | 195.4                       | -233.0 | 195.4     | - |
| OPER 388.4      | 357.0           | -357.0 | 357.0        | -357.0 | 325.6                       | -388.4 | 325.6     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |       |        |      |
|-----------|------------|-------------------------|-------------------------|------------------------------|----------------------|--------|-------|--------|------|
| INV.      | HS20       | 109.04 R                | 83.87                   | 259.00                       | 0.0                  | 71.51  | 55.01 | 245.00 |      |
|           |            | -12.66 L                | -9.74                   | 192.00                       | 0.0                  | -9.36  | -7.20 | 215.00 | 0.00 |
| OPER      | 5C1T       | 90.32 L                 | 69.48                   | 142.00                       | 0.0                  | 0.00   | 0.00  | 0.00   |      |
|           |            | -11.92 L                | -9.17                   | 116.00                       | 0.0                  | 0.00   | 0.00  | 0.00   | 0.00 |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.79            | 18.41           | 1.79               | 18.41              | HS 35.83     | 64.5                 |
| 5C1T        | 3.61            | 32.59           | 3.61               | 32.59              | 0.00         | 432.6                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 10.900

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| H              | D         | tw    | top  | 10.60 | 8.30  | 8.30  | 0.74 | 1.80 |
| 22.7           | 21.20     | 0.460 | bott | 10.60 | 8.30  | 8.30  | 0.74 | 1.80 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.90         | 21.90    | 11.34        | 11.34 | 1840.1            | 1840.1           |

| Section Modulus      |               |                      |               | Plastic Section Modulus - Z |
|----------------------|---------------|----------------------|---------------|-----------------------------|
| Positive Bending Top | Bending Bott. | Negative Bending Top | Bending Bott. | (Fy * Z)                    |
| 162.3                | 162.3         | 162.3                | 162.3         | 511.17                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 10.900

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.220 | 0.01     | 0.01  | 46.59 | 23.30 |
| bott | 3.92 | 0.74 | 11.220 | 150.00   | 83.55 |       | 23.30 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.75 | 35.26 | 35.26 | 2.908 | 999999.000 | 92.602 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 511.17 | 109.1                   |
| bott | 22.62            |                   | 0.00 |        | 109.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 184.6     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 10.900

Dead Load Moment 1.6  
Superimposed Dead Load Moment 16.7

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 235.9C          | -206.0             | 206.0           | -235.9C            | 224.9                       | -216.9             | 195.0           | -246.9             |
| OPER        | 393.2C          | -343.3             | 343.3           | -393.2C            | 374.9                       | -361.6             | 324.9           | -411.5             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 66.99 R      | 51.53              | 261.50 | 0.0                 | 41.83    | 32.18       | 247.50             |        |                |              |
|           |           | -6.33 L      | -4.87              | 192.00 | 0.0                 | -4.68    | -3.60       | 215.00             | 0.00   |                |              |
| OPER      | 5C1T      | 54.25 L      | 41.73              | 144.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -5.96 L      | -4.58              | 116.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 3.36            | 34.27                     | 2.91         | 39.01              | HS 58.20     | 104.8                |
| 5C1T        | 6.91            | 60.68                     | 5.99         | 69.07              | 0.00         | 718.7                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 10.900

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.6      | -5.7         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 110.8             | -81.4                  | 89.0                  |
| OPER      | 184.6             | -135.7                 | 148.3                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -26.80                | 2.95 | -20.61   | 2.27 | -21.22               | 3.17 | -16.32   | 2.44 |
| OPER      | 5C1T      | -21.70                | 3.85 | -16.69   | 2.96 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 3.04       | 28.10      | HS 60.79     | 109.4                |
| 5C1T   | 6.26       | 38.51      | 0.00         | 750.6                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 10.900

Dead Load Moment      Superimposed Dead Load Moment  
1.6                      16.7

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 225.2      | 221.5           | -206.9 | 221.5        | -206.9 | 203.2                       | -225.2 | 203.2     | - |
| OPER 375.3      | 357.0           | -357.0 | 357.0        | -357.0 | 338.7                       | -375.3 | 338.7     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 66.99 R                 | 51.53           | 261.50                  | 0.0       | 41.83                   | 32.18           | 247.50               |        |
|           |            | -6.33 L                 | -4.87           | 192.00                  | 0.0       | -4.68                   | -3.60           | 215.00               | 0.00   |
| OPER      | 5C1T       | 54.25 L                 | 41.73           | 144.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -5.96 L                 | -4.58           | 116.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 3.03            | 35.57 | 3.03         | 35.57 | HS 60.66     | 109.2                |
| 5C1T        | 6.24            | 62.99 | 6.24         | 62.99 | 0.00         | 749.1                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 11.000

|               |                             |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Allowable stress (fs) (psi) |           |         |         |
| RATIO/Inv.    | 0.00                        | 0.00      | 0.00    | 0.00    |
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

|                |           |       |      |       |       |       |      |      |
|----------------|-----------|-------|------|-------|-------|-------|------|------|
| Section Height | Web Depth | Thk.  |      | Dc    | b max | b min | t    | ry   |
| H              | D         | tw    | top  | 10.60 | 8.30  | 8.30  | 0.74 | 1.80 |
| 22.7           | 21.20     | 0.460 | bott | 10.60 | 8.30  | 8.30  | 0.74 | 1.80 |

## Hybrid Section Properties:

|                         |                  |                       |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

|               |          |              |       |                   |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.90         | 21.90    | 11.34        | 11.34 | 1840.1            | 1840.1           |

|                  |                  |             |       |                 |
|------------------|------------------|-------------|-------|-----------------|
| Section Modulus  |                  |             |       | Plastic Section |
| Positive Bending | Negative Bending | Modulus - Z |       |                 |
| Top              | Bott.            | Top         | Bott. | (Fy * Z)        |
| 162.3            | 162.3            | 162.3       | 162.3 | 511.17          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S01  
Check Point I. D. 11.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.220 | 0.01     | 0.01  | 46.59 | 23.30 |
| bott | 3.92 | 0.74 | 11.220 | 150.00   | 83.55 |       | 23.30 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.75 | 35.26 | 35.26 | 2.908      |
|      |       |       | 999999.000 |
|      |       |       | 92.602     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 511.17 | 109.1                   |
| bott | 22.62            |                   | 0.00 |        | 109.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 184.6     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 11.000

Dead Load Moment 0.0  
Superimposed Dead Load Moment 0.0

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 235.9C          | -206.0             | 206.0           | -235.9C            | 235.9                       | -206.0             | 206.0           | -235.9             |
| OPER        | 393.2C          | -343.3             | 343.3           | -393.2C            | 393.2                       | -343.3             | 343.3           | -393.2             |

## Live Load Effect

Impact Factors: +bend - .000 -bend - .000

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 0.00 R       | 0.00               | 0.00   | 0.00                | 0.0      | 0.00        | 0.00               | 0.00   | 0.00           |              |
|           |           | 0.00 R       | 0.00               | 0.00   | 0.00                | 0.0      | 0.00        | 0.00               | 0.00   | 0.00           | 0.00         |
| OPER      | 5C1T      | 0.00 R       | 0.00               | 0.00   | 0.00                | 0.0      | 0.00        | 0.00               | 0.00   | 0.00           |              |
|           |           | 0.00 R       | 0.00               | 0.00   | 0.00                | 0.0      | 0.00        | 0.00               | 0.00   | 0.00           | 0.00         |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 999.00          | 999.00                    | 999.00                    | 999.00             | HS 999.00    | 999.0                |
| 5C1T        | 999.00          | 999.00                    | 999.00                    | 999.00             | 0.00         | 999.0                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 11.000

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.8      | -7.6         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 110.8             | -80.2                  | 85.7         |
| OPER      | 184.6             | -133.6                 | 142.8        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -32.05                | 0.00 | -24.65   | 0.00 | -24.73               | 2.39 | -19.02   | 1.84 |
| OPER      | 5C1T      | -25.42                | 0.00 | -19.56   | 0.00 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 2.50       | 35.82      | HS 50.04     | 90.1                 |
| 5C1T   | 5.26       | 999.00     | 0.00         | 630.8                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S01  
Check Point I. D. 11.000Dead Load Moment 0.0  
Superimposed Dead Load Moment 0.0

| Rating Veh. ber | Moment Capacity top fiber |        | Moment Capacity bottom fiber |        | Available Capacity for LL+I |        |           |   |
|-----------------|---------------------------|--------|------------------------------|--------|-----------------------------|--------|-----------|---|
|                 | +bend                     | -bend  | +bend                        | -bend  | top fiber                   | -bend  | bottom fi |   |
| INV. 214.2      | 214.2                     | -214.2 | 214.2                        | -214.2 | 214.2                       | -214.2 | 214.2     | - |
| OPER 357.0      | 357.0                     | -357.0 | 357.0                        | -357.0 | 357.0                       | -357.0 | 357.0     | - |

## Live Load Effect

Impact Factors: +bend - .000 -bend - .000

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-------------------------|------------------------------|----------------------|--------|
| INV.      | HS20       | 0.00 R                  | 0.00                    | 0.00                         | 0.00                 | 0.00   |
|           |            | 0.00 R                  | 0.00                    | 0.00                         | 0.00                 | 0.00   |
| OPER      | 5C1T       | 0.00 R                  | 0.00                    | 0.00                         | 0.00                 | 0.00   |
|           |            | 0.00 R                  | 0.00                    | 0.00                         | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|------------------------|---------------------------|---------------------------|--------------|----------------------|
| HS20        | 999.00                 | 999.00                    | 999.00                    | HS 999.00    | 999.0                |
| 5C1T        | 999.00                 | 999.00                    | 999.00                    | 0.00         | 999.0                |

## BRIDGE / MEMBER DATA

Structure I. D. HAM500

Material of Construction SS  
 Year of Construction 1959  
 Roadway Width 32.000  
 Number of Spans 10

Live Load Distribution Factor 1.143

Second Live Load Dist. Factor 1.143

Comments:

Member I. D. S02 Symmetry:

|              |                  |                  |                  |                  |                   |
|--------------|------------------|------------------|------------------|------------------|-------------------|
| Span Length: | Span 1<br>25.000 | Span 2<br>25.000 | Span 3<br>25.000 | Span 4<br>25.000 | Span 5<br>25.000  |
|              | Span 6<br>25.000 | Span 7<br>25.000 | Span 8<br>25.000 | Span 9<br>25.000 | Span 10<br>25.000 |

| Range Length -- Non-Composite: |           | Section      |      | Section | Hinge Location |             |
|--------------------------------|-----------|--------------|------|---------|----------------|-------------|
| Span No.                       | Range No. | Range Length | Left | Right   | Variation      | No. 1 No. 2 |
| 1                              | 1         | 25.000       | 1    | 0       |                | 0.0 0.0     |
| 2                              | 1         | 25.000       | 2    | 0       |                | 0.0 0.0     |
| 3                              | 1         | 25.000       | 2    | 0       |                | 0.0 0.0     |
| 4                              | 1         | 25.000       | 2    | 0       |                | 0.0 0.0     |
| 5                              | 1         | 25.000       | 2    | 0       |                | 0.0 0.0     |
| 6                              | 1         | 25.000       | 2    | 0       |                | 0.0 0.0     |
| 7                              | 1         | 25.000       | 2    | 0       |                | 0.0 0.0     |
| 8                              | 1         | 25.000       | 2    | 0       |                | 0.0 0.0     |
| 9                              | 1         | 25.000       | 2    | 0       |                | 0.0 0.0     |
| 10                             | 1         | 25.000       | 1    | 0       |                | 0.0 0.0     |

| Superimposed Dead Load: |           | Dist. from Left Supp. | Distributed Load (lbs/ft) |       | Concentrated Load (kips) |
|-------------------------|-----------|-----------------------|---------------------------|-------|--------------------------|
| Span No.                | Load Type |                       | Left                      | Right |                          |
| 1                       | W         | 0.000                 | 615.0                     | 615.0 | 25.000 0.0               |
| 1                       | P         | 12.500                | 0.0                       | 0.0   | 0.000 0.1                |
| 2                       | W         | 0.000                 | 615.0                     | 615.0 | 25.000 0.0               |
| 2                       | P         | 12.500                | 0.0                       | 0.0   | 0.000 0.1                |
| 3                       | W         | 0.000                 | 615.0                     | 615.0 | 25.000 0.0               |
| 3                       | P         | 12.500                | 0.0                       | 0.0   | 0.000 0.1                |
| 4                       | W         | 0.000                 | 615.0                     | 615.0 | 25.000 0.0               |
| 4                       | P         | 12.500                | 0.0                       | 0.0   | 0.000 0.1                |
| 5                       | W         | 0.000                 | 615.0                     | 615.0 | 25.000 0.0               |
| 5                       | P         | 12.500                | 0.0                       | 0.0   | 0.000 0.1                |
| 6                       | W         | 0.000                 | 615.0                     | 615.0 | 25.000 0.0               |
| 6                       | P         | 12.500                | 0.0                       | 0.0   | 0.000 0.1                |
| 7                       | W         | 0.000                 | 615.0                     | 615.0 | 25.000 0.0               |
| 7                       | P         | 12.500                | 0.0                       | 0.0   | 0.000 0.1                |
| 8                       | W         | 0.000                 | 615.0                     | 615.0 | 25.000 0.0               |
| 8                       | P         | 12.500                | 0.0                       | 0.0   | 0.000 0.1                |

|    |   |        |       |       |        |     |
|----|---|--------|-------|-------|--------|-----|
| 9  | W | 0.000  | 615.0 | 615.0 | 25.000 | 0.0 |
| 9  | P | 12.500 | 0.0   | 0.0   | 0.000  | 0.1 |
| 10 | W | 0.000  | 615.0 | 615.0 | 25.000 | 0.0 |
| 10 | P | 12.500 | 0.0   | 0.0   | 0.000  | 0.1 |

NOTE: All distances are shown in decimal feet, moments are shown in foot-kips, and shears are shown in kips. Section and section properties are shown as: in., in.\*\*2, in.\*\*3, and in.\*\*4.

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 1.000

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |
| 21.2           | 19.76     | 0.460 | bott | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.50         | 21.50    | 10.60        | 10.60 | 1600.0            | 1600.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 151.0                | 151.0                  | 151.0                | 151.0                  | 467.60                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 1.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.210 | 0.01     | 0.01  | 43.43 | 21.66 |
| bott | 3.92 | 0.74 | 11.210 | 150.00   | 82.81 |       | 21.66 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.75 | 35.20 | 35.20 | 2.861      |
|      |       |       | 999999.000 |
|      |       |       | 94.285     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 467.60 | 109.1                   |
| bott | 22.62            |                   | 0.00 |        | 109.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 172.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
 INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
 Check Point I. D. 1.000

Dead Load Moment 0.0  
 Superimposed Dead Load Moment 0.0

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 215.8C          | -191.7             | 191.7           | -215.8C            | 215.8                       | -191.7             | 191.7           | -215.8             |
| OPER        | 359.7C          | -319.4             | 319.4           | -359.7C            | 359.7                       | -319.4             | 319.4           | -359.7             |

## Live Load Effect

Impact Factors: +bend - .000 -bend - .000

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 0.00         | R                  | 0.00   | 0.00                | 0.0      | 0.00        | 0.00               | 0.00   | 0.00           |              |
|           |           | 0.00         | R                  | 0.00   | 0.00                | 0.0      | 0.00        | 0.00               | 0.00   | 0.00           | 0.00         |
| OPER      | 5C1T      | 0.00         | R                  | 0.00   | 0.00                | 0.0      | 0.00        | 0.00               | 0.00   | 0.00           |              |
|           |           | 0.00         | R                  | 0.00   | 0.00                | 0.0      | 0.00        | 0.00               | 0.00   | 0.00           | 0.00         |

## Moment

| Rating Veh. | Rating Factor   |                    |                 |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|-----------------|--------------------|--------------|----------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 999.00          | 999.00             | 999.00          | 999.00             | HS 999.00    | 999.0                |
| 5C1T        | 999.00          | 999.00             | 999.00          | 999.00             | 0.00         | 999.0                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 1.000

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.7       | 0.0          | 6.2       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 103.3             | -83.6                  | 75.3                  |
| OPER      | 172.1             | -139.3                 | 125.5                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -2.40                 | 32.02 | -1.84    | 24.63 | -2.36                | 24.72 | -1.82    | 19.01 |
| OPER      | 5C1T      | -2.19                 | 25.40 | -1.68    | 19.54 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 34.86      | 2.35       | HS 47.03     | 84.6                 |
| 5C1T   | 63.67      | 4.94       | 0.00         | 592.8                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 1.000Dead Load Moment 0.0  
Superimposed Dead Load Moment 0.0

| Rating Veh. ber | Moment Capacity |              | Available Capacity for LL+I |           |
|-----------------|-----------------|--------------|-----------------------------|-----------|
|                 | top fiber       | bottom fiber | top fiber                   | bottom fi |
| bend            | +bend           | -bend        | +bend                       | -bend     |
| INV. 199.3      | 199.3           | -199.3       | 199.3                       | -199.3    |
| OPER 332.2      | 332.2           | -332.2       | 332.2                       | -332.2    |

## Live Load Effect

Impact Factors: +bend - .000 -bend - .000

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-------------------------|------------------------------|----------------------|--------|
| INV.      | HS20       | 0.00 R                  | 0.00                    | 0.00                         | 0.00                 | 0.00   |
|           |            | 0.00 R                  | 0.00                    | 0.00                         | 0.00                 | 0.00   |
| OPER      | 5C1T       | 0.00 R                  | 0.00                    | 0.00                         | 0.00                 | 0.00   |
|           |            | 0.00 R                  | 0.00                    | 0.00                         | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor |              | Rating Value |              | Load Capacity (tons) |
|-------------|---------------|--------------|--------------|--------------|----------------------|
|             | top fiber     | bottom fiber | top fiber    | bottom fiber |                      |
| HS20        | 999.00        | 999.00       | 999.00       | 999.00       | 999.0                |
| 5C1T        | 999.00        | 999.00       | 999.00       | 999.00       | 999.0                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 1.100

|               |                             |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Allowable stress (fs) (psi) |           |         |         |
| RATIO/Inv.    | 0.00                        | 0.00      | 0.00    | 0.00    |
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

|                |           |       |      |      |       |       |      |      |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
| H              | D         | tw    | top  | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |
| 21.2           | 19.76     | 0.460 | bott | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |

## Hybrid Section Properties:

|                         |                  |                       |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

|               |          |              |       |                   |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.50         | 21.50    | 10.60        | 10.60 | 1600.0            | 1600.0           |

|                  |                  |             |       |                 |
|------------------|------------------|-------------|-------|-----------------|
| Section Modulus  |                  |             |       | Plastic Section |
| Positive Bending | Negative Bending | Modulus - Z |       |                 |
| Top              | Bott.            | Top         | Bott. | (Fy * Z)        |
| 151.0            | 151.0            | 151.0       | 151.0 | 467.60          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 1.100

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.210 | 0.01     | 0.01  | 43.43 | 21.66 |
| bott | 3.92 | 0.74 | 11.210 | 150.00   | 82.81 |       | 21.66 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.75 | 35.20 | 35.20 | 2.861      |
|      |       |       | 999999.000 |
|      |       |       | 94.285     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 467.60 | 109.1                   |
| bott | 22.62            |                   | 0.00 |        | 109.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 172.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 1.100

Dead Load Moment 1.6  
Superimposed Dead Load Moment 13.5

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 215.8C          | -191.7             | 191.7           | -215.8C            | 206.8                       | -200.7             | 182.6           | -224.9             |
| OPER        | 359.7C          | -319.4             | 319.4           | -359.7C            | 344.6                       | -334.5             | 304.4           | -374.8             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 66.91 L      | 51.47              | -11.50 | 0.0                 | 41.79    | 32.15       | 2.50               |        |                |              |
|           |           | -6.25 R      | -4.81              | 58.00  | 0.0                 | -4.62    | -3.55       | 35.00              | 0.00   |                |              |
| OPER      | 5C1T      | 54.18 R      | 41.68              | 105.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -5.89 R      | -4.53              | 134.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 3.09            | 32.09                     | 2.73         | 35.95              | HS 54.59     | 98.3                 |
| 5C1T        | 6.36            | 56.83                     | 5.62         | 63.67              | 0.00         | 674.0                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 1.100

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| 0.6       | 0.0                    |
|           | 4.6                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 103.3             | -82.5                  | 76.3         |
| OPER      | 172.1             | -137.5                 | 127.2        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -2.95                 | 26.76 | -2.27    | 20.59 | -3.16                | 21.20 | -2.43    | 16.31 |
| OPER      | 5C1T      | -3.83                 | 21.67 | -2.94    | 16.67 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 26.08      | 2.85       | HS 57.04     | 102.7                |
| 5C1T   | 35.94      | 5.87       | 0.00         | 704.3                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 1.100

Dead Load Moment      Superimposed Dead Load Moment  
1.6                      13.5

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 208.4      | 205.3           | -193.3 | 205.3        | -193.3 | 190.3                       | -208.4 | 190.3     | - |
| OPER 347.3      | 332.2           | -332.2 | 332.2        | -332.2 | 317.1                       | -347.3 | 317.1     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 66.91 L                 | 51.47           | -11.50                  | 0.0       | 41.79                   | 32.15           | 2.50                 |        |
|           |            | -6.25 R                 | -4.81           | 58.00                   | 0.0       | -4.62                   | -3.55           | 35.00                | 0.00   |
| OPER      | 5C1T       | 54.18 R                 | 41.68           | 105.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -5.89 R                 | -4.53           | 134.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 2.84            | 33.31           | 2.84               | 33.31              | HS 56.88     | 102.4                |
| 5C1T        | 5.85            | 59.00           | 5.85               | 59.00              | 0.00         | 702.3                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 1.200

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |
| 21.2           | 19.76     | 0.460 | bott | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.50         | 21.50    | 10.60        | 10.60 | 1600.0            | 1600.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 151.0                | 151.0                  | 151.0                | 151.0                  | 467.60                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 1.200

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.210 | 0.01     | 0.01  | 43.43 | 21.66 |
| bott | 3.92 | 0.74 | 11.210 | 150.00   | 82.81 |       | 21.66 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.75 | 35.20 | 35.20 | 2.861 | 999999.000 | 94.285 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 467.60 | 109.1                   |
| bott | 22.62            |                   | 0.00 |        | 109.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 172.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 1.200

Dead Load Moment      Superimposed Dead Load Moment  
2.8                      23.1

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 215.8C             | -191.7                | 191.7              | -215.8C               | 200.3                       | -207.2                | 176.1              | -231.3                |
| OPER        | 359.7C             | -319.4                | 319.4              | -359.7C               | 333.8                       | -345.3                | 293.6              | -385.5                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 108.85 L     | 83.73              | -9.00  | 0.0                 | 71.41    | 54.93       | 5.00               |        |                |              |
|           |           | -12.51 R     | -9.62              | 58.00  | 0.0                 | -9.24    | -7.11       | 35.00              | 0.00   |                |              |
| OPER      | 5C1T      | 90.16 R      | 69.35              | 108.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -11.77 R     | -9.06              | 134.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 1.84               | 16.56                        | 1.62                               | 18.49        | HS 32.36 58.3        |
| 5C1T        | 3.70               | 29.33                        | 3.26                               | 32.75        | 0.00 390.8           |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 1.200

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.4       | 0.0          | 3.1       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 103.3             | -81.5                  | 77.4                  |
| OPER      | 172.1             | -135.8                 | 128.9                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -5.87                 | 21.77 | -4.52    | 16.75 | -5.76                | 17.86 | -4.43    | 13.74 |
| OPER      | 5C1T      | -5.81                 | 18.03 | -4.47    | 13.87 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 13.88      | 3.55       | HS 71.06     | 127.9                |  |
| 5C1T   | 23.37      | 7.15       | 0.00         | 858.0                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 1.200

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| 2.8                 | 23.1                             |

| Rating<br>Veh.<br>ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                       | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend                  | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV.<br>214.8         | 209.7           | -189.0 | 209.7        | -189.0 | 183.8                       | -214.8 | 183.8     | - |
| OPER<br>358.0         | 332.2           | -332.2 | 332.2        | -332.2 | 306.4                       | -358.0 | 306.4     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Truck<br>Veh. | Live Load Moment<br>w/imp. | Loc. of Ax.<br>w/o imp. | Front<br>Wheel | Lane<br>Dis. | Live Load Moment<br>w/imp. | Loc. of Conc.<br>w/o imp. | Load 1 | Load 2 |
|--------------|---------------|----------------------------|-------------------------|----------------|--------------|----------------------------|---------------------------|--------|--------|
| INV.         | HS20          | 108.85 L                   | 83.73                   | -9.00          | 0.0          | 71.41                      | 54.93                     | 5.00   |        |
|              |               | -12.51 R                   | -9.62                   | 58.00          | 0.0          | -9.24                      | -7.11                     | 35.00  | 0.00   |
| OPER         | 5C1T          | 90.16 R                    | 69.35                   | 108.00         | 0.0          | 0.00                       | 0.00                      | 0.00   |        |
|              |               | -11.77 R                   | -9.06                   | 134.00         | 0.0          | 0.00                       | 0.00                      | 0.00   | 0.00   |

## Serviceability

| Rating<br>Veh. | Rating       |                | Factor          |                | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------|----------------|-----------------|----------------|-----------------|----------------------------|
|                | top<br>+bend | fiber<br>-bend | bottom<br>+bend | fiber<br>-bend |                 |                            |
| HS20           | 1.69         | 17.17          | 1.69            | 17.17          | HS 33.77        | 60.8                       |
| 5C1T           | 3.40         | 30.41          | 3.40            | 30.41          | 0.00            | 407.8                      |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 1.300

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |
| 21.2           | 19.76     | 0.460 | bott | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.50         | 21.50    | 10.60        | 10.60 | 1600.0            | 1600.0           |

| Section Modulus      |               |                      |               | Plastic Section Modulus - Z |
|----------------------|---------------|----------------------|---------------|-----------------------------|
| Positive Bending Top | Bending Bott. | Negative Bending Top | Bending Bott. | (Fy * Z)                    |
| 151.0                | 151.0         | 151.0                | 151.0         | 467.60                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 1.300

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.210 | 0.01     | 0.01  | 43.43 | 21.66 |
| bott | 3.92 | 0.74 | 11.210 | 150.00   | 82.81 |       | 21.66 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.75 | 35.20 | 35.20 | 2.861      |
|      |       |       | 999999.000 |
|      |       |       | 94.285     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 467.60 | 109.1                   |
| bott | 22.62            |                   | 0.00 |        | 109.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 172.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 1.300

Dead Load Moment 3.5  
Superimposed Dead Load Moment 28.9

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 215.8C          | -191.7             | 191.7           | -215.8C            | 196.4                       | -211.0             | 172.3           | -235.2             |
| OPER        | 359.7C          | -319.4             | 319.4           | -359.7C            | 327.4                       | -351.7             | 287.1           | -392.0             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 128.35 L     | 98.73              | -6.50  | 0.0                 | 91.13    | 70.10       | 7.50               |        |                |              |
|           |           | -18.76 R     | -14.43             | 58.00  | 0.0                 | -13.86   | -10.66      | 35.00              | 0.00   |                |              |
| OPER      | 5C1T      | 109.03 R     | 83.87              | 110.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -17.66 R     | -13.58             | 134.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 1.53            | 11.25                     | 1.34         | 12.53              | HS 26.84     | 48.3                 |
| 5C1T        | 3.00            | 19.92                     | 2.63         | 22.20              | 0.00         | 316.0                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 1.300Dead Load Superimposed Dead Load  
Shear (-) Shear (+) Shear

0.2 0.0 1.5

Rat. Shear Capacity Available Capacity for LL+I  
Veh. VU (-) (+)INV. 103.3 -80.5 78.4  
OPER 172.1 -134.1 130.6

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -8.72                 | 17.11 | -6.71    | 13.16 | -8.44                | 14.73 | -6.49    | 11.33 |
| OPER      | 5C1T      | -8.57                 | 14.54 | -6.60    | 11.18 | 0.00                 | 0.00  | 0.00     | 0.00  |

## Rating Shear

| Veh. | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
|------|------------|------------|--------------|----------------------|
| HS20 | 9.23       | 4.58       | HS 91.61     | 164.9                |
| 5C1T | 15.64      | 8.99       | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 1.300

Dead Load Moment 3.5  
Superimposed Dead Load Moment 28.9

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 218.7      | 212.2           | -186.4 | 212.2        | -186.4 | 179.9                       | -218.7 | 179.9     | - |
| OPER 364.5      | 332.2           | -332.2 | 332.2        | -332.2 | 299.9                       | -364.5 | 299.9     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 128.35 L                | 98.73           | -6.50                   | 0.0       | 91.13                   | 70.10           | 7.50                 |        |
|           |            | -18.76 R                | -14.43          | 58.00                   | 0.0       | -13.86                  | -10.66          | 35.00                | 0.00   |
| OPER      | 5C1T       | 109.03 R                | 83.87           | 110.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -17.66 R                | -13.58          | 134.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.40            | 11.65           | 1.40               | 11.65              | HS 28.04     | 50.5                 |
| 5C1T        | 2.75            | 20.64           | 2.75               | 20.64              | 0.00         | 330.1                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 1.400

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |
| 21.2           | 19.76     | 0.460 | bott | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.50         | 21.50    | 10.60        | 10.60 | 1600.0            | 1600.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 151.0                | 151.0                  | 151.0                | 151.0                  | 467.60                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
 Check Point I. D. 1.400

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.210 | 0.01     | 0.01  | 43.43 | 21.66 |
| bott | 3.92 | 0.74 | 11.210 | 150.00   | 82.81 |       | 21.66 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.75 | 35.20 | 35.20 | 2.861      |
|      |       |       | 999999.000 |
|      |       |       | 94.285     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 467.60 | 109.1                   |
| bott | 22.62            |                   | 0.00 |        | 109.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 172.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 1.400

Dead Load Moment 3.7  
Superimposed Dead Load Moment 30.8

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 215.8C          | -191.7             | 191.7           | -215.8C            | 195.1                       | -212.3             | 171.0           | -236.5             |
| OPER        | 359.7C          | -319.4             | 319.4           | -359.7C            | 325.2                       | -353.9             | 284.9           | -394.2             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 128.61 L     | 98.93              | -4.00  | 0.0                 | 99.47    | 76.51       | 10.00              |        |                |              |
|           |           | -25.02 R     | -19.25             | 58.00  | 0.0                 | -18.49   | -14.22      | 35.00              | 0.00   |                |              |
| OPER      | 5C1T      | 115.53 R     | 88.87              | 109.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -23.55 R     | -18.11             | 134.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 1.52            | 8.49                      | 1.33         | 9.45               | HS 26.59     | 47.9                 |
| 5C1T        | 2.82            | 15.03                     | 2.47         | 16.74              | 0.00         | 296.0                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 1.400

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear     | (-) Shear (+) Shear    |
| 0.0       | 0.0 0.0                |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 103.3             | -79.4                           | 79.4  |
| OPER      | 172.1             | -132.4                          | 132.4 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |      | Lane Live Load Shear |       |          |      |
|-----------|-----------|-----------------------|-------|----------|------|----------------------|-------|----------|------|
|           |           | w/imp.                |       | w/o imp. |      | w/imp.               |       | w/o imp. |      |
|           |           | (-)                   | (+)   | (-)      | (+)  | (-)                  | (+)   | (-)      | (+)  |
| INV.      | HS20      | -11.47                | 12.86 | -8.82    | 9.89 | -11.17               | 11.81 | -8.59    | 9.09 |
| OPER      | 5C1T      | -11.15                | 11.39 | -8.57    | 8.76 | 0.00                 | 0.00  | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 6.93       | 6.18       | HS 123.50    | 222.3                |
| 5C1T   | 11.88      | 11.62      | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 1.400Dead Load Moment 3.7  
Superimposed Dead Load Moment 30.8

| Rating Veh. ber | Moment Capacity top fiber |        | Moment Capacity bottom fiber |        | Available Capacity for LL+I |        |           |   |
|-----------------|---------------------------|--------|------------------------------|--------|-----------------------------|--------|-----------|---|
|                 | +bend                     | -bend  | +bend                        | -bend  | top fiber                   | -bend  | bottom fi |   |
| INV. 220.0      | 213.1                     | -185.5 | 213.1                        | -185.5 | 178.6                       | -220.0 | 178.6     | - |
| OPER 366.7      | 332.2                     | -332.2 | 332.2                        | -332.2 | 297.7                       | -366.7 | 297.7     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-------------------------|-----------|-------------------------|----------------------|--------|
| INV.      | HS20       | 128.61 L                | 98.93                   | -4.00     | 0.0                     | 10.00                |        |
|           |            | -25.02 R                | -19.25                  | 58.00     | 0.0                     | 35.00                | 0.00   |
| OPER      | 5C1T       | 115.53 R                | 88.87                   | 109.00    | 0.0                     | 0.00                 |        |
|           |            | -23.55 R                | -18.11                  | 134.00    | 0.0                     | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor top fiber |       | Rating Factor bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-------------------------|-------|----------------------------|-------|--------------|----------------------|
|             | +bend                   | -bend | +bend                      | -bend |              |                      |
| HS20        | 1.39                    | 8.79  | 1.39                       | 8.79  | HS 27.78     | 50.0                 |
| 5C1T        | 2.58                    | 15.57 | 2.58                       | 15.57 | 0.00         | 309.2                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 1.500

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |
| 21.2           | 19.76     | 0.460 | bott | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.50         | 21.50    | 10.60        | 10.60 | 1600.0            | 1600.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 151.0                | 151.0                  | 151.0                | 151.0                  | 467.60                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 1.500

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.210 | 0.01     | 0.01  | 43.43 | 21.66 |
| bott | 3.92 | 0.74 | 11.210 | 150.00   | 82.81 |       | 21.66 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.65 | 35.20 | 35.20 | 2.861      |
|      |       |       | 999999.000 |
|      |       |       | 88.932     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 467.60 | 109.1                   |
| bott | 22.62            |                   | 21.84 |        | 106.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 172.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 1.500

Dead Load Superimposed Dead Load  
Moment Moment  
3.5 28.9

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 215.8C             | -191.7                | 191.7              | -215.8C               | 196.4                       | -211.1                | 172.2              | -235.2                |
| OPER        | 359.7C             | -319.4                | 319.4              | -359.7C               | 327.3                       | -351.8                | 287.1              | -392.0                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 121.30 L     | 93.31              | -15.50 | 0.0                 | 99.09    | 76.22       | 12.50              |        |                |              |
|           |           | -31.27 R     | -24.06             | 58.00  | 0.0                 | -23.11   | -17.77      | 35.00              | 0.00   |                |              |
| OPER      | 5C1T      | 114.31 R     | 87.93              | 111.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -29.43 R     | -22.64             | 134.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 1.62               | 6.75                         | 1.42            | 7.52                  | HS 28.40     | 51.1                 |
| 5C1T        | 2.86               | 11.95                        | 2.51            | 13.32                 | 0.00         | 301.4                |

## SHEAR RATING REPORT

Rating Types and Vehicles  
 INV. OPER POST SPEC  
 Structure I. D. HAM500  
 Member I. D. S02  
 Check Point I. D. 1.500  
 HS20 5C1T  
 Dead Load Superimposed Dead Load  
 Shear (-) Shear (+) Shear  
 -0.2 -1.6 0.0

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 103.3             | -78.4                  | 80.5                  |
| OPER      | 172.1             | -130.7                 | 134.1                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |            |              |              | Lane Live Load Shear |            |              |              |
|-----------|-----------|-----------------------|------------|--------------|--------------|----------------------|------------|--------------|--------------|
|           |           | w/imp. (-)            | w/imp. (+) | w/o imp. (-) | w/o imp. (+) | w/imp. (-)           | w/imp. (+) | w/o imp. (-) | w/o imp. (+) |
| INV.      | HS20      | -15.07                | 9.70       | -11.59       | 7.46         | -13.93               | 9.15       | -10.71       | 7.04         |
| OPER      | 5C1T      | -13.55                | 8.82       | -10.42       | 6.78         | 0.00                 | 0.00       | 0.00         | 0.00         |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 5.20       | 8.29       | HS 104.07    | 187.3                |
| 5C1T   | 9.64       | 15.21      | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 1.500Dead Load Moment 3.5  
Superimposed Dead Load Moment 28.9

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
|                 | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 218.7      | 212.3           | -186.4 | 212.3        | -186.4 | 179.9                       | -218.7 | 179.9     | - |
| OPER 364.6      | 332.2           | -332.2 | 332.2        | -332.2 | 299.8                       | -364.6 | 299.8     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 121.30 L                | 93.31           | -15.50                  | 0.0       | 99.09                   | 76.22           | 12.50                |        |
|           |            | -31.27 R                | -24.06          | 58.00                   | 0.0       | -23.11                  | -17.77          | 35.00                | 0.00   |
| OPER      | 5C1T       | 114.31 R                | 87.93           | 111.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -29.43 R                | -22.64          | 134.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.48            | 6.99            | 1.48               | 6.99               | HS 29.66     | 53.4                 |
| 5C1T        | 2.62            | 12.39           | 2.62               | 12.39              | 0.00         | 314.8                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 1.600

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |
| 21.2           | 19.76     | 0.460 | bott | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.50         | 21.50    | 10.60        | 10.60 | 1600.0            | 1600.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 151.0                | 151.0                  | 151.0                | 151.0                  | 467.60                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 1.600

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.210 | 0.01     | 0.01  | 43.43 | 21.66 |
| bott | 3.92 | 0.74 | 11.210 | 150.00   | 82.81 |       | 21.66 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.65 | 35.20 | 35.20 | 2.861 | 999999.000 | 88.932 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 467.60 | 109.1                   |
| bott | 22.62            |                   | 21.84 |        | 106.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 172.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 1.600

Dead Load Moment      Superimposed Dead Load Moment  
2.8                      22.8

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 215.8C             | -191.7                | 191.7              | -215.8C               | 200.5                       | -207.0                | 176.3              | -231.2                |
| OPER        | 359.7C             | -319.4                | 319.4              | -359.7C               | 334.1                       | -345.0                | 293.8              | -385.3                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment  | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|---------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 115.16 L     | 88.59              | -13.00  | 0.0                 | 88.90    | 68.38       | 15.00              |        |                |              |
|           |           | -37.53 R     | -28.87             | 58.00   | 0.0                 | -27.73   | -21.33      | 35.00              | 0.00   |                |              |
| OPER      | 5C1T      | 104.59 L     | 80.45              | -123.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -35.32 R     | -27.17             | 134.00  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 1.74               | 5.52                         | 1.53            | 6.16                  | HS 30.62     | 55.1                 |
| 5C1T        | 3.19               | 9.77                         | 2.81            | 10.91                 | 0.00         | 337.1                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 1.600

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.4      | -3.2         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 103.3             | -77.3                  | 81.6                  |
| OPER      | 172.1             | -128.8                 | 135.9                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -18.19                | 6.09 | -14.00   | 4.69 | -16.67               | 6.75 | -12.82   | 5.19 |
| OPER      | 5C1T      | -15.81                | 6.39 | -12.16   | 4.92 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 4.25       | 12.09      | HS 84.96     | 152.9                |  |
| 5C1T   | 8.15       | 21.27      | 0.00         | 977.4                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 1.600

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| 2.8                 | 22.8                             |

| Rating<br>Veh.<br>ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                       | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend                  | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV.<br>214.7         | 209.6           | -189.1 | 209.6        | -189.1 | 184.0                       | -214.7 | 184.0     | - |
| OPER<br>357.8         | 332.2           | -332.2 | 332.2        | -332.2 | 306.6                       | -357.8 | 306.6     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Truck<br>Veh. | Live Load Moment<br>w/imp. | Moment<br>w/o imp. | Loc. of Ax.<br>Front<br>Wheel | Lane<br>Dis. | Live Load Moment<br>w/imp. | Moment<br>w/o imp. | Loc. of Conc.<br>Load 1 | Load 2 |
|--------------|---------------|----------------------------|--------------------|-------------------------------|--------------|----------------------------|--------------------|-------------------------|--------|
| INV.         | HS20          | 115.16 L                   | 88.59              | -13.00                        | 0.0          | 88.90                      | 68.38              | 15.00                   |        |
|              |               | -37.53 R                   | -28.87             | 58.00                         | 0.0          | -27.73                     | -21.33             | 35.00                   | 0.00   |
| OPER         | 5C1T          | 104.59 L                   | 80.45              | -123.00                       | 0.0          | 0.00                       | 0.00               | 0.00                    |        |
|              |               | -35.32 R                   | -27.17             | 134.00                        | 0.0          | 0.00                       | 0.00               | 0.00                    | 0.00   |

## Serviceability

| Rating<br>Veh. | Rating       |                | Factor          |                | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------|----------------|-----------------|----------------|-----------------|----------------------------|
|                | top<br>+bend | fiber<br>-bend | bottom<br>+bend | fiber<br>-bend |                 |                            |
| HS20           | 1.60         | 5.72           | 1.60            | 5.72           | HS 31.95        | 57.5                       |
| 5C1T           | 2.93         | 10.13          | 2.93            | 10.13          | 0.00            | 351.8                      |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 1.700

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |
| 21.2           | 19.76     | 0.460 | bott | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.50         | 21.50    | 10.60        | 10.60 | 1600.0            | 1600.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 151.0                | 151.0                  | 151.0                | 151.0                  | 467.60                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 1.700

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.210 | 0.01     | 0.01  | 43.43 | 21.66 |
| bott | 3.92 | 0.74 | 11.210 | 150.00   | 82.81 |       | 21.66 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.65 | 35.20 | 35.20 | 2.861 | 999999.000 | 88.932 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 467.60 | 109.1                   |
| bott | 22.62            |                   | 21.84 |        | 106.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 172.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 1.700

Dead Load Moment 1.7  
Superimposed Dead Load Moment 12.9

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 215.8C             | -191.7                | 191.7              | -215.8C               | 207.1                       | -200.4                | 182.9              | -224.5                |
| OPER        | 359.7C             | -319.4                | 319.4              | -359.7C               | 345.1                       | -334.0                | 304.9              | -374.2                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment  | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|---------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 99.53 L      | 76.56              | -10.50  | 0.0                 | 71.95    | 55.35       | 17.50              |        |                |              |
|           |           | -43.78 R     | -33.68             | 58.00   | 0.0                 | -33.80   | -26.00      | 35.00              |        | 85.00          |              |
| OPER      | 5C1T      | 86.28 L      | 66.37              | -120.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -41.20 R     | -31.70             | 134.00  | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 2.08               | 4.58                         | 1.84            | 5.13                  | HS 36.76     | 66.2                 |
| 5C1T        | 4.00               | 8.10                         | 3.53            | 9.08                  | 0.00         | 424.0                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 1.700

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| -0.5      | -4.7                   |
|           | 0.0                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 103.3             | -76.3                  | 82.6                  |
| OPER      | 172.1             | -127.1                 | 137.7                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -23.31                | 3.02 | -17.93   | 2.32 | -19.35               | 4.64 | -14.88   | 3.57 |
| OPER      | 5C1T      | -18.62                | 4.32 | -14.32   | 3.33 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 3.27       | 17.81      | HS 65.44     | 117.8                |  |
| 5C1T   | 6.83       | 31.84      | 0.00         | 819.2                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 1.700

Dead Load Moment 1.7  
Superimposed Dead Load Moment 12.9

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 208.0      | 205.1           | -193.5 | 205.1        | -193.5 | 190.6                       | -208.0 | 190.6     | - |
| OPER 346.7      | 332.2           | -332.2 | 332.2        | -332.2 | 317.7                       | -346.7 | 317.7     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 99.53 L                 | 76.56                | -10.50      | 0.0       | 71.95                   | 55.35                  | 17.50  |        |
|           |            | -43.78 R                | -33.68               | 58.00       | 0.0       | -33.80                  | -26.00                 | 35.00  | 85.00  |
| OPER      | 5C1T       | 86.28 L                 | 66.37                | -120.50     | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -41.20 R                | -31.70               | 134.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.91            | 4.75            | 1.91               | 4.75               | HS 38.30     | 68.9                 |
| 5C1T        | 3.68            | 8.41            | 3.68               | 8.41               | 0.00         | 441.8                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 1.800

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |
| 21.2           | 19.76     | 0.460 | bott | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.50         | 21.50    | 10.60        | 10.60 | 1600.0            | 1600.0           |

| Section Modulus      |               |                      |               | Plastic Section Modulus - Z |
|----------------------|---------------|----------------------|---------------|-----------------------------|
| Positive Bending Top | Bending Bott. | Negative Bending Top | Bending Bott. | (Fy * Z)                    |
| 151.0                | 151.0         | 151.0                | 151.0         | 467.60                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 1.800

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.210 | 0.01     | 0.01  | 43.43 | 21.66 |
| bott | 3.92 | 0.74 | 11.210 | 150.00   | 82.81 |       | 21.66 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.65 | 35.20 | 35.20 | 2.861      |
|      |       |       | 999999.000 |
|      |       |       | 88.932     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 467.60 | 109.1                   |
| bott | 22.62            |                   | 21.84 |        | 106.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 172.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 1.800

Dead Load Moment      Superimposed Dead Load Moment  
0.1                      -0.9

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 215.8C             | -191.7                | 191.7              | -215.8C               | 216.3                       | -191.2                | 192.1              | -215.3                |
| OPER        | 359.7C             | -319.4                | 319.4              | -359.7C               | 360.5                       | -318.6                | 320.2              | -358.9                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 63.96 L      | 49.20              | -8.00  | 0.0                 | 47.55    | 36.58       | 20.00              |        |                |              |
|           |           | -50.04 R     | -38.49             | 58.00  | 0.0                 | -38.63   | -29.72      | 35.00              |        | 85.00          |              |
| OPER      | 5C1T      | 59.03 R      | 45.40              | 154.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -47.09 R     | -36.22             | 134.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 3.38               | 3.82                         | 3.00 4.30                          | HS 60.08     | 108.1                |
| 5C1T        | 6.11               | 6.77                         | 5.43 7.62                          | 0.00         | 651.1                |

## SHEAR RATING REPORT

Rating Types and Vehicles  
 INV. OPER POST SPEC  
 Structure I. D. HAM500  
 Member I. D. S02  
 Check Point I. D. 1.800  
 HS20 5C1T  
 Dead Load Superimposed Dead Load  
 Shear (-) Shear (+) Shear  
 -0.7 -6.3 0.0

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 103.3             | -75.2                  | 83.6                  |
| OPER      | 172.1             | -125.4                 | 139.4                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -28.22                | 0.97 | -21.70   | 0.75 | -21.94               | 2.83 | -16.88   | 2.18 |
| OPER      | 5C1T      | -21.72                | 2.55 | -16.71   | 1.96 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 2.67       | 29.56      | HS 53.32     | 96.0                 |
| 5C1T   | 5.77       | 54.58      | 0.00         | 692.6                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 1.800

Dead Load Moment      Superimposed Dead Load Moment  
0.1                      -0.9

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 198.8      | 199.0           | -199.6 | 199.0        | -199.6 | 199.8                       | -198.8 | 199.8     | - |
| OPER 331.4      | 332.2           | -332.2 | 332.2        | -332.2 | 333.0                       | -331.4 | 333.0     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 63.96 L                 | 49.20                | -8.00       | 0.0       | 47.55                   | 36.58                  | 20.00  |        |
|           |            | -50.04 R                | -38.49               | 58.00       | 0.0       | -38.63                  | -29.72                 | 35.00  | 85.00  |
| OPER      | 5C1T       | 59.03 R                 | 45.40                | 154.00      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -47.09 R                | -36.22               | 134.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 3.12            | 3.97            | 3.12               | 3.97               | HS 62.48     | 112.5                |
| 5C1T        | 5.64            | 7.04            | 5.64               | 7.04               | 0.00         | 677.0                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 1.900

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |
| 21.2           | 19.76     | 0.460 | bott | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.50         | 21.50    | 10.60        | 10.60 | 1600.0            | 1600.0           |

| Section Modulus      |               |                      |               | Plastic Section Modulus - Z |
|----------------------|---------------|----------------------|---------------|-----------------------------|
| Positive Bending Top | Bending Bott. | Negative Bending Top | Bending Bott. | (Fy * Z)                    |
| 151.0                | 151.0         | 151.0                | 151.0         | 467.60                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 1.900

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.210 | 0.01     | 0.01  | 43.43 | 21.66 |
| bott | 3.92 | 0.74 | 11.210 | 150.00   | 82.81 |       | 21.66 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.65 | 35.20 | 35.20 | 2.861      |
|      |       |       | 999999.000 |
|      |       |       | 88.932     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 467.60 | 109.1                   |
| bott | 22.62            |                   | 21.84 |        | 106.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 172.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 1.900

Dead Load Moment      Superimposed Dead Load Moment  
-2.0                      -18.5

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 215.8C          | -191.7             | 191.7           | -215.8C            | 228.1                       | -179.4             | 203.9           | -203.5             |
| OPER        | 359.7C          | -319.4             | 319.4           | -359.7C            | 380.2                       | -298.9             | 339.9           | -339.2             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 12.56 R      | 9.66               | 88.00  | 0.0                 | 23.61    | 18.16       | 22.50              |        |                |              |
|           |           | -62.02 L     | -47.71             | 16.00  | 0.0                 | -57.83   | -44.49      | 35.00              | 10.00  |                |              |
| OPER      | 5C1T      | 30.15 R      | 23.19              | 156.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -55.00 L     | -42.31             | -96.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 9.66            | 2.89                      | 8.64         | 3.28               | HS 57.84     | 104.1                |
| 5C1T        | 12.61           | 5.43                      | 11.27        | 6.17               | 0.00         | 652.2                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 1.900

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.9      | -7.8         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 103.3             | -74.2                  | 84.7                  |
| OPER      | 172.1             | -123.6                 | 141.1                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -32.71                | 0.64 | -25.16   | 0.49 | -24.40               | 1.34 | -18.77   | 1.03 |
| OPER      | 5C1T      | -24.64                | 1.04 | -18.95   | 0.80 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 2.27       | 63.09      | HS 45.37     | 81.7                 |
| 5C1T   | 5.02       | 136.13     | 0.00         | 602.2                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 1.900

Dead Load Moment      Superimposed Dead Load Moment  
-2.0                      -18.5

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 187.0      | 191.1           | -207.5 | 191.1        | -207.5 | 211.6                       | -187.0 | 211.6     | - |
| OPER 311.7      | 332.2           | -332.2 | 332.2        | -332.2 | 352.7                       | -311.7 | 352.7     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 12.56 R                 | 9.66            | 88.00                   | 0.0       | 23.61                   | 18.16           | 22.50                |        |
|           |            | -62.02 L                | -47.71          | 16.00                   | 0.0       | -57.83                  | -44.49          | 35.00                | 10.00  |
| OPER      | 5C1T       | 30.15 R                 | 23.19           | 156.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -55.00 L                | -42.31          | -96.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 8.96            | 3.02  | 8.96         | 3.02  | HS 60.31     | 108.6                |
| 5C1T        | 11.70           | 5.67  | 11.70        | 5.67  | 0.00         | 680.1                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 2.000

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |
| 21.2           | 19.76     | 0.460 | bott | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.50         | 21.50    | 10.60        | 10.60 | 1600.0            | 1600.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 151.0                | 151.0                  | 151.0                | 151.0                  | 467.60                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 2.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.210 | 0.01     | 0.01  | 43.43 | 21.66 |
| bott | 3.92 | 0.74 | 11.210 | 150.00   | 82.81 |       | 21.66 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.65 | 35.20 | 35.20 | 2.861      |
|      |       |       | 999999.000 |
|      |       |       | 88.932     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 467.60 | 109.1                   |
| bott | 22.62            |                   | 21.84 |        | 106.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 172.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 2.000

Dead Load Moment      Superimposed Dead Load Moment  
-4.5                      -40.0

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 207.0                       | -134.5                | 187.9              | -153.7                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 345.1                       | -224.2                | 313.1              | -256.2                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.76 R      | 12.89              | 83.00  | 0.0                 | 12.38    | 9.53        | 60.00              |        |                |              |
|           |           | -103.95 L    | -79.96             | 4.50   | 0.0                 | -95.84   | -73.73      | 15.00              |        | 35.00          |              |
| OPER      | 5C1T      | 12.96 R      | 9.97               | 285.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -76.72 L     | -59.02             | -94.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 12.35              | 1.29                         | 11.21           | 1.48                  | HS 25.88     | 46.6                 |
| 5C1T        | 26.63              | 2.92                         | 24.17           | 3.34                  | 0.00         | 350.7                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 2.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.9      | -1.1      | -7.8                   | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I |       |
|-----------|-------------------|-----------------------------|-------|
|           |                   | (-)                         | (+)   |
| INV.      | 90.8              | -73.2                       | 64.4  |
| OPER      | 151.3             | -121.9                      | 107.4 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -32.71                | 34.96 | -25.16   | 26.89 | -24.40               | 26.43 | -18.77   | 20.33 |
| OPER      | 5C1T      | -24.64                | 27.13 | -18.95   | 20.87 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.99       | 1.84       | HS 36.86     | 66.4                 |
| 5C1T   | 4.46       | 3.96       | 0.00         | 474.9                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 2.000

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -4.5                | -40.0                            |

| Rating<br>Veh.<br>ber | Moment Capacity |              | Available Capacity for LL+I |           | top fiber |           | bottom fi |           |
|-----------------------|-----------------|--------------|-----------------------------|-----------|-----------|-----------|-----------|-----------|
|                       | top fiber       | bottom fiber | top fiber                   | bottom fi | top fiber | bottom fi | top fiber | bottom fi |
|                       | +bend           | -bend        | +bend                       | -bend     | +bend     | -bend     | +bend     | -bend     |
| INV.                  | 149.9           | -185.4       | 149.9                       | -185.4    | 194.3     | -141.0    | 194.3     | -         |
| 141.0                 |                 |              |                             |           |           |           |           |           |
| OPER                  | 279.4           | -279.4       | 279.4                       | -279.4    | 323.8     | -235.0    | 323.8     | -         |
| 235.0                 |                 |              |                             |           |           |           |           |           |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Truck<br>Veh. | Live Load Moment<br>w/imp. | Loc. of Ax.<br>w/o imp. | Front<br>Wheel | Lane<br>Dis. | Live Load Moment<br>w/imp. | Loc. of Conc.<br>w/o imp. | Load 1 | Load 2 |
|--------------|---------------|----------------------------|-------------------------|----------------|--------------|----------------------------|---------------------------|--------|--------|
| INV.         | HS20          | 16.76 R                    | 12.89                   | 83.00          | 0.0          | 12.38                      | 9.53                      | 60.00  |        |
|              |               | -103.95 L                  | -79.96                  | 4.50           | 0.0          | -95.84                     | -73.73                    | 15.00  | 35.00  |
| OPER         | 5C1T          | 12.96 R                    | 9.97                    | 285.00         | 0.0          | 0.00                       | 0.00                      | 0.00   |        |
|              |               | -76.72 L                   | -59.02                  | -94.00         | 0.0          | 0.00                       | 0.00                      | 0.00   | 0.00   |

## Serviceability

| Rating<br>Veh. | Rating    |              | Factor    |              | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|-----------|--------------|-----------|--------------|-----------------|----------------------------|
|                | top fiber | bottom fiber | top fiber | bottom fiber |                 |                            |
|                | +bend     | -bend        | +bend     | -bend        |                 |                            |
| HS20           | 11.59     | 1.36         | 11.59     | 1.36         | HS 27.12        | 48.8                       |
| 5C1T           | 25.00     | 3.06         | 25.00     | 3.06         | 0.00            | 367.5                      |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 2.000

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |               |                      |               | Plastic Section Modulus - Z |
|----------------------|---------------|----------------------|---------------|-----------------------------|
| Positive Bending Top | Bending Bott. | Negative Bending Top | Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0         | 127.0                | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 2.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.65 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 82.487     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 29.65 |        | 104.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 2.000

Dead Load Superimposed Dead Load  
Moment Moment  
-4.5 -40.0

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 207.0                       | -134.5                | 187.9              | -153.7                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 345.1                       | -224.2                | 313.1              | -256.2                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.76 R      | 12.89              | 83.00  | 0.0                 | 12.38    | 9.53        | 60.00              |        |                |              |
|           |           | -103.95 L    | -79.96             | 4.50   | 0.0                 | -95.84   | -73.73      | 15.00              |        | 35.00          |              |
| OPER      | 5C1T      | 12.96 R      | 9.97               | 285.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -76.72 L     | -59.02             | -94.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 12.35              | 1.29                         | 11.21                              | 1.48         | HS 25.88 46.6        |
| 5C1T        | 26.63              | 2.92                         | 24.17                              | 3.34         | 0.00 350.7           |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 2.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -1.1      | 0.8       | -9.4                   | 8.1       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I |       |
|-----------|-------------------|-----------------------------|-------|
|           |                   | (-)                         | (+)   |
| INV.      | 90.8              | -73.2                       | 64.4  |
| OPER      | 151.3             | -121.9                      | 107.4 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -36.72                | 34.96 | -28.25   | 26.89 | -26.68               | 26.43 | -20.52   | 20.33 |
| OPER      | 5C1T      | -27.33                | 27.13 | -21.02   | 20.87 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.99       | 1.84       | HS 36.86     | 66.4                 |
| 5C1T   | 4.46       | 3.96       | 0.00         | 474.9                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 2.000

Dead Load Moment      Superimposed Dead Load Moment  
-4.5                      -40.0

| Rating Veh.<br>ber | Moment Capacity |              | Available Capacity for LL+I |           |
|--------------------|-----------------|--------------|-----------------------------|-----------|
|                    | top fiber       | bottom fiber | top fiber                   | bottom fi |
|                    | +bend           | -bend        | +bend                       | -bend     |
| bend               |                 |              |                             |           |
| INV.               | 149.9           | -185.4       | 149.9                       | -185.4    |
| 141.0              |                 |              |                             |           |
| OPER               | 279.4           | -279.4       | 279.4                       | -279.4    |
| 235.0              |                 |              |                             |           |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 16.76 R                 | 12.89           | 83.00                   | 0.0       | 12.38                   | 9.53            | 60.00                |        |
|           |            | -103.95 L               | -79.96          | 4.50                    | 0.0       | -95.84                  | -73.73          | 15.00                | 35.00  |
| OPER      | 5C1T       | 12.96 R                 | 9.97            | 285.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -76.72 L                | -59.02          | -94.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor |              | Load Capacity (tons) |              |
|-------------|---------------|--------------|----------------------|--------------|
|             | top fiber     | bottom fiber | top fiber            | bottom fiber |
|             | +bend         | -bend        | +bend                | -bend        |
| HS20        | 11.59         | 1.36         | 11.59                | 1.36         |
| 5C1T        | 25.00         | 3.06         | 25.00                | 3.06         |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 2.100

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 2.100

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.90 | 28.67 | 28.67 | 1.699 | 999999.000 | 95.159 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 29.65 |        | 104.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 2.100

Dead Load Superimposed Dead Load  
Moment Moment  
-2.6 -21.5

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 194.8                       | -146.7                | 175.6              | -165.9                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 324.7                       | -244.6                | 292.7              | -276.6                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 15.19 R      | 11.69              | 55.50  | 0.0                 | 21.49    | 16.53       | 27.50              |        |                |              |
|           |           | -67.93 R     | -52.25             | 34.00  | 0.0                 | -58.59   | -45.07      | 15.00              |        | 37.50          |              |
| OPER      | 5C1T      | 21.91 R      | 16.85              | 252.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -56.28 L     | -43.29             | -3.50  | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 9.06               | 2.16                         | 8.17                               | 2.44         | HS 43.20 77.8        |
| 5C1T        | 14.82              | 4.35                         | 13.36                              | 4.91         | 0.00 521.5           |

## SHEAR RATING REPORT

Rating Types and Vehicles  
 INV. OPER POST SPEC  
 Structure I. D. HAM500  
 Member I. D. S02  
 Check Point I. D. 2.100  
 HS20 5C1T

Dead Load Superimposed Dead Load  
 Shear (-) Shear (+) Shear  
 0.7 0.0 6.6

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -74.2                  | 65.4         |
| OPER      | 151.3             | -123.7                 | 109.1        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -2.99                 | 30.26 | -2.30    | 23.28 | -3.00                | 23.88 | -2.30    | 18.37 |
| OPER      | 5C1T      | -3.34                 | 24.05 | -2.57    | 18.50 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 24.77      | 2.16       | HS 43.25     | 77.9                 |
| 5C1T   | 37.08      | 4.54       | 0.00         | 544.3                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 2.100

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -2.6                | -21.5                            |

| Rating<br>Veh.<br>ber | Moment Capacity |              |           |           | Available Capacity for LL+I |           |           |           |
|-----------------------|-----------------|--------------|-----------|-----------|-----------------------------|-----------|-----------|-----------|
|                       | top fiber       | bottom fiber | top fiber | bottom fi | top fiber                   | bottom fi | top fiber | bottom fi |
|                       | +bend           | -bend        | +bend     | -bend     | +bend                       | -bend     | +bend     | -         |
| INV.                  | 158.0           | -177.3       | 158.0     | -177.3    | 182.1                       | -153.2    | 182.1     | -         |
| 153.2                 |                 |              |           |           |                             |           |           |           |
| OPER                  | 279.4           | -279.4       | 279.4     | -279.4    | 303.5                       | -255.3    | 303.5     | -         |
| 255.3                 |                 |              |           |           |                             |           |           |           |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Truck<br>Veh. | Live Load Moment<br>w/imp. | Loc. of Ax.<br>w/o imp. | Front<br>Wheel | Lane Dis. | Live Load Moment<br>w/imp. | Loc. of Conc.<br>w/o imp. | Load 1 | Load 2 |
|--------------|---------------|----------------------------|-------------------------|----------------|-----------|----------------------------|---------------------------|--------|--------|
| INV.         | HS20          | 15.19 R                    | 11.69                   | 55.50          | 0.0       | 21.49                      | 16.53                     | 27.50  |        |
|              |               | -67.93 R                   | -52.25                  | 34.00          | 0.0       | -58.59                     | -45.07                    | 15.00  | 37.50  |
| OPER         | 5C1T          | 21.91 R                    | 16.85                   | 252.50         | 0.0       | 0.00                       | 0.00                      | 0.00   |        |
|              |               | -56.28 L                   | -43.29                  | -3.50          | 0.0       | 0.00                       | 0.00                      | 0.00   | 0.00   |

## Serviceability

| Rating<br>Veh. | Rating    |              | Factor    |              | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|-----------|--------------|-----------|--------------|-----------------|----------------------------|
|                | top fiber | bottom fiber | top fiber | bottom fiber |                 |                            |
|                | +bend     | -bend        | +bend     | -bend        |                 |                            |
| HS20           | 8.47      | 2.26         | 8.47      | 2.26         | HS 45.10        | 81.2                       |
| 5C1T           | 13.85     | 4.54         | 13.85     | 4.54         | 0.00            | 544.4                      |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 2.200

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 2.200

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.90 | 28.67 | 28.67 | 1.699 | 999999.000 | 95.159 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 29.65 |        | 104.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 2.200

Dead Load Moment      Superimposed Dead Load Moment  
-1.0                      -6.9

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 185.2                       | -156.4                | 166.0              | -175.6                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 308.6                       | -260.7                | 276.6              | -292.7                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 58.49 R      | 45.00              | 58.00  | 0.0                 | 40.87    | 31.44       | 30.00              |        |                |              |
|           |           | -55.67 L     | -42.82             | -8.00  | 0.0                 | -37.45   | -28.81      | 15.00              |        | 47.50          |              |
| OPER      | 5C1T      | 46.46 R      | 35.74              | 255.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -44.88 L     | -34.52             | 3.00   | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------|-----------------------|--------------|----------------------|
| HS20        | 3.16               | 2.81                         | 2.84                         | 3.15                  | HS 56.20     | 101.2                |
| 5C1T        | 6.64               | 5.81                         | 5.95                         | 6.52                  | 0.00         | 697.1                |

## SHEAR RATING REPORT

Rating Types and Vehicles  
 INV. OPER POST SPEC  
 Structure I. D. HAM500  
 Member I. D. S02  
 Check Point I. D. 2.200  
 HS20 5C1T

Dead Load Superimposed Dead Load  
 Shear (-) Shear (+) Shear  
 0.5 0.0 5.1

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -73.2                  | 66.5                  |
| OPER      | 151.3             | -122.0                 | 110.8                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -2.99                 | 25.52 | -2.30    | 19.63 | -4.19                | 21.08 | -3.22    | 16.22 |
| OPER      | 5C1T      | -4.89                 | 20.74 | -3.76    | 15.96 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 17.46      | 2.60       | HS 52.08     | 93.7                 |
| 5C1T   | 24.93      | 5.34       | 0.00         | 640.8                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 2.200

Dead Load Moment      Superimposed Dead Load Moment  
-1.0                      -6.9

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 162.9      | 164.5           | -170.8 | 164.5        | -170.8 | 172.4                       | -162.9 | 172.4     | - |
| OPER 271.4      | 279.4           | -279.4 | 279.4        | -279.4 | 287.4                       | -271.4 | 287.4     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 58.49 R                 | 45.00                | 58.00       | 0.0       | 40.87                   | 31.44                  | 30.00  |        |
|           |            | -55.67 L                | -42.82               | -8.00       | 0.0       | -37.45                  | -28.81                 | 15.00  | 47.50  |
| OPER      | 5C1T       | 46.46 R                 | 35.74                | 255.00      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -44.88 L                | -34.52               | 3.00        | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 2.95            | 2.93            | 2.95               | 2.93               | HS 58.52     | 105.3                |
| 5C1T        | 6.18            | 6.05            | 6.18               | 6.05               | 0.00         | 725.8                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 2.300

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 2.300

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.90 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 95.159     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 29.65 |        | 104.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 2.300

Dead Load Moment 0.1  
Superimposed Dead Load Moment 3.9

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 178.0                       | -163.6             | 158.8           | -182.7             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 296.7                       | -272.6             | 264.7           | -304.6             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment  | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|---------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 85.73 R      | 65.95              | 60.50   | 0.0                 | 61.84    | 47.57       | 32.50              |        |                |              |
|           |           | -46.21 L     | -35.55             | -8.00   | 0.0                 | -32.60   | -25.07      | 15.00              |        | 0.00           |              |
| OPER      | 5C1T      | 68.20 R      | 52.46              | 135.50  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -40.61 L     | -31.24             | -121.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | bottom fiber -bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|--------|--------------|----------------------|
| HS20        | 2.08            | 3.54               | 1.85   | 37.05        | 66.7                 |
| 5C1T        | 4.35            | 6.71               | 3.88   | 0.00         | 465.8                |

## SHEAR RATING REPORT

Rating Types and Vehicles  
 INV. OPER POST SPEC  
 Structure I. D. HAM500  
 Member I. D. S02  
 Check Point I. D. 2.300  
 HS20 5C1T

Dead Load Superimposed Dead Load  
 Shear (-) Shear (+) Shear  
 0.4 0.0 3.5

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -72.2                  | 67.5                  |
| OPER      | 151.3             | -120.3                 | 112.5                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -4.35                 | 20.66 | -3.35    | 15.90 | -6.46                | 18.14 | -4.97    | 13.95 |
| OPER      | 5C1T      | -6.71                 | 17.47 | -5.16    | 13.44 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 11.18      | 3.27       | HS 65.31     | 117.6                |
| 5C1T   | 17.94      | 6.44       | 0.00         | 772.4                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 2.300Dead Load Moment 0.1  
Superimposed Dead Load Moment 3.9

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 170.0      | 169.2           | -166.1 | 169.2        | -166.1 | 165.3                       | -170.0 | 165.3     | - |
| OPER 283.3      | 279.4           | -279.4 | 279.4        | -279.4 | 275.5                       | -283.3 | 275.5     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 85.73 R                 | 65.95                | 60.50       | 0.0       | 61.84                   | 47.57                  | 32.50  |        |
|           |            | -46.21 L                | -35.55               | -8.00       | 0.0       | -32.60                  | -25.07                 | 15.00  | 0.00   |
| OPER      | 5C1T       | 68.20 R                 | 52.46                | 135.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -40.61 L                | -31.24               | -121.50     | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.93            | 3.68  | 1.93         | 3.68  | HS 38.56     | 69.4                 |
| 5C1T        | 4.04            | 6.98  | 4.04         | 6.98  | 0.00         | 484.7                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 2.400

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 127.0           | 127.0         | 127.0        | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 2.400

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.90 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 95.159     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 29.65 |        | 104.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 2.400

Dead Load Moment 0.8  
Superimposed Dead Load Moment 10.8

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 173.4                       | -168.2                | 154.2              | -187.3                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 289.0                       | -280.3                | 257.0              | -312.2                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment  | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|---------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 96.49 R      | 74.22              | 63.00   | 0.0                 | 74.80    | 57.54       | 35.00              |        |                |              |
|           |           | -36.75 L     | -28.27             | -8.00   | 0.0                 | -28.46   | -21.89      | 15.00              |        | 0.00           |              |
| OPER      | 5C1T      | 84.02 R      | 64.63              | 134.00  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -39.21 L     | -30.16             | -121.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 1.80               | 4.57                         | 1.60 5.10                          | HS 31.97     | 57.5                 |
| 5C1T        | 3.44               | 7.15                         | 3.06 7.96                          | 0.00         | 367.1                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 2.400

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.2       | 0.0          | 2.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -71.2                  | 68.5                  |
| OPER      | 151.3             | -118.6                 | 114.2                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -8.92                 | 16.99 | -6.86    | 13.07 | -9.03                | 15.15 | -6.94    | 11.65 |
| OPER      | 5C1T      | -8.75                 | 14.86 | -6.73    | 11.43 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 7.88       | 4.03       | HS 80.63     | 145.1                |
| 5C1T   | 13.55      | 7.68       | 0.00         | 921.6                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 2.400Dead Load Moment 0.8  
Superimposed Dead Load Moment 10.8

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 174.6      | 172.3           | -163.0 | 172.3        | -163.0 | 160.7                       | -174.6 | 160.7     | - |
| OPER 291.0      | 279.4           | -279.4 | 279.4        | -279.4 | 267.8                       | -291.0 | 267.8     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Live Load Moment w/o imp. | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-------------------------|---------------------------|-----------|-------------------------|----------------------|--------|
| INV.      | HS20       | 96.49 R                 | 74.22                   | 63.00                     | 0.0       | 74.80                   | 57.54                | 35.00  |
|           |            | -36.75 L                | -28.27                  | -8.00                     | 0.0       | -28.46                  | -21.89               | 15.00  |
| OPER      | 5C1T       | 84.02 R                 | 64.63                   | 134.00                    | 0.0       | 0.00                    | 0.00                 | 0.00   |
|           |            | -39.21 L                | -30.16                  | -121.50                   | 0.0       | 0.00                    | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.66            | 4.75            | 1.66               | 4.75               | HS 33.30     | 59.9                 |
| 5C1T        | 3.19            | 7.42            | 3.19               | 7.42               | 0.00         | 382.5                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 2.500

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |               |                      |               | Plastic Section Modulus - Z |
|----------------------|---------------|----------------------|---------------|-----------------------------|
| Positive Bending Top | Bending Bott. | Negative Bending Top | Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0         | 127.0                | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 2.500

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.80 | 28.67 | 28.67 | 1.699 | 999999.000 | 89.832 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 390.83 | 109.1                   |
| bott | 22.62            |                   | 9.40 |        | 107.5                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 2.500

Dead Load Moment 1.2  
Superimposed Dead Load Moment 13.9

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 171.4                       | -170.2             | 152.2           | -189.4             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 285.6                       | -283.7             | 253.6           | -315.7             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment  | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|---------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 94.36 L      | 72.58              | 23.50   | 0.0                 | 80.36    | 61.82       | 37.50              |        |                |              |
|           |           | -27.30 L     | -21.00             | -8.00   | 0.0                 | -24.32   | -18.71      | 15.00              |        | 0.00           |              |
| OPER      | 5C1T      | 87.72 R      | 67.48              | 136.50  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -37.81 L     | -29.08             | -121.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 1.82            | 6.24                      | 1.61                      | 6.94               | HS 32.25     | 58.1                 |
| 5C1T        | 3.26            | 7.50                      | 2.89                      | 8.35               | 0.00         | 346.9                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 2.500Dead Load Superimposed Dead Load  
Shear (-) Shear (+) Shear

0.1 0.0 0.5

Rat. Shear Capacity Available Capacity for LL+I  
Veh. VU (-) (+)INV. 90.8 -70.1 69.5  
OPER 151.3 -116.9 115.8

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |      |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |      |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)  |
| INV.      | HS20      | -13.08                | 13.29 | -10.06   | 10.22 | -11.82               | 12.21 | -9.09    | 9.39 |
| OPER      | 5C1T      | -10.98                | 12.29 | -8.45    | 9.46  | 0.00                 | 0.00  | 0.00     | 0.00 |

## Rating Shear

| Veh. | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
|------|------------|------------|--------------|----------------------|
| HS20 | 5.36       | 5.23       | HS 104.60    | 188.3                |
| 5C1T | 10.64      | 9.42       | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 2.500Dead Load Moment 1.2  
Superimposed Dead Load Moment 13.9

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 176.7      | 173.7           | -161.6 | 173.7        | -161.6 | 158.6                       | -176.7 | 158.6     | - |
| OPER 294.4      | 279.4           | -279.4 | 279.4        | -279.4 | 264.4                       | -294.4 | 264.4     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 94.36 L                 | 72.58           | 23.50                   | 0.0       | 80.36                   | 61.82           | 37.50                |        |
|           |            | -27.30 L                | -21.00          | -8.00                   | 0.0       | -24.32                  | -18.71          | 15.00                | 0.00   |
| OPER      | 5C1T       | 87.72 R                 | 67.48           | 136.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -37.81 L                | -29.08          | -121.50                 | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.68            | 6.47  | 1.68         | 6.47  | HS 33.62     | 60.5                 |
| 5C1T        | 3.01            | 7.79  | 3.01         | 7.79  | 0.00         | 361.6                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 2.600

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 2.600

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.80 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 89.832     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 390.83 | 109.1                   |
| bott | 22.62            |                   | 9.40 |        | 107.5                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 2.600

Dead Load Moment 1.1  
Superimposed Dead Load Moment 12.8

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 172.0                       | -169.5             | 152.8           | -188.7             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 286.7                       | -282.6             | 254.7           | -314.5             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment w/o imp. | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment w/o imp. | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|-----------------|---------------------|----------|-------------|--------------------|-----------------|----------------|--------------|
| INV.      | HS20      | 96.30 L      | 74.08              | 12.00           | 0.0                 | 76.22    | 58.63       | 40.00              |                 |                |              |
|           |           | -30.13 R     | -23.17             | 83.00           | 0.0                 | -26.61   | -20.47      | 60.00              | 0.00            |                |              |
| OPER      | 5C1T      | 84.08 L      | 64.68              | -98.00          | 0.0                 | 0.00     | 0.00        | 0.00               |                 |                |              |
|           |           | -36.44 R     | -28.03             | 109.50          | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00            | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 1.79            | 5.63                      | 1.59                      | 6.26               | HS 31.74     | 57.1                 |
| 5C1T        | 3.41            | 7.76                      | 3.03                      | 8.63               | 0.00         | 363.6                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 2.600

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| -0.1      | -1.2                   |
|           | 0.0                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 90.8              | -69.0                           | 70.6  |
| OPER      | 151.3             | -115.1                          | 117.7 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|-------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |       | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)   | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -16.75                | 9.12  | -12.88   | 7.02 | -14.76               | 9.40 | -11.35   | 7.23 |
| OPER      | 5C1T      | -13.49                | 10.04 | -10.38   | 7.72 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 4.12       | 7.51       | HS 82.45     | 148.4                |  |
| 5C1T   | 8.53       | 11.73      | 0.00         | 999.0                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 2.600Dead Load Moment 1.1  
Superimposed Dead Load Moment 12.8

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 176.0      | 173.2           | -162.1 | 173.2        | -162.1 | 159.3                       | -176.0 | 159.3     | - |
| OPER 293.3      | 279.4           | -279.4 | 279.4        | -279.4 | 265.5                       | -293.3 | 265.5     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 96.30 L                 | 74.08           | 12.00                   | 0.0       | 76.22                   | 58.63           | 40.00                |        |
|           |            | -30.13 R                | -23.17          | 83.00                   | 0.0       | -26.61                  | -20.47          | 60.00                | 0.00   |
| OPER      | 5C1T       | 84.08 L                 | 64.68           | -98.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -36.44 R                | -28.03          | 109.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.65            | 5.84  | 1.65         | 5.84  | HS 33.08     | 59.6                 |
| 5C1T        | 3.16            | 8.05  | 3.16         | 8.05  | 0.00         | 378.9                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 2.700

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 2.700

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.80 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 89.832     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 390.83 | 109.1                   |
| bott | 22.62            |                   | 9.40 |        | 107.5                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 2.700

Dead Load Moment 0.7  
Superimposed Dead Load Moment 7.8

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 175.3                       | -166.3             | 156.1           | -185.5             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 292.1                       | -277.2             | 260.1           | -309.2             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 86.17 L      | 66.29              | 14.50  | 0.0                 | 64.63    | 49.71       | 42.50              |        |                |              |
|           |           | -37.94 R     | -29.19             | 83.00  | 0.0                 | -30.08   | -23.14      | 60.00              | 0.00   |                |              |
| OPER      | 5C1T      | 73.27 L      | 56.36              | -95.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -38.42 R     | -29.55             | 158.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 2.03            | 4.38                      | 1.81         | 4.89               | HS 36.22     | 65.2                 |
| 5C1T        | 3.99            | 7.22                      | 3.55         | 8.05               | 0.00         | 426.0                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 2.700

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.2      | -2.7         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -68.0                  | 71.6         |
| OPER      | 151.3             | -113.4                 | 119.4        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -20.51                | 4.55 | -15.77   | 3.50 | -17.75               | 6.82 | -13.66   | 5.25 |
| OPER      | 5C1T      | -16.51                | 7.79 | -12.70   | 5.99 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 3.32       | 10.50      | HS 66.35     | 119.4                |  |
| 5C1T   | 6.87       | 15.32      | 0.00         | 824.3                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 2.700

Dead Load Moment 0.7  
Superimposed Dead Load Moment 7.8

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 172.8      | 171.1           | -164.2 | 171.1        | -164.2 | 162.5                       | -172.8 | 162.5     | - |
| OPER 287.9      | 279.4           | -279.4 | 279.4        | -279.4 | 270.9                       | -287.9 | 270.9     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 86.17 L                 | 66.29                | 14.50       | 0.0       | 64.63                   | 49.71                  | 42.50  |        |
|           |            | -37.94 R                | -29.19               | 83.00       | 0.0       | -30.08                  | -23.14                 | 60.00  | 0.00   |
| OPER      | 5C1T       | 73.27 L                 | 56.36                | -95.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -38.42 R                | -29.55               | 158.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.89            | 4.55  | 1.89         | 4.55  | HS 37.72     | 67.9                 |
| 5C1T        | 3.70            | 7.49  | 3.70         | 7.49  | 0.00         | 443.6                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 2.800

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |               |                      |               | Plastic Section Modulus - Z |
|----------------------|---------------|----------------------|---------------|-----------------------------|
| Positive Bending Top | Bending Bott. | Negative Bending Top | Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0         | 127.0                | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 2.800

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.80 | 28.67 | 28.67 | 1.699 | 999999.000 | 89.832 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 390.83 | 109.1                   |
| bott | 22.62            |                   | 9.40 |        | 107.5                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 2.800

Dead Load Moment      Superimposed Dead Load Moment  
-0.1                      -0.9

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 181.0                       | -160.6                | 161.8              | -179.8                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 301.7                       | -267.6                | 269.7              | -299.6                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 59.46 L      | 45.74              | 17.00  | 0.0                 | 45.30    | 34.84       | 45.00              |        |                |              |
|           |           | -45.76 R     | -35.20             | 83.00  | 0.0                 | -35.35   | -27.19      | 60.00              | 110.00 |                |              |
| OPER      | 5C1T      | 55.30 L      | 42.54              | -93.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -42.79 R     | -32.92             | 159.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 3.04               | 3.51                         | 2.72                               | 3.93         | 54.43                |
| 5C1T        | 5.45               | 6.25                         | 4.88                               | 7.00         | 0.00                 |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 2.800

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| -0.4      | -4.3                   |
|           | 0.0                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -67.0                  | 72.6         |
| OPER      | 151.3             | -111.7                 | 121.1        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -25.34                | 3.64 | -19.49   | 2.80 | -20.71               | 4.54 | -15.93   | 3.49 |
| OPER      | 5C1T      | -19.67                | 5.65 | -15.13   | 4.35 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 2.64       | 16.01      | HS 52.90     | 95.2                 |  |
| 5C1T   | 5.68       | 21.43      | 0.00         | 681.2                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 2.800

Dead Load Moment      Superimposed Dead Load Moment  
-0.1                      -0.9

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 167.0      | 167.2           | -168.1 | 167.2        | -168.1 | 168.3                       | -167.0 | 168.3     | - |
| OPER 278.4      | 279.4           | -279.4 | 279.4        | -279.4 | 280.4                       | -278.4 | 280.4     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 59.46 L                 | 45.74                | 17.00       | 0.0       | 45.30                   | 34.84                  | 45.00  |        |
|           |            | -45.76 R                | -35.20               | 83.00       | 0.0       | -35.35                  | -27.19                 | 60.00  | 110.00 |
| OPER      | 5C1T       | 55.30 L                 | 42.54                | -93.00      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -42.79 R                | -32.92               | 159.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 2.83            | 3.65            | 2.83               | 3.65               | HS 56.59     | 101.9                |
| 5C1T        | 5.07            | 6.51            | 5.07               | 6.51               | 0.00         | 608.6                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 2.900

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 2.900

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.80 | 28.67 | 28.67 | 1.699 | 999999.000 | 89.832 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 390.83 | 109.1                   |
| bott | 22.62            |                   | 9.40 |        | 107.5                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 2.900

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -1.3                | -13.5                            |

| Rating<br>Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|----------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|                | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.           | 180.4C             | -161.2                | 161.2              | -180.4C               | 189.3                       | -152.3                | 170.1              | -171.5                |
| OPER           | 300.6C             | -268.7                | 268.7              | -300.6C               | 315.5                       | -253.8                | 283.5              | -285.8                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Rat.<br>Veh. | Truck<br>w/imp. | Live Load<br>w/o imp. | Moment | Loc. of<br>Front<br>Wheel | Ax.<br>Dis. | Lane<br>w/imp. | Live Load<br>w/o imp. | Moment | Loc. of<br>Load 1 | Conc.<br>Load 2 |
|--------------|--------------|-----------------|-----------------------|--------|---------------------------|-------------|----------------|-----------------------|--------|-------------------|-----------------|
| INV.         | HS20         | 16.43           | L                     | 12.64  | 19.50                     | 0.0         | 25.46          | 19.58                 | 47.50  |                   |                 |
|              |              | -59.00          | L                     | -45.39 | 41.00                     | 0.0         | -53.33         | -41.03                | 60.00  | 37.50             |                 |
| OPER         | 5C1T         | 31.33           | L                     | 24.10  | -3.50                     | 0.0         | 0.00           | 0.00                  | 0.00   |                   |                 |
|              |              | -49.71          | R                     | -38.24 | 161.50                    | 0.0         | 0.00           | 0.00                  | 0.00   | 0.00              |                 |

## Moment

| Rating<br>Veh. | top fiber<br>+bend | Rating<br>bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------------|---------------------------------|-----------------|-----------------------|-----------------|----------------------------|
| HS20           | 7.44               | 2.58                            | 6.68            | 2.91                  | HS 51.62        | 92.9                       |
| 5C1T           | 10.07              | 5.11                            | 9.05            | 5.75                  | 0.00            | 612.6                      |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 2.900

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| -0.6      | -5.8                   |
|           | 0.0                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -66.0                  | 73.6         |
| OPER      | 151.3             | -110.0                 | 122.7        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -30.06                | 3.78 | -23.12   | 2.91 | -23.53               | 3.50 | -18.10   | 2.69 |
| OPER      | 5C1T      | -22.87                | 3.75 | -17.59   | 2.88 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 2.20       | 19.47      | HS 43.91     | 79.0                 |
| 5C1T   | 4.81       | 32.77      | 0.00         | 577.2                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 2.900

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -1.3                | -13.5                            |

| Rating<br>Veh.<br>ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                       | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend                  | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV.<br>158.7         | 161.7           | -173.6 | 161.7        | -173.6 | 176.6                       | -158.7 | 176.6     | - |
| OPER<br>264.5         | 279.4           | -279.4 | 279.4        | -279.4 | 294.3                       | -264.5 | 294.3     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Truck<br>Veh. | Live Load Moment<br>w/imp. | Loc. of Ax.<br>w/o imp. | Front<br>Wheel | Lane<br>Dis. | Live Load Moment<br>w/imp. | Loc. of Conc.<br>w/o imp. | Load 1 | Load 2 |
|--------------|---------------|----------------------------|-------------------------|----------------|--------------|----------------------------|---------------------------|--------|--------|
| INV.         | HS20          | 16.43 L                    | 12.64                   | 19.50          | 0.0          | 25.46                      | 19.58                     | 47.50  |        |
|              |               | -59.00 L                   | -45.39                  | 41.00          | 0.0          | -53.33                     | -41.03                    | 60.00  | 37.50  |
| OPER         | 5C1T          | 31.33 L                    | 24.10                   | -3.50          | 0.0          | 0.00                       | 0.00                      | 0.00   |        |
|              |               | -49.71 R                   | -38.24                  | 161.50         | 0.0          | 0.00                       | 0.00                      | 0.00   | 0.00   |

## Serviceability

| Rating<br>Veh. | Rating       |                | Factor          |                | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------|----------------|-----------------|----------------|-----------------|----------------------------|
|                | top<br>+bend | fiber<br>-bend | bottom<br>+bend | fiber<br>-bend |                 |                            |
| HS20           | 6.93         | 2.69           | 6.93            | 2.69           | HS 53.80        | 96.8                       |
| 5C1T           | 9.39         | 5.32           | 9.39            | 5.32           | 0.00            | 638.5                      |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 3.000

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 3.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.80 | 28.67 | 28.67 | 1.699 | 999999.000 | 89.832 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 390.83 | 109.1                   |
| bott | 22.62            |                   | 9.40 |        | 107.5                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 3.000

Dead Load Superimposed Dead Load  
Moment Moment  
-2.9 -30.0

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 200.1                       | -141.4                | 181.0              | -160.6                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 333.6                       | -235.7                | 301.6              | -267.7                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment  | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|---------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 19.98 L      | 15.37              | -8.00   | 0.0                 | 17.84    | 13.72       | 15.00              |        |                |              |
|           |           | -98.43 L     | -75.72             | 29.50   | 0.0                 | -89.21   | -68.63      | 60.00              |        | 40.00          |              |
| OPER      | 5C1T      | 15.39 L      | 11.84              | -208.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -61.54 L     | -47.34             | -69.00  | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 10.02              | 1.44                         | 9.06                               | 1.63         | HS 28.74 51.7        |
| 5C1T        | 21.67              | 3.83                         | 19.60                              | 4.35         | 0.00 459.7           |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 3.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.6      | -0.7      | -5.8                   | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 90.8              | -65.0                           | 64.8  |
| OPER      | 151.3             | -108.3                          | 108.0 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -30.06                | 34.53 | -23.12   | 26.56 | -23.53               | 26.28 | -18.10   | 20.22 |
| OPER      | 5C1T      | -22.87                | 26.22 | -17.59   | 20.17 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.88       | 1.88       | HS 37.52     | 67.5                 |
| 5C1T   | 4.18       | 4.12       | 0.00         | 494.1                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 3.000

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -2.9                | -30.0                            |

| Rating<br>Veh.<br>ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                       | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend                  | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV.<br>147.9         | 154.5           | -180.8 | 154.5        | -180.8 | 187.4                       | -147.9 | 187.4     | - |
| OPER<br>246.5         | 279.4           | -279.4 | 279.4        | -279.4 | 312.3                       | -246.5 | 312.3     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Truck<br>Veh. | Live Load Moment<br>w/imp. | Moment<br>w/o imp. | Loc. of Ax.<br>Front<br>Wheel | Lane<br>Dis. | Live Load Moment<br>w/imp. | Moment<br>w/o imp. | Loc. of Conc.<br>Load 1 | Load 2 |
|--------------|---------------|----------------------------|--------------------|-------------------------------|--------------|----------------------------|--------------------|-------------------------|--------|
| INV.         | HS20          | 19.98 L                    | 15.37              | -8.00                         | 0.0          | 17.84                      | 13.72              | 15.00                   |        |
|              |               | -98.43 L                   | -75.72             | 29.50                         | 0.0          | -89.21                     | -68.63             | 60.00                   | 40.00  |
| OPER         | 5C1T          | 15.39 L                    | 11.84              | -208.50                       | 0.0          | 0.00                       | 0.00               | 0.00                    |        |
|              |               | -61.54 L                   | -47.34             | -69.00                        | 0.0          | 0.00                       | 0.00               | 0.00                    | 0.00   |

## Serviceability

| Rating<br>Veh. | Rating       |                | Factor          |                | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------|----------------|-----------------|----------------|-----------------|----------------------------|
|                | top<br>+bend | fiber<br>-bend | bottom<br>+bend | fiber<br>-bend |                 |                            |
| HS20           | 9.38         | 1.50           | 9.38            | 1.50           | HS 30.05        | 54.1                       |
| 5C1T           | 20.30        | 4.01           | 20.30           | 4.01           | 0.00            | 480.6                      |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 3.000

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 3.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.79 | 28.67 | 28.67 | 1.699 | 999999.000 | 89.700 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 390.83 | 109.1                   |
| bott | 22.62            |                   | 9.40 |        | 107.5                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 3.000

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -2.9                | -30.0                            |

| Rating<br>Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|----------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|                | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.           | 180.4C             | -161.2                | 161.2              | -180.4C               | 200.1                       | -141.4                | 181.0              | -160.6                |
| OPER           | 300.6C             | -268.7                | 268.7              | -300.6C               | 333.6                       | -235.7                | 301.6              | -267.7                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Rat.<br>Veh. | Truck<br>w/imp. | Live Load<br>w/o imp. | Moment<br>w/o imp. | Loc. of<br>Front<br>Wheel | Ax.<br>Dis. | Lane<br>w/imp. | Live Load<br>w/o imp. | Moment<br>w/o imp. | Loc. of<br>Load 1 | Conc.<br>Load 2 |
|--------------|--------------|-----------------|-----------------------|--------------------|---------------------------|-------------|----------------|-----------------------|--------------------|-------------------|-----------------|
| INV.         | HS20         | 19.98 L         | 15.37                 | -8.00              | 0.0                       | 17.84       | 13.72          | 15.00                 |                    |                   |                 |
|              |              | -98.43 L        | -75.72                | 29.50              | 0.0                       | -89.21      | -68.63         | 60.00                 | 40.00              |                   |                 |
| OPER         | 5C1T         | 15.39 L         | 11.84                 | -208.50            | 0.0                       | 0.00        | 0.00           | 0.00                  |                    |                   |                 |
|              |              | -61.54 L        | -47.34                | -69.00             | 0.0                       | 0.00        | 0.00           | 0.00                  | 0.00               |                   |                 |

## Moment

| Rating<br>Veh. | Rating Factor      |                       |                    |                       | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------------|-----------------------|--------------------|-----------------------|-----------------|----------------------------|
|                | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |                 |                            |
| HS20           | 10.02              | 1.44                  | 9.06               | 1.63                  | HS 28.74        | 51.7                       |
| 5C1T           | 21.67              | 3.83                  | 19.60              | 4.35                  | 0.00            | 459.7                      |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 3.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.7      | 0.8       | -7.3                   | 7.7       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I |       |
|-----------|-------------------|-----------------------------|-------|
|           |                   | (-)                         | (+)   |
| INV.      | 90.8              | -65.0                       | 64.8  |
| OPER      | 151.3             | -108.3                      | 108.0 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -34.48                | 34.53 | -26.52   | 26.56 | -26.11               | 26.28 | -20.08   | 20.22 |
| OPER      | 5C1T      | -25.93                | 26.22 | -19.95   | 20.17 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.88       | 1.88       | HS 37.52     | 67.5                 |
| 5C1T   | 4.18       | 4.12       | 0.00         | 494.1                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 3.000

Dead Load Moment      Superimposed Dead Load Moment  
-2.9                      -30.0

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 147.9      | 154.5           | -180.8 | 154.5        | -180.8 | 187.4                       | -147.9 | 187.4     | - |
| OPER 246.5      | 279.4           | -279.4 | 279.4        | -279.4 | 312.3                       | -246.5 | 312.3     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 19.98 L                 | 15.37                | -8.00       | 0.0       | 17.84                   | 13.72                  | 15.00  |        |
|           |            | -98.43 L                | -75.72               | 29.50       | 0.0       | -89.21                  | -68.63                 | 60.00  | 40.00  |
| OPER      | 5C1T       | 15.39 L                 | 11.84                | -208.50     | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -61.54 L                | -47.34               | -69.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 9.38            | 1.50  | 9.38         | 1.50  | HS 30.05     | 54.1                 |
| 5C1T        | 20.30           | 4.01  | 20.30        | 4.01  | 0.00         | 480.6                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 3.100

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 3.100

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.79 | 28.67 | 28.67 | 1.699 | 999999.000 | 89.700 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 390.83 | 109.1                   |
| bott | 22.62            |                   | 9.40 |        | 107.5                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 3.100

Dead Load Moment      Superimposed Dead Load Moment  
-1.2                      -12.8

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 188.8                       | -152.8                | 169.6              | -172.0                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 314.7                       | -254.6                | 282.7              | -286.6                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.13 R      | 12.41              | 80.50  | 0.0                 | 25.97    | 19.97       | 52.50              |        |                |              |
|           |           | -58.69 R     | -45.15             | 59.00  | 0.0                 | -52.89   | -40.68      | 40.00              | 62.50  |                |              |
| OPER      | 5C1T      | 30.53 R      | 23.48              | 190.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -47.24 L     | -36.34             | 25.50  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 7.27               | 2.60                         | 6.53                               | 2.93         | HS 52.06 93.7        |
| 5C1T        | 10.31              | 5.39                         | 9.26                               | 6.07         | 0.00 646.8           |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 3.100

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.6       | 0.0          | 6.1       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -73.9                  | 65.8         |
| OPER      | 151.3             | -123.1                 | 109.7        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -2.98                 | 30.12 | -2.29    | 23.17 | -3.23                | 23.71 | -2.48    | 18.24 |
| OPER      | 5C1T      | -3.64                 | 23.40 | -2.80    | 18.00 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 22.88      | 2.18       | HS 43.69     | 78.6                 |
| 5C1T   | 33.86      | 4.69       | 0.00         | 562.4                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 3.100

Dead Load Moment      Superimposed Dead Load Moment  
-1.2                      -12.8

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 159.2      | 162.0           | -173.3 | 162.0        | -173.3 | 176.1                       | -159.2 | 176.1     | - |
| OPER 265.4      | 279.4           | -279.4 | 279.4        | -279.4 | 293.4                       | -265.4 | 293.4     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 16.13 R                 | 12.41                | 80.50       | 0.0       | 25.97                   | 19.97                  | 52.50  |        |
|           |            | -58.69 R                | -45.15               | 59.00       | 0.0       | -52.89                  | -40.68                 | 40.00  | 62.50  |
| OPER      | 5C1T       | 30.53 R                 | 23.48                | 190.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -47.24 L                | -36.34               | 25.50       | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 6.78            | 2.71  | 6.78         | 2.71  | HS 54.26     | 97.7                 |
| 5C1T        | 9.61            | 5.62  | 9.61         | 5.62  | 0.00         | 674.1                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 3.200

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 127.0           | 127.0         | 127.0        | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 3.200

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.79 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 89.700     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 390.83 | 109.1                   |
| bott | 22.62            |                   | 9.40 |        | 107.5                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 3.200

Dead Load Moment 0.1  
Superimposed Dead Load Moment 0.5

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 180.0                       | -161.6             | 160.8           | -180.8             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 300.0                       | -269.3             | 268.0           | -301.3             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 59.37 R      | 45.67              | 83.00  | 0.0                 | 44.98    | 34.60       | 55.00              |        |                |              |
|           |           | -45.31 L     | -34.85             | 17.00  | 0.0                 | -33.04   | -25.42      | 40.00              | 72.50  |                |              |
| OPER      | 5C1T      | 56.26 R      | 43.27              | 193.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -40.12 L     | -30.86             | 28.00  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 3.03            | 3.57                      | 2.71         | 3.99               | HS 54.18     | 97.5                 |
| 5C1T        | 5.33            | 6.71                      | 4.76         | 7.51               | 0.00         | 571.7                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 3.200

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| 0.5       | 0.0                    |
|           | 4.6                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -72.8                  | 66.8         |
| OPER      | 151.3             | -121.4                 | 111.4        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -2.98                 | 25.40 | -2.29    | 19.54 | -4.47                | 20.91 | -3.44    | 16.08 |
| OPER      | 5C1T      | -5.32                 | 20.31 | -4.09    | 15.63 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 16.30      | 2.63       | HS 52.61     | 94.7                 |
| 5C1T   | 22.84      | 5.48       | 0.00         | 657.8                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 3.200Dead Load Moment 0.1  
Superimposed Dead Load Moment 0.5

| Rating Veh. ber | Moment Capacity top fiber |        | bottom fiber |        | Available Capacity for LL+I |        |       |   |
|-----------------|---------------------------|--------|--------------|--------|-----------------------------|--------|-------|---|
|                 | +bend                     | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend | - |
| INV. 168.0      | 167.9                     | -167.4 | 167.9        | -167.4 | 167.3                       | -168.0 | 167.3 | - |
| OPER 280.0      | 279.4                     | -279.4 | 279.4        | -279.4 | 278.8                       | -280.0 | 278.8 | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 59.37 R                 | 45.67           | 83.00                   | 0.0       | 44.98                   | 34.60           | 55.00                |        |
|           |            | -45.31 L                | -34.85          | 17.00                   | 0.0       | -33.04                  | -25.42          | 40.00                | 72.50  |
| OPER      | 5C1T       | 56.26 R                 | 43.27           | 193.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -40.12 L                | -30.86          | 28.00                   | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor top fiber |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-------------------------|-------|--------------|-------|--------------|----------------------|
|             | +bend                   | -bend | +bend        | -bend |              |                      |
| HS20        | 2.82                    | 3.71  | 2.82         | 3.71  | HS 56.35     | 101.4                |
| 5C1T        | 4.95                    | 6.98  | 4.95         | 6.98  | 0.00         | 594.6                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 3.300

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |               |                      |               | Plastic Section Modulus - Z |
|----------------------|---------------|----------------------|---------------|-----------------------------|
| Positive Bending Top | Bending Bott. | Negative Bending Top | Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0         | 127.0                | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 3.300

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.79 | 28.67 | 28.67 | 1.699 | 999999.000 | 89.700 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 390.83 | 109.1                   |
| bott | 22.62            |                   | 9.40 |        | 107.5                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 3.300

Dead Load Moment      Superimposed Dead Load Moment  
1.0                      10.0

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 173.7                       | -167.8                | 154.5              | -187.0                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 289.6                       | -279.7                | 257.6              | -311.7                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment  | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|---------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 86.43 R      | 66.48              | 85.50   | 0.0                 | 65.39    | 50.30       | 57.50              |        |                |              |
|           |           | -37.61 L     | -28.93             | 17.00   | 0.0                 | -29.08   | -22.37      | 40.00              |        | 0.00           |              |
| OPER      | 5C1T      | 76.13 R      | 58.56              | 108.50  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -36.19 L     | -27.84             | -145.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 2.01               | 4.46                         | 1.79                               | 4.97         | HS 35.76             |
| 5C1T        | 3.80               | 7.73                         | 3.38                               | 8.61         | 0.00 406.0           |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 3.300

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear     | (-) Shear (+) Shear    |
| 0.3       | 0.0 3.0                |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 90.8              | -71.8                           | 67.8  |
| OPER      | 151.3             | -119.7                          | 113.0 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -4.41                 | 20.57 | -3.39    | 15.82 | -6.74                | 17.96 | -5.19    | 13.81 |
| OPER      | 5C1T      | -7.28                 | 17.15 | -5.60    | 13.19 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 10.65      | 3.30       | HS 65.94     | 118.7                |
| 5C1T   | 16.44      | 6.59       | 0.00         | 791.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
 INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
 Check Point I. D. 3.300

Dead Load Moment      Superimposed Dead Load Moment  
 1.0                      10.0

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 174.3      | 172.1           | -163.2 | 172.1        | -163.2 | 161.0                       | -174.3 | 161.0     | - |
| OPER 290.5      | 279.4           | -279.4 | 279.4        | -279.4 | 268.3                       | -290.5 | 268.3     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 86.43 R                 | 66.48                | 85.50       | 0.0       | 65.39                   | 50.30                  | 57.50  |        |
|           |            | -37.61 L                | -28.93               | 17.00       | 0.0       | -29.08                  | -22.37                 | 40.00  | 0.00   |
| OPER      | 5C1T       | 76.13 R                 | 58.56                | 108.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -36.19 L                | -27.84               | -145.00     | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.86            | 4.63  | 1.86         | 4.63  | HS 37.26     | 67.1                 |
| 5C1T        | 3.52            | 8.02  | 3.52         | 8.02  | 0.00         | 422.9                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 3.400

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 127.0           | 127.0         | 127.0        | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 3.400

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.79 | 28.67 | 28.67 | 1.699 | 999999.000 | 89.700 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 390.83 | 109.1                   |
| bott | 22.62            |                   | 9.40 |        | 107.5                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 3.400

Dead Load Moment 1.6  
Superimposed Dead Load Moment 15.7

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 170.0                       | -171.6             | 150.8           | -190.8             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 283.4                       | -285.9             | 251.4           | -317.9             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment  | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|---------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 96.97 R      | 74.59              | 88.00   | 0.0                 | 77.63    | 59.72       | 60.00              |        |                |              |
|           |           | -29.91 L     | -23.01             | 17.00   | 0.0                 | -25.66   | -19.74      | 40.00              |        | 0.00           |              |
| OPER      | 5C1T      | 88.02 R      | 67.71              | 111.00  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -33.75 L     | -25.96             | -143.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 1.75            | 5.74                      | 1.55         | 6.38               | HS 31.11     | 56.0                 |
| 5C1T        | 3.22            | 8.47                      | 2.86         | 9.42               | 0.00         | 342.7                |

## SHEAR RATING REPORT

Rating Types and Vehicles  
 INV. OPER POST SPEC  
 Structure I. D. HAM500  
 Member I. D. S02  
 Check Point I. D. 3.400  
 HS20 5C1T

Dead Load Superimposed Dead Load  
 Shear (-) Shear (+) Shear  
 0.1 0.0 1.5

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -70.8                  | 68.8                  |
| OPER      | 151.3             | -118.0                 | 114.7                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -8.97                 | 16.78 | -6.90    | 12.90 | -9.31                | 14.97 | -7.17    | 11.51 |
| OPER      | 5C1T      | -9.47                 | 14.06 | -7.28    | 10.81 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 7.60       | 4.10       | HS 82.08     | 147.7                |
| 5C1T   | 12.46      | 8.16       | 0.00         | 979.4                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 3.400Dead Load Moment 1.6  
Superimposed Dead Load Moment 15.7

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 178.0      | 174.6           | -160.7 | 174.6        | -160.7 | 157.3                       | -178.0 | 157.3     | - |
| OPER 296.7      | 279.4           | -279.4 | 279.4        | -279.4 | 262.1                       | -296.7 | 262.1     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 96.97 R                 | 74.59           | 88.00                   | 0.0       | 77.63                   | 59.72           | 60.00                |        |
|           |            | -29.91 L                | -23.01          | 17.00                   | 0.0       | -25.66                  | -19.74          | 40.00                | 0.00   |
| OPER      | 5C1T       | 88.02 R                 | 67.71           | 111.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -33.75 L                | -25.96          | -143.50                 | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.62            | 5.95            | 1.62               | 5.95               | HS 32.44     | 58.4                 |
| 5C1T        | 2.98            | 8.79            | 2.98               | 8.79               | 0.00         | 357.3                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 3.500

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |               |                      |               | Plastic Section Modulus - Z |
|----------------------|---------------|----------------------|---------------|-----------------------------|
| Positive Bending Top | Bending Bott. | Negative Bending Top | Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0         | 127.0                | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 3.500

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.79 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 89.700     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 19.26 |        | 105.8                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 3.500

Dead Load Moment 1.7  
Superimposed Dead Load Moment 17.5

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 168.8                       | -172.7             | 149.6           | -191.9             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 281.4                       | -287.9             | 249.4           | -319.9             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment  | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|---------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 94.67 R      | 72.82              | 76.50   | 0.0                 | 82.45    | 63.42       | 62.50              |        |                |              |
|           |           | -22.43 R     | -17.25             | 108.00  | 0.0                 | -22.28   | -17.14      | 85.00              | 0.00   |                |              |
| OPER      | 5C1T      | 90.81 L      | 69.86              | -123.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -33.69 R     | -25.92             | 134.50  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 1.78            | 7.70                      | 1.58         | 8.56               | HS 31.61     | 56.9                 |
| 5C1T        | 3.10            | 8.55                      | 2.75         | 9.49               | 0.00         | 329.6                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 3.500

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| 0.0       | -0.1                   |
|           | 0.1                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -69.8                  | 69.9                  |
| OPER      | 151.3             | -116.3                 | 116.4                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |      |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |      |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)  |
| INV.      | HS20      | -13.12                | 13.12 | -10.09   | 10.09 | -12.11               | 12.03 | -9.32    | 9.26 |
| OPER      | 5C1T      | -11.77                | 11.58 | -9.05    | 8.91  | 0.00                 | 0.00  | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 5.32       | 5.32       | HS 106.37    | 191.5                |
| 5C1T   | 9.88       | 10.06      | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 3.500Dead Load Moment 1.7  
Superimposed Dead Load Moment 17.5

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 179.2      | 175.3           | -159.9 | 175.3        | -159.9 | 156.1                       | -179.2 | 156.1     | - |
| OPER 298.6      | 279.4           | -279.4 | 279.4        | -279.4 | 260.2                       | -298.6 | 260.2     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 94.67 R                 | 72.82           | 76.50                   | 0.0       | 82.45                   | 63.42           | 62.50                |        |
|           |            | -22.43 R                | -17.25          | 108.00                  | 0.0       | -22.28                  | -17.14          | 85.00                | 0.00   |
| OPER      | 5C1T       | 90.81 L                 | 69.86           | -123.50                 | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -33.69 R                | -25.92          | 134.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.65            | 7.99            | 1.65               | 7.99               | HS 32.98     | 59.4                 |
| 5C1T        | 2.87            | 8.86            | 2.87               | 8.86               | 0.00         | 343.8                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 3.600

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 3.600

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.84 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 92.114     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 19.26 |        | 105.8                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 3.600

Dead Load Moment 1.5  
Superimposed Dead Load Moment 15.2

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 170.4                       | -171.2                | 151.2              | -190.4                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 284.0                       | -285.3                | 252.0              | -317.3                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment  | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|---------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 97.00 L      | 74.62              | 37.00   | 0.0                 | 77.56    | 59.66       | 65.00              |        |                |              |
|           |           | -30.20 R     | -23.23             | 108.00  | 0.0                 | -26.05   | -20.04      | 85.00              | 0.00   |                |              |
| OPER      | 5C1T      | 87.63 L      | 67.41              | -121.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -35.29 R     | -27.15             | 268.50  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|--------|--------------|----------------------|
| HS20        | 1.76               | 5.67                         | 1.56   | 31.17        | 56.1                 |
| 5C1T        | 3.24               | 8.09                         | 2.88   | 0.00         | 345.1                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 3.600

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.2      | -1.7         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -68.7                  | 71.0         |
| OPER      | 151.3             | -114.5                 | 118.3        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -16.78                | 8.97 | -12.91   | 6.90 | -15.05               | 9.24 | -11.57   | 7.11 |
| OPER      | 5C1T      | -14.26                | 9.27 | -10.97   | 7.13 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 4.09       | 7.68       | HS 81.89     | 147.4                |  |
| 5C1T   | 8.03       | 12.76      | 0.00         | 963.7                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 3.600

Dead Load Moment 1.5  
Superimposed Dead Load Moment 15.2

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 177.6      | 174.3           | -161.0 | 174.3        | -161.0 | 157.6                       | -177.6 | 157.6     | - |
| OPER 296.1      | 279.4           | -279.4 | 279.4        | -279.4 | 262.7                       | -296.1 | 262.7     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 97.00 L                 | 74.62                | 37.00       | 0.0       | 77.56                   | 59.66                  | 65.00  |        |
|           |            | -30.20 R                | -23.23               | 108.00      | 0.0       | -26.05                  | -20.04                 | 85.00  | 0.00   |
| OPER      | 5C1T       | 87.63 L                 | 67.41                | -121.00     | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -35.29 R                | -27.15               | 268.50      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.62            | 5.88  | 1.62         | 5.88  | HS 32.50     | 58.5                 |
| 5C1T        | 3.00            | 8.39  | 3.00         | 8.39  | 0.00         | 359.8                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 3.700

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus  |                  |       |       | Plastic Section |
|------------------|------------------|-------|-------|-----------------|
| Positive Bending | Negative Bending |       |       | Modulus - Z     |
| Top              | Bott.            | Top   | Bott. | (Fy * Z)        |
| 127.0            | 127.0            | 127.0 | 127.0 | 390.83          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 3.700

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.84 | 28.67 | 28.67 | 1.699 | 999999.000 | 92.114 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 19.26 |        | 105.8                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 3.700

Dead Load Moment 0.9  
Superimposed Dead Load Moment 9.0

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 174.5                       | -167.1             | 155.3           | -186.3             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 290.8                       | -278.5             | 258.8           | -310.5             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 86.47 L      | 66.52              | 39.50  | 0.0                 | 65.25    | 50.19       | 67.50              |        |                |              |
|           |           | -37.98 R     | -29.21             | 108.00 | 0.0                 | -29.81   | -22.93      | 85.00              | 0.00   |                |              |
| OPER      | 5C1T      | 74.93 L      | 57.64              | -70.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -38.35 R     | -29.50             | 270.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 2.02            | 4.40                      | 1.80                      | 4.91               | HS 35.92     | 64.6                 |
| 5C1T        | 3.88            | 7.26                      | 3.45                      | 8.10               | 0.00         | 414.5                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 3.700

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.3      | -3.2         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -67.7                  | 72.0         |
| OPER      | 151.3             | -112.8                 | 119.9        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -20.56                | 4.42 | -15.82   | 3.40 | -18.03               | 6.66 | -13.87   | 5.13 |
| OPER      | 5C1T      | -17.32                | 7.09 | -13.33   | 5.45 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 3.29       | 10.80      | HS 65.82     | 118.5                |  |
| 5C1T   | 6.51       | 16.92      | 0.00         | 781.3                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 3.700Dead Load Moment 0.9  
Superimposed Dead Load Moment 9.0

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 173.5      | 171.6           | -163.7 | 171.6        | -163.7 | 161.7                       | -173.5 | 161.7     | - |
| OPER 289.2      | 279.4           | -279.4 | 279.4        | -279.4 | 269.6                       | -289.2 | 269.6     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 86.47 L                 | 66.52                | 39.50       | 0.0       | 65.25                   | 50.19                  | 67.50  |        |
|           |            | -37.98 R                | -29.21               | 108.00      | 0.0       | -29.81                  | -22.93                 | 85.00  | 0.00   |
| OPER      | 5C1T       | 74.93 L                 | 57.64                | -70.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -38.35 R                | -29.50               | 270.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.87            | 4.57            | 1.87               | 4.57               | HS 37.41     | 67.3                 |
| 5C1T        | 3.60            | 7.54            | 3.60               | 7.54               | 0.00         | 431.7                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 3.800

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus  |                  |       |       | Plastic Section |
|------------------|------------------|-------|-------|-----------------|
| Positive Bending | Negative Bending |       |       | Modulus - Z     |
| Top              | Bott.            | Top   | Bott. | (Fy * Z)        |
| 127.0            | 127.0            | 127.0 | 127.0 | 390.83          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 3.800

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.84 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 92.114     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 19.26 |        | 105.8                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 3.800

Dead Load Moment      Superimposed Dead Load Moment  
-0.1                      -1.1

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 181.1                       | -160.5                | 161.9              | -179.7                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 301.9                       | -267.4                | 269.9              | -299.4                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 59.43 L      | 45.72              | 42.00  | 0.0                 | 45.25    | 34.81       | 70.00              |        |                |              |
|           |           | -45.75 R     | -35.19             | 108.00 | 0.0                 | -35.42   | -27.25      | 85.00              | 135.00 |                |              |
| OPER      | 5C1T      | 55.09 L      | 42.38              | -68.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -42.86 R     | -32.97             | 184.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 3.05               | 3.51                         | 2.72            | 3.93                  | HS 54.49     | 98.1                 |
| 5C1T        | 5.48               | 6.24                         | 4.90            | 6.99                  | 0.00         | 587.9                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 3.800

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| -0.5      | -4.8                   |
|           | 0.0                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -66.7                  | 73.0                  |
| OPER      | 151.3             | -111.1                 | 121.6                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -25.39                | 2.94 | -19.53   | 2.26 | -20.98               | 4.39 | -16.14   | 3.38 |
| OPER      | 5C1T      | -20.48                | 5.11 | -15.75   | 3.93 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |                      |
|--------|------------|------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value         |
| HS20   | 2.62       | 16.63      | 52.50                |
| 5C1T   | 5.43       | 23.79      | 0.00                 |
|        |            |            | Load Capacity (tons) |
|        |            |            | 94.5                 |
|        |            |            | 651.1                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 3.800

Dead Load Moment Superimposed Dead Load Moment

-0.1 -1.1

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 166.9      | 167.2           | -168.1 | 167.2        | -168.1 | 168.4                       | -166.9 | 168.4     | - |
| OPER 278.2      | 279.4           | -279.4 | 279.4        | -279.4 | 280.6                       | -278.2 | 280.6     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 59.43 L                 | 45.72                | 42.00       | 0.0       | 45.25                   | 34.81                  | 70.00  |        |
|           |            | -45.75 R                | -35.19               | 108.00      | 0.0       | -35.42                  | -27.25                 | 85.00  | 135.00 |
| OPER      | 5C1T       | 55.09 L                 | 42.38                | -68.00      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -42.86 R                | -32.97               | 184.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 2.83            | 3.65            | 2.83               | 3.65               | HS 56.66     | 102.0                |
| 5C1T        | 5.09            | 6.49            | 5.09               | 6.49               | 0.00         | 611.3                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 3.900

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |               |                      |               | Plastic Section Modulus - Z |
|----------------------|---------------|----------------------|---------------|-----------------------------|
| Positive Bending Top | Bending Bott. | Negative Bending Top | Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0         | 127.0                | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 3.900

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.84 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 92.114     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 19.26 |        | 105.8                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 3.900

Dead Load Superimposed Dead Load  
Moment Moment  
-1.5 -15.0

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 190.3                       | -151.3                | 171.1              | -170.5                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 317.1                       | -252.2                | 285.2              | -284.1                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.21 L      | 12.47              | 44.50  | 0.0                 | 25.07    | 19.29       | 72.50              |        |                |              |
|           |           | -58.98 L     | -45.37             | 66.00  | 0.0                 | -54.10   | -41.62      | 85.00              |        | 62.50          |              |
| OPER      | 5C1T      | 29.53 L      | 22.72              | 21.50  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -50.55 R     | -38.88             | 186.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 7.59               | 2.57                         | 6.82            | 2.89                  | HS 51.30     | 92.3                 |
| 5C1T        | 10.74              | 4.99                         | 9.65            | 5.62                  | 0.00         | 598.6                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 3.900

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.6      | -6.3         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -65.6                  | 74.0         |
| OPER      | 151.3             | -109.4                 | 123.3        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -30.11                | 3.08 | -23.16   | 2.37 | -23.79               | 3.13 | -18.30   | 2.41 |
| OPER      | 5C1T      | -23.57                | 3.40 | -18.13   | 2.61 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 2.18       | 23.61      | HS 43.60     | 78.5                 |
| 5C1T   | 4.64       | 36.31      | 0.00         | 557.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 3.900

Dead Load Moment      Superimposed Dead Load Moment  
-1.5                      -15.0

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 157.7      | 161.0           | -174.2 | 161.0        | -174.2 | 177.5                       | -157.7 | 177.5     | - |
| OPER 262.9      | 279.4           | -279.4 | 279.4        | -279.4 | 295.9                       | -262.9 | 295.9     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 16.21 L                 | 12.47                | 44.50       | 0.0       | 25.07                   | 19.29                  | 72.50  |        |
|           |            | -58.98 L                | -45.37               | 66.00       | 0.0       | -54.10                  | -41.62                 | 85.00  | 62.50  |
| OPER      | 5C1T       | 29.53 L                 | 22.72                | 21.50       | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -50.55 R                | -38.88               | 186.50      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 7.08            | 2.67  | 7.08         | 2.67  | HS 53.49     | 96.3                 |
| 5C1T        | 10.02           | 5.20  | 10.02        | 5.20  | 0.00         | 624.1                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 4.000

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 4.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.84 | 28.67 | 28.67 | 1.699 | 999999.000 | 92.114 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 19.26 |        | 105.8                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 4.000

Dead Load Superimposed Dead Load  
Moment Moment  
-3.3 -32.7

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 202.0                       | -139.6                | 182.8              | -158.8                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 336.7                       | -232.6                | 304.7              | -264.6                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.43 R      | 12.63              | 133.00 | 0.0                 | 16.32    | 12.55       | 110.00             |        |                |              |
|           |           | -98.55 L     | -75.80             | 54.50  | 0.0                 | -90.65   | -69.73      | 85.00              |        | 65.00          |              |
| OPER      | 5C1T      | 12.70 R      | 9.77               | 335.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -64.62 R     | -49.71             | 193.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|--------|--------------|----------------------|
| HS20        | 12.30              | 1.42                         | 11.13  | HS 28.33     | 51.0                 |
| 5C1T        | 26.51              | 3.60                         | 24.00  | 0.00         | 432.0                |

## SHEAR RATING REPORT

Rating Types and Vehicles  
 INV. OPER POST SPEC  
 Structure I. D. HAM500  
 Member I. D. S02  
 Check Point I. D. 4.000  
 HS20 5C1T

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.6      | -0.8      | -6.3                   | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I |       |
|-----------|-------------------|-----------------------------|-------|
|           |                   | (-)                         | (+)   |
| INV.      | 90.8              | -64.6                       | 64.7  |
| OPER      | 151.3             | -107.7                      | 107.8 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -30.11                | 34.53 | -23.16   | 26.56 | -23.79               | 26.35 | -18.30   | 20.27 |
| OPER      | 5C1T      | -23.57                | 26.31 | -18.13   | 20.23 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.87       | 1.87       | HS 37.44     | 67.4                 |
| 5C1T   | 4.07       | 4.10       | 0.00         | 488.9                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 4.000

Dead Load Moment      Superimposed Dead Load Moment  
-3.3                      -32.7

| Rating Veh.<br>ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|--------------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                    | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend               | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV.<br>146.0      | 153.2           | -182.0 | 153.2        | -182.0 | 189.3                       | -146.0 | 189.3     | - |
| OPER<br>243.4      | 279.4           | -279.4 | 279.4        | -279.4 | 315.4                       | -243.4 | 315.4     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 16.43 R                 | 12.63           | 133.00                  | 0.0       | 16.32                   | 12.55           | 110.00               |        |
|           |            | -98.55 L                | -75.80          | 54.50                   | 0.0       | -90.65                  | -69.73          | 85.00                | 65.00  |
| OPER      | 5C1T       | 12.70 R                 | 9.77            | 335.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -64.62 R                | -49.71          | 193.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 11.52           | 1.48  | 11.52        | 1.48  | HS 29.64     | 53.3                 |
| 5C1T        | 24.84           | 3.77  | 24.84        | 3.77  | 0.00         | 451.9                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 4.000

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 4.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.84 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 92.114     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 19.26 |        | 105.8                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 4.000

Dead Load Moment      Superimposed Dead Load Moment  
-3.3                      -32.7

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 202.0                       | -139.6             | 182.8           | -158.8             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 336.7                       | -232.6             | 304.7           | -264.6             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.43 R      | 12.63              | 133.00 | 0.0                 | 16.32    | 12.55       | 110.00             |        |                |              |
|           |           | -98.55 L     | -75.80             | 54.50  | 0.0                 | -90.65   | -69.73      | 85.00              | 65.00  |                |              |
| OPER      | 5C1T      | 12.70 R      | 9.77               | 335.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -64.62 R     | -49.71             | 193.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 12.30           | 1.42                      | 11.13        | 1.61               | HS 28.33     | 51.0                 |
| 5C1T        | 26.51           | 3.60                      | 24.00        | 4.09               | 0.00         | 432.0                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 4.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.8      | 0.8       | -7.9                   | 7.8       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I |       |
|-----------|-------------------|-----------------------------|-------|
|           |                   | (-)                         | (+)   |
| INV.      | 90.8              | -64.6                       | 64.7  |
| OPER      | 151.3             | -107.7                      | 107.8 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -34.52                | 34.53 | -26.56   | 26.56 | -26.36               | 26.35 | -20.28   | 20.27 |
| OPER      | 5C1T      | -26.44                | 26.31 | -20.34   | 20.23 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.87       | 1.87       | HS 37.44     | 67.4                 |
| 5C1T   | 4.07       | 4.10       | 0.00         | 488.9                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 4.000

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -3.3                | -32.7                            |

| Rating<br>Veh.<br>ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                       | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend                  | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV.<br>146.0         | 153.2           | -182.0 | 153.2        | -182.0 | 189.3                       | -146.0 | 189.3     | - |
| OPER<br>243.4         | 279.4           | -279.4 | 279.4        | -279.4 | 315.4                       | -243.4 | 315.4     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Truck<br>Veh. | Live Load Moment<br>w/imp. | Moment<br>w/o imp. | Loc. of Ax.<br>Front<br>Wheel | Lane<br>Dis. | Live Load Moment<br>w/imp. | Moment<br>w/o imp. | Loc. of Conc.<br>Load 1 | Load 2 |
|--------------|---------------|----------------------------|--------------------|-------------------------------|--------------|----------------------------|--------------------|-------------------------|--------|
| INV.         | HS20          | 16.43 R                    | 12.63              | 133.00                        | 0.0          | 16.32                      | 12.55              | 110.00                  |        |
|              |               | -98.55 L                   | -75.80             | 54.50                         | 0.0          | -90.65                     | -69.73             | 85.00                   | 65.00  |
| OPER         | 5C1T          | 12.70 R                    | 9.77               | 335.00                        | 0.0          | 0.00                       | 0.00               | 0.00                    |        |
|              |               | -64.62 R                   | -49.71             | 193.00                        | 0.0          | 0.00                       | 0.00               | 0.00                    | 0.00   |

## Serviceability

| Rating<br>Veh. | Rating       |                | Factor          |                | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------|----------------|-----------------|----------------|-----------------|----------------------------|
|                | top<br>+bend | fiber<br>-bend | bottom<br>+bend | fiber<br>-bend |                 |                            |
| HS20           | 11.52        | 1.48           | 11.52           | 1.48           | HS 29.64        | 53.3                       |
| 5C1T           | 24.84        | 3.77           | 24.84           | 3.77           | 0.00            | 451.9                      |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 4.100

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |               |                      |               | Plastic Section Modulus - Z |
|----------------------|---------------|----------------------|---------------|-----------------------------|
| Positive Bending Top | Bending Bott. | Negative Bending Top | Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0         | 127.0                | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 4.100

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.85 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 92.188     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 19.26 |        | 105.8                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 4.100

Dead Load Moment      Superimposed Dead Load Moment  
-1.6                      -15.2

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 190.4                       | -151.2                | 171.2              | -170.3                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 317.4                       | -251.9                | 285.4              | -283.9                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.19 R      | 12.46              | 105.50 | 0.0                 | 25.38    | 19.52       | 77.50              |        |                |              |
|           |           | -58.96 R     | -45.35             | 84.00  | 0.0                 | -54.15   | -41.66      | 65.00              | 87.50  |                |              |
| OPER      | 5C1T      | 29.07 R      | 22.36              | 215.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -50.95 L     | -39.19             | -36.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 7.50               | 2.56                         | 6.75 2.89                          | HS 51.28     | 92.3                 |
| 5C1T        | 10.92              | 4.95                         | 9.82 5.57                          | 0.00         | 593.4                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 4.100

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| 0.6       | 0.0                    |
|           | 6.2                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 90.8              | -73.9                           | 65.7  |
| OPER      | 151.3             | -123.2                          | 109.5 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -2.98                 | 30.12 | -2.29    | 23.17 | -3.19                | 23.78 | -2.46    | 18.29 |
| OPER      | 5C1T      | -3.53                 | 23.47 | -2.71    | 18.05 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 23.17      | 2.18       | HS 43.63     | 78.5                 |
| 5C1T   | 34.96      | 4.66       | 0.00         | 559.9                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 4.100

Dead Load Moment      Superimposed Dead Load Moment  
-1.6                      -15.2

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 157.6      | 161.0           | -174.3 | 161.0        | -174.3 | 177.7                       | -157.6 | 177.7     | - |
| OPER 262.7      | 279.4           | -279.4 | 279.4        | -279.4 | 296.1                       | -262.7 | 296.1     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 16.19 R                 | 12.46                | 105.50      | 0.0       | 25.38                   | 19.52                  | 77.50  |        |
|           |            | -58.96 R                | -45.35               | 84.00       | 0.0       | -54.15                  | -41.66                 | 65.00  | 87.50  |
| OPER      | 5C1T       | 29.07 R                 | 22.36                | 215.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -50.95 L                | -39.19               | -36.50      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 7.00            | 2.67  | 7.00         | 2.67  | HS 53.46     | 96.2                 |
| 5C1T        | 10.19           | 5.16  | 10.19        | 5.16  | 0.00         | 618.7                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 4.200

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 127.0           | 127.0         | 127.0        | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 4.200

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.85 | 28.67 | 28.67 | 1.699 | 999999.000 | 92.188 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 19.26 |        | 105.8                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 4.200

Dead Load Moment      Superimposed Dead Load Moment  
-0.2                      -1.5

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 181.4                       | -160.2                | 162.2              | -179.4                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 302.3                       | -267.0                | 270.3              | -299.0                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 59.43 R      | 45.71              | 108.00 | 0.0                 | 44.49    | 34.23       | 80.00              |        |                |              |
|           |           | -45.74 L     | -35.19             | 42.00  | 0.0                 | -35.63   | -27.41      | 65.00              |        | 15.00          |              |
| OPER      | 5C1T      | 54.49 R      | 41.92              | 218.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -43.35 L     | -33.35             | -34.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 3.05               | 3.50                         | 2.73            | 3.92                  | HS 54.58     | 98.3                 |
| 5C1T        | 5.55               | 6.16                         | 4.96            | 6.90                  | 0.00         | 595.2                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 4.200

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| 0.5       | 0.0                    |
|           | 4.7                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -72.9                  | 66.7         |
| OPER      | 151.3             | -121.5                 | 111.2        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -2.98                 | 25.40 | -2.29    | 19.54 | -4.44                | 20.97 | -3.41    | 16.13 |
| OPER      | 5C1T      | -5.22                 | 20.38 | -4.02    | 15.68 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 16.44      | 2.63       | HS 52.54     | 94.6                 |
| 5C1T   | 23.26      | 5.45       | 0.00         | 654.6                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 4.200

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -0.2                | -1.5                             |

| Rating<br>Veh.<br>ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                       | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend                  | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV.<br>166.6         | 167.0           | -168.3 | 167.0        | -168.3 | 168.6                       | -166.6 | 168.6     | - |
| OPER<br>277.7         | 279.4           | -279.4 | 279.4        | -279.4 | 281.1                       | -277.7 | 281.1     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Truck<br>Veh. | Live Load Moment<br>w/imp. | Loc. of Ax.<br>w/o imp. | Front<br>Wheel | Lane<br>Dis. | Live Load Moment<br>w/imp. | Loc. of Conc.<br>w/o imp. | Load 1 | Load 2 |
|--------------|---------------|----------------------------|-------------------------|----------------|--------------|----------------------------|---------------------------|--------|--------|
| INV.         | HS20          | 59.43 R                    | 45.71                   | 108.00         | 0.0          | 44.49                      | 34.23                     | 80.00  |        |
|              |               | -45.74 L                   | -35.19                  | 42.00          | 0.0          | -35.63                     | -27.41                    | 65.00  | 15.00  |
| OPER         | 5C1T          | 54.49 R                    | 41.92                   | 218.00         | 0.0          | 0.00                       | 0.00                      | 0.00   |        |
|              |               | -43.35 L                   | -33.35                  | -34.00         | 0.0          | 0.00                       | 0.00                      | 0.00   | 0.00   |

## Serviceability

| Rating<br>Veh. | Rating       |                | Factor          |                | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------|----------------|-----------------|----------------|-----------------|----------------------------|
|                | top<br>+bend | fiber<br>-bend | bottom<br>+bend | fiber<br>-bend |                 |                            |
| HS20           | 2.84         | 3.64           | 2.84            | 3.64           | HS 56.75        | 102.2                      |
| 5C1T           | 5.16         | 6.41           | 5.16            | 6.41           | 0.00            | 618.9                      |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 4.300

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 127.0           | 127.0         | 127.0        | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 4.300

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.85 | 28.67 | 28.67 | 1.699 | 999999.000 | 92.188 |

## LFD - Moment Values

| Compact Values (C) |                  | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|--------------------|------------------|-------|--------|-------------------------|
|                    | 4110/<br>sqrt Fy |       |        |                         |
| top                | 22.62            | 0.00  | 390.83 | 109.1                   |
| bott               | 22.62            | 19.26 |        | 105.8                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 4.300

Dead Load Moment 0.8  
Superimposed Dead Load Moment 8.4

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 174.9                       | -166.7             | 155.7           | -185.9             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 291.5                       | -277.8             | 259.5           | -309.8             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment  | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|---------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 86.47 R      | 66.52              | 110.50  | 0.0                 | 65.00    | 50.00       | 82.50              |        |                |              |
|           |           | -37.97 L     | -29.21             | 42.00   | 0.0                 | -30.01   | -23.08      | 65.00              | 0.00   |                |              |
| OPER      | 5C1T      | 74.55 R      | 57.34              | 133.50  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -38.82 L     | -29.86             | -120.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber +bend | bottom fiber -bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|--------|--------------|----------------------|
| HS20        | 2.02            | 4.39               | 1.80   | 36.01        | 64.8                 |
| 5C1T        | 3.91            | 7.16               | 3.48   | 0.00         | 417.7                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 4.300

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear     | (-) Shear (+) Shear    |
| 0.3       | 0.0 3.2                |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 90.8              | -71.9                           | 67.7  |
| OPER      | 151.3             | -119.9                          | 112.9 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -4.41                 | 20.57 | -3.40    | 15.82 | -6.71                | 18.02 | -5.16    | 13.86 |
| OPER      | 5C1T      | -7.18                 | 17.22 | -5.52    | 13.25 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 10.72      | 3.29       | HS 65.86     | 118.6                |
| 5C1T   | 16.69      | 6.56       | 0.00         | 786.7                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 4.300Dead Load Moment 0.8  
Superimposed Dead Load Moment 8.4

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 173.1      | 171.3           | -164.0 | 171.3        | -164.0 | 162.1                       | -173.1 | 162.1     | - |
| OPER 288.6      | 279.4           | -279.4 | 279.4        | -279.4 | 270.2                       | -288.6 | 270.2     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 86.47 R                 | 66.52           | 110.50                  | 0.0       | 65.00                   | 50.00           | 82.50                |        |
|           |            | -37.97 L                | -29.21          | 42.00                   | 0.0       | -30.01                  | -23.08          | 65.00                | 0.00   |
| OPER      | 5C1T       | 74.55 R                 | 57.34           | 133.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -38.82 L                | -29.86          | -120.00                 | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.88            | 4.56            | 1.88               | 4.56               | HS 37.50     | 67.5                 |
| 5C1T        | 3.62            | 7.43            | 3.62               | 7.43               | 0.00         | 435.0                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 4.400

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |               |                      |               | Plastic Section Modulus - Z |
|----------------------|---------------|----------------------|---------------|-----------------------------|
| Positive Bending Top | Bending Bott. | Negative Bending Top | Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0         | 127.0                | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 4.400

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.85 | 28.67 | 28.67 | 1.699 | 999999.000 | 92.188 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 19.26 |        | 105.8                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 4.400

Dead Load Moment 1.4  
Superimposed Dead Load Moment 14.4

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 170.9                       | -170.6             | 151.7           | -189.8             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 284.9                       | -284.4             | 252.9           | -316.4             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment  | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|---------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 97.00 R      | 74.62              | 113.00  | 0.0                 | 77.32    | 59.48       | 85.00              |        |                |              |
|           |           | -30.20 L     | -23.23             | 42.00   | 0.0                 | -26.40   | -20.31      | 65.00              | 0.00   |                |              |
| OPER      | 5C1T      | 86.98 R      | 66.91              | 271.00  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -35.71 L     | -27.47             | -118.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 1.76            | 5.65                      | 1.56                      | 6.29               | HS 31.28     | 56.3                 |
| 5C1T        | 3.28            | 7.96                      | 2.91                      | 8.86               | 0.00         | 348.9                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 4.400Dead Load Superimposed Dead Load  
Shear (-) Shear (+) Shear

0.2 0.0 1.6

Rat. Shear Capacity Available Capacity for LL+I  
Veh. VU (-) (+)INV. 90.8 -70.9 68.7  
OPER 151.3 -118.2 114.6

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Rat.<br>Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|--------------|--------------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|              |              | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|              |              | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.         | HS20         | -8.97                 | 16.78 | -6.90    | 12.91 | -9.28                | 15.04 | -7.14    | 11.57 |
| OPER         | 5C1T         | -9.34                 | 14.16 | -7.19    | 10.89 | 0.00                 | 0.00  | 0.00     | 0.00  |

## Rating Shear

| Veh. | Rating<br>(-) | Factor<br>(+) | Rating<br>Value | Load<br>Capacity<br>(tons) |
|------|---------------|---------------|-----------------|----------------------------|
| HS20 | 7.64          | 4.10          | HS 81.95        | 147.5                      |
| 5C1T | 12.65         | 8.09          | 0.00            | 971.3                      |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 4.400

Dead Load Moment 1.4  
Superimposed Dead Load Moment 14.4

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 177.1      | 173.9           | -161.3 | 173.9        | -161.3 | 158.2                       | -177.1 | 158.2     | - |
| OPER 295.2      | 279.4           | -279.4 | 279.4        | -279.4 | 263.6                       | -295.2 | 263.6     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 97.00 R                 | 74.62                | 113.00      | 0.0       | 77.32                   | 59.48                  | 85.00  |        |
|           |            | -30.20 L                | -23.23               | 42.00       | 0.0       | -26.40                  | -20.31                 | 65.00  | 0.00   |
| OPER      | 5C1T       | 86.98 R                 | 66.91                | 271.00      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -35.71 L                | -27.47               | -118.50     | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.63            | 5.86  | 1.63         | 5.86  | HS 32.61     | 58.7                 |
| 5C1T        | 3.03            | 8.27  | 3.03         | 8.27  | 0.00         | 363.7                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 4.500

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 4.500

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.84 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 91.901     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 18.12 |        | 106.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
 INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
 Check Point I. D. 4.500

Dead Load Moment 1.6  
 Superimposed Dead Load Moment 16.5

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 169.5                       | -172.1             | 150.3           | -191.3             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 282.5                       | -286.8             | 250.5           | -318.8             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 94.68 R      | 72.83              | 101.50 | 0.0                 | 82.22    | 63.25       | 87.50              |        |                |              |
|           |           | -22.43 R     | -17.26             | 133.00 | 0.0                 | -22.80   | -17.53      | 110.00             | 0.00   |                |              |
| OPER      | 5C1T      | 89.93 R      | 69.18              | 273.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -34.36 L     | -26.43             | -71.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 1.79            | 7.55                      | 1.59                      | 8.39               | HS 31.75     | 57.2                 |
| 5C1T        | 3.14            | 8.35                      | 2.79                      | 9.28               | 0.00         | 334.3                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 4.500

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear     | (-) Shear (+) Shear    |
| 0.0       | 0.0 0.1                |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 90.8              | -69.9                           | 69.8  |
| OPER      | 151.3             | -116.5                          | 116.3 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |      |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |      |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)  |
| INV.      | HS20      | -13.12                | 13.12 | -10.10   | 10.10 | -12.08               | 12.10 | -9.29    | 9.31 |
| OPER      | 5C1T      | -11.64                | 11.66 | -8.95    | 8.97  | 0.00                 | 0.00  | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 5.32       | 5.32       | HS 106.31    | 191.4                |
| 5C1T   | 10.01      | 9.97       | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 4.500Dead Load Moment 1.6  
Superimposed Dead Load Moment 16.5

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 178.5      | 174.9           | -160.4 | 174.9        | -160.4 | 156.8                       | -178.5 | 156.8     | - |
| OPER 297.5      | 279.4           | -279.4 | 279.4        | -279.4 | 261.3                       | -297.5 | 261.3     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 94.68 R                 | 72.83           | 101.50                  | 0.0       | 82.22                   | 63.25           | 87.50                |        |
|           |            | -22.43 R                | -17.26          | 133.00                  | 0.0       | -22.80                  | -17.53          | 110.00               | 0.00   |
| OPER      | 5C1T       | 89.93 R                 | 69.18           | 273.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -34.36 L                | -26.43          | -71.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.66            | 7.83  | 1.66         | 7.83  | HS 33.11     | 59.6                 |
| 5C1T        | 2.90            | 8.66  | 2.90         | 8.66  | 0.00         | 348.6                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 4.600

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 4.600

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.84 | 28.67 | 28.67 | 1.699 | 999999.000 | 91.901 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 18.12 |        | 106.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 4.600

Dead Load Moment 1.4  
Superimposed Dead Load Moment 14.5

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 170.8                       | -170.8             | 151.6           | -189.9             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 284.7                       | -284.6             | 252.7           | -316.6             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 97.01 L      | 74.62              | 62.00  | 0.0                 | 77.41    | 59.55       | 90.00              |        |                |              |
|           |           | -30.21 R     | -23.24             | 133.00 | 0.0                 | -26.38   | -20.29      | 110.00             | 0.00   |                |              |
| OPER      | 5C1T      | 86.79 L      | 66.76              | 39.00  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -35.45 R     | -27.27             | 206.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | Rating Factor   |                    |                 |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|-----------------|--------------------|--------------|----------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.76            | 5.65               | 1.56            | 6.29               | HS 31.26     | 56.3                 |
| 5C1T        | 3.28            | 8.03               | 2.91            | 8.93               | 0.00         | 349.4                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 4.600

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| -0.2      | -1.6                   |
|           | 0.0                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 90.8              | -68.8                           | 70.9  |
| OPER      | 151.3             | -114.6                          | 118.1 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -16.78                | 8.97 | -12.91   | 6.90 | -15.01               | 9.31 | -11.55   | 7.16 |
| OPER      | 5C1T      | -14.11                | 9.40 | -10.85   | 7.23 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 4.10       | 7.61       | HS 81.99     | 147.6                |  |
| 5C1T   | 8.13       | 12.57      | 0.00         | 975.3                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 4.600Dead Load Moment 1.4  
Superimposed Dead Load Moment 14.5

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 177.2      | 174.0           | -161.3 | 174.0        | -161.3 | 158.1                       | -177.2 | 158.1     | - |
| OPER 295.3      | 279.4           | -279.4 | 279.4        | -279.4 | 263.5                       | -295.3 | 263.5     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Live Load Moment w/o imp. | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-------------------------|---------------------------|-----------|-------------------------|----------------------|--------|
| INV.      | HS20       | 97.01 L                 | 74.62                   | 62.00                     | 0.0       | 77.41                   | 59.55                | 90.00  |
|           |            | -30.21 R                | -23.24                  | 133.00                    | 0.0       | -26.38                  | -20.29               | 110.00 |
| OPER      | 5C1T       | 86.79 L                 | 66.76                   | 39.00                     | 0.0       | 0.00                    | 0.00                 | 0.00   |
|           |            | -35.45 R                | -27.27                  | 206.50                    | 0.0       | 0.00                    | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.63            | 5.87  | 1.63         | 5.87  | HS 32.59     | 58.7                 |
| 5C1T        | 3.04            | 8.33  | 3.04         | 8.33  | 0.00         | 364.3                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 4.700

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |               |                      |               | Plastic Section Modulus - Z |
|----------------------|---------------|----------------------|---------------|-----------------------------|
| Positive Bending Top | Bending Bott. | Negative Bending Top | Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0         | 127.0                | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 4.700

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.84 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 91.901     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 18.12 |        | 106.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 4.700

Dead Load Moment 0.8  
Superimposed Dead Load Moment 8.7

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 174.7                       | -166.9             | 155.5           | -186.1             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 291.1                       | -278.2             | 259.2           | -310.1             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 86.48 L      | 66.52              | 64.50  | 0.0                 | 65.18    | 50.14       | 92.50              |        |                |              |
|           |           | -37.98 R     | -29.21             | 133.00 | 0.0                 | -29.97   | -23.05      | 110.00             | 0.00   |                |              |
| OPER      | 5C1T      | 74.85 L      | 57.58              | 41.50  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -38.35 R     | -29.50             | 295.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber +bend | bottom fiber -bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|--------|--------------|----------------------|
| HS20        | 2.02            | 4.39               | 1.80   | HS 35.96     | 64.7                 |
| 5C1T        | 3.89            | 7.25               | 3.46   | 0.00         | 415.4                |

## SHEAR RATING REPORT

Structure I. D. HAM500

Rating Types and Vehicles  
INV. OPER POST SPEC

Member I. D. S02  
Check Point I. D. 4.700

HS20 5C1T

Dead Load Superimposed Dead Load  
Shear (-) Shear (+) Shear

-0.3 -3.1 0.0

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -67.8                  | 71.9                  |
| OPER      | 151.3             | -113.0                 | 119.8                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -20.57                | 4.41 | -15.82   | 3.40 | -18.00               | 6.73 | -13.85   | 5.18 |
| OPER      | 5C1T      | -17.15                | 7.25 | -13.20   | 5.58 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 3.30       | 10.67      | HS 65.90     | 118.6                |  |
| 5C1T   | 6.59       | 16.52      | 0.00         | 790.2                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 4.700Dead Load Moment 0.8  
Superimposed Dead Load Moment 8.7

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 173.3      | 171.4           | -163.8 | 171.4        | -163.8 | 161.9                       | -173.3 | 161.9     | - |
| OPER 288.9      | 279.4           | -279.4 | 279.4        | -279.4 | 269.9                       | -288.9 | 269.9     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 86.48 L                 | 66.52                | 64.50       | 0.0       | 65.18                   | 50.14                  | 92.50  |        |
|           |            | -37.98 R                | -29.21               | 133.00      | 0.0       | -29.97                  | -23.05                 | 110.00 | 0.00   |
| OPER      | 5C1T       | 74.85 L                 | 57.58                | 41.50       | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -38.35 R                | -29.50               | 295.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.87            | 4.56            | 1.87               | 4.56               | HS 37.45     | 67.4                 |
| 5C1T        | 3.61            | 7.53            | 3.61               | 7.53               | 0.00         | 432.7                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 4.800

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |               |                      |               | Plastic Section Modulus - Z |
|----------------------|---------------|----------------------|---------------|-----------------------------|
| Positive Bending Top | Bending Bott. | Negative Bending Top | Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0         | 127.0                | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 4.800

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.84 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 91.901     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 18.12 |        | 106.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 4.800

Dead Load Moment      Superimposed Dead Load Moment  
-0.1                      -1.0

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 181.1                       | -160.5                | 161.9              | -179.7                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 301.8                       | -267.5                | 269.8              | -299.5                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 59.43 L      | 45.72              | 67.00  | 0.0                 | 45.27    | 34.83       | 95.00              |        |                |              |
|           |           | -45.75 R     | -35.19             | 133.00 | 0.0                 | -35.40   | -27.23      | 110.00             | 160.00 |                |              |
| OPER      | 5C1T      | 55.13 L      | 42.41              | -43.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -42.81 R     | -32.93             | 209.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 3.05               | 3.51                         | 2.72                               | 3.93         | 54.48                |
| 5C1T        | 5.47               | 6.25                         | 4.89                               | 6.99         | 0.00                 |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 4.800

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.5      | -4.7         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -66.8                  | 72.9                  |
| OPER      | 151.3             | -111.3                 | 121.5                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -25.40                | 2.98 | -19.54   | 2.29 | -20.95               | 4.46 | -16.12   | 3.43 |
| OPER      | 5C1T      | -20.29                | 5.31 | -15.61   | 4.08 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 2.63       | 16.35      | HS 52.57     | 94.6                 |  |
| 5C1T   | 5.48       | 22.90      | 0.00         | 658.1                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 4.800

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -0.1                | -1.0                             |

| Rating<br>Veh.<br>ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                       | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend                  | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV.<br>166.9         | 167.2           | -168.1 | 167.2        | -168.1 | 168.3                       | -166.9 | 168.3     | - |
| OPER<br>278.2         | 279.4           | -279.4 | 279.4        | -279.4 | 280.6                       | -278.2 | 280.6     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Truck<br>Veh. | Live Load Moment<br>w/imp. | Loc. of Ax.<br>w/o imp. | Front<br>Wheel | Lane<br>Dis. | Live Load Moment<br>w/imp. | Loc. of Conc.<br>w/o imp. | Load 1 | Load 2 |
|--------------|---------------|----------------------------|-------------------------|----------------|--------------|----------------------------|---------------------------|--------|--------|
| INV.         | HS20          | 59.43 L                    | 45.72                   | 67.00          | 0.0          | 45.27                      | 34.83                     | 95.00  |        |
|              |               | -45.75 R                   | -35.19                  | 133.00         | 0.0          | -35.40                     | -27.23                    | 110.00 | 160.00 |
| OPER         | 5C1T          | 55.13 L                    | 42.41                   | -43.00         | 0.0          | 0.00                       | 0.00                      | 0.00   |        |
|              |               | -42.81 R                   | -32.93                  | 209.00         | 0.0          | 0.00                       | 0.00                      | 0.00   | 0.00   |

## Serviceability

| Rating<br>Veh. | Rating       |                | Factor          |                | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------|----------------|-----------------|----------------|-----------------|----------------------------|
|                | top<br>+bend | fiber<br>-bend | bottom<br>+bend | fiber<br>-bend |                 |                            |
| HS20           | 2.83         | 3.65           | 2.83            | 3.65           | HS 56.65        | 102.0                      |
| 5C1T           | 5.09         | 6.50           | 5.09            | 6.50           | 0.00            | 610.7                      |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 4.900

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 4.900

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.84 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 91.901     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 18.12 |        | 106.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 4.900

Dead Load Moment      Superimposed Dead Load Moment  
-1.5                      -14.6

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 190.0                       | -151.6                | 170.8              | -170.8                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 316.7                       | -252.6                | 284.7              | -284.6                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.20 L      | 12.46              | 69.50  | 0.0                 | 25.27    | 19.44       | 97.50              |        |                |              |
|           |           | -58.98 L     | -45.37             | 91.00  | 0.0                 | -54.00   | -41.54      | 110.00             |        | 87.50          |              |
| OPER      | 5C1T      | 30.01 L      | 23.09              | -40.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -50.24 R     | -38.65             | 211.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 7.52               | 2.57                         | 6.76                               | 2.89         | HS 51.40 92.5        |
| 5C1T        | 10.55              | 5.03                         | 9.49                               | 5.66         | 0.00 603.3           |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 4.900

|                 |                        |
|-----------------|------------------------|
| Dead Load       | Superimposed Dead Load |
| Shear (-) Shear | (+) Shear              |
| -0.6            | -6.2                   |
|                 | 0.0                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 90.8              | -65.7                           | 73.9  |
| OPER      | 151.3             | -109.6                          | 123.2 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -30.11                | 3.11 | -23.17   | 2.39 | -23.76               | 3.21 | -18.28   | 2.47 |
| OPER      | 5C1T      | -23.37                | 3.61 | -17.98   | 2.78 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 2.18       | 23.00      | HS 43.66     | 78.6                 |
| 5C1T   | 4.69       | 34.12      | 0.00         | 562.6                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 4.900

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -1.5                | -14.6                            |

| Rating<br>Veh.<br>ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                       | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend                  | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV.<br>158.0         | 161.2           | -174.1 | 161.2        | -174.1 | 177.3                       | -158.0 | 177.3     | - |
| OPER<br>263.3         | 279.4           | -279.4 | 279.4        | -279.4 | 295.5                       | -263.3 | 295.5     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Truck<br>Veh. | Live Load Moment<br>w/imp. | Moment<br>w/o imp. | Loc. of Ax.<br>Front<br>Wheel | Lane<br>Dis. | Live Load Moment<br>w/imp. | Moment<br>w/o imp. | Loc. of Conc.<br>Load 1 | Load 2 |
|--------------|---------------|----------------------------|--------------------|-------------------------------|--------------|----------------------------|--------------------|-------------------------|--------|
| INV.         | HS20          | 16.20 L                    | 12.46              | 69.50                         | 0.0          | 25.27                      | 19.44              | 97.50                   |        |
|              |               | -58.98 L                   | -45.37             | 91.00                         | 0.0          | -54.00                     | -41.54             | 110.00                  | 87.50  |
| OPER         | 5C1T          | 30.01 L                    | 23.09              | -40.50                        | 0.0          | 0.00                       | 0.00               | 0.00                    |        |
|              |               | -50.24 R                   | -38.65             | 211.50                        | 0.0          | 0.00                       | 0.00               | 0.00                    | 0.00   |

## Serviceability

| Rating<br>Veh. | Rating       |                | Factor          |                | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------|----------------|-----------------|----------------|-----------------|----------------------------|
|                | top<br>+bend | fiber<br>-bend | bottom<br>+bend | fiber<br>-bend |                 |                            |
| HS20           | 7.01         | 2.68           | 7.01            | 2.68           | HS 53.58        | 96.4                       |
| 5C1T           | 9.85         | 5.24           | 9.85            | 5.24           | 0.00            | 629.0                      |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 5.000

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 127.0           | 127.0         | 127.0        | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 5.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.84 | 28.67 | 28.67 | 1.699 | 999999.000 | 91.901 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 18.12 |        | 106.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 5.000

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -3.2                | -32.0                            |

| Rating<br>Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|----------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|                | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.           | 180.4C             | -161.2                | 161.2              | -180.4C               | 201.5                       | -140.1                | 182.3              | -159.3                |
| OPER           | 300.6C             | -268.7                | 268.7              | -300.6C               | 335.8                       | -233.5                | 303.8              | -265.5                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Rat.<br>Veh. | Truck<br>w/imp. | Live Load<br>w/o imp. | Moment | Loc. of<br>Front<br>Wheel | Ax.<br>Dis. | Lane<br>w/imp. | Live Load<br>w/o imp. | Moment | Loc. of<br>Load 1 | Conc.<br>Load 2 |
|--------------|--------------|-----------------|-----------------------|--------|---------------------------|-------------|----------------|-----------------------|--------|-------------------|-----------------|
| INV.         | HS20         | 16.42 R         | 12.63                 | 158.00 | 0.0                       | 16.69       | 12.84          | 135.00                |        |                   |                 |
|              |              | -98.55 L        | -75.81                | 79.50  | 0.0                       | -90.47      | -69.59         | 110.00                |        | 90.00             |                 |
| OPER         | 5C1T         | 12.72 R         | 9.78                  | 360.00 | 0.0                       | 0.00        | 0.00           | 0.00                  |        |                   |                 |
|              |              | -63.99 R        | -49.22                | 218.00 | 0.0                       | 0.00        | 0.00           | 0.00                  |        | 0.00              |                 |

## Moment

| Rating<br>Veh. | top fiber<br>+bend | Rating<br>bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------------|---------------------------------|-----------------|-----------------------|-----------------|----------------------------|
| HS20           | 12.07              | 1.42                            | 10.92           | 1.62                  | HS 28.43        | 51.2                       |
| 5C1T           | 26.40              | 3.65                            | 23.89           | 4.15                  | 0.00            | 437.8                      |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 5.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.6      | -0.8      | -6.2                   | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I |       |
|-----------|-------------------|-----------------------------|-------|
|           |                   | (-)                         | (+)   |
| INV.      | 90.8              | -64.7                       | 64.7  |
| OPER      | 151.3             | -107.9                      | 107.9 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -30.11                | 34.53 | -23.17   | 26.56 | -23.76               | 26.34 | -18.28   | 20.26 |
| OPER      | 5C1T      | -23.37                | 26.26 | -17.98   | 20.20 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.88       | 1.87       | HS 37.48     | 67.5                 |
| 5C1T   | 4.11       | 4.11       | 0.00         | 492.9                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 5.000

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -3.2                | -32.0                            |

| Rating<br>Veh.<br>ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                       | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend                  | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV.<br>146.5         | 153.6           | -181.7 | 153.6        | -181.7 | 188.7                       | -146.5 | 188.7     | - |
| OPER<br>244.2         | 279.4           | -279.4 | 279.4        | -279.4 | 314.6                       | -244.2 | 314.6     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Truck<br>Veh. | Live Load Moment<br>w/imp. | Moment<br>w/o imp. | Loc. of Ax.<br>Front<br>Wheel | Lane<br>Dis. | Live Load Moment<br>w/imp. | Moment<br>w/o imp. | Loc. of Conc.<br>Load 1 | Load 2 |
|--------------|---------------|----------------------------|--------------------|-------------------------------|--------------|----------------------------|--------------------|-------------------------|--------|
| INV.         | HS20          | 16.42 R                    | 12.63              | 158.00                        | 0.0          | 16.69                      | 12.84              | 135.00                  |        |
|              |               | -98.55 L                   | -75.81             | 79.50                         | 0.0          | -90.47                     | -69.59             | 110.00                  | 90.00  |
| OPER         | 5C1T          | 12.72 R                    | 9.78               | 360.00                        | 0.0          | 0.00                       | 0.00               | 0.00                    |        |
|              |               | -63.99 R                   | -49.22             | 218.00                        | 0.0          | 0.00                       | 0.00               | 0.00                    | 0.00   |

## Serviceability

| Rating<br>Veh. | Rating       |                | Factor          |                | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------|----------------|-----------------|----------------|-----------------|----------------------------|
|                | top<br>+bend | fiber<br>-bend | bottom<br>+bend | fiber<br>-bend |                 |                            |
| HS20           | 11.31        | 1.49           | 11.31           | 1.49           | HS 29.74        | 53.5                       |
| 5C1T           | 24.73        | 3.82           | 24.73           | 3.82           | 0.00            | 458.0                      |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 5.000

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 5.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.84 | 28.67 | 28.67 | 1.699 | 999999.000 | 91.892 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 18.12 |        | 106.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 5.000

Dead Load Moment      Superimposed Dead Load Moment  
-3.2                      -32.0

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 201.5                       | -140.1                | 182.3              | -159.3                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 335.8                       | -233.5                | 303.8              | -265.5                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.42 R      | 12.63              | 158.00 | 0.0                 | 16.69    | 12.84       | 135.00             |        |                |              |
|           |           | -98.55 L     | -75.81             | 79.50  | 0.0                 | -90.47   | -69.59      | 110.00             |        | 90.00          |              |
| OPER      | 5C1T      | 12.72 R      | 9.78               | 360.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -63.99 R     | -49.22             | 218.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 12.07              | 1.42                         | 10.92           | 1.62                  | HS 28.43     | 51.2                 |
| 5C1T        | 26.40              | 3.65                         | 23.89           | 4.15                  | 0.00         | 437.8                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 5.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.8      | 0.8       | -7.7                   | 7.7       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 90.8              | -64.7                           | 64.7  |
| OPER      | 151.3             | -107.9                          | 107.9 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -34.53                | 34.53 | -26.56   | 26.56 | -26.33               | 26.34 | -20.25   | 20.26 |
| OPER      | 5C1T      | -26.23                | 26.26 | -20.18   | 20.20 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.88       | 1.87       | HS 37.48     | 67.5                 |
| 5C1T   | 4.11       | 4.11       | 0.00         | 492.9                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 5.000

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -3.2                | -32.0                            |

| Rating<br>Veh.<br>ber | Moment Capacity |              | Available Capacity for LL+I |           |       |        |       |   |
|-----------------------|-----------------|--------------|-----------------------------|-----------|-------|--------|-------|---|
|                       | top fiber       | bottom fiber | top fiber                   | bottom fi |       |        |       |   |
|                       | +bend           | -bend        | +bend                       | -bend     | +bend | -bend  | +bend | - |
| bend                  |                 |              |                             |           |       |        |       |   |
| INV.                  | 153.6           | -181.7       | 153.6                       | -181.7    | 188.7 | -146.5 | 188.7 | - |
| 146.5                 |                 |              |                             |           |       |        |       |   |
| OPER                  | 279.4           | -279.4       | 279.4                       | -279.4    | 314.6 | -244.2 | 314.6 | - |
| 244.2                 |                 |              |                             |           |       |        |       |   |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Truck<br>Veh. | Live Load Moment<br>w/imp. | Moment<br>w/o imp. | Loc. of Ax.<br>Front<br>Wheel | Lane<br>Dis. | Live Load Moment<br>w/imp. | Moment<br>w/o imp. | Loc. of Conc.<br>Load 1 | Load 2 |
|--------------|---------------|----------------------------|--------------------|-------------------------------|--------------|----------------------------|--------------------|-------------------------|--------|
| INV.         | HS20          | 16.42 R                    | 12.63              | 158.00                        | 0.0          | 16.69                      | 12.84              | 135.00                  |        |
|              |               | -98.55 L                   | -75.81             | 79.50                         | 0.0          | -90.47                     | -69.59             | 110.00                  | 90.00  |
| OPER         | 5C1T          | 12.72 R                    | 9.78               | 360.00                        | 0.0          | 0.00                       | 0.00               | 0.00                    |        |
|              |               | -63.99 R                   | -49.22             | 218.00                        | 0.0          | 0.00                       | 0.00               | 0.00                    | 0.00   |

## Serviceability

| Rating<br>Veh. | Rating    |              | Factor    |              | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|-----------|--------------|-----------|--------------|-----------------|----------------------------|
|                | top fiber | bottom fiber | top fiber | bottom fiber |                 |                            |
|                | +bend     | -bend        | +bend     | -bend        |                 |                            |
| HS20           | 11.31     | 1.49         | 11.31     | 1.49         | HS 29.74        | 53.5                       |
| 5C1T           | 24.73     | 3.82         | 24.73     | 3.82         | 0.00            | 458.0                      |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 5.100

|               |                             |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Allowable stress (fs) (psi) |           |         |         |
| RATIO/Inv.    | 0.00                        | 0.00      | 0.00    | 0.00    |
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

|                |           |       |      |      |       |       |      |      |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

|                         |                  |                       |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

|               |          |              |       |                   |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

|                  |                  |             |       |                 |
|------------------|------------------|-------------|-------|-----------------|
| Section Modulus  |                  |             |       | Plastic Section |
| Positive Bending | Negative Bending | Modulus - Z |       |                 |
| Top              | Bott.            | Top         | Bott. | (Fy * Z)        |
| 127.0            | 127.0            | 127.0       | 127.0 | 390.83          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 5.100

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.84 | 28.67 | 28.67 | 1.699 | 999999.000 | 91.892 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 18.12 |        | 106.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 5.100

Dead Load Moment      Superimposed Dead Load Moment  
-1.5                      -14.5

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 190.0                       | -151.6                | 170.8              | -170.8                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 316.6                       | -252.7                | 284.6              | -284.6                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.20 R      | 12.46              | 130.50 | 0.0                 | 25.71    | 19.77       | 102.50             |        |                |              |
|           |           | -58.98 R     | -45.37             | 109.00 | 0.0                 | -54.00   | -41.54      | 90.00              | 112.50 |                |              |
| OPER      | 5C1T      | 30.00 R      | 23.08              | 240.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -50.21 L     | -38.62             | -11.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 7.39               | 2.57                         | 6.64                               | 2.90         | HS 51.41 92.5        |
| 5C1T        | 10.56              | 5.03                         | 9.49                               | 5.67         | 0.00 603.8           |

## SHEAR RATING REPORT

Rating Types and Vehicles  
 INV. OPER POST SPEC  
 Structure I. D. HAM500  
 Member I. D. S02  
 Check Point I. D. 5.100  
 HS20 5C1T

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.6       | 0.0          | 6.2       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -73.9                  | 65.7                  |
| OPER      | 151.3             | -123.2                 | 109.5                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -2.98                 | 30.12 | -2.29    | 23.17 | -3.21                | 23.77 | -2.47    | 18.29 |
| OPER      | 5C1T      | -3.58                 | 23.41 | -2.76    | 18.01 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 23.02      | 2.18       | HS 43.65     | 78.6                 |
| 5C1T   | 34.37      | 4.68       | 0.00         | 561.5                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 5.100

Dead Load Moment      Superimposed Dead Load Moment  
-1.5                      -14.5

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 158.0      | 161.2           | -174.0 | 161.2        | -174.0 | 177.2                       | -158.0 | 177.2     | - |
| OPER 263.4      | 279.4           | -279.4 | 279.4        | -279.4 | 295.4                       | -263.4 | 295.4     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 16.20 R                 | 12.46           | 130.50                  | 0.0       | 25.71                   | 19.77           | 102.50               |        |
|           |            | -58.98 R                | -45.37          | 109.00                  | 0.0       | -54.00                  | -41.54          | 90.00                | 112.50 |
| OPER      | 5C1T       | 30.00 R                 | 23.08           | 240.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -50.21 L                | -38.62          | -11.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 6.89            | 2.68  | 6.89         | 2.68  | HS 53.60     | 96.5                 |
| 5C1T        | 9.85            | 5.25  | 9.85         | 5.25  | 0.00         | 629.5                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 5.200

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 127.0           | 127.0         | 127.0        | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 5.200

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.84 | 28.67 | 28.67 | 1.699 | 999999.000 | 91.892 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 18.12 |        | 106.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 5.200

Dead Load Moment      Superimposed Dead Load Moment  
-0.1                      -0.9

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 181.0                       | -160.6                | 161.8              | -179.8                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 301.7                       | -267.6                | 269.7              | -299.6                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 59.43 R      | 45.72              | 133.00 | 0.0                 | 44.77    | 34.44       | 105.00             |        |                |              |
|           |           | -45.75 L     | -35.19             | 67.00  | 0.0                 | -35.33   | -27.18      | 90.00              | 40.00  |                |              |
| OPER      | 5C1T      | 55.14 R      | 42.42              | 243.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -42.63 L     | -32.79             | -9.00  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 3.05               | 3.51                         | 2.72            | 3.93                  | HS 54.46     | 98.0                 |
| 5C1T        | 5.47               | 6.28                         | 4.89            | 7.03                  | 0.00         | 586.9                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 5.200

|                 |                        |
|-----------------|------------------------|
| Dead Load       | Superimposed Dead Load |
| Shear (-) Shear | (+) Shear              |
| 0.5             | 0.0                    |
|                 | 4.7                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -72.9                  | 66.7         |
| OPER      | 151.3             | -121.5                 | 111.2        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -2.98                 | 25.40 | -2.29    | 19.54 | -4.46                | 20.96 | -3.43    | 16.12 |
| OPER      | 5C1T      | -5.28                 | 20.33 | -4.06    | 15.64 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 16.36      | 2.63       | HS 52.56     | 94.6                 |
| 5C1T   | 23.00      | 5.47       | 0.00         | 656.7                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 5.200

Dead Load Moment      Superimposed Dead Load Moment  
-0.1                      -0.9

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 167.0      | 167.2           | -168.1 | 167.2        | -168.1 | 168.3                       | -167.0 | 168.3     | - |
| OPER 278.4      | 279.4           | -279.4 | 279.4        | -279.4 | 280.4                       | -278.4 | 280.4     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 59.43 R                 | 45.72                | 133.00      | 0.0       | 44.77                   | 34.44                  | 105.00 |        |
|           |            | -45.75 L                | -35.19               | 67.00       | 0.0       | -35.33                  | -27.18                 | 90.00  | 40.00  |
| OPER      | 5C1T       | 55.14 R                 | 42.42                | 243.00      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -42.63 L                | -32.79               | -9.00       | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 2.83            | 3.65  | 2.83         | 3.65  | HS 56.63     | 101.9                |
| 5C1T        | 5.09            | 6.53  | 5.09         | 6.53  | 0.00         | 610.3                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 5.300

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 127.0           | 127.0         | 127.0        | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 5.300

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.84 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 91.892     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 18.12 |        | 106.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 5.300

Dead Load Moment 0.9  
Superimposed Dead Load Moment 8.8

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 174.6                       | -167.0             | 155.4           | -186.2             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 291.0                       | -278.3             | 259.0           | -310.3             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 86.48 R      | 66.52              | 135.50 | 0.0                 | 65.23    | 50.17       | 107.50             |        |                |              |
|           |           | -37.98 L     | -29.21             | 67.00  | 0.0                 | -29.90   | -23.00      | 90.00              | 0.00   |                |              |
| OPER      | 5C1T      | 74.87 R      | 57.59              | 158.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -38.20 L     | -29.39             | -95.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber +bend | bottom fiber -bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|--------|--------------|----------------------|
| HS20        | 2.02            | 4.40               | 1.80   | 35.94        | 64.7                 |
| 5C1T        | 3.89            | 7.28               | 3.46   | 0.00         | 415.1                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 5.300

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear     | (-) Shear (+) Shear    |
| 0.3       | 0.0 3.1                |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 90.8              | -71.9                           | 67.8  |
| OPER      | 151.3             | -119.8                          | 112.9 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -4.41                 | 20.57 | -3.40    | 15.82 | -6.73                | 18.01 | -5.18    | 13.86 |
| OPER      | 5C1T      | -7.23                 | 17.18 | -5.56    | 13.22 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 10.68      | 3.29       | HS 65.89     | 118.6                |
| 5C1T   | 16.57      | 6.57       | 0.00         | 788.6                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 5.300Dead Load Moment 0.9  
Superimposed Dead Load Moment 8.8

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 173.4      | 171.5           | -163.8 | 171.5        | -163.8 | 161.8                       | -173.4 | 161.8     | - |
| OPER 289.1      | 279.4           | -279.4 | 279.4        | -279.4 | 269.7                       | -289.1 | 269.7     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Live Load Moment w/o imp. | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-------------------------|---------------------------|-----------|-------------------------|----------------------|--------|
| INV.      | HS20       | 86.48 R                 | 66.52                   | 135.50                    | 0.0       | 65.23                   | 50.17                | 107.50 |
|           |            | -37.98 L                | -29.21                  | 67.00                     | 0.0       | -29.90                  | -23.00               | 90.00  |
| OPER      | 5C1T       | 74.87 R                 | 57.59                   | 158.50                    | 0.0       | 0.00                    | 0.00                 | 0.00   |
|           |            | -38.20 L                | -29.39                  | -95.00                    | 0.0       | 0.00                    | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.87            | 4.57  | 1.87         | 4.57  | HS 37.43     | 67.4                 |
| 5C1T        | 3.60            | 7.57  | 3.60         | 7.57  | 0.00         | 432.3                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 5.400

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 5.400

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.84 | 28.67 | 28.67 | 1.699 | 999999.000 | 91.892 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 18.12 |        | 106.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 5.400

Dead Load Moment 1.4  
Superimposed Dead Load Moment 14.7

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 170.7                       | -170.9             | 151.5           | -190.1             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 284.5                       | -284.8             | 252.5           | -316.8             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 97.01 R      | 74.62              | 138.00 | 0.0                 | 77.50    | 59.62       | 110.00             |        |                |              |
|           |           | -30.21 L     | -23.24             | 67.00  | 0.0                 | -26.32   | -20.25      | 90.00              | 0.00   |                |              |
| OPER      | 5C1T      | 86.98 R      | 66.91              | 296.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -35.20 L     | -27.08             | -93.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | Rating Factor   |                    |                 |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|-----------------|--------------------|--------------|----------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend |              |                      |
| HS20        | 1.76            | 5.66               | 1.56            | 6.29               | HS 31.23     | 56.2                 |
| 5C1T        | 3.27            | 8.09               | 2.90            | 9.00               | 0.00         | 348.3                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 5.400

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.2       | 0.0          | 1.6       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -70.9                  | 68.8                  |
| OPER      | 151.3             | -118.1                 | 114.6                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -8.97                 | 16.78 | -6.90    | 12.91 | -9.30                | 15.03 | -7.16    | 11.56 |
| OPER      | 5C1T      | -9.38                 | 14.13 | -7.22    | 10.87 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 7.62       | 4.10       | HS 81.98     | 147.6                |
| 5C1T   | 12.59      | 8.11       | 0.00         | 973.5                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 5.400

Dead Load Moment 1.4  
Superimposed Dead Load Moment 14.7

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 177.3      | 174.1           | -161.2 | 174.1        | -161.2 | 157.9                       | -177.3 | 157.9     | - |
| OPER 295.6      | 279.4           | -279.4 | 279.4        | -279.4 | 263.2                       | -295.6 | 263.2     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |        |        |      |
|-----------|------------|-------------------------|-------------------------|------------------------------|----------------------|--------|--------|--------|------|
| INV.      | HS20       | 97.01 R                 | 74.62                   | 138.00                       | 0.0                  | 77.50  | 59.62  | 110.00 |      |
|           |            | -30.21 L                | -23.24                  | 67.00                        | 0.0                  | -26.32 | -20.25 | 90.00  | 0.00 |
| OPER      | 5C1T       | 86.98 R                 | 66.91                   | 296.00                       | 0.0                  | 0.00   | 0.00   | 0.00   |      |
|           |            | -35.20 L                | -27.08                  | -93.50                       | 0.0                  | 0.00   | 0.00   | 0.00   | 0.00 |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.63            | 5.87  | 1.63         | 5.87  | HS 32.56     | 58.6                 |
| 5C1T        | 3.03            | 8.40  | 3.03         | 8.40  | 0.00         | 363.2                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 5.500

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 5.500

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.84 | 28.67 | 28.67 | 1.699 | 999999.000 | 91.892 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 18.54 |        | 105.9                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 5.500

Dead Load Moment 1.6  
Superimposed Dead Load Moment 16.8

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 169.3                       | -172.2             | 150.1           | -191.4             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 282.2                       | -287.1             | 250.2           | -319.0             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 94.68 L      | 72.83              | 98.50  | 0.0                 | 82.35    | 63.34       | 112.50             |        |                |              |
|           |           | -22.43 R     | -17.26             | 158.00 | 0.0                 | -22.73   | -17.49      | 135.00             | 0.00   |                |              |
| OPER      | 5C1T      | 89.96 L      | 69.20              | -73.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -34.25 L     | -26.34             | 40.50  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 1.79            | 7.58                      | 1.59                      | 8.42               | HS 31.72     | 57.1                 |
| 5C1T        | 3.14            | 8.38                      | 2.78                      | 9.32               | 0.00         | 333.8                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 5.500

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| 0.0       | 0.0                    |
|           | 0.1                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -69.9                  | 69.8                  |
| OPER      | 151.3             | -116.4                 | 116.3                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |            |              |              | Lane Live Load Shear |            |              |              |
|-----------|-----------|-----------------------|------------|--------------|--------------|----------------------|------------|--------------|--------------|
|           |           | w/imp. (-)            | w/imp. (+) | w/o imp. (-) | w/o imp. (+) | w/imp. (-)           | w/imp. (+) | w/o imp. (-) | w/o imp. (+) |
| INV.      | HS20      | -13.12                | 13.12      | -10.10       | 10.10        | -12.10               | 12.09      | -9.31        | 9.30         |
| OPER      | 5C1T      | -11.66                | 11.65      | -8.97        | 8.96         | 0.00                 | 0.00       | 0.00         | 0.00         |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 5.32       | 5.32       | HS 106.35    | 191.4                |
| 5C1T   | 9.98       | 9.99       | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 5.500

Dead Load Moment      Superimposed Dead Load Moment  
1.6                      16.8

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 178.7      | 175.0           | -160.3 | 175.0        | -160.3 | 156.6                       | -178.7 | 156.6     | - |
| OPER 297.8      | 279.4           | -279.4 | 279.4        | -279.4 | 261.0                       | -297.8 | 261.0     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 94.68 L                 | 72.83                | 98.50       | 0.0       | 82.35                   | 63.34                  | 112.50 |        |
|           |            | -22.43 R                | -17.26               | 158.00      | 0.0       | -22.73                  | -17.49                 | 135.00 | 0.00   |
| OPER      | 5C1T       | 89.96 L                 | 69.20                | -73.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -34.25 L                | -26.34               | 40.50       | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.65            | 7.86  | 1.65         | 7.86  | HS 33.08     | 59.5                 |
| 5C1T        | 2.90            | 8.70  | 2.90         | 8.70  | 0.00         | 348.2                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 5.600

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 5.600

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.84 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 91.997     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 18.54 |        | 105.9                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 5.600

Dead Load Moment 1.4  
Superimposed Dead Load Moment 14.7

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 170.7                       | -170.9             | 151.5           | -190.0             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 284.5                       | -284.8             | 252.6           | -316.7             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 97.01 L      | 74.62              | 87.00  | 0.0                 | 77.49    | 59.61       | 115.00             |        |                |              |
|           |           | -30.21 R     | -23.24             | 158.00 | 0.0                 | -26.34   | -20.27      | 135.00             | 0.00   |                |              |
| OPER      | 5C1T      | 87.02 L      | 66.94              | -71.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -35.34 R     | -27.19             | 318.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 1.76            | 5.66                      | 1.56         | 6.29               | HS 31.24     | 56.2                 |
| 5C1T        | 3.27            | 8.06                      | 2.90         | 8.96               | 0.00         | 348.3                |

## SHEAR RATING REPORT

Rating Types and Vehicles  
 INV. OPER POST SPEC  
 Structure I. D. HAM500  
 Member I. D. S02  
 Check Point I. D. 5.600  
 HS20 5C1T  
 Dead Load Superimposed Dead Load  
 Shear (-) Shear (+) Shear  
 -0.2 -1.6 0.0

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 90.8              | -68.8                           | 70.9  |
| OPER      | 151.3             | -114.6                          | 118.1 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -16.78                | 8.97 | -12.91   | 6.90 | -15.03               | 9.29 | -11.56   | 7.15 |
| OPER      | 5C1T      | -14.15                | 9.37 | -10.88   | 7.20 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 4.10       | 7.63       | HS 81.96     | 147.5                |  |
| 5C1T   | 8.10       | 12.61      | 0.00         | 972.1                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 5.600

Dead Load Moment 1.4  
Superimposed Dead Load Moment 14.7

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 177.3      | 174.1           | -161.2 | 174.1        | -161.2 | 158.0                       | -177.3 | 158.0     | - |
| OPER 295.5      | 279.4           | -279.4 | 279.4        | -279.4 | 263.3                       | -295.5 | 263.3     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Live Load Moment w/o imp. | Loc. of Conc. Load 1 | Live Load Moment w/imp. | Loc. of Conc. Load 2 |
|-----------|------------|-------------------------|-------------------------|---------------------------|----------------------|-------------------------|----------------------|
| INV.      | HS20       | 97.01 L                 | 74.62                   | 87.00                     | 0.0                  | 77.49                   | 59.61                |
|           |            | -30.21 R                | -23.24                  | 158.00                    | 0.0                  | -26.34                  | -20.27               |
| OPER      | 5C1T       | 87.02 L                 | 66.94                   | -71.00                    | 0.0                  | 0.00                    | 0.00                 |
|           |            | -35.34 R                | -27.19                  | 318.50                    | 0.0                  | 0.00                    | 0.00                 |

## Serviceability

| Rating Veh. | Rating Factor   |                    | Load Capacity (tons) |                    |
|-------------|-----------------|--------------------|----------------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend      | bottom fiber -bend |
| HS20        | 1.63            | 5.87               | 1.63                 | 5.87               |
| 5C1T        | 3.03            | 8.36               | 3.03                 | 8.36               |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 5.700

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 5.700

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.84 | 28.67 | 28.67 | 1.699 | 999999.000 | 91.997 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 18.54 |        | 105.9                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 5.700

Dead Load Moment      Superimposed Dead Load Moment  
0.8                      8.7

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 174.6                       | -166.9                | 155.5              | -186.1                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 291.1                       | -278.2                | 259.1              | -310.2                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 86.48 L      | 66.52              | 89.50  | 0.0                 | 65.20    | 50.15       | 117.50             |        |                |              |
|           |           | -37.98 R     | -29.21             | 158.00 | 0.0                 | -29.95   | -23.04      | 135.00             |        | 0.00           |              |
| OPER      | 5C1T      | 74.81 L      | 57.55              | 66.50  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -38.38 R     | -29.52             | 320.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|--------|--------------|----------------------|
| HS20        | 2.02               | 4.39                         | 1.80   | 35.95        | 64.7                 |
| 5C1T        | 3.89               | 7.25                         | 3.46   | 0.00         | 415.6                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 5.700

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.3      | -3.2         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -67.7                  | 71.9         |
| OPER      | 151.3             | -112.9                 | 119.8        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -20.57                | 4.41 | -15.82   | 3.40 | -18.02               | 6.72 | -13.86   | 5.17 |
| OPER      | 5C1T      | -17.20                | 7.22 | -13.23   | 5.55 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 3.29       | 10.69      | HS 65.88     | 118.6                |  |
| 5C1T   | 6.56       | 16.60      | 0.00         | 787.6                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 5.700Dead Load Moment 0.8  
Superimposed Dead Load Moment 8.7

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 173.4      | 171.5           | -163.8 | 171.5        | -163.8 | 161.9                       | -173.4 | 161.9     | - |
| OPER 289.0      | 279.4           | -279.4 | 279.4        | -279.4 | 269.8                       | -289.0 | 269.8     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Live Load Moment w/o imp. | Loc. of Conc. Load 1 | Live Load Moment w/imp. | Loc. of Conc. Load 2 |
|-----------|------------|-------------------------|-------------------------|---------------------------|----------------------|-------------------------|----------------------|
| INV.      | HS20       | 86.48 L                 | 66.52                   | 89.50                     | 0.0                  | 65.20                   | 50.15                |
|           |            | -37.98 R                | -29.21                  | 158.00                    | 0.0                  | -29.95                  | -23.04               |
| OPER      | 5C1T       | 74.81 L                 | 57.55                   | 66.50                     | 0.0                  | 0.00                    | 0.00                 |
|           |            | -38.38 R                | -29.52                  | 320.00                    | 0.0                  | 0.00                    | 0.00                 |

## Serviceability

| Rating Veh. | Rating Factor   |                    | Load Capacity (tons) |                    |
|-------------|-----------------|--------------------|----------------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend      | bottom fiber -bend |
| HS20        | 1.87            | 4.57               | 1.87                 | 4.57               |
| 5C1T        | 3.61            | 7.53               | 3.61                 | 7.53               |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 5.800

|               |                             |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Allowable stress (fs) (psi) |           |         |         |
| RATIO/Inv.    | 0.00                        | 0.00      | 0.00    | 0.00    |
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

|                |           |       |      |      |       |       |      |      |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

|                         |                  |                       |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

|               |          |              |       |                   |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

|                  |                  |             |       |                 |
|------------------|------------------|-------------|-------|-----------------|
| Section Modulus  |                  |             |       | Plastic Section |
| Positive Bending | Negative Bending | Modulus - Z |       |                 |
| Top              | Bott.            | Top         | Bott. | (Fy * Z)        |
| 127.0            | 127.0            | 127.0       | 127.0 | 390.83          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 5.800

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.84 | 28.67 | 28.67 | 1.699 | 999999.000 | 91.997 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 18.54 |        | 105.9                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 5.800

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -0.1                | -1.1                             |

| Rating<br>Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|----------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|                | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.           | 180.4C             | -161.2                | 161.2              | -180.4C               | 181.1                       | -160.5                | 161.9              | -179.7                |
| OPER           | 300.6C             | -268.7                | 268.7              | -300.6C               | 301.9                       | -267.4                | 269.9              | -299.4                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Rat.<br>Veh. | Truck<br>w/imp. | Live Load<br>w/o imp. | Moment | Loc. of<br>Front<br>Wheel | Ax.<br>Dis. | Lane<br>w/imp. | Live Load<br>w/o imp. | Moment | Loc. of<br>Load 1 | Conc.<br>Load 2 |
|--------------|--------------|-----------------|-----------------------|--------|---------------------------|-------------|----------------|-----------------------|--------|-------------------|-----------------|
| INV.         | HS20         | 59.43 L         | 45.72                 | 92.00  | 0.0                       | 45.25       | 34.81          | 120.00                |        |                   |                 |
|              |              | -45.75 R        | -35.19                | 158.00 | 0.0                       | -35.42      | -27.24         | 135.00                | 185.00 |                   |                 |
| OPER         | 5C1T         | 55.12 L         | 42.40                 | -18.00 | 0.0                       | 0.00        | 0.00           | 0.00                  |        |                   |                 |
|              |              | -42.84 R        | -32.95                | 234.00 | 0.0                       | 0.00        | 0.00           | 0.00                  | 0.00   |                   |                 |

## Moment

| Rating<br>Veh. | top fiber<br>+bend | Rating<br>bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------------|---------------------------------|-----------------|-----------------------|-----------------|----------------------------|
| HS20           | 3.05               | 3.51                            | 2.72            | 3.93                  | HS 54.49        | 98.1                       |
| 5C1T           | 5.48               | 6.24                            | 4.90            | 6.99                  | 0.00            | 587.5                      |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 5.800

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.5      | -4.7         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -66.7                  | 72.9         |
| OPER      | 151.3             | -111.2                 | 121.5        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -25.40                | 2.98 | -19.54   | 2.29 | -20.97               | 4.45 | -16.13   | 3.42 |
| OPER      | 5C1T      | -20.35                | 5.27 | -15.65   | 4.05 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 2.63       | 16.39      | HS 52.55     | 94.6                 |  |
| 5C1T   | 5.47       | 23.08      | 0.00         | 656.0                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 5.800

Dead Load Moment      Superimposed Dead Load Moment  
-0.1                      -1.1

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 166.9      | 167.2           | -168.1 | 167.2        | -168.1 | 168.4                       | -166.9 | 168.4     | - |
| OPER 278.2      | 279.4           | -279.4 | 279.4        | -279.4 | 280.6                       | -278.2 | 280.6     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 59.43 L                 | 45.72                | 92.00       | 0.0       | 45.25                   | 34.81                  | 120.00 |        |
|           |            | -45.75 R                | -35.19               | 158.00      | 0.0       | -35.42                  | -27.24                 | 135.00 | 185.00 |
| OPER      | 5C1T       | 55.12 L                 | 42.40                | -18.00      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -42.84 R                | -32.95               | 234.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 2.83            | 3.65            | 2.83               | 3.65               | HS 56.66     | 102.0                |
| 5C1T        | 5.09            | 6.49            | 5.09               | 6.49               | 0.00         | 610.9                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 5.900

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |               |                      |               | Plastic Section Modulus - Z |
|----------------------|---------------|----------------------|---------------|-----------------------------|
| Positive Bending Top | Bending Bott. | Negative Bending Top | Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0         | 127.0                | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 5.900

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.84 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 91.997     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 18.54 |        | 105.9                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 5.900

Dead Load Superimposed Dead Load  
Moment Moment  
-1.5 -14.7

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 190.1                       | -151.5                | 170.9              | -170.7                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 316.9                       | -252.4                | 284.9              | -284.4                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.20 L      | 12.46              | 94.50  | 0.0                 | 25.22    | 19.40       | 122.50             |        |                |              |
|           |           | -58.98 L     | -45.37             | 116.00 | 0.0                 | -54.07   | -41.59      | 135.00             | 112.50 |                |              |
| OPER      | 5C1T      | 29.91 L      | 23.01              | -15.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -50.42 R     | -38.78             | 236.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 7.54               | 2.57                         | 6.78 2.89                          | HS 51.36     | 92.5                 |
| 5C1T        | 10.59              | 5.01                         | 9.52 5.64                          | 0.00         | 600.8                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 5.900

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.6      | -6.2         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -65.7                  | 73.9         |
| OPER      | 151.3             | -109.5                 | 123.2        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -30.12                | 3.11 | -23.17   | 2.39 | -23.78               | 3.20 | -18.29   | 2.46 |
| OPER      | 5C1T      | -23.42                | 3.57 | -18.02   | 2.74 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 2.18       | 23.08      | HS 43.64     | 78.6                 |
| 5C1T   | 4.68       | 34.55      | 0.00         | 561.1                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 5.900

Dead Load Moment      Superimposed Dead Load Moment  
-1.5                      -14.7

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 157.9      | 161.2           | -174.1 | 161.2        | -174.1 | 177.4                       | -157.9 | 177.4     | - |
| OPER 263.2      | 279.4           | -279.4 | 279.4        | -279.4 | 295.6                       | -263.2 | 295.6     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 16.20 L                 | 12.46                | 94.50       | 0.0       | 25.22                   | 19.40                  | 122.50 |        |
|           |            | -58.98 L                | -45.37               | 116.00      | 0.0       | -54.07                  | -41.59                 | 135.00 | 112.50 |
| OPER      | 5C1T       | 29.91 L                 | 23.01                | -15.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -50.42 R                | -38.78               | 236.50      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 7.03            | 2.68  | 7.03         | 2.68  | HS 53.55     | 96.4                 |
| 5C1T        | 9.88            | 5.22  | 9.88         | 5.22  | 0.00         | 626.4                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 6.000

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 127.0           | 127.0         | 127.0        | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 6.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.84 | 28.67 | 28.67 | 1.699 | 999999.000 | 91.997 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 18.54 |        | 105.9                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 6.000

Dead Load Moment      Superimposed Dead Load Moment  
-3.3                      -32.2

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 201.7                       | -139.9                | 182.5              | -159.1                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 336.1                       | -233.2                | 304.1              | -265.2                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment  | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|---------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.42 L      | 12.63              | 67.00   | 0.0                 | 16.62    | 12.78       | 90.00              |        |                |              |
|           |           | -98.55 R     | -75.81             | 145.50  | 0.0                 | -90.58   | -69.68      | 115.00             | 135.00 |                |              |
| OPER      | 5C1T      | 12.69 L      | 9.76               | -135.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -64.25 L     | -49.42             | 7.00    | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 12.14              | 1.42                         | 10.98           | 1.61                  | HS 28.39     | 51.1                 |
| 5C1T        | 26.48              | 3.63                         | 23.96           | 4.13                  | 0.00         | 435.6                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 6.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.6      | -0.8      | -6.2                   | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 90.8              | -64.7                           | 64.7  |
| OPER      | 151.3             | -107.8                          | 107.8 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -30.12                | 34.53 | -23.17   | 26.56 | -23.78               | 26.35 | -18.29   | 20.27 |
| OPER      | 5C1T      | -23.42                | 26.27 | -18.02   | 20.21 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.87       | 1.87       | HS 37.48     | 67.5                 |
| 5C1T   | 4.10       | 4.10       | 0.00         | 492.5                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 6.000

Dead Load Moment      Superimposed Dead Load Moment  
-3.3                      -32.2

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 146.4      | 153.5           | -181.8 | 153.5        | -181.8 | 188.9                       | -146.4 | 188.9     | - |
| OPER 243.9      | 279.4           | -279.4 | 279.4        | -279.4 | 314.9                       | -243.9 | 314.9     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 16.42 L                 | 12.63           | 67.00                   | 0.0       | 16.62                   | 12.78           | 90.00                |        |
|           |            | -98.55 R                | -75.81          | 145.50                  | 0.0       | -90.58                  | -69.68          | 115.00               | 135.00 |
| OPER      | 5C1T       | 12.69 L                 | 9.76            | -135.00                 | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -64.25 L                | -49.42          | 7.00                    | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 11.37           | 1.49            | 11.37              | 1.49               | HS 29.70     | 53.5                 |
| 5C1T        | 24.81           | 3.80            | 24.81              | 3.80               | 0.00         | 455.6                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 6.000

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |               |                      |               | Plastic Section Modulus - Z |
|----------------------|---------------|----------------------|---------------|-----------------------------|
| Positive Bending Top | Bending Bott. | Negative Bending Top | Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0         | 127.0                | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 6.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.84 | 28.67 | 28.67 | 1.699 | 999999.000 | 91.997 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 18.54 |        | 105.9                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 6.000

Dead Load Superimposed Dead Load  
Moment Moment  
-3.3 -32.2

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 201.7                       | -139.9                | 182.5              | -159.1                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 336.1                       | -233.2                | 304.1              | -265.2                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load w/imp. | Load Moment w/o imp. | Loc. of Front Wheel | Ax. Dis. | Lane Live Load w/imp. | Load Moment w/o imp. | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|------------------------|----------------------|---------------------|----------|-----------------------|----------------------|----------------|--------------|
| INV.      | HS20      | 16.42 L                | 12.63                | 67.00               | 0.0      | 16.62                 | 12.78                | 90.00          |              |
|           |           | -98.55 R               | -75.81               | 145.50              | 0.0      | -90.58                | -69.68               | 115.00         | 135.00       |
| OPER      | 5C1T      | 12.69 L                | 9.76                 | -135.00             | 0.0      | 0.00                  | 0.00                 | 0.00           |              |
|           |           | -64.25 L               | -49.42               | 7.00                | 0.0      | 0.00                  | 0.00                 | 0.00           | 0.00         |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 12.14              | 1.42                         | 10.98           | 1.61                  | HS 28.39     | 51.1                 |
| 5C1T        | 26.48              | 3.63                         | 23.96           | 4.13                  | 0.00         | 435.6                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 6.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.8      | 0.8       | -7.8                   | 7.8       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I |       |
|-----------|-------------------|-----------------------------|-------|
|           |                   | (-)                         | (+)   |
| INV.      | 90.8              | -64.7                       | 64.7  |
| OPER      | 151.3             | -107.8                      | 107.8 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -34.53                | 34.53 | -26.56   | 26.56 | -26.35               | 26.35 | -20.27   | 20.27 |
| OPER      | 5C1T      | -26.27                | 26.27 | -20.21   | 20.21 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.87       | 1.87       | HS 37.48     | 67.5                 |
| 5C1T   | 4.10       | 4.10       | 0.00         | 492.5                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 6.000

Dead Load Moment      Superimposed Dead Load Moment  
-3.3                      -32.2

| Rating Veh.<br>ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|--------------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                    | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend               | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV.<br>146.4      | 153.5           | -181.8 | 153.5        | -181.8 | 188.9                       | -146.4 | 188.9     | - |
| OPER<br>243.9      | 279.4           | -279.4 | 279.4        | -279.4 | 314.9                       | -243.9 | 314.9     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 16.42 L                 | 12.63           | 67.00                   | 0.0       | 16.62                   | 12.78           | 90.00                |        |
|           |            | -98.55 R                | -75.81          | 145.50                  | 0.0       | -90.58                  | -69.68          | 115.00               | 135.00 |
| OPER      | 5C1T       | 12.69 L                 | 9.76            | -135.00                 | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -64.25 L                | -49.42          | 7.00                    | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 11.37           | 1.49  | 11.37        | 1.49  | HS 29.70     | 53.5                 |
| 5C1T        | 24.81           | 3.80  | 24.81        | 3.80  | 0.00         | 455.6                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 6.100

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 6.100

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.84 | 28.67 | 28.67 | 1.699 | 999999.000 | 91.997 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 18.54 |        | 105.9                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 6.100

Dead Load Superimposed Dead Load  
Moment Moment  
-1.5 -14.7

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 190.1                       | -151.5                | 170.9              | -170.7                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 316.9                       | -252.4                | 284.9              | -284.4                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.20 R      | 12.46              | 155.50 | 0.0                 | 25.65    | 19.73       | 127.50             |        |                |              |
|           |           | -58.98 R     | -45.37             | 134.00 | 0.0                 | -54.09   | -41.61      | 115.00             |        | 137.50         |              |
| OPER      | 5C1T      | 29.91 R      | 23.01              | 265.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -50.42 L     | -38.78             | 13.50  | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 7.41               | 2.57                         | 6.66                               | 2.89         | HS 51.36 92.5        |
| 5C1T        | 10.59              | 5.01                         | 9.52                               | 5.64         | 0.00 600.8           |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 6.100

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.6       | 0.0          | 6.2       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -73.9                  | 65.7         |
| OPER      | 151.3             | -123.2                 | 109.5        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -2.98                 | 30.12 | -2.29    | 23.17 | -3.20                | 23.78 | -2.46    | 18.29 |
| OPER      | 5C1T      | -3.57                 | 23.42 | -2.74    | 18.02 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 23.08      | 2.18       | HS 43.64     | 78.6                 |
| 5C1T   | 34.55      | 4.68       | 0.00         | 561.1                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 6.100

Dead Load Moment      Superimposed Dead Load Moment  
-1.5                      -14.7

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 157.9      | 161.2           | -174.1 | 161.2        | -174.1 | 177.4                       | -157.9 | 177.4     | - |
| OPER 263.2      | 279.4           | -279.4 | 279.4        | -279.4 | 295.6                       | -263.2 | 295.6     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 16.20 R                 | 12.46           | 155.50                  | 0.0       | 25.65                   | 19.73           | 127.50               |        |
|           |            | -58.98 R                | -45.37          | 134.00                  | 0.0       | -54.09                  | -41.61          | 115.00               | 137.50 |
| OPER      | 5C1T       | 29.91 R                 | 23.01           | 265.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -50.42 L                | -38.78          | 13.50                   | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 6.91            | 2.68            | 6.91               | 2.68               | HS 53.55     | 96.4                 |
| 5C1T        | 9.88            | 5.22            | 9.88               | 5.22               | 0.00         | 626.4                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 6.200

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus  |                  |       |       | Plastic Section |
|------------------|------------------|-------|-------|-----------------|
| Positive Bending | Negative Bending |       |       | Modulus - Z     |
| Top              | Bott.            | Top   | Bott. | (Fy * Z)        |
| 127.0            | 127.0            | 127.0 | 127.0 | 390.83          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 6.200

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.84 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 91.997     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 18.54 |        | 105.9                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 6.200

Dead Load Moment      Superimposed Dead Load Moment  
-0.1                      -1.1

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 181.1                       | -160.5                | 161.9              | -179.7                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 301.9                       | -267.4                | 269.9              | -299.4                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 59.43 R      | 45.72              | 158.00 | 0.0                 | 44.74    | 34.41       | 130.00             |        |                |              |
|           |           | -45.75 L     | -35.19             | 92.00  | 0.0                 | -35.41   | -27.24      | 115.00             |        | 65.00          |              |
| OPER      | 5C1T      | 55.12 R      | 42.40              | 268.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -42.84 L     | -32.95             | 16.00  | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 3.05               | 3.51                         | 2.72            | 3.93                  | HS 54.49     | 98.1                 |
| 5C1T        | 5.48               | 6.24                         | 4.90            | 6.99                  | 0.00         | 587.5                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 6.200

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| 0.5       | 0.0                    |
|           | 4.7                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -72.9                  | 66.7                  |
| OPER      | 151.3             | -121.5                 | 111.2                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -2.98                 | 25.40 | -2.29    | 19.54 | -4.45                | 20.97 | -3.42    | 16.13 |
| OPER      | 5C1T      | -5.27                 | 20.35 | -4.05    | 15.65 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 16.39      | 2.63       | HS 52.55     | 94.6                 |
| 5C1T   | 23.08      | 5.47       | 0.00         | 656.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 6.200

Dead Load Moment      Superimposed Dead Load Moment  
-0.1                      -1.1

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 166.9      | 167.2           | -168.1 | 167.2        | -168.1 | 168.4                       | -166.9 | 168.4     | - |
| OPER 278.2      | 279.4           | -279.4 | 279.4        | -279.4 | 280.6                       | -278.2 | 280.6     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 59.43 R                 | 45.72           | 158.00                  | 0.0       | 44.74                   | 34.41           | 130.00               |        |
|           |            | -45.75 L                | -35.19          | 92.00                   | 0.0       | -35.41                  | -27.24          | 115.00               | 65.00  |
| OPER      | 5C1T       | 55.12 R                 | 42.40           | 268.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -42.84 L                | -32.95          | 16.00                   | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 2.83            | 3.65            | 2.83               | 3.65               | HS 56.66     | 102.0                |
| 5C1T        | 5.09            | 6.49            | 5.09               | 6.49               | 0.00         | 610.9                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 6.300

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus  |                  |       |       | Plastic Section |
|------------------|------------------|-------|-------|-----------------|
| Positive Bending | Negative Bending |       |       | Modulus - Z     |
| Top              | Bott.            | Top   | Bott. | (Fy * Z)        |
| 127.0            | 127.0            | 127.0 | 127.0 | 390.83          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 6.300

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.84 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 91.997     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 18.54 |        | 105.9                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 6.300

Dead Load Moment 0.8  
Superimposed Dead Load Moment 8.7

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 174.6                       | -166.9             | 155.5           | -186.1             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 291.1                       | -278.2             | 259.1           | -310.2             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 86.48 R      | 66.52              | 160.50 | 0.0                 | 65.20    | 50.15       | 132.50             |        |                |              |
|           |           | -37.98 L     | -29.21             | 92.00  | 0.0                 | -29.96   | -23.04      | 115.00             |        | 0.00           |              |
| OPER      | 5C1T      | 74.81 R      | 57.55              | 183.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -38.38 L     | -29.52             | -70.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | bottom fiber -bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|--------|--------------|----------------------|
| HS20        | 2.02            | 4.39               | 1.80   | 35.95        | 64.7                 |
| 5C1T        | 3.89            | 7.25               | 3.46   | 0.00         | 415.6                |

## SHEAR RATING REPORT

Rating Types and Vehicles  
 INV. OPER POST SPEC  
 Structure I. D. HAM500  
 Member I. D. S02  
 Check Point I. D. 6.300  
 HS20 5C1T

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| 0.3       | 0.0                    |
|           | 3.2                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -71.9                  | 67.7                  |
| OPER      | 151.3             | -119.8                 | 112.9                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |            |              |              | Lane Live Load Shear |            |              |              |
|-----------|-----------|-----------------------|------------|--------------|--------------|----------------------|------------|--------------|--------------|
|           |           | w/imp. (-)            | w/imp. (+) | w/o imp. (-) | w/o imp. (+) | w/imp. (-)           | w/imp. (+) | w/o imp. (-) | w/o imp. (+) |
| INV.      | HS20      | -4.41                 | 20.57      | -3.40        | 15.82        | -6.72                | 18.02      | -5.17        | 13.86        |
| OPER      | 5C1T      | -7.22                 | 17.20      | -5.55        | 13.23        | 0.00                 | 0.00       | 0.00         | 0.00         |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 10.69      | 3.29       | HS 65.88     | 118.6                |
| 5C1T   | 16.60      | 6.56       | 0.00         | 787.6                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 6.300Dead Load Moment 0.8  
Superimposed Dead Load Moment 8.7

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
|                 | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 173.4      | 171.5           | -163.8 | 171.5        | -163.8 | 161.9                       | -173.4 | 161.9     | - |
| OPER 289.0      | 279.4           | -279.4 | 279.4        | -279.4 | 269.8                       | -289.0 | 269.8     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Live Load Moment w/o imp. | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-------------------------|---------------------------|-----------|-------------------------|----------------------|--------|
| INV.      | HS20       | 86.48 R                 | 66.52                   | 160.50                    | 0.0       | 65.20                   | 50.15                | 132.50 |
|           |            | -37.98 L                | -29.21                  | 92.00                     | 0.0       | -29.96                  | -23.04               | 115.00 |
| OPER      | 5C1T       | 74.81 R                 | 57.55                   | 183.50                    | 0.0       | 0.00                    | 0.00                 | 0.00   |
|           |            | -38.38 L                | -29.52                  | -70.00                    | 0.0       | 0.00                    | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.87            | 4.57  | 1.87         | 4.57  | HS 37.44     | 67.4                 |
| 5C1T        | 3.61            | 7.53  | 3.61         | 7.53  | 0.00         | 432.8                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 6.400

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 127.0           | 127.0         | 127.0        | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 6.400

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.84 | 28.67 | 28.67 | 1.699 | 999999.000 | 91.997 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 18.54 |        | 105.9                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 6.400

Dead Load Moment 1.4  
Superimposed Dead Load Moment 14.7

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 170.7                       | -170.9             | 151.5           | -190.0             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 284.5                       | -284.8             | 252.6           | -316.7             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 97.01 R      | 74.62              | 163.00 | 0.0                 | 77.49    | 59.61       | 135.00             |        |                |              |
|           |           | -30.21 L     | -23.24             | 92.00  | 0.0                 | -26.35   | -20.27      | 115.00             | 0.00   |                |              |
| OPER      | 5C1T      | 87.02 R      | 66.94              | 321.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -35.34 L     | -27.19             | -68.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | Rating Factor   |                    |                 |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|-----------------|--------------------|--------------|----------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend |              |                      |
| HS20        | 1.76            | 5.66               | 1.56            | 6.29               | HS 31.24     | 56.2                 |
| 5C1T        | 3.27            | 8.06               | 2.90            | 8.96               | 0.00         | 348.3                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 6.400

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| 0.2       | 0.0                    |
|           | 1.6                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -70.9                  | 68.8                  |
| OPER      | 151.3             | -118.1                 | 114.6                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -8.97                 | 16.78 | -6.90    | 12.91 | -9.29                | 15.03 | -7.15    | 11.56 |
| OPER      | 5C1T      | -9.37                 | 14.15 | -7.20    | 10.88 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 7.63       | 4.10       | HS 81.96     | 147.5                |  |
| 5C1T   | 12.61      | 8.10       | 0.00         | 972.1                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 6.400

Dead Load Moment      Superimposed Dead Load Moment  
1.4                      14.7

| Rating Veh.<br>ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|--------------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                    | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend               | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV.<br>177.3      | 174.1           | -161.2 | 174.1        | -161.2 | 158.0                       | -177.3 | 158.0     | - |
| OPER<br>295.5      | 279.4           | -279.4 | 279.4        | -279.4 | 263.3                       | -295.5 | 263.3     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 97.01 R                 | 74.62                | 163.00      | 0.0       | 77.49                   | 59.61                  | 135.00 |        |
|           |            | -30.21 L                | -23.24               | 92.00       | 0.0       | -26.35                  | -20.27                 | 115.00 | 0.00   |
| OPER      | 5C1T       | 87.02 R                 | 66.94                | 321.00      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -35.34 L                | -27.19               | -68.50      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.63            | 5.87  | 1.63         | 5.87  | HS 32.57     | 58.6                 |
| 5C1T        | 3.03            | 8.36  | 3.03         | 8.36  | 0.00         | 363.1                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 6.500

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 6.500

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.84 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 91.848     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 17.94 |        | 106.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 6.500

Dead Load Moment 1.6  
Superimposed Dead Load Moment 16.8

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 169.3                       | -172.2             | 150.1           | -191.4             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 282.2                       | -287.1             | 250.2           | -319.0             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 94.68 L      | 72.83              | 123.50 | 0.0                 | 82.35    | 63.34       | 137.50             |        |                |              |
|           |           | -22.44 L     | -17.26             | 92.00  | 0.0                 | -22.73   | -17.49      | 115.00             |        | 0.00           |              |
| OPER      | 5C1T      | 89.96 R      | 69.20              | 323.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -34.25 R     | -26.34             | 209.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 1.79            | 7.58                      | 1.59                      | 8.42               | HS 31.72     | 57.1                 |
| 5C1T        | 3.14            | 8.38                      | 2.78                      | 9.32               | 0.00         | 333.8                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 6.500

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear     | (-) Shear (+) Shear    |
| 0.0       | 0.0 0.1                |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 90.8              | -69.9                           | 69.8  |
| OPER      | 151.3             | -116.4                          | 116.3 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |      |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |      |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)  |
| INV.      | HS20      | -13.12                | 13.12 | -10.10   | 10.10 | -12.09               | 12.10 | -9.30    | 9.31 |
| OPER      | 5C1T      | -11.65                | 11.66 | -8.96    | 8.97  | 0.00                 | 0.00  | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 5.32       | 5.32       | HS 106.33    | 191.4                |
| 5C1T   | 10.00      | 9.97       | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 6.500

Dead Load Moment      Superimposed Dead Load Moment  
1.6                      16.8

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 178.7      | 175.0           | -160.3 | 175.0        | -160.3 | 156.6                       | -178.7 | 156.6     | - |
| OPER 297.8      | 279.4           | -279.4 | 279.4        | -279.4 | 261.0                       | -297.8 | 261.0     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 94.68 L                 | 72.83           | 123.50                  | 0.0       | 82.35                   | 63.34           | 137.50               |        |
|           |            | -22.44 L                | -17.26          | 92.00                   | 0.0       | -22.73                  | -17.49          | 115.00               | 0.00   |
| OPER      | 5C1T       | 89.96 R                 | 69.20           | 323.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -34.25 R                | -26.34          | 209.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.65            | 7.86  | 1.65         | 7.86  | HS 33.08     | 59.5                 |
| 5C1T        | 2.90            | 8.70  | 2.90         | 8.70  | 0.00         | 348.2                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 6.600

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 127.0           | 127.0         | 127.0        | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 6.600

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.84 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 91.848     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 17.94 |        | 106.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 6.600

Dead Load Moment 1.4  
Superimposed Dead Load Moment 14.7

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 170.7                       | -170.9             | 151.5           | -190.1             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 284.5                       | -284.8             | 252.5           | -316.8             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 97.01 L      | 74.62              | 112.00 | 0.0                 | 77.50    | 59.62       | 140.00             |        |                |              |
|           |           | -30.21 R     | -23.24             | 183.00 | 0.0                 | -26.32   | -20.25      | 160.00             | 0.00   |                |              |
| OPER      | 5C1T      | 86.98 L      | 66.91              | -46.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -35.20 R     | -27.08             | 343.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | Rating Factor   |                    |                 |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|-----------------|--------------------|--------------|----------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.76            | 5.66               | 1.56            | 6.29               | HS 31.23     | 56.2                 |
| 5C1T        | 3.27            | 8.09               | 2.90            | 9.00               | 0.00         | 348.3                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 6.600

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| -0.2      | -1.6                   |
|           | 0.0                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -68.8                  | 70.9                  |
| OPER      | 151.3             | -114.6                 | 118.1                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |            |              |              | Lane Live Load Shear |            |              |              |
|-----------|-----------|-----------------------|------------|--------------|--------------|----------------------|------------|--------------|--------------|
|           |           | w/imp. (-)            | w/imp. (+) | w/o imp. (-) | w/o imp. (+) | w/imp. (-)           | w/imp. (+) | w/o imp. (-) | w/o imp. (+) |
| INV.      | HS20      | -16.78                | 8.97       | -12.91       | 6.90         | -15.03               | 9.30       | -11.56       | 7.16         |
| OPER      | 5C1T      | -14.13                | 9.38       | -10.87       | 7.22         | 0.00                 | 0.00       | 0.00         | 0.00         |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 4.10       | 7.62       | HS 81.98     | 147.6                |  |
| 5C1T   | 8.11       | 12.59      | 0.00         | 973.5                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 6.600

Dead Load Moment      Superimposed Dead Load Moment  
1.4                      14.7

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 177.3      | 174.1           | -161.2 | 174.1        | -161.2 | 157.9                       | -177.3 | 157.9     | - |
| OPER 295.6      | 279.4           | -279.4 | 279.4        | -279.4 | 263.2                       | -295.6 | 263.2     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 97.01 L                 | 74.62                | 112.00      | 0.0       | 77.50                   | 59.62                  | 140.00 |        |
|           |            | -30.21 R                | -23.24               | 183.00      | 0.0       | -26.32                  | -20.25                 | 160.00 | 0.00   |
| OPER      | 5C1T       | 86.98 L                 | 66.91                | -46.00      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -35.20 R                | -27.08               | 343.50      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.63            | 5.87  | 1.63         | 5.87  | HS 32.56     | 58.6                 |
| 5C1T        | 3.03            | 8.40  | 3.03         | 8.40  | 0.00         | 363.2                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 6.700

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |               |                      |               | Plastic Section Modulus - Z |
|----------------------|---------------|----------------------|---------------|-----------------------------|
| Positive Bending Top | Bending Bott. | Negative Bending Top | Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0         | 127.0                | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 6.700

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.84 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 91.848     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 17.94 |        | 106.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 6.700

Dead Load Moment 0.9  
Superimposed Dead Load Moment 8.8

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 174.6                       | -167.0             | 155.4           | -186.2             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 291.0                       | -278.3             | 259.0           | -310.3             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 86.48 L      | 66.52              | 114.50 | 0.0                 | 65.23    | 50.17       | 142.50             |        |                |              |
|           |           | -37.98 R     | -29.21             | 183.00 | 0.0                 | -29.90   | -23.00      | 160.00             |        | 0.00           |              |
| OPER      | 5C1T      | 74.87 L      | 57.59              | 91.50  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -38.20 R     | -29.39             | 345.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | bottom fiber -bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|--------|--------------|----------------------|
| HS20        | 2.02            | 4.40               | 1.80   | 35.94        | 64.7                 |
| 5C1T        | 3.89            | 7.28               | 3.46   | 0.00         | 415.1                |

## SHEAR RATING REPORT

Rating Types and Vehicles  
 INV. OPER POST SPEC  
 Structure I. D. HAM500  
 Member I. D. S02  
 Check Point I. D. 6.700  
 HS20 5C1T

Dead Load Superimposed Dead Load  
 Shear (-) Shear (+) Shear  
 -0.3 -3.1 0.0

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -67.8                  | 71.9                  |
| OPER      | 151.3             | -112.9                 | 119.8                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |            |              |              | Lane Live Load Shear |            |              |              |
|-----------|-----------|-----------------------|------------|--------------|--------------|----------------------|------------|--------------|--------------|
|           |           | w/imp. (-)            | w/imp. (+) | w/o imp. (-) | w/o imp. (+) | w/imp. (-)           | w/imp. (+) | w/o imp. (-) | w/o imp. (+) |
| INV.      | HS20      | -20.57                | 4.41       | -15.82       | 3.40         | -18.01               | 6.73       | -13.86       | 5.18         |
| OPER      | 5C1T      | -17.19                | 7.23       | -13.22       | 5.56         | 0.00                 | 0.00       | 0.00         | 0.00         |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 3.29       | 10.68      | HS 65.89     | 118.6                |  |
| 5C1T   | 6.57       | 16.57      | 0.00         | 788.6                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 6.700

Dead Load Moment 0.9  
Superimposed Dead Load Moment 8.8

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 173.4      | 171.5           | -163.8 | 171.5        | -163.8 | 161.8                       | -173.4 | 161.8     | - |
| OPER 289.1      | 279.4           | -279.4 | 279.4        | -279.4 | 269.7                       | -289.1 | 269.7     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |        |
|-----------|------------|-------------------------|-------------------------|-----------|-------------------------|----------------------|--------|--------|
| INV.      | HS20       | 86.48 L                 | 66.52                   | 114.50    | 0.0                     | 65.23                | 50.17  | 142.50 |
|           |            | -37.98 R                | -29.21                  | 183.00    | 0.0                     | -29.90               | -23.00 | 160.00 |
| OPER      | 5C1T       | 74.87 L                 | 57.59                   | 91.50     | 0.0                     | 0.00                 | 0.00   | 0.00   |
|           |            | -38.20 R                | -29.39                  | 345.00    | 0.0                     | 0.00                 | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.87            | 4.57            | 1.87               | 4.57               | HS 37.43     | 67.4                 |
| 5C1T        | 3.60            | 7.57            | 3.60               | 7.57               | 0.00         | 432.3                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 6.800

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 6.800

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.84 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 91.848     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 17.94 |        | 106.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 6.800

Dead Load Moment      Superimposed Dead Load Moment  
-0.1                      -0.9

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 181.0                       | -160.6                | 161.8              | -179.8                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 301.7                       | -267.6                | 269.7              | -299.6                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 59.43 L      | 45.72              | 117.00 | 0.0                 | 45.29    | 34.84       | 145.00             |        |                |              |
|           |           | -45.75 R     | -35.19             | 183.00 | 0.0                 | -35.34   | -27.18      | 160.00             |        | 210.00         |              |
| OPER      | 5C1T      | 55.14 L      | 42.42              | 7.00   | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -42.63 R     | -32.79             | 259.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 3.05               | 3.51                         | 2.72                               | 3.93         | 54.46                |
| 5C1T        | 5.47               | 6.28                         | 4.89                               | 7.03         | 0.00                 |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 6.800

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| -0.5      | -4.7                   |
|           | 0.0                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -66.7                  | 72.9         |
| OPER      | 151.3             | -111.2                 | 121.5        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -25.40                | 2.98 | -19.54   | 2.29 | -20.96               | 4.46 | -16.12   | 3.43 |
| OPER      | 5C1T      | -20.33                | 5.28 | -15.64   | 4.06 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 2.63       | 16.36      | HS 52.56     | 94.6                 |  |
| 5C1T   | 5.47       | 23.00      | 0.00         | 656.7                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 6.800

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -0.1                | -0.9                             |

| Rating<br>Veh.<br>ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                       | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend                  | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV.<br>167.0         | 167.2           | -168.1 | 167.2        | -168.1 | 168.3                       | -167.0 | 168.3     | - |
| OPER<br>278.4         | 279.4           | -279.4 | 279.4        | -279.4 | 280.4                       | -278.4 | 280.4     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Truck<br>Veh. | Live Load Moment<br>w/imp. | Moment<br>w/o imp. | Loc. of Ax.<br>Front<br>Wheel | Lane<br>Dis. | Live Load Moment<br>w/imp. | Moment<br>w/o imp. | Loc. of Conc.<br>Load 1 | Load 2 |
|--------------|---------------|----------------------------|--------------------|-------------------------------|--------------|----------------------------|--------------------|-------------------------|--------|
| INV.         | HS20          | 59.43 L                    | 45.72              | 117.00                        | 0.0          | 45.29                      | 34.84              | 145.00                  |        |
|              |               | -45.75 R                   | -35.19             | 183.00                        | 0.0          | -35.34                     | -27.18             | 160.00                  | 210.00 |
| OPER         | 5C1T          | 55.14 L                    | 42.42              | 7.00                          | 0.0          | 0.00                       | 0.00               | 0.00                    |        |
|              |               | -42.63 R                   | -32.79             | 259.00                        | 0.0          | 0.00                       | 0.00               | 0.00                    | 0.00   |

## Serviceability

| Rating<br>Veh. | Rating       |                | Factor          |                | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------|----------------|-----------------|----------------|-----------------|----------------------------|
|                | top<br>+bend | fiber<br>-bend | bottom<br>+bend | fiber<br>-bend |                 |                            |
| HS20           | 2.83         | 3.65           | 2.83            | 3.65           | HS 56.63        | 101.9                      |
| 5C1T           | 5.09         | 6.53           | 5.09            | 6.53           | 0.00            | 610.3                      |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 6.900

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 127.0           | 127.0         | 127.0        | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 6.900

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.84 | 28.67 | 28.67 | 1.699 | 999999.000 | 91.848 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 17.94 |        | 106.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 6.900

Dead Load Moment      Superimposed Dead Load Moment  
-1.5                      -14.5

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 190.0                       | -151.6                | 170.8              | -170.8                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 316.6                       | -252.7                | 284.6              | -284.6                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.20 L      | 12.46              | 119.50 | 0.0                 | 25.28    | 19.44       | 147.50             |        |                |              |
|           |           | -58.98 L     | -45.37             | 141.00 | 0.0                 | -53.97   | -41.52      | 160.00             |        | 137.50         |              |
| OPER      | 5C1T      | 30.00 L      | 23.07              | 9.50   | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -50.21 R     | -38.62             | 261.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 7.52               | 2.57                         | 6.76                               | 2.90         | HS 51.41 92.5        |
| 5C1T        | 10.56              | 5.03                         | 9.49                               | 5.67         | 0.00 603.9           |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 6.900

|                 |                        |
|-----------------|------------------------|
| Dead Load       | Superimposed Dead Load |
| Shear (-) Shear | (+) Shear              |
| -0.6            | -6.2                   |
|                 | 0.0                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 90.8              | -65.7                           | 73.9  |
| OPER      | 151.3             | -109.5                          | 123.2 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |            |              |              | Lane Live Load Shear |            |              |              |
|-----------|-----------|-----------------------|------------|--------------|--------------|----------------------|------------|--------------|--------------|
|           |           | w/imp. (-)            | (+) w/imp. | w/o imp. (-) | (+) w/o imp. | w/imp. (-)           | (+) w/imp. | w/o imp. (-) | (+) w/o imp. |
| INV.      | HS20      | -30.12                | 3.11       | -23.17       | 2.39         | -23.77               | 3.21       | -18.29       | 2.47         |
| OPER      | 5C1T      | -23.41                | 3.58       | -18.01       | 2.76         | 0.00                 | 0.00       | 0.00         | 0.00         |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 2.18       | 23.02      | HS 43.65     | 78.6                 |
| 5C1T   | 4.68       | 34.37      | 0.00         | 561.5                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 6.900

Dead Load Moment      Superimposed Dead Load Moment  
-1.5                      -14.5

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 158.0      | 161.2           | -174.0 | 161.2        | -174.0 | 177.2                       | -158.0 | 177.2     | - |
| OPER 263.4      | 279.4           | -279.4 | 279.4        | -279.4 | 295.4                       | -263.4 | 295.4     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 16.20 L                 | 12.46                | 119.50      | 0.0       | 25.28                   | 19.44                  | 147.50 |        |
|           |            | -58.98 L                | -45.37               | 141.00      | 0.0       | -53.97                  | -41.52                 | 160.00 | 137.50 |
| OPER      | 5C1T       | 30.00 L                 | 23.07                | 9.50        | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -50.21 R                | -38.62               | 261.50      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 7.01            | 2.68            | 7.01               | 2.68               | HS 53.60     | 96.5                 |
| 5C1T        | 9.85            | 5.25            | 9.85               | 5.25               | 0.00         | 629.5                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 7.000

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus  |                  |       |       | Plastic Section |
|------------------|------------------|-------|-------|-----------------|
| Positive Bending | Negative Bending |       |       | Modulus - Z     |
| Top              | Bott.            | Top   | Bott. | (Fy * Z)        |
| 127.0            | 127.0            | 127.0 | 127.0 | 390.83          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 7.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.84 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 91.848     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 17.94 |        | 106.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 7.000

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -3.2                | -32.0                            |

| Rating<br>Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|----------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|                | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.           | 180.4C             | -161.2                | 161.2              | -180.4C               | 201.5                       | -140.1                | 182.3              | -159.3                |
| OPER           | 300.6C             | -268.7                | 268.7              | -300.6C               | 335.8                       | -233.5                | 303.8              | -265.5                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Rat.<br>Veh. | Truck Live<br>w/imp. | Load Moment<br>w/o imp. | Loc. of<br>Front<br>Wheel | Ax.<br>Dis. | Lane Live<br>w/imp. | Load Moment<br>w/o imp. | Loc. of<br>Load 1 | Conc.<br>Load 2 |
|--------------|--------------|----------------------|-------------------------|---------------------------|-------------|---------------------|-------------------------|-------------------|-----------------|
| INV.         | HS20         | 16.42 L              | 12.63                   | 92.00                     | 0.0         | 16.69               | 12.84                   | 115.00            |                 |
|              |              | -98.55 L             | -75.81                  | 129.50                    | 0.0         | -90.47              | -69.59                  | 140.00            | 160.00          |
| OPER         | 5C1T         | 12.80 R              | 9.85                    | 408.50                    | 0.0         | 0.00                | 0.00                    | 0.00              |                 |
|              |              | -64.03 R             | -49.26                  | 266.50                    | 0.0         | 0.00                | 0.00                    | 0.00              | 0.00            |

## Moment

| Rating<br>Veh. | top fiber<br>+bend | Rating<br>bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------------|---------------------------------|-----------------|-----------------------|-----------------|----------------------------|
| HS20           | 12.07              | 1.42                            | 10.92           | 1.62                  | HS 28.43        | 51.2                       |
| 5C1T           | 26.24              | 3.65                            | 23.74           | 4.15                  | 0.00            | 437.5                      |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 7.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.6      | -0.8      | -6.2                   | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -64.7                  | 64.7         |
| OPER      | 151.3             | -107.9                 | 107.9        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -30.12                | 34.53 | -23.17   | 26.56 | -23.77               | 26.33 | -18.29   | 20.25 |
| OPER      | 5C1T      | -23.41                | 26.23 | -18.01   | 20.18 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.87       | 1.88       | HS 37.48     | 67.5                 |
| 5C1T   | 4.11       | 4.11       | 0.00         | 492.9                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 7.000

Dead Load Moment      Superimposed Dead Load Moment  
-3.2                      -32.0

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 146.5      | 153.6           | -181.7 | 153.6        | -181.7 | 188.7                       | -146.5 | 188.7     | - |
| OPER 244.2      | 279.4           | -279.4 | 279.4        | -279.4 | 314.6                       | -244.2 | 314.6     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 16.42 L                 | 12.63           | 92.00                   | 0.0       | 16.69                   | 12.84           | 115.00               |        |
|           |            | -98.55 L                | -75.81          | 129.50                  | 0.0       | -90.47                  | -69.59          | 140.00               | 160.00 |
| OPER      | 5C1T       | 12.80 R                 | 9.85            | 408.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -64.03 R                | -49.26          | 266.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 11.31           | 1.49            | 11.31              | 1.49               | HS 29.74     | 53.5                 |
| 5C1T        | 24.58           | 3.81            | 24.58              | 3.81               | 0.00         | 457.7                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 7.000

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 7.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.84 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 91.848     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 17.94 |        | 106.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 7.000

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -3.2                | -32.0                            |

| Rating<br>Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|----------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|                | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.           | 180.4C             | -161.2                | 161.2              | -180.4C               | 201.5                       | -140.1                | 182.3              | -159.3                |
| OPER           | 300.6C             | -268.7                | 268.7              | -300.6C               | 335.8                       | -233.5                | 303.8              | -265.5                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Rat.<br>Veh. | Truck<br>w/imp. | Live Load<br>w/o imp. | Moment | Loc. of<br>Front<br>Wheel | Ax.<br>Dis. | Lane<br>w/imp. | Live Load<br>w/o imp. | Moment | Loc. of<br>Load 1 | Conc.<br>Load 2 |
|--------------|--------------|-----------------|-----------------------|--------|---------------------------|-------------|----------------|-----------------------|--------|-------------------|-----------------|
| INV.         | HS20         | 16.42 L         | 12.63                 | 92.00  | 0.0                       | 16.69       | 12.84          | 115.00                |        |                   |                 |
|              |              | -98.55 L        | -75.81                | 129.50 | 0.0                       | -90.47      | -69.59         | 140.00                | 160.00 |                   |                 |
| OPER         | 5C1T         | 12.80 R         | 9.85                  | 408.50 | 0.0                       | 0.00        | 0.00           | 0.00                  |        |                   |                 |
|              |              | -64.03 R        | -49.26                | 266.50 | 0.0                       | 0.00        | 0.00           | 0.00                  | 0.00   |                   |                 |

## Moment

| Rating<br>Veh. | top fiber<br>+bend | Rating<br>bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------------|---------------------------------|-----------------|-----------------------|-----------------|----------------------------|
| HS20           | 12.07              | 1.42                            | 10.92           | 1.62                  | HS 28.43        | 51.2                       |
| 5C1T           | 26.24              | 3.65                            | 23.74           | 4.15                  | 0.00            | 437.5                      |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 7.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.8      | 0.8       | -7.7                   | 7.7       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I |       |
|-----------|-------------------|-----------------------------|-------|
|           |                   | (-)                         | (+)   |
| INV.      | 90.8              | -64.7                       | 64.7  |
| OPER      | 151.3             | -107.9                      | 107.9 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -34.53                | 34.53 | -26.56   | 26.56 | -26.34               | 26.33 | -20.26   | 20.25 |
| OPER      | 5C1T      | -26.26                | 26.23 | -20.20   | 20.18 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.87       | 1.88       | HS 37.48     | 67.5                 |
| 5C1T   | 4.11       | 4.11       | 0.00         | 492.9                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 7.000

Dead Load Moment      Superimposed Dead Load Moment  
-3.2                      -32.0

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 146.5      | 153.6           | -181.7 | 153.6        | -181.7 | 188.7                       | -146.5 | 188.7     | - |
| OPER 244.2      | 279.4           | -279.4 | 279.4        | -279.4 | 314.6                       | -244.2 | 314.6     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 16.42 L                 | 12.63           | 92.00                   | 0.0       | 16.69                   | 12.84           | 115.00               |        |
|           |            | -98.55 L                | -75.81          | 129.50                  | 0.0       | -90.47                  | -69.59          | 140.00               | 160.00 |
| OPER      | 5C1T       | 12.80 R                 | 9.85            | 408.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -64.03 R                | -49.26          | 266.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 11.31           | 1.49            | 11.31              | 1.49               | HS 29.74     | 53.5                 |
| 5C1T        | 24.58           | 3.81            | 24.58              | 3.81               | 0.00         | 457.7                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 7.100

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 7.100

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.84 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 91.857     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 17.94 |        | 106.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 7.100

Dead Load Superimposed Dead Load  
Moment Moment  
-1.5 -14.6

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 190.0                       | -151.6                | 170.8              | -170.8                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 316.7                       | -252.6                | 284.7              | -284.6                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.20 R      | 12.46              | 180.50 | 0.0                 | 25.70    | 19.77       | 152.50             |        |                |              |
|           |           | -58.98 R     | -45.37             | 159.00 | 0.0                 | -54.03   | -41.56      | 140.00             |        | 162.50         |              |
| OPER      | 5C1T      | 30.01 R      | 23.09              | 290.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -50.24 L     | -38.65             | 38.50  | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 7.39               | 2.57                         | 6.65                               | 2.89         | HS 51.40 92.5        |
| 5C1T        | 10.55              | 5.03                         | 9.49                               | 5.66         | 0.00 603.3           |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 7.100

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| 0.6       | 0.0                    |
|           | 6.2                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -73.9                  | 65.7         |
| OPER      | 151.3             | -123.2                 | 109.6        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -2.98                 | 30.11 | -2.29    | 23.17 | -3.21                | 23.76 | -2.47    | 18.28 |
| OPER      | 5C1T      | -3.61                 | 23.37 | -2.78    | 17.98 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 23.00      | 2.18       | HS 43.66     | 78.6                 |
| 5C1T   | 34.12      | 4.69       | 0.00         | 562.6                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 7.100

Dead Load Moment      Superimposed Dead Load Moment  
-1.5                      -14.6

| Rating Veh.<br>ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|--------------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                    | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend               | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV.<br>158.0      | 161.2           | -174.1 | 161.2        | -174.1 | 177.3                       | -158.0 | 177.3     | - |
| OPER<br>263.3      | 279.4           | -279.4 | 279.4        | -279.4 | 295.5                       | -263.3 | 295.5     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 16.20 R                 | 12.46           | 180.50                  | 0.0       | 25.70                   | 19.77           | 152.50               |        |
|           |            | -58.98 R                | -45.37          | 159.00                  | 0.0       | -54.03                  | -41.56          | 140.00               | 162.50 |
| OPER      | 5C1T       | 30.01 R                 | 23.09           | 290.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -50.24 L                | -38.65          | 38.50                   | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 6.90            | 2.68  | 6.90         | 2.68  | HS 53.58     | 96.4                 |
| 5C1T        | 9.85            | 5.24  | 9.85         | 5.24  | 0.00         | 629.0                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 7.200

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |               |                      |               | Plastic Section Modulus - Z |
|----------------------|---------------|----------------------|---------------|-----------------------------|
| Positive Bending Top | Bending Bott. | Negative Bending Top | Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0         | 127.0                | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 7.200

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.84 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 91.857     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 17.94 |        | 106.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 7.200

Dead Load Moment      Superimposed Dead Load Moment  
-0.1                      -1.0

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 181.1                       | -160.5             | 161.9           | -179.7             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 301.8                       | -267.5             | 269.8           | -299.5             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 59.43 R      | 45.72              | 183.00 | 0.0                 | 44.76    | 34.43       | 155.00             |        |                |              |
|           |           | -45.75 L     | -35.19             | 117.00 | 0.0                 | -35.40   | -27.23      | 140.00             | 90.00  |                |              |
| OPER      | 5C1T      | 55.13 R      | 42.41              | 293.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -42.81 L     | -32.93             | 41.00  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 3.05            | 3.51                      | 2.72         | 3.93               | HS 54.48     | 98.1                 |
| 5C1T        | 5.47            | 6.25                      | 4.89         | 6.99               | 0.00         | 587.3                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 7.200

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| 0.5       | 0.0                    |
|           | 4.7                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -72.9                  | 66.8         |
| OPER      | 151.3             | -121.5                 | 111.3        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -2.98                 | 25.40 | -2.29    | 19.54 | -4.46                | 20.95 | -3.43    | 16.12 |
| OPER      | 5C1T      | -5.31                 | 20.29 | -4.08    | 15.61 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 16.35      | 2.63       | HS 52.57     | 94.6                 |
| 5C1T   | 22.90      | 5.48       | 0.00         | 658.1                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 7.200

Dead Load Moment      Superimposed Dead Load Moment  
-0.1                      -1.0

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 166.9      | 167.2           | -168.1 | 167.2        | -168.1 | 168.3                       | -166.9 | 168.3     | - |
| OPER 278.2      | 279.4           | -279.4 | 279.4        | -279.4 | 280.6                       | -278.2 | 280.6     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |        |
|-----------|------------|-------------------------|-------------------------|-----------|-------------------------|----------------------|--------|--------|
| INV.      | HS20       | 59.43 R                 | 45.72                   | 183.00    | 0.0                     | 44.76                | 34.43  | 155.00 |
|           |            | -45.75 L                | -35.19                  | 117.00    | 0.0                     | -35.40               | -27.23 | 140.00 |
| OPER      | 5C1T       | 55.13 R                 | 42.41                   | 293.00    | 0.0                     | 0.00                 | 0.00   | 0.00   |
|           |            | -42.81 L                | -32.93                  | 41.00     | 0.0                     | 0.00                 | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 2.83            | 3.65            | 2.83               | 3.65               | HS 56.65     | 102.0                |
| 5C1T        | 5.09            | 6.50            | 5.09               | 6.50               | 0.00         | 610.7                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 7.300

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |               |                      |               | Plastic Section Modulus - Z |
|----------------------|---------------|----------------------|---------------|-----------------------------|
| Positive Bending Top | Bending Bott. | Negative Bending Top | Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0         | 127.0                | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 7.300

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.84 | 28.67 | 28.67 | 1.699 | 999999.000 | 91.857 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 17.94 |        | 106.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 7.300

Dead Load Moment 0.8  
Superimposed Dead Load Moment 8.7

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 174.7                       | -166.9             | 155.5           | -186.1             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 291.1                       | -278.2             | 259.2           | -310.1             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 86.48 R      | 66.52              | 185.50 | 0.0                 | 65.18    | 50.14       | 157.50             |        |                |              |
|           |           | -37.98 L     | -29.21             | 117.00 | 0.0                 | -29.97   | -23.05      | 140.00             |        | 0.00           |              |
| OPER      | 5C1T      | 74.85 R      | 57.58              | 208.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -38.35 L     | -29.50             | -45.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | bottom fiber -bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|--------|--------------|----------------------|
| HS20        | 2.02            | 4.39               | 1.80   | 35.96        | 64.7                 |
| 5C1T        | 3.89            | 7.25               | 3.46   | 0.00         | 415.4                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 7.300

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear     | (-) Shear (+) Shear    |
| 0.3       | 0.0 3.1                |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -71.9                  | 67.8         |
| OPER      | 151.3             | -119.8                 | 113.0        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |            |              |              | Lane Live Load Shear |            |              |              |
|-----------|-----------|-----------------------|------------|--------------|--------------|----------------------|------------|--------------|--------------|
|           |           | w/imp. (-)            | (+) w/imp. | w/o imp. (-) | (+) w/o imp. | w/imp. (-)           | (+) w/imp. | w/o imp. (-) | (+) w/o imp. |
| INV.      | HS20      | -4.41                 | 20.57      | -3.40        | 15.82        | -6.73                | 18.00      | -5.18        | 13.85        |
| OPER      | 5C1T      | -7.25                 | 17.15      | -5.58        | 13.20        | 0.00                 | 0.00       | 0.00         | 0.00         |

| Rating |            | Shear      |                      |
|--------|------------|------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value         |
| HS20   | 10.67      | 3.30       | HS 65.90             |
| 5C1T   | 16.52      | 6.59       | 0.00                 |
|        |            |            | Load Capacity (tons) |
|        |            |            | 118.6                |
|        |            |            | 790.2                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 7.300

Dead Load Moment 0.8  
Superimposed Dead Load Moment 8.7

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 173.3      | 171.4           | -163.8 | 171.4        | -163.8 | 161.9                       | -173.3 | 161.9     | - |
| OPER 288.9      | 279.4           | -279.4 | 279.4        | -279.4 | 269.9                       | -288.9 | 269.9     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Live Load Moment w/o imp. | Loc. of Conc. Load 1 | Live Load Moment w/imp. | Loc. of Conc. Load 2 |
|-----------|------------|-------------------------|-------------------------|---------------------------|----------------------|-------------------------|----------------------|
| INV.      | HS20       | 86.48 R                 | 66.52                   | 185.50                    | 0.0                  | 65.18                   | 50.14                |
|           |            | -37.98 L                | -29.21                  | 117.00                    | 0.0                  | -29.97                  | -23.05               |
| OPER      | 5C1T       | 74.85 R                 | 57.58                   | 208.50                    | 0.0                  | 0.00                    | 0.00                 |
|           |            | -38.35 L                | -29.50                  | -45.00                    | 0.0                  | 0.00                    | 0.00                 |

## Serviceability

| Rating Veh. | Rating Factor   |                    | Load Capacity (tons) |                    |
|-------------|-----------------|--------------------|----------------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend      | bottom fiber -bend |
| HS20        | 1.87            | 4.56               | 1.87                 | 4.56               |
| 5C1T        | 3.61            | 7.53               | 3.61                 | 7.53               |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 7.400

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 7.400

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.84 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 91.857     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 17.94 |        | 106.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 7.400

Dead Load Moment 1.4  
Superimposed Dead Load Moment 14.5

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 170.8                       | -170.8             | 151.6           | -189.9             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 284.7                       | -284.6             | 252.7           | -316.6             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 97.01 R      | 74.62              | 188.00 | 0.0                 | 77.41    | 59.55       | 160.00             |        |                |              |
|           |           | -30.21 L     | -23.24             | 117.00 | 0.0                 | -26.38   | -20.29      | 140.00             | 0.00   |                |              |
| OPER      | 5C1T      | 86.79 R      | 66.76              | 211.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -35.45 L     | -27.27             | 43.50  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 1.76            | 5.65                      | 1.56                      | 6.29               | HS 31.26     | 56.3                 |
| 5C1T        | 3.28            | 8.03                      | 2.91                      | 8.93               | 0.00         | 349.4                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 7.400

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| 0.2       | 0.0                    |
|           | 1.6                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -70.9                  | 68.8                  |
| OPER      | 151.3             | -118.1                 | 114.6                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |            |              |              | Lane Live Load Shear |            |              |              |
|-----------|-----------|-----------------------|------------|--------------|--------------|----------------------|------------|--------------|--------------|
|           |           | w/imp. (-)            | w/imp. (+) | w/o imp. (-) | w/o imp. (+) | w/imp. (-)           | w/imp. (+) | w/o imp. (-) | w/o imp. (+) |
| INV.      | HS20      | -8.97                 | 16.78      | -6.90        | 12.91        | -9.31                | 15.01      | -7.16        | 11.55        |
| OPER      | 5C1T      | -9.40                 | 14.11      | -7.23        | 10.85        | 0.00                 | 0.00       | 0.00         | 0.00         |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 7.61       | 4.10       | HS 81.99     | 147.6                |  |
| 5C1T   | 12.57      | 8.13       | 0.00         | 975.3                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 7.400

Dead Load Moment 1.4  
Superimposed Dead Load Moment 14.5

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 177.2      | 174.0           | -161.3 | 174.0        | -161.3 | 158.1                       | -177.2 | 158.1     | - |
| OPER 295.3      | 279.4           | -279.4 | 279.4        | -279.4 | 263.5                       | -295.3 | 263.5     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |        |        |      |
|-----------|------------|-------------------------|-------------------------|------------------------------|----------------------|--------|--------|--------|------|
| INV.      | HS20       | 97.01 R                 | 74.62                   | 188.00                       | 0.0                  | 77.41  | 59.55  | 160.00 |      |
|           |            | -30.21 L                | -23.24                  | 117.00                       | 0.0                  | -26.38 | -20.29 | 140.00 | 0.00 |
| OPER      | 5C1T       | 86.79 R                 | 66.76                   | 211.00                       | 0.0                  | 0.00   | 0.00   | 0.00   |      |
|           |            | -35.45 L                | -27.27                  | 43.50                        | 0.0                  | 0.00   | 0.00   | 0.00   | 0.00 |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.63            | 5.87            | 1.63               | 5.87               | HS 32.59     | 58.7                 |
| 5C1T        | 3.04            | 8.33            | 3.04               | 8.33               | 0.00         | 364.3                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 7.500

|               |                             |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Allowable stress (fs) (psi) |           |         |         |
| RATIO/Inv.    | 0.00                        | 0.00      | 0.00    | 0.00    |
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

|                |           |       |      |      |       |       |      |      |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

|                         |                  |                       |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

|               |          |              |       |                   |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

|                  |                  |             |       |                 |
|------------------|------------------|-------------|-------|-----------------|
| Section Modulus  |                  |             |       | Plastic Section |
| Positive Bending | Negative Bending | Modulus - Z |       |                 |
| Top              | Bott.            | Top         | Bott. | (Fy * Z)        |
| 127.0            | 127.0            | 127.0       | 127.0 | 390.83          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 7.500

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.84 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 91.857     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 19.26 |        | 105.8                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 7.500

Dead Load Moment 1.6  
Superimposed Dead Load Moment 16.5

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 169.5                       | -172.1             | 150.3           | -191.3             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 282.5                       | -286.8             | 250.5           | -318.8             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 94.68 L      | 72.83              | 148.50 | 0.0                 | 82.22    | 63.25       | 162.50             |        |                |              |
|           |           | -22.43 L     | -17.26             | 117.00 | 0.0                 | -22.80   | -17.54      | 140.00             |        | 0.00           |              |
| OPER      | 5C1T      | 89.93 L      | 69.18              | -23.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -34.36 R     | -26.43             | 321.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 1.79            | 7.55                      | 1.59                      | 8.39               | HS 31.75     | 57.2                 |
| 5C1T        | 3.14            | 8.35                      | 2.79                      | 9.28               | 0.00         | 334.3                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 7.500

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.0       | 0.0          | 0.1       |

| Rat. | Shear | Capacity | Available Capacity for LL+I |
|------|-------|----------|-----------------------------|
| Veh. |       | VU       | (-) (+)                     |
| INV. | 90.8  |          | -69.8 69.8                  |
| OPER | 151.3 |          | -116.4 116.3                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. | Rat. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |      |
|------|------|-----------------------|-------|----------|-------|----------------------|-------|----------|------|
|      |      | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |      |
| Typ. | Veh. | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)  |
| INV. | HS20 | -13.12                | 13.12 | -10.10   | 10.10 | -12.10               | 12.08 | -9.31    | 9.29 |
| OPER | 5C1T | -11.66                | 11.64 | -8.97    | 8.95  | 0.00                 | 0.00  | 0.00     | 0.00 |

| Rating |        | Shear  |           |          |
|--------|--------|--------|-----------|----------|
| Veh.   | Rating | Factor | Rating    | Load     |
|        | (-)    | (+)    | Value     | Capacity |
|        |        |        |           | (tons)   |
| HS20   | 5.32   | 5.32   | HS 106.37 | 191.5    |
| 5C1T   | 9.98   | 10.00  | 0.00      | 999.0    |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 7.500

Dead Load Moment 1.6  
Superimposed Dead Load Moment 16.5

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 178.5      | 174.9           | -160.4 | 174.9        | -160.4 | 156.8                       | -178.5 | 156.8     | - |
| OPER 297.5      | 279.4           | -279.4 | 279.4        | -279.4 | 261.3                       | -297.5 | 261.3     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 94.68 L                 | 72.83           | 148.50                  | 0.0       | 82.22                   | 63.25           | 162.50               |        |
|           |            | -22.43 L                | -17.26          | 117.00                  | 0.0       | -22.80                  | -17.54          | 140.00               | 0.00   |
| OPER      | 5C1T       | 89.93 L                 | 69.18           | -23.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -34.36 R                | -26.43          | 321.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.66            | 7.83            | 1.66               | 7.83               | HS 33.11     | 59.6                 |
| 5C1T        | 2.90            | 8.66            | 2.90               | 8.66               | 0.00         | 348.6                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 7.600

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 7.600

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.85 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 92.188     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 19.26 |        | 105.8                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 7.600

Dead Load Moment      Superimposed Dead Load Moment  
1.4                      14.4

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 170.9                       | -170.6                | 151.7              | -189.8                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 284.9                       | -284.4                | 252.9              | -316.4                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 97.00 L      | 74.62              | 137.00 | 0.0                 | 77.32    | 59.48       | 165.00             |        |                |              |
|           |           | -30.20 R     | -23.23             | 208.00 | 0.0                 | -26.40   | -20.31      | 185.00             |        | 0.00           |              |
| OPER      | 5C1T      | 86.98 L      | 66.91              | -21.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -35.71 R     | -27.47             | 368.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 1.76               | 5.65                         | 1.56                               | 6.29         | HS 31.28             |
| 5C1T        | 3.28               | 7.96                         | 2.91                               | 8.86         | 0.00                 |

## SHEAR RATING REPORT

Rating Types and Vehicles  
 INV. OPER POST SPEC  
 Structure I. D. HAM500  
 Member I. D. S02  
 Check Point I. D. 7.600  
 HS20 5C1T

Dead Load Superimposed Dead Load  
 Shear (-) Shear (+) Shear  
 -0.2 -1.6 0.0

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 90.8              | -68.7                           | 70.9  |
| OPER      | 151.3             | -114.6                          | 118.2 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |            |              |              | Lane Live Load Shear |            |              |              |
|-----------|-----------|-----------------------|------------|--------------|--------------|----------------------|------------|--------------|--------------|
|           |           | w/imp. (-)            | (+) w/imp. | w/o imp. (-) | (+) w/o imp. | w/imp. (-)           | (+) w/imp. | w/o imp. (-) | (+) w/o imp. |
| INV.      | HS20      | -16.78                | 8.97       | -12.91       | 6.90         | -15.04               | 9.28       | -11.57       | 7.14         |
| OPER      | 5C1T      | -14.16                | 9.34       | -10.89       | 7.19         | 0.00                 | 0.00       | 0.00         | 0.00         |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 4.10       | 7.64       | HS 81.95     | 147.5                |
| 5C1T   | 8.09       | 12.65      | 0.00         | 971.3                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 7.600

Dead Load Moment      Superimposed Dead Load Moment  
1.4                      14.4

| Rating Veh.<br>ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|--------------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                    | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend               | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV.<br>177.1      | 173.9           | -161.3 | 173.9        | -161.3 | 158.2                       | -177.1 | 158.2     | - |
| OPER<br>295.2      | 279.4           | -279.4 | 279.4        | -279.4 | 263.6                       | -295.2 | 263.6     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 97.00 L                 | 74.62           | 137.00                  | 0.0       | 77.32                   | 59.48           | 165.00               |        |
|           |            | -30.20 R                | -23.23          | 208.00                  | 0.0       | -26.40                  | -20.31          | 185.00               | 0.00   |
| OPER      | 5C1T       | 86.98 L                 | 66.91           | -21.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -35.71 R                | -27.47          | 368.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.63            | 5.86            | 1.63               | 5.86               | HS 32.61     | 58.7                 |
| 5C1T        | 3.03            | 8.27            | 3.03               | 8.27               | 0.00         | 363.7                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 7.700

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus  |                  |       |       | Plastic Section |
|------------------|------------------|-------|-------|-----------------|
| Positive Bending | Negative Bending |       |       | Modulus - Z     |
| Top              | Bott.            | Top   | Bott. | (Fy * Z)        |
| 127.0            | 127.0            | 127.0 | 127.0 | 390.83          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 7.700

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.85 | 28.67 | 28.67 | 1.699 | 999999.000 | 92.188 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 19.26 |        | 105.8                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 7.700

Dead Load Moment 0.8  
Superimposed Dead Load Moment 8.4

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 174.9                       | -166.7             | 155.7           | -185.9             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 291.5                       | -277.8             | 259.5           | -309.8             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 86.47 L      | 66.52              | 139.50 | 0.0                 | 65.00    | 50.00       | 167.50             |        |                |              |
|           |           | -37.97 R     | -29.21             | 208.00 | 0.0                 | -30.01   | -23.08      | 185.00             | 0.00   |                |              |
| OPER      | 5C1T      | 74.55 L      | 57.34              | 116.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -38.82 R     | -29.86             | 370.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 2.02            | 4.39                      | 1.80         | 4.89               | HS 36.01     | 64.8                 |
| 5C1T        | 3.91            | 7.16                      | 3.48         | 7.98               | 0.00         | 417.7                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 7.700

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.3      | -3.2         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -67.7                  | 71.9         |
| OPER      | 151.3             | -112.9                 | 119.9        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -20.57                | 4.41 | -15.82   | 3.40 | -18.02               | 6.71 | -13.86   | 5.16 |
| OPER      | 5C1T      | -17.22                | 7.18 | -13.25   | 5.52 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 3.29       | 10.72      | HS 65.86     | 118.6                |  |
| 5C1T   | 6.56       | 16.69      | 0.00         | 786.7                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 7.700Dead Load Moment 0.8  
Superimposed Dead Load Moment 8.4

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 173.1      | 171.3           | -164.0 | 171.3        | -164.0 | 162.1                       | -173.1 | 162.1     | - |
| OPER 288.6      | 279.4           | -279.4 | 279.4        | -279.4 | 270.2                       | -288.6 | 270.2     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 86.47 L                 | 66.52           | 139.50                  | 0.0       | 65.00                   | 50.00           | 167.50               |        |
|           |            | -37.97 R                | -29.21          | 208.00                  | 0.0       | -30.01                  | -23.08          | 185.00               | 0.00   |
| OPER      | 5C1T       | 74.55 L                 | 57.34           | 116.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -38.82 R                | -29.86          | 370.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.88            | 4.56  | 1.88         | 4.56  | HS 37.50     | 67.5                 |
| 5C1T        | 3.62            | 7.43  | 3.62         | 7.43  | 0.00         | 435.0                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 7.800

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus  |                  |       |       | Plastic Section |
|------------------|------------------|-------|-------|-----------------|
| Positive Bending | Negative Bending |       |       | Modulus - Z     |
| Top              | Bott.            | Top   | Bott. | (Fy * Z)        |
| 127.0            | 127.0            | 127.0 | 127.0 | 390.83          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 7.800

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.85 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 92.188     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 19.26 |        | 105.8                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 7.800

Dead Load Moment      Superimposed Dead Load Moment  
-0.2                      -1.5

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 181.4                       | -160.2                | 162.2              | -179.4                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 302.3                       | -267.0                | 270.3              | -299.0                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 59.43 L      | 45.71              | 142.00 | 0.0                 | 45.01    | 34.62       | 170.00             |        |                |              |
|           |           | -45.74 R     | -35.19             | 208.00 | 0.0                 | -35.64   | -27.41      | 185.00             |        | 235.00         |              |
| OPER      | 5C1T      | 54.49 L      | 41.92              | 32.00  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -43.35 R     | -33.35             | 284.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 3.05               | 3.50                         | 2.73                               | 3.92         | HS 54.58             |
| 5C1T        | 5.55               | 6.16                         | 4.96                               | 6.90         | 0.00                 |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 7.800

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.5      | -4.7         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -66.7                  | 72.9         |
| OPER      | 151.3             | -111.2                 | 121.5        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -25.40                | 2.98 | -19.54   | 2.29 | -20.97               | 4.44 | -16.13   | 3.41 |
| OPER      | 5C1T      | -20.38                | 5.22 | -15.68   | 4.02 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 2.63       | 16.44      | HS 52.54     | 94.6                 |  |
| 5C1T   | 5.45       | 23.26      | 0.00         | 654.6                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 7.800

Dead Load Moment      Superimposed Dead Load Moment  
-0.2                      -1.5

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 166.6      | 167.0           | -168.3 | 167.0        | -168.3 | 168.6                       | -166.6 | 168.6     | - |
| OPER 277.7      | 279.4           | -279.4 | 279.4        | -279.4 | 281.1                       | -277.7 | 281.1     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 59.43 L                 | 45.71                | 142.00      | 0.0       | 45.01                   | 34.62                  | 170.00 |        |
|           |            | -45.74 R                | -35.19               | 208.00      | 0.0       | -35.64                  | -27.41                 | 185.00 | 235.00 |
| OPER      | 5C1T       | 54.49 L                 | 41.92                | 32.00       | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -43.35 R                | -33.35               | 284.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 2.84            | 3.64            | 2.84               | 3.64               | HS 56.75     | 102.2                |
| 5C1T        | 5.16            | 6.41            | 5.16               | 6.41               | 0.00         | 618.9                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 7.900

|               |                             |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Allowable stress (fs) (psi) |           |         |         |
| RATIO/Inv.    | 0.00                        | 0.00      | 0.00    | 0.00    |
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

|                |           |       |      |      |       |       |      |      |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

|                         |                  |                       |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

|               |          |              |       |                   |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

|                  |                  |             |       |                 |
|------------------|------------------|-------------|-------|-----------------|
| Section Modulus  |                  |             |       | Plastic Section |
| Positive Bending | Negative Bending | Modulus - Z |       |                 |
| Top              | Bott.            | Top         | Bott. | (Fy * Z)        |
| 127.0            | 127.0            | 127.0       | 127.0 | 390.83          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 7.900

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.85 | 28.67 | 28.67 | 1.699 | 999999.000 | 92.188 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 19.26 |        | 105.8                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 7.900

Dead Load Moment      Superimposed Dead Load Moment  
-1.6                      -15.2

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 190.4                       | -151.2                | 171.2              | -170.3                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 317.4                       | -251.9                | 285.4              | -283.9                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.19 L      | 12.46              | 144.50 | 0.0                 | 24.95    | 19.19       | 172.50             |        |                |              |
|           |           | -58.96 L     | -45.35             | 166.00 | 0.0                 | -54.13   | -41.64      | 185.00             | 162.50 |                |              |
| OPER      | 5C1T      | 29.07 L      | 22.36              | 34.50  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -50.95 R     | -39.19             | 286.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 7.63               | 2.56                         | 6.86                               | 2.89         | HS 51.28 92.3        |
| 5C1T        | 10.92              | 4.95                         | 9.82                               | 5.57         | 0.00 593.4           |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 7.900

| Dead Load | Superimposed Dead Load | Dead Load |
|-----------|------------------------|-----------|
| Shear     | (-) Shear              | (+) Shear |
| -0.6      | -6.2                   | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -65.7                  | 73.9                  |
| OPER      | 151.3             | -109.5                 | 123.2                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -30.12                | 3.11 | -23.17   | 2.39 | -23.78               | 3.19 | -18.29   | 2.46 |
| OPER      | 5C1T      | -23.47                | 3.53 | -18.05   | 2.71 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 2.18       | 23.17      | HS 43.63     | 78.5                 |
| 5C1T   | 4.66       | 34.96      | 0.00         | 559.9                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 7.900

Dead Load Moment      Superimposed Dead Load Moment  
-1.6                      -15.2

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 157.6      | 161.0           | -174.3 | 161.0        | -174.3 | 177.7                       | -157.6 | 177.7     | - |
| OPER 262.7      | 279.4           | -279.4 | 279.4        | -279.4 | 296.1                       | -262.7 | 296.1     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 16.19 L                 | 12.46                | 144.50      | 0.0       | 24.95                   | 19.19                  | 172.50 |        |
|           |            | -58.96 L                | -45.35               | 166.00      | 0.0       | -54.13                  | -41.64                 | 185.00 | 162.50 |
| OPER      | 5C1T       | 29.07 L                 | 22.36                | 34.50       | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -50.95 R                | -39.19               | 286.50      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 7.12            | 2.67  | 7.12         | 2.67  | HS 53.46     | 96.2                 |
| 5C1T        | 10.19           | 5.16  | 10.19        | 5.16  | 0.00         | 618.7                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 8.000

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 127.0           | 127.0         | 127.0        | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 8.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.85 | 28.67 | 28.67 | 1.699 | 999999.000 | 92.188 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 19.26 |        | 105.8                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 8.000

Dead Load Moment      Superimposed Dead Load Moment  
-3.3                      -32.7

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 202.0                       | -139.6                | 182.8              | -158.8                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 336.7                       | -232.6                | 304.7              | -264.6                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.43 L      | 12.63              | 117.00 | 0.0                 | 16.32    | 12.55       | 140.00             |        |                |              |
|           |           | -98.55 R     | -75.80             | 195.50 | 0.0                 | -90.65   | -69.73      | 165.00             |        | 185.00         |              |
| OPER      | 5C1T      | 12.70 L      | 9.77               | -85.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -64.71 R     | -49.78             | 291.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 12.30              | 1.42                         | 11.13           | 1.61                  | HS 28.33     | 51.0                 |
| 5C1T        | 26.51              | 3.60                         | 24.00           | 4.09                  | 0.00         | 431.4                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 8.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.6      | -0.8      | -6.2                   | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 90.8              | -64.7                           | 64.6  |
| OPER      | 151.3             | -107.8                          | 107.7 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -30.12                | 34.52 | -23.17   | 26.56 | -23.78               | 26.36 | -18.29   | 20.28 |
| OPER      | 5C1T      | -23.47                | 26.44 | -18.05   | 20.34 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.87       | 1.87       | HS 37.44     | 67.4                 |
| 5C1T   | 4.10       | 4.07       | 0.00         | 488.9                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 8.000

Dead Load Moment      Superimposed Dead Load Moment  
-3.3                      -32.7

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 146.0      | 153.2           | -182.0 | 153.2        | -182.0 | 189.3                       | -146.0 | 189.3     | - |
| OPER 243.4      | 279.4           | -279.4 | 279.4        | -279.4 | 315.4                       | -243.4 | 315.4     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 16.43 L                 | 12.63                | 117.00      | 0.0       | 16.32                   | 12.55                  | 140.00 |        |
|           |            | -98.55 R                | -75.80               | 195.50      | 0.0       | -90.65                  | -69.73                 | 165.00 | 185.00 |
| OPER      | 5C1T       | 12.70 L                 | 9.77                 | -85.00      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -64.71 R                | -49.78               | 291.50      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 11.52           | 1.48  | 11.52        | 1.48  | HS 29.64     | 53.3                 |
| 5C1T        | 24.84           | 3.76  | 24.84        | 3.76  | 0.00         | 451.3                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 8.000

|               |                             |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Allowable stress (fs) (psi) |           |         |         |
| RATIO/Inv.    | 0.00                        | 0.00      | 0.00    | 0.00    |
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

|                |           |       |      |      |       |       |      |      |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

|                         |                  |                       |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

|               |          |              |       |                   |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

|                  |                  |             |       |                 |
|------------------|------------------|-------------|-------|-----------------|
| Section Modulus  |                  |             |       | Plastic Section |
| Positive Bending | Negative Bending | Modulus - Z |       |                 |
| Top              | Bott.            | Top         | Bott. | (Fy * Z)        |
| 127.0            | 127.0            | 127.0       | 127.0 | 390.83          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 8.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.84 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 92.114     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 19.26 |        | 105.8                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 8.000

Dead Load Moment      Superimposed Dead Load Moment  
-3.3                      -32.7

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 202.0                       | -139.6                | 182.8              | -158.8                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 336.7                       | -232.6                | 304.7              | -264.6                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.43 L      | 12.63              | 117.00 | 0.0                 | 16.32    | 12.55       | 140.00             |        |                |              |
|           |           | -98.55 R     | -75.80             | 195.50 | 0.0                 | -90.65   | -69.73      | 165.00             | 185.00 |                |              |
| OPER      | 5C1T      | 12.70 L      | 9.77               | -85.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -64.71 R     | -49.78             | 291.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 12.30              | 1.42                         | 11.13                              | 1.61         | HS 28.33 51.0        |
| 5C1T        | 26.51              | 3.60                         | 24.00                              | 4.09         | 0.00 431.4           |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 8.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.8      | 0.8       | -7.8                   | 7.9       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I |       |
|-----------|-------------------|-----------------------------|-------|
|           |                   | (-)                         | (+)   |
| INV.      | 90.8              | -64.7                       | 64.6  |
| OPER      | 151.3             | -107.8                      | 107.7 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -34.53                | 34.52 | -26.56   | 26.56 | -26.35               | 26.36 | -20.27   | 20.28 |
| OPER      | 5C1T      | -26.31                | 26.44 | -20.23   | 20.34 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.87       | 1.87       | HS 37.44     | 67.4                 |
| 5C1T   | 4.10       | 4.07       | 0.00         | 488.9                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 8.000

Dead Load Moment      Superimposed Dead Load Moment  
-3.3                      -32.7

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 146.0      | 153.2           | -182.0 | 153.2        | -182.0 | 189.3                       | -146.0 | 189.3     | - |
| OPER 243.4      | 279.4           | -279.4 | 279.4        | -279.4 | 315.4                       | -243.4 | 315.4     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 16.43 L                 | 12.63           | 117.00                  | 0.0       | 16.32                   | 12.55           | 140.00               |        |
|           |            | -98.55 R                | -75.80          | 195.50                  | 0.0       | -90.65                  | -69.73          | 165.00               | 185.00 |
| OPER      | 5C1T       | 12.70 L                 | 9.77            | -85.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -64.71 R                | -49.78          | 291.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 11.52           | 1.48  | 11.52        | 1.48  | HS 29.64     | 53.3                 |
| 5C1T        | 24.84           | 3.76  | 24.84        | 3.76  | 0.00         | 451.3                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 8.100

|               |                             |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Allowable stress (fs) (psi) |           |         |         |
| RATIO/Inv.    | 0.00                        | 0.00      | 0.00    | 0.00    |
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

|                |           |       |      |      |       |       |      |      |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

|                         |                  |                       |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

|               |          |              |       |                   |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

|                  |                  |             |       |                 |
|------------------|------------------|-------------|-------|-----------------|
| Section Modulus  |                  |             |       | Plastic Section |
| Positive Bending | Negative Bending | Modulus - Z |       |                 |
| Top              | Bott.            | Top         | Bott. | (Fy * Z)        |
| 127.0            | 127.0            | 127.0       | 127.0 | 390.83          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 8.100

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.84 | 28.67 | 28.67 | 1.699 | 999999.000 | 92.114 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 19.26 |        | 105.8                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 8.100

Dead Load Moment      Superimposed Dead Load Moment  
-1.5                      -15.0

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 190.3                       | -151.3             | 171.1           | -170.5             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 317.1                       | -252.2             | 285.2           | -284.1             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.21 R      | 12.47              | 205.50 | 0.0                 | 25.50    | 19.62       | 177.50             |        |                |              |
|           |           | -58.98 R     | -45.37             | 184.00 | 0.0                 | -54.13   | -41.64      | 165.00             | 187.50 |                |              |
| OPER      | 5C1T      | 29.53 R      | 22.72              | 228.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -50.55 L     | -38.88             | 63.50  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 7.46            | 2.57                      | 6.71                      | 2.89               | HS 51.30     | 92.3                 |
| 5C1T        | 10.74           | 4.99                      | 9.65                      | 5.62               | 0.00         | 598.6                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 8.100

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.6       | 0.0          | 6.3       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -74.0                  | 65.6         |
| OPER      | 151.3             | -123.3                 | 109.4        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -2.94                 | 30.11 | -2.26    | 23.16 | -3.13                | 23.79 | -2.41    | 18.30 |
| OPER      | 5C1T      | -3.40                 | 23.57 | -2.61    | 18.13 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 23.61      | 2.18       | HS 43.60     | 78.5                 |
| 5C1T   | 36.31      | 4.64       | 0.00         | 557.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 8.100

Dead Load Moment      Superimposed Dead Load Moment  
-1.5                      -15.0

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 157.7      | 161.0           | -174.2 | 161.0        | -174.2 | 177.5                       | -157.7 | 177.5     | - |
| OPER 262.9      | 279.4           | -279.4 | 279.4        | -279.4 | 295.9                       | -262.9 | 295.9     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 16.21 R                 | 12.47                | 205.50      | 0.0       | 25.50                   | 19.62                  | 177.50 |        |
|           |            | -58.98 R                | -45.37               | 184.00      | 0.0       | -54.13                  | -41.64                 | 165.00 | 187.50 |
| OPER      | 5C1T       | 29.53 R                 | 22.72                | 228.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -50.55 L                | -38.88               | 63.50       | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 6.96            | 2.67  | 6.96         | 2.67  | HS 53.49     | 96.3                 |
| 5C1T        | 10.02           | 5.20  | 10.02        | 5.20  | 0.00         | 624.1                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 8.200

|               |                             |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Allowable stress (fs) (psi) |           |         |         |
| RATIO/Inv.    | 0.00                        | 0.00      | 0.00    | 0.00    |
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

|                |           |       |      |      |       |       |      |      |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

|                         |                  |                       |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

|               |          |              |       |                   |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

|                  |                  |             |       |                 |
|------------------|------------------|-------------|-------|-----------------|
| Section Modulus  |                  |             |       | Plastic Section |
| Positive Bending | Negative Bending | Modulus - Z |       |                 |
| Top              | Bott.            | Top         | Bott. | (Fy * Z)        |
| 127.0            | 127.0            | 127.0       | 127.0 | 390.83          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 8.200

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.84 | 28.67 | 28.67 | 1.699 | 999999.000 | 92.114 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 19.26 |        | 105.8                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 8.200

|                     |                                  |
|---------------------|----------------------------------|
| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
| -0.1                | -1.1                             |

| Rating<br>Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|----------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|                | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.           | 180.4C             | -161.2                | 161.2              | -180.4C               | 181.1                       | -160.5                | 161.9              | -179.7                |
| OPER           | 300.6C             | -268.7                | 268.7              | -300.6C               | 301.9                       | -267.4                | 269.9              | -299.4                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Rat.<br>Veh. | Truck<br>w/imp. | Live Load<br>w/o imp. | Moment | Loc. of<br>Front<br>Wheel | Ax.<br>Dis. | Lane<br>w/imp. | Live Load<br>w/o imp. | Moment | Loc. of<br>Load 1 | Conc.<br>Load 2 |
|--------------|--------------|-----------------|-----------------------|--------|---------------------------|-------------|----------------|-----------------------|--------|-------------------|-----------------|
| INV.         | HS20         | 59.43 R         | 45.72                 | 208.00 | 0.0                       | 44.74       | 34.41          | 180.00                |        |                   |                 |
|              |              | -45.75 L        | -35.19                | 142.00 | 0.0                       | -35.41      | -27.24         | 165.00                |        | 115.00            |                 |
| OPER         | 5C1T         | 55.09 R         | 42.38                 | 318.00 | 0.0                       | 0.00        | 0.00           | 0.00                  |        |                   |                 |
|              |              | -42.86 L        | -32.97                | 66.00  | 0.0                       | 0.00        | 0.00           | 0.00                  |        | 0.00              |                 |

## Moment

| Rating<br>Veh. | top fiber<br>+bend | Rating<br>bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------------|---------------------------------|-----------------|-----------------------|-----------------|----------------------------|
| HS20           | 3.05               | 3.51                            | 2.72            | 3.93                  | HS 54.49        | 98.1                       |
| 5C1T           | 5.48               | 6.24                            | 4.90            | 6.99                  | 0.00            | 587.9                      |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 8.200

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| 0.5       | 0.0                    |
|           | 4.8                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -73.0                  | 66.7                  |
| OPER      | 151.3             | -121.6                 | 111.1                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -2.94                 | 25.39 | -2.26    | 19.53 | -4.39                | 20.98 | -3.38    | 16.14 |
| OPER      | 5C1T      | -5.11                 | 20.48 | -3.93    | 15.75 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 16.63      | 2.62       | HS 52.50     | 94.5                 |
| 5C1T   | 23.79      | 5.43       | 0.00         | 651.1                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 8.200

Dead Load Moment      Superimposed Dead Load Moment  
-0.1                      -1.1

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 166.9      | 167.2           | -168.1 | 167.2        | -168.1 | 168.4                       | -166.9 | 168.4     | - |
| OPER 278.2      | 279.4           | -279.4 | 279.4        | -279.4 | 280.6                       | -278.2 | 280.6     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 59.43 R                 | 45.72           | 208.00                  | 0.0       | 44.74                   | 34.41           | 180.00               |        |
|           |            | -45.75 L                | -35.19          | 142.00                  | 0.0       | -35.41                  | -27.24          | 165.00               | 115.00 |
| OPER      | 5C1T       | 55.09 R                 | 42.38           | 318.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -42.86 L                | -32.97          | 66.00                   | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 2.83            | 3.65            | 2.83               | 3.65               | HS 56.66     | 102.0                |
| 5C1T        | 5.09            | 6.49            | 5.09               | 6.49               | 0.00         | 611.3                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 8.300

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 8.300

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.84 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 92.114     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 19.26 |        | 105.8                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 8.300

Dead Load Moment 0.9  
Superimposed Dead Load Moment 9.0

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 174.5                       | -167.1             | 155.3           | -186.3             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 290.8                       | -278.5             | 258.8           | -310.5             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 86.47 R      | 66.52              | 210.50 | 0.0                 | 65.25    | 50.19       | 182.50             |        |                |              |
|           |           | -37.98 L     | -29.21             | 142.00 | 0.0                 | -29.81   | -22.93      | 165.00             |        | 0.00           |              |
| OPER      | 5C1T      | 74.93 R      | 57.64              | 320.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -38.35 L     | -29.50             | -20.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | bottom fiber -bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|--------|--------------|----------------------|
| HS20        | 2.02            | 4.40               | 1.80   | 35.92        | 64.6                 |
| 5C1T        | 3.88            | 7.26               | 3.45   | 0.00         | 414.5                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 8.300

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear     | (-) Shear (+) Shear    |
| 0.3       | 0.0 3.2                |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -72.0                  | 67.7         |
| OPER      | 151.3             | -119.9                 | 112.8        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -4.42                 | 20.56 | -3.40    | 15.82 | -6.66                | 18.03 | -5.13    | 13.87 |
| OPER      | 5C1T      | -7.09                 | 17.32 | -5.45    | 13.33 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 10.80      | 3.29       | HS 65.82     | 118.5                |
| 5C1T   | 16.92      | 6.51       | 0.00         | 781.3                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 8.300

Dead Load Moment 0.9  
Superimposed Dead Load Moment 9.0

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 173.5      | 171.6           | -163.7 | 171.6        | -163.7 | 161.7                       | -173.5 | 161.7     | - |
| OPER 289.2      | 279.4           | -279.4 | 279.4        | -279.4 | 269.6                       | -289.2 | 269.6     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |        |        |      |
|-----------|------------|-------------------------|-------------------------|------------------------------|----------------------|--------|--------|--------|------|
| INV.      | HS20       | 86.47 R                 | 66.52                   | 210.50                       | 0.0                  | 65.25  | 50.19  | 182.50 |      |
|           |            | -37.98 L                | -29.21                  | 142.00                       | 0.0                  | -29.81 | -22.93 | 165.00 | 0.00 |
| OPER      | 5C1T       | 74.93 R                 | 57.64                   | 320.50                       | 0.0                  | 0.00   | 0.00   | 0.00   |      |
|           |            | -38.35 L                | -29.50                  | -20.00                       | 0.0                  | 0.00   | 0.00   | 0.00   | 0.00 |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.87            | 4.57            | 1.87               | 4.57               | HS 37.41     | 67.3                 |
| 5C1T        | 3.60            | 7.54            | 3.60               | 7.54               | 0.00         | 431.7                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 8.400

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |               |                      |               | Plastic Section Modulus - Z |
|----------------------|---------------|----------------------|---------------|-----------------------------|
| Positive Bending Top | Bending Bott. | Negative Bending Top | Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0         | 127.0                | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 8.400

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.84 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 92.114     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 19.26 |        | 105.8                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 8.400

Dead Load Moment 1.5  
Superimposed Dead Load Moment 15.2

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 170.4                       | -171.2             | 151.2           | -190.4             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 284.0                       | -285.3             | 252.0           | -317.3             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 97.01 R      | 74.62              | 213.00 | 0.0                 | 77.56    | 59.66       | 185.00             |        |                |              |
|           |           | -30.20 L     | -23.23             | 142.00 | 0.0                 | -26.05   | -20.04      | 165.00             | 0.00   |                |              |
| OPER      | 5C1T      | 87.63 R      | 67.41              | 371.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -35.29 L     | -27.15             | -18.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 1.76            | 5.67                      | 1.56                      | 6.30               | HS 31.17     | 56.1                 |
| 5C1T        | 3.24            | 8.09                      | 2.88                      | 8.99               | 0.00         | 345.1                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 8.400

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| 0.2       | 0.0                    |
|           | 1.7                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -71.0                  | 68.7                  |
| OPER      | 151.3             | -118.3                 | 114.5                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -8.97                 | 16.78 | -6.90    | 12.91 | -9.24                | 15.05 | -7.11    | 11.57 |
| OPER      | 5C1T      | -9.27                 | 14.26 | -7.13    | 10.97 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 7.68       | 4.09       | HS 81.89     | 147.4                |  |
| 5C1T   | 12.76      | 8.03       | 0.00         | 963.7                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 8.400

Dead Load Moment 1.5  
Superimposed Dead Load Moment 15.2

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 177.6      | 174.3           | -161.0 | 174.3        | -161.0 | 157.6                       | -177.6 | 157.6     | - |
| OPER 296.1      | 279.4           | -279.4 | 279.4        | -279.4 | 262.7                       | -296.1 | 262.7     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |        |
|-----------|------------|-------------------------|-------------------------|-----------|-------------------------|----------------------|--------|--------|
| INV.      | HS20       | 97.01 R                 | 74.62                   | 213.00    | 0.0                     | 77.56                | 59.66  | 185.00 |
|           |            | -30.20 L                | -23.23                  | 142.00    | 0.0                     | -26.05               | -20.04 | 165.00 |
| OPER      | 5C1T       | 87.63 R                 | 67.41                   | 371.00    | 0.0                     | 0.00                 | 0.00   | 0.00   |
|           |            | -35.29 L                | -27.15                  | -18.50    | 0.0                     | 0.00                 | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.62            | 5.88            | 1.62               | 5.88               | HS 32.50     | 58.5                 |
| 5C1T        | 3.00            | 8.39            | 3.00               | 8.39               | 0.00         | 359.8                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 8.500

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 8.500

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.79 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 89.700     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 390.83 | 109.1                   |
| bott | 22.62            |                   | 9.40 |        | 107.5                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 8.500

Dead Load Moment 1.7  
Superimposed Dead Load Moment 17.5

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 168.8                       | -172.7             | 149.6           | -191.9             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 281.4                       | -287.9             | 249.4           | -319.9             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 94.67        | L                  | 72.82  | 173.50              | 0.0      | 82.45       | 63.42              | 187.50 |                |              |
|           |           | -22.43       | L                  | -17.25 | 142.00              | 0.0      | -22.28      | -17.14             | 165.00 | 0.00           |              |
| OPER      | 5C1T      | 90.81        | R                  | 69.86  | 373.50              | 0.0      | 0.00        | 0.00               | 0.00   |                |              |
|           |           | -33.69       | L                  | -25.92 | 115.50              | 0.0      | 0.00        | 0.00               | 0.00   | 0.00           | 0.00         |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 1.78            | 7.70                      | 1.58                      | 8.56               | HS 31.61     | 56.9                 |
| 5C1T        | 3.10            | 8.55                      | 2.75                      | 9.49               | 0.00         | 329.6                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 8.500

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear     | (-) Shear (+) Shear    |
| 0.0       | 0.0 0.2                |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 90.8              | -69.9                           | 69.7  |
| OPER      | 151.3             | -116.6                          | 116.2 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |            |              |              | Lane Live Load Shear |            |              |              |
|-----------|-----------|-----------------------|------------|--------------|--------------|----------------------|------------|--------------|--------------|
|           |           | w/imp. (-)            | (+) w/imp. | w/o imp. (-) | (+) w/o imp. | w/imp. (-)           | (+) w/imp. | w/o imp. (-) | (+) w/o imp. |
| INV.      | HS20      | -13.12                | 13.12      | -10.09       | 10.09        | -12.03               | 12.11      | -9.26        | 9.32         |
| OPER      | 5C1T      | -11.58                | 11.77      | -8.91        | 9.05         | 0.00                 | 0.00       | 0.00         | 0.00         |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 5.33       | 5.31       | HS 106.25    | 191.3                |
| 5C1T   | 10.07      | 9.87       | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 8.500

Dead Load Moment 1.7  
Superimposed Dead Load Moment 17.5

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 179.2      | 175.3           | -159.9 | 175.3        | -159.9 | 156.1                       | -179.2 | 156.1     | - |
| OPER 298.6      | 279.4           | -279.4 | 279.4        | -279.4 | 260.2                       | -298.6 | 260.2     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 94.67 L                 | 72.82                | 173.50      | 0.0       | 82.45                   | 63.42                  | 187.50 |        |
|           |            | -22.43 L                | -17.25               | 142.00      | 0.0       | -22.28                  | -17.14                 | 165.00 | 0.00   |
| OPER      | 5C1T       | 90.81 R                 | 69.86                | 373.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -33.69 L                | -25.92               | 115.50      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.65            | 7.99  | 1.65         | 7.99  | HS 32.98     | 59.4                 |
| 5C1T        | 2.87            | 8.86  | 2.87         | 8.86  | 0.00         | 343.8                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 8.600

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 8.600

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.79 | 28.67 | 28.67 | 1.699 | 999999.000 | 89.700 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 390.83 | 109.1                   |
| bott | 22.62            |                   | 9.40 |        | 107.5                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 8.600

Dead Load Moment 1.6  
Superimposed Dead Load Moment 15.7

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 170.0                       | -171.6             | 150.8           | -190.8             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 283.4                       | -285.9             | 251.4           | -317.9             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 96.97 L      | 74.59              | 162.00 | 0.0                 | 77.63    | 59.72       | 190.00             |        |                |              |
|           |           | -29.91 R     | -23.01             | 233.00 | 0.0                 | -25.66   | -19.74      | 210.00             |        | 0.00           |              |
| OPER      | 5C1T      | 88.02 L      | 67.71              | 139.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -33.75 R     | -25.96             | 393.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 1.75            | 5.74                      | 1.55         | 6.38               | HS 31.11     | 56.0                 |
| 5C1T        | 3.22            | 8.47                      | 2.86         | 9.42               | 0.00         | 342.7                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 8.600

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.1      | -1.5         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -68.8                  | 70.8                  |
| OPER      | 151.3             | -114.7                 | 118.0                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -16.78                | 8.97 | -12.90   | 6.90 | -14.97               | 9.31 | -11.51   | 7.16 |
| OPER      | 5C1T      | -14.06                | 9.47 | -10.81   | 7.28 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 4.10       | 7.60       | HS 82.08     | 147.7                |
| 5C1T   | 8.16       | 12.46      | 0.00         | 979.4                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 8.600

Dead Load Moment 1.6  
Superimposed Dead Load Moment 15.7

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 178.0      | 174.6           | -160.7 | 174.6        | -160.7 | 157.3                       | -178.0 | 157.3     | - |
| OPER 296.7      | 279.4           | -279.4 | 279.4        | -279.4 | 262.1                       | -296.7 | 262.1     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 96.97 L                 | 74.59                | 162.00      | 0.0       | 77.63                   | 59.72                  | 190.00 |        |
|           |            | -29.91 R                | -23.01               | 233.00      | 0.0       | -25.66                  | -19.74                 | 210.00 | 0.00   |
| OPER      | 5C1T       | 88.02 L                 | 67.71                | 139.00      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -33.75 R                | -25.96               | 393.50      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.62            | 5.95  | 1.62         | 5.95  | HS 32.44     | 58.4                 |
| 5C1T        | 2.98            | 8.79  | 2.98         | 8.79  | 0.00         | 357.3                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 8.700

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 8.700

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.79 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 89.700     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 390.83 | 109.1                   |
| bott | 22.62            |                   | 9.40 |        | 107.5                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 8.700

Dead Load Moment 1.0  
Superimposed Dead Load Moment 10.0

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 173.7                       | -167.8             | 154.5           | -187.0             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 289.6                       | -279.7             | 257.6           | -311.7             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 86.43 L      | 66.48              | 164.50 | 0.0                 | 65.39    | 50.30       | 192.50             |        |                |              |
|           |           | -37.61 R     | -28.93             | 233.00 | 0.0                 | -29.08   | -22.37      | 210.00             |        | 0.00           |              |
| OPER      | 5C1T      | 76.13 L      | 58.56              | 141.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -36.19 R     | -27.84             | 395.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | bottom fiber -bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|--------|--------------|----------------------|
| HS20        | 2.01            | 4.46               | 1.79   | 35.76        | 64.4                 |
| 5C1T        | 3.80            | 7.73               | 3.38   | 0.00         | 406.0                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 8.700

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| -0.3      | -3.0                   |
|           | 0.0                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -67.8                  | 71.8                  |
| OPER      | 151.3             | -113.0                 | 119.7                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |            |              |              | Lane Live Load Shear |            |              |              |
|-----------|-----------|-----------------------|------------|--------------|--------------|----------------------|------------|--------------|--------------|
|           |           | w/imp. (-)            | w/imp. (+) | w/o imp. (-) | w/o imp. (+) | w/imp. (-)           | w/imp. (+) | w/o imp. (-) | w/o imp. (+) |
| INV.      | HS20      | -20.57                | 4.41       | -15.82       | 3.39         | -17.96               | 6.74       | -13.81       | 5.19         |
| OPER      | 5C1T      | -17.15                | 7.28       | -13.19       | 5.60         | 0.00                 | 0.00       | 0.00         | 0.00         |

| Rating |            | Shear      |                      |
|--------|------------|------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value         |
| HS20   | 3.30       | 10.65      | HS 65.94             |
| 5C1T   | 6.59       | 16.44      | 0.00                 |
|        |            |            | Load Capacity (tons) |
|        |            |            | 118.7                |
|        |            |            | 791.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 8.700

Dead Load Moment      Superimposed Dead Load Moment  
1.0                      10.0

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 174.3      | 172.1           | -163.2 | 172.1        | -163.2 | 161.0                       | -174.3 | 161.0     | - |
| OPER 290.5      | 279.4           | -279.4 | 279.4        | -279.4 | 268.3                       | -290.5 | 268.3     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 86.43 L                 | 66.48                | 164.50      | 0.0       | 65.39                   | 50.30                  | 192.50 |        |
|           |            | -37.61 R                | -28.93               | 233.00      | 0.0       | -29.08                  | -22.37                 | 210.00 | 0.00   |
| OPER      | 5C1T       | 76.13 L                 | 58.56                | 141.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -36.19 R                | -27.84               | 395.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.86            | 4.63  | 1.86         | 4.63  | HS 37.26     | 67.1                 |
| 5C1T        | 3.52            | 8.02  | 3.52         | 8.02  | 0.00         | 422.9                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 8.800

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |               |                      |               | Plastic Section Modulus - Z |
|----------------------|---------------|----------------------|---------------|-----------------------------|
| Positive Bending Top | Bending Bott. | Negative Bending Top | Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0         | 127.0                | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 8.800

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.79 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 89.700     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 390.83 | 109.1                   |
| bott | 22.62            |                   | 9.40 |        | 107.5                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 8.800

Dead Load Moment 0.1  
Superimposed Dead Load Moment 0.5

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 180.0                       | -161.6             | 160.8           | -180.8             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 300.0                       | -269.3             | 268.0           | -301.3             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 59.36 L      | 45.67              | 167.00 | 0.0                 | 45.49    | 34.99       | 195.00             |        |                |              |
|           |           | -45.31 R     | -34.85             | 233.00 | 0.0                 | -33.05   | -25.42      | 210.00             | 177.50 |                |              |
| OPER      | 5C1T      | 56.26 L      | 43.27              | 57.00  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -40.12 R     | -30.86             | 222.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | bottom fiber -bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|--------|--------------|----------------------|
| HS20        | 3.03            | 3.57               | 2.71   | 54.18        | 97.5                 |
| 5C1T        | 5.33            | 6.71               | 4.76   | 0.00         | 571.7                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 8.800

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.5      | -4.6         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -66.8                  | 72.8                  |
| OPER      | 151.3             | -111.4                 | 121.4                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -25.40                | 2.98 | -19.54   | 2.29 | -20.91               | 4.47 | -16.08   | 3.44 |
| OPER      | 5C1T      | -20.31                | 5.32 | -15.63   | 4.09 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 2.63       | 16.30      | HS 52.61     | 94.7                 |  |
| 5C1T   | 5.48       | 22.84      | 0.00         | 657.8                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 8.800

Dead Load Moment 0.1  
Superimposed Dead Load Moment 0.5

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 168.0      | 167.9           | -167.4 | 167.9        | -167.4 | 167.3                       | -168.0 | 167.3     | - |
| OPER 280.0      | 279.4           | -279.4 | 279.4        | -279.4 | 278.8                       | -280.0 | 278.8     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 59.36 L                 | 45.67                | 167.00      | 0.0       | 45.49                   | 34.99                  | 195.00 |        |
|           |            | -45.31 R                | -34.85               | 233.00      | 0.0       | -33.05                  | -25.42                 | 210.00 | 177.50 |
| OPER      | 5C1T       | 56.26 L                 | 43.27                | 57.00       | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -40.12 R                | -30.86               | 222.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 2.82            | 3.71  | 2.82         | 3.71  | HS 56.35     | 101.4                |
| 5C1T        | 4.95            | 6.98  | 4.95         | 6.98  | 0.00         | 594.6                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 8.900

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |               |                      |               | Plastic Section Modulus - Z |
|----------------------|---------------|----------------------|---------------|-----------------------------|
| Positive Bending Top | Bending Bott. | Negative Bending Top | Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0         | 127.0                | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 8.900

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.79 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 89.700     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 390.83 | 109.1                   |
| bott | 22.62            |                   | 9.40 |        | 107.5                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 8.900

Dead Load Moment      Superimposed Dead Load Moment  
-1.2                      -12.8

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 188.8                       | -152.8                | 169.6              | -172.0                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 314.7                       | -254.6                | 282.7              | -286.6                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.13        | L                  | 12.41  | 169.50              | 0.0      | 25.54       | 19.64              | 197.50 |                |              |
|           |           | -58.69       | L                  | -45.15 | 191.00              | 0.0      | -52.86      | -40.66             | 210.00 | 187.50         |              |
| OPER      | 5C1T      | 30.53        | L                  | 23.48  | 59.50               | 0.0      | 0.00        | 0.00               | 0.00   |                |              |
|           |           | -47.24       | R                  | -36.34 | 224.50              | 0.0      | 0.00        | 0.00               | 0.00   | 0.00           | 0.00         |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 7.39               | 2.60                         | 6.64                               | 2.93         | 93.7                 |
| 5C1T        | 10.31              | 5.39                         | 9.26                               | 6.07         | 646.8                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 8.900

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| -0.6      | -6.1                   |
|           | 0.0                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -65.8                  | 73.9         |
| OPER      | 151.3             | -109.7                 | 123.1        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -30.12                | 3.11 | -23.17   | 2.39 | -23.71               | 3.23 | -18.24   | 2.48 |
| OPER      | 5C1T      | -23.40                | 3.64 | -18.00   | 2.80 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 2.18       | 22.88      | HS 43.69     | 78.6                 |
| 5C1T   | 4.69       | 33.86      | 0.00         | 562.4                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 8.900

Dead Load Moment      Superimposed Dead Load Moment  
-1.2                      -12.8

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 159.2      | 162.0           | -173.3 | 162.0        | -173.3 | 176.1                       | -159.2 | 176.1     | - |
| OPER 265.4      | 279.4           | -279.4 | 279.4        | -279.4 | 293.4                       | -265.4 | 293.4     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 16.13 L                 | 12.41           | 169.50                  | 0.0       | 25.54                   | 19.64           | 197.50               |        |
|           |            | -58.69 L                | -45.15          | 191.00                  | 0.0       | -52.86                  | -40.66          | 210.00               | 187.50 |
| OPER      | 5C1T       | 30.53 L                 | 23.48           | 59.50                   | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -47.24 R                | -36.34          | 224.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 6.89            | 2.71  | 6.89         | 2.71  | HS 54.26     | 97.7                 |
| 5C1T        | 9.61            | 5.62  | 9.61         | 5.62  | 0.00         | 674.1                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 9.000

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 9.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.79 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 89.700     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 390.83 | 109.1                   |
| bott | 22.62            |                   | 9.40 |        | 107.5                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 9.000

Dead Load Moment      Superimposed Dead Load Moment  
-2.9                      -30.0

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 200.1                       | -141.4                | 181.0              | -160.6                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 333.6                       | -235.7                | 301.6              | -267.7                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 19.98 R      | 15.37              | 258.00 | 0.0                 | 17.84    | 13.72       | 235.00             |        |                |              |
|           |           | -98.43 R     | -75.72             | 220.50 | 0.0                 | -89.21   | -68.63      | 190.00             |        | 210.00         |              |
| OPER      | 5C1T      | 15.39 R      | 11.84              | 458.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -61.73 R     | -47.48             | 318.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 10.02              | 1.44                         | 9.06            | 1.63                  | HS 28.74     | 51.7                 |
| 5C1T        | 21.67              | 3.82                         | 19.60           | 4.34                  | 0.00         | 458.3                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 9.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.6      | -0.8      | -6.1                   | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 90.8              | -64.8                           | 65.0  |
| OPER      | 151.3             | -108.0                          | 108.3 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -30.12                | 34.48 | -23.17   | 26.52 | -23.71               | 26.11 | -18.24   | 20.08 |
| OPER      | 5C1T      | -23.40                | 25.93 | -18.00   | 19.95 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.88       | 1.88       | HS 37.52     | 67.5                 |
| 5C1T   | 4.12       | 4.18       | 0.00         | 494.1                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 9.000

Dead Load Moment      Superimposed Dead Load Moment  
-2.9                      -30.0

| Rating Veh.<br>ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|--------------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                    | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend               | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV.<br>147.9      | 154.5           | -180.8 | 154.5        | -180.8 | 187.4                       | -147.9 | 187.4     | - |
| OPER<br>246.5      | 279.4           | -279.4 | 279.4        | -279.4 | 312.3                       | -246.5 | 312.3     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 19.98 R                 | 15.37                | 258.00      | 0.0       | 17.84                   | 13.72                  | 235.00 |        |
|           |            | -98.43 R                | -75.72               | 220.50      | 0.0       | -89.21                  | -68.63                 | 190.00 | 210.00 |
| OPER      | 5C1T       | 15.39 R                 | 11.84                | 458.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -61.73 R                | -47.48               | 318.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 9.38            | 1.50  | 9.38         | 1.50  | HS 30.05     | 54.1                 |
| 5C1T        | 20.30           | 3.99  | 20.30        | 3.99  | 0.00         | 479.2                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 9.000

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 127.0           | 127.0         | 127.0        | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 9.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.79 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 89.700     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 390.83 | 109.1                   |
| bott | 22.62            |                   | 9.40 |        | 107.5                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 9.000

Dead Load Moment      Superimposed Dead Load Moment  
-2.9                      -30.0

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 200.1                       | -141.4             | 181.0           | -160.6             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 333.6                       | -235.7             | 301.6           | -267.7             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 19.98 R      | 15.37              | 258.00 | 0.0                 | 17.84    | 13.72       | 235.00             |        |                |              |
|           |           | -98.43 R     | -75.72             | 220.50 | 0.0                 | -89.21   | -68.63      | 190.00             |        | 210.00         |              |
| OPER      | 5C1T      | 15.39 R      | 11.84              | 458.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -61.73 R     | -47.48             | 318.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 10.02           | 1.44                      | 9.06                      | 1.63               | HS 28.74     | 51.7                 |
| 5C1T        | 21.67           | 3.82                      | 19.60                     | 4.34               | 0.00         | 458.3                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 9.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.8      | 0.7       | -7.7                   | 7.3       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 90.8              | -64.8                           | 65.0  |
| OPER      | 151.3             | -108.0                          | 108.3 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -34.53                | 34.48 | -26.56   | 26.52 | -26.28               | 26.11 | -20.22   | 20.08 |
| OPER      | 5C1T      | -26.22                | 25.93 | -20.17   | 19.95 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.88       | 1.88       | HS 37.52     | 67.5                 |
| 5C1T   | 4.12       | 4.18       | 0.00         | 494.1                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 9.000

Dead Load Moment      Superimposed Dead Load Moment  
-2.9                      -30.0

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 147.9      | 154.5           | -180.8 | 154.5        | -180.8 | 187.4                       | -147.9 | 187.4     | - |
| OPER 246.5      | 279.4           | -279.4 | 279.4        | -279.4 | 312.3                       | -246.5 | 312.3     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 19.98 R                 | 15.37           | 258.00                  | 0.0       | 17.84                   | 13.72           | 235.00               |        |
|           |            | -98.43 R                | -75.72          | 220.50                  | 0.0       | -89.21                  | -68.63          | 190.00               | 210.00 |
| OPER      | 5C1T       | 15.39 R                 | 11.84           | 458.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -61.73 R                | -47.48          | 318.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 9.38            | 1.50            | 9.38               | 1.50               | HS 30.05     | 54.1                 |
| 5C1T        | 20.30           | 3.99            | 20.30              | 3.99               | 0.00         | 479.2                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 9.100

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |               |                      |               | Plastic Section Modulus - Z |
|----------------------|---------------|----------------------|---------------|-----------------------------|
| Positive Bending Top | Bending Bott. | Negative Bending Top | Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0         | 127.0                | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
 Check Point I. D. 9.100

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.80 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 89.832     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 390.83 | 109.1                   |
| bott | 22.62            |                   | 9.40 |        | 107.5                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 9.100

|                     |                                  |
|---------------------|----------------------------------|
| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
| -1.3                | -13.5                            |

| Rating<br>Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|----------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|                | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.           | 180.4C             | -161.2                | 161.2              | -180.4C               | 189.3                       | -152.3                | 170.1              | -171.5                |
| OPER           | 300.6C             | -268.7                | 268.7              | -300.6C               | 315.5                       | -253.8                | 283.5              | -285.8                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Rat.<br>Veh. | Truck Live<br>w/imp. | Load Moment<br>w/o imp. | Loc. of<br>Front<br>Wheel | Ax.<br>Dis. | Lane Live<br>w/imp. | Load Moment<br>w/o imp. | Loc. of<br>Load 1 | Conc.<br>Load 2 |
|--------------|--------------|----------------------|-------------------------|---------------------------|-------------|---------------------|-------------------------|-------------------|-----------------|
| INV.         | HS20         | 16.43 R              | 12.64                   | 230.50                    | 0.0         | 25.89               | 19.91                   | 202.50            |                 |
|              |              | -59.00 R             | -45.39                  | 209.00                    | 0.0         | -53.36              | -41.05                  | 190.00            | 212.50          |
| OPER         | 5C1T         | 31.33 R              | 24.10                   | 253.50                    | 0.0         | 0.00                | 0.00                    | 0.00              |                 |
|              |              | -49.71 L             | -38.24                  | 88.50                     | 0.0         | 0.00                | 0.00                    | 0.00              | 0.00            |

## Moment

| Rating<br>Veh. | top fiber<br>+bend | Rating<br>bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------------|---------------------------------|-----------------|-----------------------|-----------------|----------------------------|
| HS20           | 7.31               | 2.58                            | 6.57            | 2.91                  | HS 51.61        | 92.9                       |
| 5C1T           | 10.07              | 5.11                            | 9.05            | 5.75                  | 0.00            | 612.6                      |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 9.100

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.6       | 0.0          | 5.8       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -73.6                  | 66.0         |
| OPER      | 151.3             | -122.7                 | 110.0        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -3.64                 | 30.06 | -2.80    | 23.12 | -3.50                | 23.53 | -2.69    | 18.10 |
| OPER      | 5C1T      | -3.75                 | 22.87 | -2.88    | 17.59 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 20.23      | 2.20       | HS 43.91     | 79.0                 |
| 5C1T   | 32.77      | 4.81       | 0.00         | 577.2                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 9.100

Dead Load Moment      Superimposed Dead Load Moment  
-1.3                      -13.5

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 158.7      | 161.7           | -173.6 | 161.7        | -173.6 | 176.6                       | -158.7 | 176.6     | - |
| OPER 264.5      | 279.4           | -279.4 | 279.4        | -279.4 | 294.3                       | -264.5 | 294.3     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |        |        |        |
|-----------|------------|-------------------------|-------------------------|------------------------------|----------------------|--------|--------|--------|--------|
| INV.      | HS20       | 16.43 R                 | 12.64                   | 230.50                       | 0.0                  | 25.89  | 19.91  | 202.50 |        |
|           |            | -59.00 R                | -45.39                  | 209.00                       | 0.0                  | -53.36 | -41.05 | 190.00 | 212.50 |
| OPER      | 5C1T       | 31.33 R                 | 24.10                   | 253.50                       | 0.0                  | 0.00   | 0.00   | 0.00   |        |
|           |            | -49.71 L                | -38.24                  | 88.50                        | 0.0                  | 0.00   | 0.00   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 6.82            | 2.69            | 6.82               | 2.69               | HS 53.80     | 96.8                 |
| 5C1T        | 9.39            | 5.32            | 9.39               | 5.32               | 0.00         | 638.5                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 9.200

|               |                             |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Allowable stress (fs) (psi) |           |         |         |
| RATIO/Inv.    | 0.00                        | 0.00      | 0.00    | 0.00    |
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

|                |           |       |      |      |       |       |      |      |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

|                         |                  |                       |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

|               |          |              |       |                   |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

|                  |                  |             |       |                 |
|------------------|------------------|-------------|-------|-----------------|
| Section Modulus  |                  |             |       | Plastic Section |
| Positive Bending | Negative Bending | Modulus - Z |       |                 |
| Top              | Bott.            | Top         | Bott. | (Fy * Z)        |
| 127.0            | 127.0            | 127.0       | 127.0 | 390.83          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 9.200

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.80 | 28.67 | 28.67 | 1.699 | 999999.000 | 89.832 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 390.83 | 109.1                   |
| bott | 22.62            |                   | 9.40 |        | 107.5                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 9.200

Dead Load Moment      Superimposed Dead Load Moment  
-0.1                      -0.9

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 181.0                       | -160.6                | 161.8              | -179.8                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 301.7                       | -267.6                | 269.7              | -299.6                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 59.46 R      | 45.74              | 233.00 | 0.0                 | 44.78    | 34.45       | 205.00             |        |                |              |
|           |           | -45.76 L     | -35.20             | 167.00 | 0.0                 | -35.35   | -27.19      | 190.00             | 140.00 |                |              |
| OPER      | 5C1T      | 55.30 R      | 42.54              | 343.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -42.79 L     | -32.92             | 91.00  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 3.04               | 3.51                         | 2.72                               | 3.93         | 54.43                |
| 5C1T        | 5.45               | 6.25                         | 4.88                               | 7.00         | 0.00                 |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 9.200

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| 0.4       | 0.0                    |
|           | 4.3                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -72.6                  | 67.0                  |
| OPER      | 151.3             | -121.1                 | 111.7                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |            |              |              | Lane Live Load Shear |            |              |              |
|-----------|-----------|-----------------------|------------|--------------|--------------|----------------------|------------|--------------|--------------|
|           |           | w/imp. (-)            | w/imp. (+) | w/o imp. (-) | w/o imp. (+) | w/imp. (-)           | w/imp. (+) | w/o imp. (-) | w/o imp. (+) |
| INV.      | HS20      | -3.64                 | 25.34      | -2.80        | 19.49        | -4.54                | 20.71      | -3.49        | 15.93        |
| OPER      | 5C1T      | -5.65                 | 19.67      | -4.35        | 15.13        | 0.00                 | 0.00       | 0.00         | 0.00         |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 16.01      | 2.64       | HS 52.90     | 95.2                 |
| 5C1T   | 21.43      | 5.68       | 0.00         | 681.2                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 9.200

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -0.1                | -0.9                             |

| Rating<br>Veh.<br>ber | Moment Capacity |              | Available Capacity for LL+I |           | top fiber |           | bottom fi |           |
|-----------------------|-----------------|--------------|-----------------------------|-----------|-----------|-----------|-----------|-----------|
|                       | top fiber       | bottom fiber | top fiber                   | bottom fi | top fiber | bottom fi | top fiber | bottom fi |
|                       | +bend           | -bend        | +bend                       | -bend     | +bend     | -bend     | +bend     | -bend     |
| INV.                  | 167.2           | -168.1       | 167.2                       | -168.1    | 168.3     | -167.0    | 168.3     | -         |
| 167.0                 |                 |              |                             |           |           |           |           |           |
| OPER                  | 279.4           | -279.4       | 279.4                       | -279.4    | 280.4     | -278.4    | 280.4     | -         |
| 278.4                 |                 |              |                             |           |           |           |           |           |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Truck<br>Veh. | Live Load Moment<br>w/imp. | Loc. of Ax.<br>w/o imp. | Front<br>Wheel | Lane<br>Dis. | Live Load Moment<br>w/imp. | Loc. of Conc.<br>w/o imp. | Load 1 | Load 2 |
|--------------|---------------|----------------------------|-------------------------|----------------|--------------|----------------------------|---------------------------|--------|--------|
| INV.         | HS20          | 59.46 R                    | 45.74                   | 233.00         | 0.0          | 44.78                      | 34.45                     | 205.00 |        |
|              |               | -45.76 L                   | -35.20                  | 167.00         | 0.0          | -35.35                     | -27.19                    | 190.00 | 140.00 |
| OPER         | 5C1T          | 55.30 R                    | 42.54                   | 343.00         | 0.0          | 0.00                       | 0.00                      | 0.00   |        |
|              |               | -42.79 L                   | -32.92                  | 91.00          | 0.0          | 0.00                       | 0.00                      | 0.00   | 0.00   |

## Serviceability

| Rating<br>Veh. | Rating    |              | Factor    |              | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|-----------|--------------|-----------|--------------|-----------------|----------------------------|
|                | top fiber | bottom fiber | top fiber | bottom fiber |                 |                            |
|                | +bend     | -bend        | +bend     | -bend        |                 |                            |
| HS20           | 2.83      | 3.65         | 2.83      | 3.65         | HS 56.59        | 101.9                      |
| 5C1T           | 5.07      | 6.51         | 5.07      | 6.51         | 0.00            | 608.5                      |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 9.300

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |               |                      |               | Plastic Section Modulus - Z |
|----------------------|---------------|----------------------|---------------|-----------------------------|
| Positive Bending Top | Bending Bott. | Negative Bending Top | Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0         | 127.0                | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 9.300

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.80 | 28.67 | 28.67 | 1.699 | 999999.000 | 89.832 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 390.83 | 109.1                   |
| bott | 22.62            |                   | 9.40 |        | 107.5                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 9.300

Dead Load Moment 0.7  
Superimposed Dead Load Moment 7.8

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 175.3                       | -166.3             | 156.1           | -185.5             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 292.1                       | -277.2             | 260.1           | -309.2             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 86.17 R      | 66.29              | 235.50 | 0.0                 | 64.63    | 49.71       | 207.50             |        |                |              |
|           |           | -37.94 L     | -29.19             | 167.00 | 0.0                 | -30.08   | -23.14      | 190.00             |        | 0.00           |              |
| OPER      | 5C1T      | 73.27 R      | 56.36              | 345.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -38.42 L     | -29.56             | 92.00  | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | bottom fiber -bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|--------|--------------|----------------------|
| HS20        | 2.03            | 4.38               | 1.81   | 36.22        | 65.2                 |
| 5C1T        | 3.99            | 7.22               | 3.55   | 0.00         | 426.0                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 9.300

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.2       | 0.0          | 2.7       |

| Rat. | Shear Capacity | Available Capacity for LL+I |
|------|----------------|-----------------------------|
| Veh. | VU             | (-) (+)                     |
| INV. | 90.8           | -71.6 68.0                  |
| OPER | 151.3          | -119.4 113.4                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. | Rat. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|------|------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|      |      | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
| Typ. | Veh. | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV. | HS20 | -4.55                 | 20.51 | -3.50    | 15.77 | -6.82                | 17.75 | -5.25    | 13.66 |
| OPER | 5C1T | -7.79                 | 16.51 | -5.99    | 12.70 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 10.50      | 3.32       | HS 66.35     | 119.4                |
| 5C1T   | 15.32      | 6.87       | 0.00         | 824.3                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 9.300

Dead Load Moment 0.7  
Superimposed Dead Load Moment 7.8

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 172.8      | 171.1           | -164.2 | 171.1        | -164.2 | 162.5                       | -172.8 | 162.5     | - |
| OPER 287.9      | 279.4           | -279.4 | 279.4        | -279.4 | 270.9                       | -287.9 | 270.9     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |        |        |      |
|-----------|------------|-------------------------|-------------------------|------------------------------|----------------------|--------|--------|--------|------|
| INV.      | HS20       | 86.17 R                 | 66.29                   | 235.50                       | 0.0                  | 64.63  | 49.71  | 207.50 |      |
|           |            | -37.94 L                | -29.19                  | 167.00                       | 0.0                  | -30.08 | -23.14 | 190.00 | 0.00 |
| OPER      | 5C1T       | 73.27 R                 | 56.36                   | 345.50                       | 0.0                  | 0.00   | 0.00   | 0.00   |      |
|           |            | -38.42 L                | -29.56                  | 92.00                        | 0.0                  | 0.00   | 0.00   | 0.00   | 0.00 |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.89            | 4.55            | 1.89               | 4.55               | HS 37.72     | 67.9                 |
| 5C1T        | 3.70            | 7.49            | 3.70               | 7.49               | 0.00         | 443.6                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 9.400

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |               |                      |               | Plastic Section Modulus - Z |
|----------------------|---------------|----------------------|---------------|-----------------------------|
| Positive Bending Top | Bending Bott. | Negative Bending Top | Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0         | 127.0                | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 9.400

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.80 | 28.67 | 28.67 | 1.699 | 999999.000 | 89.832 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 390.83 | 109.1                   |
| bott | 22.62            |                   | 9.40 |        | 107.5                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 9.400

Dead Load Moment 1.1  
Superimposed Dead Load Moment 12.8

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 172.0                       | -169.5             | 152.8           | -188.7             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 286.7                       | -282.6             | 254.7           | -314.5             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 96.30 R      | 74.08              | 238.00 | 0.0                 | 76.22    | 58.63       | 210.00             |        |                |              |
|           |           | -30.13 L     | -23.17             | 167.00 | 0.0                 | -26.61   | -20.47      | 190.00             |        | 0.00           |              |
| OPER      | 5C1T      | 84.08 R      | 64.68              | 348.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -36.44 L     | -28.03             | 140.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 1.79            | 5.63                      | 1.59                      | 6.26               | HS 31.74     | 57.1                 |
| 5C1T        | 3.41            | 7.76                      | 3.03                      | 8.63               | 0.00         | 363.6                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 9.400Dead Load Superimposed Dead Load  
Shear (-) Shear (+) Shear

0.1 0.0 1.2

Rat. Shear Capacity Available Capacity for LL+I  
Veh. VU (-) (+)INV. 90.8 -70.6 69.0  
OPER 151.3 -117.7 115.1

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -9.12                 | 16.75 | -7.02    | 12.88 | -9.40                | 14.76 | -7.23    | 11.35 |
| OPER      | 5C1T      | -10.04                | 13.49 | -7.72    | 10.38 | 0.00                 | 0.00  | 0.00     | 0.00  |

## Rating Shear

| Veh. | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
|------|------------|------------|--------------|----------------------|
| HS20 | 7.51       | 4.12       | HS 82.45     | 148.4                |
| 5C1T | 11.73      | 8.53       | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 9.400Dead Load Moment 1.1  
Superimposed Dead Load Moment 12.8

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 176.0      | 173.2           | -162.1 | 173.2        | -162.1 | 159.3                       | -176.0 | 159.3     | - |
| OPER 293.3      | 279.4           | -279.4 | 279.4        | -279.4 | 265.5                       | -293.3 | 265.5     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 96.30 R                 | 74.08           | 238.00                  | 0.0       | 76.22                   | 58.63           | 210.00               |        |
|           |            | -30.13 L                | -23.17          | 167.00                  | 0.0       | -26.61                  | -20.47          | 190.00               | 0.00   |
| OPER      | 5C1T       | 84.08 R                 | 64.68           | 348.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -36.44 L                | -28.03          | 140.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.65            | 5.84            | 1.65               | 5.84               | HS 33.08     | 59.6                 |
| 5C1T        | 3.16            | 8.05            | 3.16               | 8.05               | 0.00         | 378.9                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 9.500

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 9.500

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.80 | 28.67 | 28.67 | 1.699 | 999999.000 | 89.832 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 29.65 |        | 104.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 9.500

Dead Load Moment 1.2  
Superimposed Dead Load Moment 13.9

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 171.4                       | -170.2             | 152.2           | -189.4             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 285.6                       | -283.7             | 253.6           | -315.7             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment w/o imp. | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment w/o imp. | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|-----------------|---------------------|----------|-------------|--------------------|-----------------|----------------|--------------|
| INV.      | HS20      | 94.36 R      | 72.58              | 226.50          | 0.0                 | 80.36    | 61.82       | 212.50             |                 |                |              |
|           |           | -27.30 R     | -21.00             | 258.00          | 0.0                 | -24.32   | -18.71      | 235.00             | 0.00            |                |              |
| OPER      | 5C1T      | 87.72 L      | 67.48              | 113.50          | 0.0                 | 0.00     | 0.00        | 0.00               |                 |                |              |
|           |           | -37.81 R     | -29.08             | 371.50          | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00            | 0.00           |              |

## Moment

| Rating Veh. | Rating Factor   |                    |                 |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|-----------------|--------------------|--------------|----------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend |              |                      |
| HS20        | 1.82            | 6.24               | 1.61            | 6.94               | HS 32.25     | 58.1                 |
| 5C1T        | 3.26            | 7.50               | 2.89            | 8.35               | 0.00         | 346.9                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 9.500

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| -0.1      | -0.4                   |
|           | 0.1                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -69.6                  | 70.1                  |
| OPER      | 151.3             | -116.0                 | 116.8                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |      |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |      |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)  |
| INV.      | HS20      | -13.29                | 13.08 | -10.22   | 10.06 | -12.21               | 11.82 | -9.39    | 9.09 |
| OPER      | 5C1T      | -12.29                | 10.98 | -9.46    | 8.45  | 0.00                 | 0.00  | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 5.24       | 5.36       | HS 104.72    | 188.5                |
| 5C1T   | 9.43       | 10.63      | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 9.500

Dead Load Moment 1.2  
Superimposed Dead Load Moment 13.9

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 176.7      | 173.7           | -161.6 | 173.7        | -161.6 | 158.6                       | -176.7 | 158.6     | - |
| OPER 294.4      | 279.4           | -279.4 | 279.4        | -279.4 | 264.4                       | -294.4 | 264.4     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |        |        |      |
|-----------|------------|-------------------------|-------------------------|------------------------------|----------------------|--------|--------|--------|------|
| INV.      | HS20       | 94.36 R                 | 72.58                   | 226.50                       | 0.0                  | 80.36  | 61.82  | 212.50 |      |
|           |            | -27.30 R                | -21.00                  | 258.00                       | 0.0                  | -24.32 | -18.71 | 235.00 | 0.00 |
| OPER      | 5C1T       | 87.72 L                 | 67.48                   | 113.50                       | 0.0                  | 0.00   | 0.00   | 0.00   |      |
|           |            | -37.81 R                | -29.08                  | 371.50                       | 0.0                  | 0.00   | 0.00   | 0.00   | 0.00 |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.68            | 6.47  | 1.68         | 6.47  | HS 33.62     | 60.5                 |
| 5C1T        | 3.01            | 7.79  | 3.01         | 7.79  | 0.00         | 361.6                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 9.600

|               |                             |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Allowable stress (fs) (psi) |           |         |         |
| RATIO/Inv.    | 0.00                        | 0.00      | 0.00    | 0.00    |
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

|                |           |       |      |      |       |       |      |      |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

|                         |                  |                       |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

|               |          |              |       |                   |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

|                  |                  |             |       |                 |
|------------------|------------------|-------------|-------|-----------------|
| Section Modulus  |                  |             |       | Plastic Section |
| Positive Bending | Negative Bending | Modulus - Z |       |                 |
| Top              | Bott.            | Top         | Bott. | (Fy * Z)        |
| 127.0            | 127.0            | 127.0       | 127.0 | 390.83          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
 Check Point I. D. 9.600

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.90 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 95.159     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 29.65 |        | 104.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 9.600

Dead Load Moment 0.8  
Superimposed Dead Load Moment 10.8

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 173.4                       | -168.2             | 154.2           | -187.3             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 289.0                       | -280.3             | 257.0           | -312.2             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 96.49 L      | 74.22              | 187.00 | 0.0                 | 74.80    | 57.54       | 215.00             |        |                |              |
|           |           | -36.75 R     | -28.27             | 258.00 | 0.0                 | -28.46   | -21.89      | 235.00             | 0.00   |                |              |
| OPER      | 5C1T      | 84.02 L      | 64.63              | 116.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -39.21 R     | -30.16             | 371.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 1.80            | 4.57                      | 1.60                      | 5.10               | HS 31.97     | 57.5                 |
| 5C1T        | 3.44            | 7.15                      | 3.06                      | 7.96               | 0.00         | 367.1                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 9.600

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.2      | -2.0         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 90.8              | -68.5                           | 71.2  |
| OPER      | 151.3             | -114.2                          | 118.6 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -16.99                | 8.92 | -13.07   | 6.86 | -15.15               | 9.03 | -11.65   | 6.94 |
| OPER      | 5C1T      | -14.48                | 8.75 | -11.13   | 6.73 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 4.03       | 7.88       | HS 80.63     | 145.1                |
| 5C1T   | 7.89       | 13.55      | 0.00         | 946.3                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 9.600

Dead Load Moment 0.8  
Superimposed Dead Load Moment 10.8

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 174.6      | 172.3           | -163.0 | 172.3        | -163.0 | 160.7                       | -174.6 | 160.7     | - |
| OPER 291.0      | 279.4           | -279.4 | 279.4        | -279.4 | 267.8                       | -291.0 | 267.8     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |        |
|-----------|------------|-------------------------|-------------------------|-----------|-------------------------|----------------------|--------|--------|
| INV.      | HS20       | 96.49 L                 | 74.22                   | 187.00    | 0.0                     | 74.80                | 57.54  | 215.00 |
|           |            | -36.75 R                | -28.27                  | 258.00    | 0.0                     | -28.46               | -21.89 | 235.00 |
| OPER      | 5C1T       | 84.02 L                 | 64.63                   | 116.00    | 0.0                     | 0.00                 | 0.00   | 0.00   |
|           |            | -39.21 R                | -30.16                  | 371.50    | 0.0                     | 0.00                 | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.66            | 4.75            | 1.66               | 4.75               | HS 33.30     | 59.9                 |
| 5C1T        | 3.19            | 7.42            | 3.19               | 7.42               | 0.00         | 382.5                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 9.700

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 127.0           | 127.0         | 127.0        | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 9.700

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.90 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 95.159     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 29.65 |        | 104.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 9.700

Dead Load Moment 0.1  
Superimposed Dead Load Moment 3.9

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 178.0                       | -163.6             | 158.8           | -182.7             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 296.7                       | -272.6             | 264.7           | -304.6             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 85.73 L      | 65.95              | 189.50 | 0.0                 | 61.84    | 47.57       | 217.50             |        |                |              |
|           |           | -46.21 R     | -35.55             | 258.00 | 0.0                 | -32.60   | -25.07      | 235.00             | 0.00   |                |              |
| OPER      | 5C1T      | 68.20 L      | 52.46              | 114.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -40.61 R     | -31.24             | 371.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | bottom fiber -bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|--------|--------------|----------------------|
| HS20        | 2.08            | 3.54               | 1.85   | 37.05        | 66.7                 |
| 5C1T        | 4.35            | 6.71               | 3.88   | 0.00         | 465.8                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 9.700

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| -0.4      | -3.5                   |
|           | 0.0                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -67.5                  | 72.2         |
| OPER      | 151.3             | -112.5                 | 120.3        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |            |              |              | Lane Live Load Shear |            |              |              |
|-----------|-----------|-----------------------|------------|--------------|--------------|----------------------|------------|--------------|--------------|
|           |           | w/imp. (-)            | w/imp. (+) | w/o imp. (-) | w/o imp. (+) | w/imp. (-)           | w/imp. (+) | w/o imp. (-) | w/o imp. (+) |
| INV.      | HS20      | -20.66                | 4.35       | -15.90       | 3.35         | -18.14               | 6.46       | -13.95       | 4.97         |
| OPER      | 5C1T      | -17.47                | 6.71       | -13.44       | 5.16         | 0.00                 | 0.00       | 0.00         | 0.00         |

| Rating |            | Shear      |                      |
|--------|------------|------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value         |
| HS20   | 3.27       | 11.18      | HS 65.31             |
| 5C1T   | 6.44       | 17.94      | 0.00                 |
|        |            |            | Load Capacity (tons) |
|        |            |            | 117.6                |
|        |            |            | 772.4                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 9.700

Dead Load Moment 0.1  
Superimposed Dead Load Moment 3.9

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 170.0      | 169.2           | -166.1 | 169.2        | -166.1 | 165.3                       | -170.0 | 165.3     | - |
| OPER 283.3      | 279.4           | -279.4 | 279.4        | -279.4 | 275.5                       | -283.3 | 275.5     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 85.73 L                 | 65.95                | 189.50      | 0.0       | 61.84                   | 47.57                  | 217.50 |        |
|           |            | -46.21 R                | -35.55               | 258.00      | 0.0       | -32.60                  | -25.07                 | 235.00 | 0.00   |
| OPER      | 5C1T       | 68.20 L                 | 52.46                | 114.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -40.61 R                | -31.24               | 371.50      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.93            | 3.68            | 1.93               | 3.68               | HS 38.56     | 69.4                 |
| 5C1T        | 4.04            | 6.98            | 4.04               | 6.98               | 0.00         | 484.7                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 9.800

|               |                             |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Allowable stress (fs) (psi) |           |         |         |
| RATIO/Inv.    | 0.00                        | 0.00      | 0.00    | 0.00    |
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

|                |           |       |      |      |       |       |      |      |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

|                         |                  |                       |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

|               |          |              |       |                   |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

|                  |                  |             |       |                 |
|------------------|------------------|-------------|-------|-----------------|
| Section Modulus  |                  |             |       | Plastic Section |
| Positive Bending | Negative Bending | Modulus - Z |       |                 |
| Top              | Bott.            | Top         | Bott. | (Fy * Z)        |
| 127.0            | 127.0            | 127.0       | 127.0 | 390.83          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 9.800

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.90 | 28.67 | 28.67 | 1.699 | 999999.000 | 95.159 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 29.65 |        | 104.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 9.800

|                     |                                  |
|---------------------|----------------------------------|
| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
| -1.0                | -6.9                             |

| Rating<br>Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|----------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|                | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.           | 180.4C             | -161.2                | 161.2              | -180.4C               | 185.2                       | -156.4                | 166.0              | -175.6                |
| OPER           | 300.6C             | -268.7                | 268.7              | -300.6C               | 308.6                       | -260.7                | 276.6              | -292.7                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Rat.<br>Veh. | Truck<br>w/imp. | Live Load<br>w/o imp. | Moment<br>w/o imp. | Loc. of<br>Front<br>Wheel | Ax.<br>Dis. | Lane<br>w/imp. | Live Load<br>w/o imp. | Moment<br>w/o imp. | Loc. of<br>Load 1 | Conc.<br>Load 2 |
|--------------|--------------|-----------------|-----------------------|--------------------|---------------------------|-------------|----------------|-----------------------|--------------------|-------------------|-----------------|
| INV.         | HS20         | 58.49 L         | 45.00                 | 192.00             | 0.0                       | 41.39       | 31.84          | 220.00                |                    |                   |                 |
|              |              | -55.67 R        | -42.82                | 258.00             | 0.0                       | -37.46      | -28.81         | 235.00                |                    | 202.50            |                 |
| OPER         | 5C1T         | 46.46 L         | 35.74                 | -5.00              | 0.0                       | 0.00        | 0.00           | 0.00                  |                    |                   |                 |
|              |              | -44.90 R        | -34.54                | 247.50             | 0.0                       | 0.00        | 0.00           | 0.00                  |                    | 0.00              |                 |

## Moment

| Rating<br>Veh. | top fiber<br>+bend | Rating<br>bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------------|---------------------------------|-----------------|-----------------------|-----------------|----------------------------|
| HS20           | 3.16               | 2.81                            | 2.84            | 3.15                  | HS 56.20        | 101.2                      |
| 5C1T           | 6.64               | 5.81                            | 5.95            | 6.52                  | 0.00            | 696.7                      |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 9.800

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.5      | -5.1         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -66.5                  | 73.2         |
| OPER      | 151.3             | -110.8                 | 122.0        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -25.52                | 2.99 | -19.63   | 2.30 | -21.08               | 4.19 | -16.22   | 3.22 |
| OPER      | 5C1T      | -20.74                | 4.89 | -15.96   | 3.76 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 2.60       | 17.46      | HS 52.08     | 93.7                 |
| 5C1T   | 5.34       | 24.93      | 0.00         | 640.8                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 9.800

Dead Load Moment      Superimposed Dead Load Moment  
-1.0                      -6.9

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 162.9      | 164.5           | -170.8 | 164.5        | -170.8 | 172.4                       | -162.9 | 172.4     | - |
| OPER 271.4      | 279.4           | -279.4 | 279.4        | -279.4 | 287.4                       | -271.4 | 287.4     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 58.49 L                 | 45.00                | 192.00      | 0.0       | 41.39                   | 31.84                  | 220.00 |        |
|           |            | -55.67 R                | -42.82               | 258.00      | 0.0       | -37.46                  | -28.81                 | 235.00 | 202.50 |
| OPER      | 5C1T       | 46.46 L                 | 35.74                | -5.00       | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -44.90 R                | -34.54               | 247.50      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 2.95            | 2.93            | 2.95               | 2.93               | HS 58.52     | 105.3                |
| 5C1T        | 6.18            | 6.05            | 6.18               | 6.05               | 0.00         | 725.4                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 9.900

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 127.0           | 127.0         | 127.0        | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 9.900

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.90 | 28.67 | 28.67 | 1.699 | 999999.000 | 95.159 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 29.65 |        | 104.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 9.900

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -2.6                | -21.5                            |

| Rating<br>Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|----------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|                | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.           | 180.4C             | -161.2                | 161.2              | -180.4C               | 194.8                       | -146.7                | 175.6              | -165.9                |
| OPER           | 300.6C             | -268.7                | 268.7              | -300.6C               | 324.7                       | -244.6                | 292.7              | -276.6                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Rat.<br>Veh. | Truck Live<br>w/imp. | Load Moment<br>w/o imp. | Loc. of<br>Front<br>Wheel | Ax.<br>Dis. | Lane Live<br>w/imp. | Load Moment<br>w/o imp. | Loc. of<br>Load 1 | Conc.<br>Load 2 |
|--------------|--------------|----------------------|-------------------------|---------------------------|-------------|---------------------|-------------------------|-------------------|-----------------|
| INV.         | HS20         | 15.19 L              | 11.69                   | 194.50                    | 0.0         | 21.07               | 16.20                   | 222.50            |                 |
|              |              | -67.93 L             | -52.25                  | 216.00                    | 0.0         | -58.56              | -45.05                  | 235.00            | 212.50          |
| OPER         | 5C1T         | 21.91 L              | 16.85                   | -2.50                     | 0.0         | 0.00                | 0.00                    | 0.00              |                 |
|              |              | -56.28 R             | -43.29                  | 253.50                    | 0.0         | 0.00                | 0.00                    | 0.00              | 0.00            |

## Moment

| Rating<br>Veh. | top fiber<br>+bend | Rating<br>bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------------|---------------------------------|-----------------|-----------------------|-----------------|----------------------------|
| HS20           | 9.25               | 2.16                            | 8.34            | 2.44                  | HS 43.20        | 77.8                       |
| 5C1T           | 14.82              | 4.35                            | 13.36           | 4.91                  | 0.00            | 521.5                      |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 9.900

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.7      | -6.6         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -65.4                  | 74.2                  |
| OPER      | 151.3             | -109.1                 | 123.7                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -30.26                | 3.13 | -23.28   | 2.40 | -23.88               | 3.00 | -18.37   | 2.30 |
| OPER      | 5C1T      | -24.05                | 3.34 | -18.50   | 2.57 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 2.16       | 23.74      | HS 43.25     | 77.9                 |
| 5C1T   | 4.54       | 37.08      | 0.00         | 544.3                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 9.900

Dead Load Moment      Superimposed Dead Load Moment  
-2.6                      -21.5

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 153.2      | 158.0           | -177.3 | 158.0        | -177.3 | 182.1                       | -153.2 | 182.1     | - |
| OPER 255.3      | 279.4           | -279.4 | 279.4        | -279.4 | 303.5                       | -255.3 | 303.5     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 15.19 L                 | 11.69                | 194.50      | 0.0       | 21.07                   | 16.20                  | 222.50 |        |
|           |            | -67.93 L                | -52.25               | 216.00      | 0.0       | -58.56                  | -45.05                 | 235.00 | 212.50 |
| OPER      | 5C1T       | 21.91 L                 | 16.85                | -2.50       | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -56.28 R                | -43.29               | 253.50      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 8.64            | 2.26  | 8.64         | 2.26  | HS 45.10     | 81.2                 |
| 5C1T        | 13.85           | 4.54  | 13.85        | 4.54  | 0.00         | 544.4                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 10.000

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 10.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.90 | 28.67 | 28.67 | 1.699 | 999999.000 | 95.159 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 29.65 |        | 104.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 10.000

Dead Load Superimposed Dead Load  
Moment Moment  
-4.5 -40.0

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 215.8C             | -161.2                | 161.2              | -215.8C               | 242.5                       | -134.5                | 187.9              | -189.1                |
| OPER        | 359.7C             | -268.7                | 268.7              | -359.7C               | 404.1                       | -224.2                | 313.1              | -315.2                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.76 L      | 12.89              | 167.00 | 0.0                 | 12.38    | 9.53        | 190.00             |        |                |              |
|           |           | -103.30 R    | -79.46             | 246.50 | 0.0                 | -95.85   | -73.73      | 235.00             |        | 215.00         |              |
| OPER      | 5C1T      | 12.96 L      | 9.97               | -35.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -76.72 R     | -59.02             | 344.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 14.47              | 1.30                         | 11.21                              | 1.83         | 26.05                |
| 5C1T        | 31.19              | 2.92                         | 24.17                              | 4.11         | 0.00                 |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 10.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.7      | -0.8      | -6.6                   | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 103.3             | -64.4                  | 73.2         |
| OPER      | 172.1             | -107.4                 | 121.9        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -30.26                | 36.72 | -23.28   | 28.25 | -23.88               | 26.68 | -18.37   | 20.52 |
| OPER      | 5C1T      | -24.05                | 27.33 | -18.50   | 21.02 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.86       | 1.99       | HS 37.16     | 66.9                 |
| 5C1T   | 3.98       | 4.46       | 0.00         | 477.5                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 10.000

Dead Load Moment      Superimposed Dead Load Moment  
-4.5                      -40.0

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 141.0      | 149.9           | -185.4 | 149.9        | -185.4 | 194.3                       | -141.0 | 194.3     | - |
| OPER 235.0      | 279.4           | -279.4 | 279.4        | -279.4 | 323.8                       | -235.0 | 323.8     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 16.76 L                 | 12.89                | 167.00      | 0.0       | 12.38                   | 9.53                   | 190.00 |        |
|           |            | -103.30 R               | -79.46               | 246.50      | 0.0       | -95.85                  | -73.73                 | 235.00 | 215.00 |
| OPER      | 5C1T       | 12.96 L                 | 9.97                 | -35.00      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -76.72 R                | -59.02               | 344.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 11.59           | 1.37  | 11.59        | 1.37  | HS 27.29     | 49.1                 |
| 5C1T        | 25.00           | 3.06  | 25.00        | 3.06  | 0.00         | 367.5                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 10.000

|               |                             |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Allowable stress (fs) (psi) |           |         |         |
| RATIO/Inv.    | 0.00                        | 0.00      | 0.00    | 0.00    |
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

|                |           |       |      |      |       |       |      |      |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
| H              | D         | tw    | top  | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |
| 21.2           | 19.76     | 0.460 | bott | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |

## Hybrid Section Properties:

|                         |                  |                       |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

|               |          |              |       |                   |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.50         | 21.50    | 10.60        | 10.60 | 1600.0            | 1600.0           |

|                  |                  |             |       |                 |
|------------------|------------------|-------------|-------|-----------------|
| Section Modulus  |                  |             |       | Plastic Section |
| Positive Bending | Negative Bending | Modulus - Z |       |                 |
| Top              | Bott.            | Top         | Bott. | (Fy * Z)        |
| 127.0            | 127.0            | 127.0       | 127.0 | 467.60          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 10.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.210 | 0.01     | 0.01  | 43.43 | 21.66 |
| bott | 3.92 | 0.74 | 11.210 | 150.00   | 82.81 |       | 21.66 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.65 | 35.20 | 35.20 | 2.861      |
|      |       |       | 999999.000 |
|      |       |       | 105.738    |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 467.60 | 109.1                   |
| bott | 22.62            |                   | 21.84 |        | 106.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 172.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 10.000

Dead Load Moment      Superimposed Dead Load Moment  
-4.5                      -40.0

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 215.8C             | -161.2                | 161.2              | -215.8C               | 242.5                       | -134.5                | 187.9              | -189.1                |
| OPER        | 359.7C             | -268.7                | 268.7              | -359.7C               | 404.1                       | -224.2                | 313.1              | -315.2                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.76 L      | 12.89              | 167.00 | 0.0                 | 12.38    | 9.53        | 190.00             |        |                |              |
|           |           | -103.30 R    | -79.46             | 246.50 | 0.0                 | -95.85   | -73.73      | 235.00             |        | 215.00         |              |
| OPER      | 5C1T      | 12.96 L      | 9.97               | -35.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -76.72 R     | -59.02             | 344.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 14.47              | 1.30                         | 11.21           | 1.83                  | HS 26.05     | 46.9                 |
| 5C1T        | 31.19              | 2.92                         | 24.17           | 4.11                  | 0.00         | 350.7                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 10.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.8      | 1.1       | -8.1                   | 9.4       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 103.3             | -64.4                           | 73.2  |
| OPER      | 172.1             | -107.4                          | 121.9 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -34.68                | 36.72 | -26.68   | 28.25 | -26.43               | 26.68 | -20.33   | 20.52 |
| OPER      | 5C1T      | -26.99                | 27.33 | -20.76   | 21.02 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.86       | 1.99       | HS 37.16     | 66.9                 |
| 5C1T   | 3.98       | 4.46       | 0.00         | 477.5                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 10.000

Dead Load Moment      Superimposed Dead Load Moment  
-4.5                      -40.0

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 141.0      | 149.9           | -185.4 | 149.9        | -185.4 | 194.3                       | -141.0 | 194.3     | - |
| OPER 235.0      | 279.4           | -279.4 | 279.4        | -279.4 | 323.8                       | -235.0 | 323.8     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 16.76 L                 | 12.89           | 167.00                  | 0.0       | 12.38                   | 9.53            | 190.00               |        |
|           |            | -103.30 R               | -79.46          | 246.50                  | 0.0       | -95.85                  | -73.73          | 235.00               | 215.00 |
| OPER      | 5C1T       | 12.96 L                 | 9.97            | -35.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -76.72 R                | -59.02          | 344.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 11.59           | 1.37            | 11.59              | 1.37               | HS 27.29     | 49.1                 |
| 5C1T        | 25.00           | 3.06            | 25.00              | 3.06               | 0.00         | 367.5                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 10.100

|               |                             |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Allowable stress (fs) (psi) |           |         |         |
| RATIO/Inv.    | 0.00                        | 0.00      | 0.00    | 0.00    |
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |
| 21.2           | 19.76     | 0.460 | bott | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.50         | 21.50    | 10.60        | 10.60 | 1600.0            | 1600.0           |

| Section Modulus  |                  |       |       | Plastic Section |
|------------------|------------------|-------|-------|-----------------|
| Positive Bending | Negative Bending |       |       | Modulus - Z     |
| Top              | Bott.            | Top   | Bott. | (Fy * Z)        |
| 151.0            | 151.0            | 151.0 | 151.0 | 467.60          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 10.100

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.210 | 0.01     | 0.01  | 43.43 | 21.66 |
| bott | 3.92 | 0.74 | 11.210 | 150.00   | 82.81 |       | 21.66 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.65 | 35.20 | 35.20 | 2.861      |
|      |       |       | 999999.000 |
|      |       |       | 88.932     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 467.60 | 109.1                   |
| bott | 22.62            |                   | 21.84 |        | 106.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 172.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 10.100

Dead Load Superimposed Dead Load  
Moment Moment  
-2.0 -18.5

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 215.8C             | -191.7                | 191.7              | -215.8C               | 228.1                       | -179.4                | 203.9              | -203.5                |
| OPER        | 359.7C             | -319.4                | 319.4              | -359.7C               | 380.2                       | -298.9                | 339.9              | -339.2                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 12.56 L      | 9.66               | 162.00 | 0.0                 | 24.05    | 18.50       | 227.50             |        |                |              |
|           |           | -62.02 R     | -47.71             | 234.00 | 0.0                 | -57.85   | -44.50      | 215.00             |        | 240.00         |              |
| OPER      | 5C1T      | 30.15 L      | 23.19              | 93.50  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -55.00 R     | -42.31             | 346.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 9.48               | 2.89                         | 8.48                               | 3.28         | HS 57.84             |
| 5C1T        | 12.61              | 5.43                         | 11.27                              | 6.17         | 0.00                 |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 10.100

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.9       | 0.0          | 7.8       |

| Rat. | Shear | Capacity | Available Capacity for LL+I |
|------|-------|----------|-----------------------------|
| Veh. |       | VU       | (-) (+)                     |
| INV. | 103.3 |          | -84.7 74.2                  |
| OPER | 172.1 |          | -141.1 123.6                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. | Rat. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|------|------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|      |      | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
| Typ. | Veh. | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV. | HS20 | -0.64                 | 32.71 | -0.49    | 25.16 | -1.34                | 24.40 | -1.03    | 18.77 |
| OPER | 5C1T | -1.04                 | 24.64 | -0.80    | 18.95 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |        | Shear  |          |          |
|--------|--------|--------|----------|----------|
| Veh.   | Rating | Factor | Rating   | Load     |
|        | (-)    | (+)    | Value    | Capacity |
|        |        |        |          | (tons)   |
| HS20   | 63.09  | 2.27   | HS 45.37 | 81.7     |
| 5C1T   | 136.13 | 5.02   | 0.00     | 602.2    |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 10.100

Dead Load Moment      Superimposed Dead Load Moment  
-2.0                      -18.5

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 187.0      | 191.1           | -207.5 | 191.1        | -207.5 | 211.6                       | -187.0 | 211.6     | - |
| OPER 311.7      | 332.2           | -332.2 | 332.2        | -332.2 | 352.7                       | -311.7 | 352.7     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 12.56 L                 | 9.66                 | 162.00      | 0.0       | 24.05                   | 18.50                  | 227.50 |        |
|           |            | -62.02 R                | -47.71               | 234.00      | 0.0       | -57.85                  | -44.50                 | 215.00 | 240.00 |
| OPER      | 5C1T       | 30.15 L                 | 23.19                | 93.50       | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -55.00 R                | -42.31               | 346.50      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 8.80            | 3.02  | 8.80         | 3.02  | HS 60.31     | 108.6                |
| 5C1T        | 11.70           | 5.67  | 11.70        | 5.67  | 0.00         | 680.1                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 10.200

|               |                             |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Allowable stress (fs) (psi) |           |         |         |
| RATIO/Inv.    | 0.00                        | 0.00      | 0.00    | 0.00    |
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

|                |           |       |      |      |       |       |      |      |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
| H              | D         | tw    | top  | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |
| 21.2           | 19.76     | 0.460 | bott | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |

## Hybrid Section Properties:

|                         |                  |                       |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

|               |          |              |       |                   |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.50         | 21.50    | 10.60        | 10.60 | 1600.0            | 1600.0           |

|                  |                  |             |       |                 |
|------------------|------------------|-------------|-------|-----------------|
| Section Modulus  |                  |             |       | Plastic Section |
| Positive Bending | Negative Bending | Modulus - Z |       |                 |
| Top              | Bott.            | Top         | Bott. | (Fy * Z)        |
| 151.0            | 151.0            | 151.0       | 151.0 | 467.60          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 10.200

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.210 | 0.01     | 0.01  | 43.43 | 21.66 |
| bott | 3.92 | 0.74 | 11.210 | 150.00   | 82.81 |       | 21.66 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.65 | 35.20 | 35.20 | 2.861 | 999999.000 | 88.932 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 467.60 | 109.1                   |
| bott | 22.62            |                   | 21.84 |        | 106.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 172.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 10.200

Dead Load Moment      Superimposed Dead Load Moment  
0.1                      -0.9

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 215.8C             | -191.7                | 191.7              | -215.8C               | 216.3                       | -191.2                | 192.1              | -215.3                |
| OPER        | 359.7C             | -319.4                | 319.4              | -359.7C               | 360.5                       | -318.6                | 320.2              | -358.9                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 63.97 R      | 49.20              | 258.00 | 0.0                 | 47.55    | 36.58       | 230.00             |        |                |              |
|           |           | -50.04 L     | -38.49             | 192.00 | 0.0                 | -38.63   | -29.72      | 215.00             |        | 165.00         |              |
| OPER      | 5C1T      | 59.03 L      | 45.40              | 96.00  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -47.09 L     | -36.22             | 116.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 3.38               | 3.82                         | 3.00 4.30                          | HS 60.08     | 108.1                |
| 5C1T        | 6.11               | 6.77                         | 5.43 7.62                          | 0.00         | 651.1                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 10.200

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.7       | 0.0          | 6.3       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 103.3             | -83.6                  | 75.2                  |
| OPER      | 172.1             | -139.4                 | 125.4                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -0.97                 | 28.22 | -0.75    | 21.70 | -2.83                | 21.94 | -2.18    | 16.88 |
| OPER      | 5C1T      | -2.55                 | 21.72 | -1.96    | 16.71 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 29.56      | 2.67       | HS 53.32     | 96.0                 |
| 5C1T   | 54.58      | 5.77       | 0.00         | 692.6                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 10.200

Dead Load Moment      Superimposed Dead Load Moment  
0.1                      -0.9

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 198.8      | 199.0           | -199.6 | 199.0        | -199.6 | 199.8                       | -198.8 | 199.8     | - |
| OPER 331.4      | 332.2           | -332.2 | 332.2        | -332.2 | 333.0                       | -331.4 | 333.0     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 63.97 R                 | 49.20                | 258.00      | 0.0       | 47.55                   | 36.58                  | 230.00 |        |
|           |            | -50.04 L                | -38.49               | 192.00      | 0.0       | -38.63                  | -29.72                 | 215.00 | 165.00 |
| OPER      | 5C1T       | 59.03 L                 | 45.40                | 96.00       | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -47.09 L                | -36.22               | 116.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 3.12            | 3.97            | 3.12               | 3.97               | HS 62.48     | 112.5                |
| 5C1T        | 5.64            | 7.04            | 5.64               | 7.04               | 0.00         | 677.0                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 10.300

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |
| 21.2           | 19.76     | 0.460 | bott | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.50         | 21.50    | 10.60        | 10.60 | 1600.0            | 1600.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 151.0                | 151.0                  | 151.0                | 151.0                  | 467.60                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 10.300

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.210 | 0.01     | 0.01  | 43.43 | 21.66 |
| bott | 3.92 | 0.74 | 11.210 | 150.00   | 82.81 |       | 21.66 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.65 | 35.20 | 35.20 | 2.861 | 999999.000 | 88.932 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 467.60 | 109.1                   |
| bott | 22.62            |                   | 21.84 |        | 106.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 172.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 10.300

Dead Load Moment 1.7  
Superimposed Dead Load Moment 12.9

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 215.8C          | -191.7             | 191.7           | -215.8C            | 207.1                       | -200.4             | 182.9           | -224.5             |
| OPER        | 359.7C          | -319.4             | 319.4           | -359.7C            | 345.1                       | -334.0             | 304.9           | -374.2             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 99.53 R      | 76.56              | 260.50 | 0.0                 | 71.95    | 55.35       | 232.50             |        |                |              |
|           |           | -43.78 L     | -33.68             | 192.00 | 0.0                 | -33.81   | -26.00      | 215.00             | 165.00 |                |              |
| OPER      | 5C1T      | 86.28 R      | 66.37              | 370.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -41.20 L     | -31.70             | 116.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | Rating Factor   |                    |                 |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|-----------------|--------------------|--------------|----------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend |              |                      |
| HS20        | 2.08            | 4.58               | 1.84            | 5.13               | HS 36.76     | 66.2                 |
| 5C1T        | 4.00            | 8.10               | 3.53            | 9.08               | 0.00         | 424.0                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 10.300

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| 0.5       | 0.0                    |
|           | 4.7                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 103.3             | -82.6                  | 76.3                  |
| OPER      | 172.1             | -137.7                 | 127.1                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -3.02                 | 23.31 | -2.32    | 17.93 | -4.64                | 19.35 | -3.57    | 14.88 |
| OPER      | 5C1T      | -4.32                 | 18.62 | -3.33    | 14.32 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 17.81      | 3.27       | HS 65.44     | 117.8                |
| 5C1T   | 31.84      | 6.83       | 0.00         | 819.2                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 10.300

Dead Load Moment      Superimposed Dead Load Moment  
1.7                      12.9

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 208.0      | 205.1           | -193.5 | 205.1        | -193.5 | 190.6                       | -208.0 | 190.6     | - |
| OPER 346.7      | 332.2           | -332.2 | 332.2        | -332.2 | 317.7                       | -346.7 | 317.7     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 99.53 R                 | 76.56                | 260.50      | 0.0       | 71.95                   | 55.35                  | 232.50 |        |
|           |            | -43.78 L                | -33.68               | 192.00      | 0.0       | -33.81                  | -26.00                 | 215.00 | 165.00 |
| OPER      | 5C1T       | 86.28 R                 | 66.37                | 370.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -41.20 L                | -31.70               | 116.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.91            | 4.75  | 1.91         | 4.75  | HS 38.30     | 68.9                 |
| 5C1T        | 3.68            | 8.41  | 3.68         | 8.41  | 0.00         | 441.8                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 10.400

|               |                             |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Allowable stress (fs) (psi) |           |         |         |
| RATIO/Inv.    | 0.00                        | 0.00      | 0.00    | 0.00    |
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

|                |           |       |      |      |       |       |      |      |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
| H              | D         | tw    | top  | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |
| 21.2           | 19.76     | 0.460 | bott | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |

## Hybrid Section Properties:

|                         |                  |                       |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

|               |          |              |       |                   |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.50         | 21.50    | 10.60        | 10.60 | 1600.0            | 1600.0           |

|                  |                  |             |       |                 |
|------------------|------------------|-------------|-------|-----------------|
| Section Modulus  |                  |             |       | Plastic Section |
| Positive Bending | Negative Bending | Modulus - Z |       |                 |
| Top              | Bott.            | Top         | Bott. | (Fy * Z)        |
| 151.0            | 151.0            | 151.0       | 151.0 | 467.60          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 10.400

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.210 | 0.01     | 0.01  | 43.43 | 21.66 |
| bott | 3.92 | 0.74 | 11.210 | 150.00   | 82.81 |       | 21.66 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.65 | 35.20 | 35.20 | 2.861      |
|      |       |       | 999999.000 |
|      |       |       | 88.932     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 467.60 | 109.1                   |
| bott | 22.62            |                   | 21.84 |        | 106.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 172.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 10.400

Dead Load Moment      Superimposed Dead Load Moment  
2.8                      22.8

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 215.8C             | -191.7                | 191.7              | -215.8C               | 200.5                       | -207.0                | 176.3              | -231.2                |
| OPER        | 359.7C             | -319.4                | 319.4              | -359.7C               | 334.1                       | -345.0                | 293.8              | -385.3                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 115.16 R     | 88.59              | 263.00 | 0.0                 | 88.90    | 68.38       | 235.00             |        |                |              |
|           |           | -37.53 L     | -28.87             | 192.00 | 0.0                 | -27.73   | -21.33      | 215.00             |        | 0.00           |              |
| OPER      | 5C1T      | 104.59 R     | 80.45              | 373.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -35.32 L     | -27.17             | 116.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 1.74               | 5.52                         | 1.53                               | 6.16         | HS 30.62             |
| 5C1T        | 3.19               | 9.77                         | 2.81                               | 10.91        | 0.00                 |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 10.400

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.4       | 0.0          | 3.2       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 103.3             | -81.6                  | 77.3                  |
| OPER      | 172.1             | -135.9                 | 128.8                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -6.09                 | 18.19 | -4.69    | 14.00 | -6.75                | 16.67 | -5.19    | 12.82 |
| OPER      | 5C1T      | -6.39                 | 15.81 | -4.92    | 12.16 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 12.09      | 4.25       | HS 84.96     | 152.9                |  |
| 5C1T   | 21.27      | 8.15       | 0.00         | 977.4                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 10.400

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| 2.8                 | 22.8                             |

| Rating<br>Veh.<br>ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                       | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend                  | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV.<br>214.7         | 209.6           | -189.1 | 209.6        | -189.1 | 184.0                       | -214.7 | 184.0     | - |
| OPER<br>357.8         | 332.2           | -332.2 | 332.2        | -332.2 | 306.6                       | -357.8 | 306.6     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Truck<br>Veh. | Live Load Moment<br>w/imp. | Loc. of Ax.<br>w/o imp. | Front<br>Wheel | Lane<br>Dis. | Live Load Moment<br>w/imp. | Loc. of Conc.<br>w/o imp. | Load 1 | Load 2 |
|--------------|---------------|----------------------------|-------------------------|----------------|--------------|----------------------------|---------------------------|--------|--------|
| INV.         | HS20          | 115.16 R                   | 88.59                   | 263.00         | 0.0          | 88.90                      | 68.38                     | 235.00 |        |
|              |               | -37.53 L                   | -28.87                  | 192.00         | 0.0          | -27.73                     | -21.33                    | 215.00 | 0.00   |
| OPER         | 5C1T          | 104.59 R                   | 80.45                   | 373.00         | 0.0          | 0.00                       | 0.00                      | 0.00   |        |
|              |               | -35.32 L                   | -27.17                  | 116.00         | 0.0          | 0.00                       | 0.00                      | 0.00   | 0.00   |

## Serviceability

| Rating<br>Veh. | Rating       |                | Factor          |                | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------|----------------|-----------------|----------------|-----------------|----------------------------|
|                | top<br>+bend | fiber<br>-bend | bottom<br>+bend | fiber<br>-bend |                 |                            |
| HS20           | 1.60         | 5.72           | 1.60            | 5.72           | HS 31.95        | 57.5                       |
| 5C1T           | 2.93         | 10.13          | 2.93            | 10.13          | 0.00            | 351.8                      |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 10.500

|               |                             |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Allowable stress (fs) (psi) |           |         |         |
| RATIO/Inv.    | 0.00                        | 0.00      | 0.00    | 0.00    |
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

|                |           |       |      |      |       |       |      |      |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
| H              | D         | tw    | top  | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |
| 21.2           | 19.76     | 0.460 | bott | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |

## Hybrid Section Properties:

|                         |                  |                       |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

|               |          |              |       |                   |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.50         | 21.50    | 10.60        | 10.60 | 1600.0            | 1600.0           |

|                  |                  |             |       |                 |
|------------------|------------------|-------------|-------|-----------------|
| Section Modulus  |                  |             |       | Plastic Section |
| Positive Bending | Negative Bending | Modulus - Z |       |                 |
| Top              | Bott.            | Top         | Bott. | (Fy * Z)        |
| 151.0            | 151.0            | 151.0       | 151.0 | 467.60          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 10.500

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.210 | 0.01     | 0.01  | 43.43 | 21.66 |
| bott | 3.92 | 0.74 | 11.210 | 150.00   | 82.81 |       | 21.66 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.65 | 35.20 | 35.20 | 2.861 | 999999.000 | 88.932 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 467.60 | 109.1                   |
| bott | 22.62            |                   | 0.00 |        | 109.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 172.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 10.500

Dead Load Superimposed Dead Load  
Moment Moment  
3.5 28.9

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 215.8C             | -191.7                | 191.7              | -215.8C               | 196.4                       | -211.1                | 172.2              | -235.2                |
| OPER        | 359.7C             | -319.4                | 319.4              | -359.7C               | 327.3                       | -351.8                | 287.1              | -392.0                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 121.30 R     | 93.31              | 265.50 | 0.0                 | 99.09    | 76.22       | 237.50             |        |                |              |
|           |           | -31.27 L     | -24.06             | 192.00 | 0.0                 | -23.11   | -17.77      | 215.00             | 0.00   |                |              |
| OPER      | 5C1T      | 114.31 L     | 87.93              | 138.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -29.43 L     | -22.64             | 116.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 1.62               | 6.75                         | 1.42                               | 7.52         | HS 28.40             |
| 5C1T        | 2.86               | 11.95                        | 2.51                               | 13.32        | 0.00                 |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 10.500Dead Load Superimposed Dead Load  
Shear (-) Shear (+) Shear

0.2 0.0 1.7

Rat. Shear Capacity Available Capacity for LL+I  
Veh. VU (-) (+)INV. 103.3 -80.5 78.3  
OPER 172.1 -134.2 130.5

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -9.70                 | 15.07 | -7.46    | 11.59 | -9.15                | 13.93 | -7.04    | 10.71 |
| OPER      | 5C1T      | -8.82                 | 13.55 | -6.78    | 10.42 | 0.00                 | 0.00  | 0.00     | 0.00  |

## Rating Shear

| Veh. | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
|------|------------|------------|--------------|----------------------|
| HS20 | 8.30       | 5.20       | HS 103.97    | 187.1                |
| 5C1T | 15.22      | 9.63       | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 10.500

Dead Load Moment 3.5  
Superimposed Dead Load Moment 28.9

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 218.7      | 212.3           | -186.4 | 212.3        | -186.4 | 179.9                       | -218.7 | 179.9     | - |
| OPER 364.6      | 332.2           | -332.2 | 332.2        | -332.2 | 299.8                       | -364.6 | 299.8     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |        |
|-----------|------------|-------------------------|-------------------------|-----------|-------------------------|----------------------|--------|--------|
| INV.      | HS20       | 121.30 R                | 93.31                   | 265.50    | 0.0                     | 99.09                | 76.22  | 237.50 |
|           |            | -31.27 L                | -24.06                  | 192.00    | 0.0                     | -23.11               | -17.77 | 215.00 |
| OPER      | 5C1T       | 114.31 L                | 87.93                   | 138.50    | 0.0                     | 0.00                 | 0.00   | 0.00   |
|           |            | -29.43 L                | -22.64                  | 116.00    | 0.0                     | 0.00                 | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.48            | 6.99            | 1.48               | 6.99               | HS 29.66     | 53.4                 |
| 5C1T        | 2.62            | 12.39           | 2.62               | 12.39              | 0.00         | 314.8                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 10.600

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |
| 21.2           | 19.76     | 0.460 | bott | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.50         | 21.50    | 10.60        | 10.60 | 1600.0            | 1600.0           |

| Section Modulus      |               |                      |               | Plastic Section Modulus - Z |
|----------------------|---------------|----------------------|---------------|-----------------------------|
| Positive Bending Top | Bending Bott. | Negative Bending Top | Bending Bott. | (Fy * Z)                    |
| 151.0                | 151.0         | 151.0                | 151.0         | 467.60                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 10.600

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.210 | 0.01     | 0.01  | 43.43 | 21.66 |
| bott | 3.92 | 0.74 | 11.210 | 150.00   | 82.81 |       | 21.66 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.75 | 35.20 | 35.20 | 2.861      |
|      |       |       | 999999.000 |
|      |       |       | 94.285     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 467.60 | 109.1                   |
| bott | 22.62            |                   | 0.00 |        | 109.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 172.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 10.600

Dead Load Moment 3.7  
Superimposed Dead Load Moment 30.8

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 215.8C          | -191.7             | 191.7           | -215.8C            | 195.1                       | -212.3             | 171.0           | -236.5             |
| OPER        | 359.7C          | -319.4             | 319.4           | -359.7C            | 325.2                       | -353.9             | 284.9           | -394.2             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 128.61 R     | 98.93              | 254.00 | 0.0                 | 99.47    | 76.52       | 240.00             |        |                |              |
|           |           | -25.02 L     | -19.25             | 192.00 | 0.0                 | -18.49   | -14.22      | 215.00             | 0.00   |                |              |
| OPER      | 5C1T      | 115.53 L     | 88.87              | 141.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -23.55 L     | -18.11             | 116.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 1.52            | 8.49                      | 1.33         | 9.45               | HS 26.59     | 47.9                 |
| 5C1T        | 2.82            | 15.03                     | 2.47         | 16.74              | 0.00         | 296.0                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 10.600

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.0       | 0.0          | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 103.3             | -79.4                  | 79.4                  |
| OPER      | 172.1             | -132.4                 | 132.4                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |      | Lane Live Load Shear |       |          |      |
|-----------|-----------|-----------------------|-------|----------|------|----------------------|-------|----------|------|
|           |           | w/imp.                |       | w/o imp. |      | w/imp.               |       | w/o imp. |      |
|           |           | (-)                   | (+)   | (-)      | (+)  | (-)                  | (+)   | (-)      | (+)  |
| INV.      | HS20      | -12.86                | 11.47 | -9.89    | 8.82 | -11.81               | 11.17 | -9.09    | 8.59 |
| OPER      | 5C1T      | -11.39                | 11.15 | -8.76    | 8.57 | 0.00                 | 0.00  | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 6.18       | 6.93       | HS 123.50    | 222.3                |
| 5C1T   | 11.62      | 11.88      | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 10.600

Dead Load Moment 3.7  
Superimposed Dead Load Moment 30.8

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 220.0      | 213.1           | -185.5 | 213.1        | -185.5 | 178.6                       | -220.0 | 178.6     | - |
| OPER 366.7      | 332.2           | -332.2 | 332.2        | -332.2 | 297.7                       | -366.7 | 297.7     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |        |
|-----------|------------|-------------------------|-------------------------|-----------|-------------------------|----------------------|--------|--------|
| INV.      | HS20       | 128.61 R                | 98.93                   | 254.00    | 0.0                     | 99.47                | 76.52  | 240.00 |
|           |            | -25.02 L                | -19.25                  | 192.00    | 0.0                     | -18.49               | -14.22 | 215.00 |
| OPER      | 5C1T       | 115.53 L                | 88.87                   | 141.00    | 0.0                     | 0.00                 | 0.00   | 0.00   |
|           |            | -23.55 L                | -18.11                  | 116.00    | 0.0                     | 0.00                 | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.39            | 8.79  | 1.39         | 8.79  | HS 27.78     | 50.0                 |
| 5C1T        | 2.58            | 15.57 | 2.58         | 15.57 | 0.00         | 309.2                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 10.700

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |
| 21.2           | 19.76     | 0.460 | bott | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.50         | 21.50    | 10.60        | 10.60 | 1600.0            | 1600.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 151.0                | 151.0                  | 151.0                | 151.0                  | 467.60                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 10.700

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.210 | 0.01     | 0.01  | 43.43 | 21.66 |
| bott | 3.92 | 0.74 | 11.210 | 150.00   | 82.81 |       | 21.66 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.75 | 35.20 | 35.20 | 2.861      |
|      |       |       | 999999.000 |
|      |       |       | 94.285     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 467.60 | 109.1                   |
| bott | 22.62            |                   | 0.00 |        | 109.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 172.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 10.700

Dead Load Moment      Superimposed Dead Load Moment  
3.5                      28.9

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 215.8C             | -191.7                | 191.7              | -215.8C               | 196.4                       | -211.0                | 172.3              | -235.2                |
| OPER        | 359.7C             | -319.4                | 319.4              | -359.7C               | 327.4                       | -351.7                | 287.1              | -392.0                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 128.35 R     | 98.73              | 256.50 | 0.0                 | 91.13    | 70.10       | 242.50             |        |                |              |
|           |           | -18.76 L     | -14.43             | 192.00 | 0.0                 | -13.86   | -10.66      | 215.00             |        | 0.00           |              |
| OPER      | 5C1T      | 109.03 L     | 83.87              | 139.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -17.66 L     | -13.58             | 116.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 1.53               | 11.25                        | 1.34                               | 26.84        | 48.3                 |
| 5C1T        | 3.00               | 19.92                        | 2.63                               | 0.00         | 316.0                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 10.700

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.2      | -1.5         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 103.3             | -78.4                  | 80.5                  |
| OPER      | 172.1             | -130.6                 | 134.1                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -17.11                | 8.72 | -13.16   | 6.71 | -14.73               | 8.44 | -11.33   | 6.49 |
| OPER      | 5C1T      | -14.54                | 8.57 | -11.18   | 6.60 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 4.58       | 9.23       | HS 91.61     | 164.9                |
| 5C1T   | 8.99       | 15.64      | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 10.700

Dead Load Moment 3.5  
Superimposed Dead Load Moment 28.9

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 218.7      | 212.2           | -186.4 | 212.2        | -186.4 | 179.9                       | -218.7 | 179.9     | - |
| OPER 364.5      | 332.2           | -332.2 | 332.2        | -332.2 | 299.9                       | -364.5 | 299.9     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 128.35 R                | 98.73           | 256.50                  | 0.0       | 91.13                   | 70.10           | 242.50               |        |
|           |            | -18.76 L                | -14.43          | 192.00                  | 0.0       | -13.86                  | -10.66          | 215.00               | 0.00   |
| OPER      | 5C1T       | 109.03 L                | 83.87           | 139.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -17.66 L                | -13.58          | 116.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.40            | 11.65 | 1.40         | 11.65 | HS 28.04     | 50.5                 |
| 5C1T        | 2.75            | 20.64 | 2.75         | 20.64 | 0.00         | 330.1                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 10.800

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |
| 21.2           | 19.76     | 0.460 | bott | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.50         | 21.50    | 10.60        | 10.60 | 1600.0            | 1600.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 151.0                | 151.0                  | 151.0                | 151.0                  | 467.60                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 10.800

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.210 | 0.01     | 0.01  | 43.43 | 21.66 |
| bott | 3.92 | 0.74 | 11.210 | 150.00   | 82.81 |       | 21.66 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.75 | 35.20 | 35.20 | 2.861      |
|      |       |       | 999999.000 |
|      |       |       | 94.285     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 467.60 | 109.1                   |
| bott | 22.62            |                   | 0.00 |        | 109.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 172.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 10.800

Dead Load Moment      Superimposed Dead Load Moment  
2.8                      23.1

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 215.8C          | -191.7             | 191.7           | -215.8C            | 200.3                       | -207.2             | 176.1           | -231.3             |
| OPER        | 359.7C          | -319.4             | 319.4           | -359.7C            | 333.8                       | -345.3             | 293.6           | -385.5             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 108.85 R     | 83.73              | 259.00 | 0.0                 | 71.41    | 54.93       | 245.00             |        |                |              |
|           |           | -12.51 L     | -9.62              | 192.00 | 0.0                 | -9.24    | -7.11       | 215.00             | 0.00   |                |              |
| OPER      | 5C1T      | 90.16 L      | 69.35              | 142.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -11.77 L     | -9.06              | 116.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 1.84            | 16.56                     | 1.62                      | 18.49              | HS 32.36     | 58.3                 |
| 5C1T        | 3.70            | 29.33                     | 3.26                      | 32.75              | 0.00         | 390.8                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 10.800

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.4      | -3.1         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 103.3             | -77.4                  | 81.5                  |
| OPER      | 172.1             | -128.9                 | 135.8                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -21.77                | 5.87 | -16.75   | 4.52 | -17.86               | 5.76 | -13.74   | 4.43 |
| OPER      | 5C1T      | -18.03                | 5.81 | -13.87   | 4.47 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 3.55       | 13.88      | HS 71.06     | 127.9                |  |
| 5C1T   | 7.15       | 23.37      | 0.00         | 858.0                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 10.800

Dead Load Moment      Superimposed Dead Load Moment  
2.8                      23.1

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 214.8      | 209.7           | -189.0 | 209.7        | -189.0 | 183.8                       | -214.8 | 183.8     | - |
| OPER 358.0      | 332.2           | -332.2 | 332.2        | -332.2 | 306.4                       | -358.0 | 306.4     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 108.85 R                | 83.73           | 259.00                  | 0.0       | 71.41                   | 54.93           | 245.00               |        |
|           |            | -12.51 L                | -9.62           | 192.00                  | 0.0       | -9.24                   | -7.11           | 215.00               | 0.00   |
| OPER      | 5C1T       | 90.16 L                 | 69.35           | 142.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -11.77 L                | -9.06           | 116.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.69            | 17.17           | 1.69               | 17.17              | HS 33.77     | 60.8                 |
| 5C1T        | 3.40            | 30.41           | 3.40               | 30.41              | 0.00         | 407.8                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 10.900

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Depth | Web Thk. |      | Dc   | b max | b min | t    | ry   |
|----------------|-------|----------|------|------|-------|-------|------|------|
| H              | D     | tw       | top  | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |
| 21.2           | 19.76 | 0.460    | bott | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.50         | 21.50    | 10.60        | 10.60 | 1600.0            | 1600.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 151.0                | 151.0                  | 151.0                | 151.0                  | 467.60                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 10.900

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.210 | 0.01     | 0.01  | 43.43 | 21.66 |
| bott | 3.92 | 0.74 | 11.210 | 150.00   | 82.81 |       | 21.66 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.75 | 35.20 | 35.20 | 2.861 | 999999.000 | 94.285 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 467.60 | 109.1                   |
| bott | 22.62            |                   | 0.00 |        | 109.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 172.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 10.900

Dead Load Moment      Superimposed Dead Load Moment  
1.6                      13.5

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 215.8C             | -191.7                | 191.7              | -215.8C               | 206.8                       | -200.7                | 182.6              | -224.9                |
| OPER        | 359.7C             | -319.4                | 319.4              | -359.7C               | 344.6                       | -334.5                | 304.4              | -374.8                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 66.91 R      | 51.47              | 261.50 | 0.0                 | 41.79    | 32.15       | 247.50             |        |                |              |
|           |           | -6.25 L      | -4.81              | 192.00 | 0.0                 | -4.62    | -3.55       | 215.00             |        | 0.00           |              |
| OPER      | 5C1T      | 54.18 L      | 41.68              | 144.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -5.89 L      | -4.53              | 116.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 3.09               | 32.09                        | 2.73            | 35.95                 | HS 54.59     | 98.3                 |
| 5C1T        | 6.36               | 56.83                        | 5.62            | 63.67                 | 0.00         | 674.0                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 10.900

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.6      | -4.6         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 103.3             | -76.3                  | 82.5                  |
| OPER      | 172.1             | -127.2                 | 137.5                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -26.76                | 2.95 | -20.59   | 2.27 | -21.20               | 3.16 | -16.31   | 2.43 |
| OPER      | 5C1T      | -21.67                | 3.83 | -16.67   | 2.94 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 2.85       | 26.08      | HS 57.04     | 102.7                |  |
| 5C1T   | 5.87       | 35.94      | 0.00         | 704.3                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 10.900

Dead Load Moment      Superimposed Dead Load Moment  
1.6                      13.5

| Rating Veh. ber | Moment Capacity top fiber |        | Moment Capacity bottom fiber |        | Available Capacity for LL+I |        |           |   |
|-----------------|---------------------------|--------|------------------------------|--------|-----------------------------|--------|-----------|---|
|                 | +bend                     | -bend  | +bend                        | -bend  | top fiber                   | -bend  | bottom fi |   |
| INV. 208.4      | 205.3                     | -193.3 | 205.3                        | -193.3 | 190.3                       | -208.4 | 190.3     | - |
| OPER 347.3      | 332.2                     | -332.2 | 332.2                        | -332.2 | 317.1                       | -347.3 | 317.1     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 66.91 R                 | 51.47           | 261.50                  | 0.0       | 41.79                   | 32.15           | 247.50               |        |
|           |            | -6.25 L                 | -4.81           | 192.00                  | 0.0       | -4.62                   | -3.55           | 215.00               | 0.00   |
| OPER      | 5C1T       | 54.18 L                 | 41.68           | 144.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -5.89 L                 | -4.53           | 116.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor top fiber |       | Rating Factor bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-------------------------|-------|----------------------------|-------|--------------|----------------------|
|             | +bend                   | -bend | +bend                      | -bend |              |                      |
| HS20        | 2.84                    | 33.31 | 2.84                       | 33.31 | HS 56.88     | 102.4                |
| 5C1T        | 5.85                    | 59.00 | 5.85                       | 59.00 | 0.00         | 702.3                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 11.000

|               |                             |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Allowable stress (fs) (psi) |           |         |         |
| RATIO/Inv.    | 0.00                        | 0.00      | 0.00    | 0.00    |
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

|                |           |       |      |      |       |       |      |      |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
| H              | D         | tw    | top  | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |
| 21.2           | 19.76     | 0.460 | bott | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |

## Hybrid Section Properties:

|                         |                  |                       |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

|               |          |              |       |                   |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.50         | 21.50    | 10.60        | 10.60 | 1600.0            | 1600.0           |

|                  |                  |             |       |                 |
|------------------|------------------|-------------|-------|-----------------|
| Section Modulus  |                  |             |       | Plastic Section |
| Positive Bending | Negative Bending | Modulus - Z |       |                 |
| Top              | Bott.            | Top         | Bott. | (Fy * Z)        |
| 151.0            | 151.0            | 151.0       | 151.0 | 467.60          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S02  
Check Point I. D. 11.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.210 | 0.01     | 0.01  | 43.43 | 21.66 |
| bott | 3.92 | 0.74 | 11.210 | 150.00   | 82.81 |       | 21.66 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.75 | 35.20 | 35.20 | 2.861 | 999999.000 | 94.285 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 467.60 | 109.1                   |
| bott | 22.62            |                   | 0.00 |        | 109.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 172.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
 INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
 Check Point I. D. 11.000

Dead Load Moment 0.0  
 Superimposed Dead Load Moment 0.0

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 215.8C          | -191.7             | 191.7           | -215.8C            | 215.8                       | -191.7             | 191.7           | -215.8             |
| OPER        | 359.7C          | -319.4             | 319.4           | -359.7C            | 359.7                       | -319.4             | 319.4           | -359.7             |

## Live Load Effect

Impact Factors: +bend - .000 -bend - .000

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 0.00 R       | 0.00               | 0.00   | 0.00                | 0.0      | 0.00        | 0.00               | 0.00   | 0.00           |              |
|           |           | 0.00 R       | 0.00               | 0.00   | 0.00                | 0.0      | 0.00        | 0.00               | 0.00   | 0.00           | 0.00         |
| OPER      | 5C1T      | 0.00 R       | 0.00               | 0.00   | 0.00                | 0.0      | 0.00        | 0.00               | 0.00   | 0.00           |              |
|           |           | 0.00 R       | 0.00               | 0.00   | 0.00                | 0.0      | 0.00        | 0.00               | 0.00   | 0.00           | 0.00         |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 999.00          | 999.00                    | 999.00                    | 999.00             | HS 999.00    | 999.0                |
| 5C1T        | 999.00          | 999.00                    | 999.00                    | 999.00             | 0.00         | 999.0                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 11.000

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.7      | -6.2         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 103.3             | -75.3                  | 79.9         |
| OPER      | 172.1             | -125.5                 | 133.1        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -32.02                | 0.00 | -24.63   | 0.00 | -24.72               | 2.36 | -19.01   | 1.82 |
| OPER      | 5C1T      | -25.40                | 0.00 | -19.54   | 0.00 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 2.35       | 33.80      | HS 47.03     | 84.6                 |
| 5C1T   | 4.94       | 999.00     | 0.00         | 592.8                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S02  
Check Point I. D. 11.000Dead Load Moment 0.0  
Superimposed Dead Load Moment 0.0

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 199.3      | 199.3           | -199.3 | 199.3        | -199.3 | 199.3                       | -199.3 | 199.3     | - |
| OPER 332.2      | 332.2           | -332.2 | 332.2        | -332.2 | 332.2                       | -332.2 | 332.2     | - |

## Live Load Effect

Impact Factors: +bend - .000 -bend - .000

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 0.00 R                  | 0.00            | 0.00                    | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | 0.00 R                  | 0.00            | 0.00                    | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |
| OPER      | 5C1T       | 0.00 R                  | 0.00            | 0.00                    | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | 0.00 R                  | 0.00            | 0.00                    | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |        | bottom fiber |        | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------|--------------|--------|--------------|----------------------|
|             | top fiber +bend | -bend  | +bend        | -bend  |              |                      |
| HS20        | 999.00          | 999.00 | 999.00       | 999.00 | HS 999.00    | 999.0                |
| 5C1T        | 999.00          | 999.00 | 999.00       | 999.00 | 0.00         | 999.0                |

## BRIDGE / MEMBER DATA

Structure I. D. HAM500

Material of Construction SS  
 Year of Construction 1959  
 Roadway Width 32.000  
 Number of Spans 10

Live Load Distribution Factor 1.143

Second Live Load Dist. Factor 1.143

Comments:

Member I. D. S03 Symmetry:

|              |                  |                  |                  |                  |                   |
|--------------|------------------|------------------|------------------|------------------|-------------------|
| Span Length: | Span 1<br>25.000 | Span 2<br>25.000 | Span 3<br>25.000 | Span 4<br>25.000 | Span 5<br>25.000  |
|              | Span 6<br>25.000 | Span 7<br>25.000 | Span 8<br>25.000 | Span 9<br>25.000 | Span 10<br>25.000 |

| Range Length -- Non-Composite: |           | Section      |      | Section | Hinge Location |             |
|--------------------------------|-----------|--------------|------|---------|----------------|-------------|
| Span No.                       | Range No. | Range Length | Left | Right   | Variation      | No. 1 No. 2 |
| 1                              | 1         | 25.000       | 1    | 0       |                | 0.0 0.0     |
| 2                              | 1         | 25.000       | 2    | 0       |                | 0.0 0.0     |
| 3                              | 1         | 25.000       | 2    | 0       |                | 0.0 0.0     |
| 4                              | 1         | 25.000       | 2    | 0       |                | 0.0 0.0     |
| 5                              | 1         | 25.000       | 2    | 0       |                | 0.0 0.0     |
| 6                              | 1         | 25.000       | 2    | 0       |                | 0.0 0.0     |
| 7                              | 1         | 25.000       | 2    | 0       |                | 0.0 0.0     |
| 8                              | 1         | 25.000       | 2    | 0       |                | 0.0 0.0     |
| 9                              | 1         | 25.000       | 2    | 0       |                | 0.0 0.0     |
| 10                             | 1         | 25.000       | 1    | 0       |                | 0.0 0.0     |

Superimposed Dead Load:

| Span No. | Load Type | Dist. from Left Supp. | Distributed Load (lbs/ft) |       | Length | Concentrated Load (kips) |
|----------|-----------|-----------------------|---------------------------|-------|--------|--------------------------|
|          |           |                       | Left                      | Right |        |                          |
| 1        | W         | 0.000                 | 688.0                     | 688.0 | 25.000 | 0.0                      |
| 1        | P         | 12.500                | 0.0                       | 0.0   | 0.000  | 0.1                      |
| 2        | W         | 0.000                 | 688.0                     | 688.0 | 25.000 | 0.0                      |
| 2        | P         | 12.500                | 0.0                       | 0.0   | 0.000  | 0.1                      |
| 3        | W         | 0.000                 | 688.0                     | 688.0 | 25.000 | 0.0                      |
| 3        | P         | 12.500                | 0.0                       | 0.0   | 0.000  | 0.1                      |
| 4        | W         | 0.000                 | 688.0                     | 688.0 | 25.000 | 0.0                      |
| 4        | P         | 12.500                | 0.0                       | 0.0   | 0.000  | 0.1                      |
| 5        | W         | 0.000                 | 688.0                     | 688.0 | 25.000 | 0.0                      |
| 5        | P         | 12.500                | 0.0                       | 0.0   | 0.000  | 0.1                      |
| 6        | W         | 0.000                 | 688.0                     | 688.0 | 25.000 | 0.0                      |
| 6        | P         | 12.500                | 0.0                       | 0.0   | 0.000  | 0.1                      |
| 7        | W         | 0.000                 | 688.0                     | 688.0 | 25.000 | 0.0                      |
| 7        | P         | 12.500                | 0.0                       | 0.0   | 0.000  | 0.1                      |
| 8        | W         | 0.000                 | 688.0                     | 688.0 | 25.000 | 0.0                      |
| 8        | P         | 12.500                | 0.0                       | 0.0   | 0.000  | 0.1                      |

|    |   |        |       |       |        |     |
|----|---|--------|-------|-------|--------|-----|
| 9  | W | 0.000  | 688.0 | 688.0 | 25.000 | 0.0 |
| 9  | P | 12.500 | 0.0   | 0.0   | 0.000  | 0.1 |
| 10 | W | 0.000  | 688.0 | 688.0 | 25.000 | 0.0 |
| 10 | P | 12.500 | 0.0   | 0.0   | 0.000  | 0.1 |

NOTE: All distances are shown in decimal feet, moments are shown in foot-kips, and shears are shown in kips. Section and section properties are shown as: in., in.\*\*2, in.\*\*3, and in.\*\*4.

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 1.000

|               |                             |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Allowable stress (fs) (psi) |           |         |         |
| RATIO/Inv.    | 0.00                        | 0.00      | 0.00    | 0.00    |
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

|                |           |       |      |      |       |       |      |      |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
| H              | D         | tw    | top  | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |
| 21.2           | 19.76     | 0.460 | bott | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |

## Hybrid Section Properties:

|                         |                  |                       |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

|               |          |              |       |                   |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.50         | 21.50    | 10.60        | 10.60 | 1600.0            | 1600.0           |

|                  |                  |             |       |                 |
|------------------|------------------|-------------|-------|-----------------|
| Section Modulus  |                  |             |       | Plastic Section |
| Positive Bending | Negative Bending | Modulus - Z |       |                 |
| Top              | Bott.            | Top         | Bott. | (Fy * Z)        |
| 151.0            | 151.0            | 151.0       | 151.0 | 467.60          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 1.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.210 | 0.01     | 0.01  | 43.43 | 21.66 |
| bott | 3.92 | 0.74 | 11.210 | 150.00   | 82.81 |       | 21.66 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.75 | 35.20 | 35.20 | 2.861      |
|      |       |       | 999999.000 |
|      |       |       | 94.285     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 467.60 | 109.1                   |
| bott | 22.62            |                   | 0.00 |        | 109.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 172.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 1.000

Dead Load Moment 0.0  
Superimposed Dead Load Moment 0.0

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 215.8C          | -191.7             | 191.7           | -215.8C            | 215.8                       | -191.7             | 191.7           | -215.8             |
| OPER        | 359.7C          | -319.4             | 319.4           | -359.7C            | 359.7                       | -319.4             | 319.4           | -359.7             |

## Live Load Effect

Impact Factors: +bend - .000 -bend - .000

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 0.00 R       | 0.00               | 0.00   | 0.00                | 0.0      | 0.00        | 0.00               | 0.00   | 0.00           |              |
|           |           | 0.00 R       | 0.00               | 0.00   | 0.00                | 0.0      | 0.00        | 0.00               | 0.00   | 0.00           | 0.00         |
| OPER      | 5C1T      | 0.00 R       | 0.00               | 0.00   | 0.00                | 0.0      | 0.00        | 0.00               | 0.00   | 0.00           |              |
|           |           | 0.00 R       | 0.00               | 0.00   | 0.00                | 0.0      | 0.00        | 0.00               | 0.00   | 0.00           | 0.00         |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 999.00          | 999.00                    | 999.00                    | 999.00             | HS 999.00    | 999.0                |
| 5C1T        | 999.00          | 999.00                    | 999.00                    | 999.00             | 0.00         | 999.0                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 1.000

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.7       | 0.0          | 6.9       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 103.3             | -84.0                  | 74.9                  |
| OPER      | 172.1             | -140.0                 | 124.8                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -2.40                 | 32.02 | -1.84    | 24.63 | -2.36                | 24.72 | -1.82    | 19.01 |
| OPER      | 5C1T      | -2.19                 | 25.40 | -1.68    | 19.54 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 35.04      | 2.34       | HS 46.75     | 84.2                 |
| 5C1T   | 64.00      | 4.91       | 0.00         | 589.3                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 1.000Dead Load Moment 0.0  
Superimposed Dead Load Moment 0.0

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 199.3      | 199.3           | -199.3 | 199.3        | -199.3 | 199.3                       | -199.3 | 199.3     | - |
| OPER 332.2      | 332.2           | -332.2 | 332.2        | -332.2 | 332.2                       | -332.2 | 332.2     | - |

## Live Load Effect

Impact Factors: +bend - .000 -bend - .000

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-------------------------|------------------------------|----------------------|--------|
| INV.      | HS20       | 0.00 R                  | 0.00                    | 0.00                         | 0.00                 | 0.00   |
|           |            | 0.00 R                  | 0.00                    | 0.00                         | 0.00                 | 0.00   |
| OPER      | 5C1T       | 0.00 R                  | 0.00                    | 0.00                         | 0.00                 | 0.00   |
|           |            | 0.00 R                  | 0.00                    | 0.00                         | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                    | Rating Value    |                    | Load Capacity (tons) |
|-------------|-----------------|--------------------|-----------------|--------------------|----------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend |                      |
| HS20        | 999.00          | 999.00             | 999.00          | 999.00             | 999.0                |
| 5C1T        | 999.00          | 999.00             | 999.00          | 999.00             | 999.0                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 1.100

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |
| 21.2           | 19.76     | 0.460 | bott | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.50         | 21.50    | 10.60        | 10.60 | 1600.0            | 1600.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 151.0                | 151.0                  | 151.0                | 151.0                  | 467.60                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 1.100

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.210 | 0.01     | 0.01  | 43.43 | 21.66 |
| bott | 3.92 | 0.74 | 11.210 | 150.00   | 82.81 |       | 21.66 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.75 | 35.20 | 35.20 | 2.861 | 999999.000 | 94.285 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 467.60 | 109.1                   |
| bott | 22.62            |                   | 0.00 |        | 109.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 172.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 1.100

Dead Load Moment 1.6  
Superimposed Dead Load Moment 15.0

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 215.8C             | -191.7                | 191.7              | -215.8C               | 205.8                       | -201.6                | 181.7              | -225.8                |
| OPER        | 359.7C             | -319.4                | 319.4              | -359.7C               | 343.0                       | -336.1                | 302.8              | -376.3                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 66.91 L      | 51.47              | -11.50 | 0.0                 | 41.79    | 32.15       | 2.50               |        |                |              |
|           |           | -6.25 R      | -4.81              | 58.00  | 0.0                 | -4.62    | -3.55       | 35.00              | 0.00   |                |              |
| OPER      | 5C1T      | 54.18 R      | 41.68              | 105.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -5.89 R      | -4.53              | 134.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor | bottom fiber<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|--------|-----------------------|-----------------------|--------------|----------------------|
| HS20        | 3.08               | 32.24                        | 2.71   | 36.10                 | HS                    | 54.30        | 97.7                 |
| 5C1T        | 6.33               | 57.10                        | 5.59   | 63.94                 |                       | 0.00         | 670.5                |

## SHEAR RATING REPORT

Rating Types and Vehicles  
 INV. OPER POST SPEC  
 Structure I. D. HAM500  
 Member I. D. S03  
 Check Point I. D. 1.100  
 HS20 5C1T  
 Dead Load Superimposed Dead Load  
 Shear (-) Shear (+) Shear  
 0.6 0.0 5.2

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 103.3             | -82.9                  | 76.0                  |
| OPER      | 172.1             | -138.1                 | 126.7                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -2.95                 | 26.76 | -2.27    | 20.59 | -3.16                | 21.20 | -2.43    | 16.31 |
| OPER      | 5C1T      | -3.83                 | 21.67 | -2.94    | 16.67 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 26.19      | 2.84       | HS 56.79     | 102.2                |
| 5C1T   | 36.08      | 5.84       | 0.00         | 701.3                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 1.100

Dead Load Moment 1.6  
Superimposed Dead Load Moment 15.0

| Rating Veh. ber | Moment Capacity top fiber |        | Moment Capacity bottom fiber |        | Available Capacity for LL+I |                 |                 |                 |
|-----------------|---------------------------|--------|------------------------------|--------|-----------------------------|-----------------|-----------------|-----------------|
|                 | +bend                     | -bend  | +bend                        | -bend  | top fiber +bend             | top fiber -bend | bottom fi +bend | bottom fi -bend |
| INV. 209.3      | 206.0                     | -192.7 | 206.0                        | -192.7 | 189.3                       | -209.3          | 189.3           | -               |
| OPER 348.9      | 332.2                     | -332.2 | 332.2                        | -332.2 | 315.5                       | -348.9          | 315.5           | -               |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Live Load Moment w/o imp. | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-------------------------|---------------------------|-----------|-------------------------|----------------------|--------|
| INV.      | HS20       | 66.91 L                 | 51.47                   | -11.50                    | 0.0       | 41.79                   | 32.15                | 2.50   |
|           |            | -6.25 R                 | -4.81                   | 58.00                     | 0.0       | -4.62                   | -3.55                | 35.00  |
| OPER      | 5C1T       | 54.18 R                 | 41.68                   | 105.50                    | 0.0       | 0.00                    | 0.00                 | 0.00   |
|           |            | -5.89 R                 | -4.53                   | 134.00                    | 0.0       | 0.00                    | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor top fiber |       | Rating Factor bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-------------------------|-------|----------------------------|-------|--------------|----------------------|
|             | +bend                   | -bend | +bend                      | -bend |              |                      |
| HS20        | 2.83                    | 33.46 | 2.83                       | 33.46 | HS 56.59     | 101.9                |
| 5C1T        | 5.82                    | 59.27 | 5.82                       | 59.27 | 0.00         | 698.8                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 1.200

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |
| 21.2           | 19.76     | 0.460 | bott | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.50         | 21.50    | 10.60        | 10.60 | 1600.0            | 1600.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 151.0                | 151.0                  | 151.0                | 151.0                  | 467.60                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 1.200

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.210 | 0.01     | 0.01  | 43.43 | 21.66 |
| bott | 3.92 | 0.74 | 11.210 | 150.00   | 82.81 |       | 21.66 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.75 | 35.20 | 35.20 | 2.861      |
|      |       |       | 999999.000 |
|      |       |       | 94.285     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 467.60 | 109.1                   |
| bott | 22.62            |                   | 0.00 |        | 109.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 172.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 1.200

Dead Load Moment 2.8  
Superimposed Dead Load Moment 25.8

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 215.8C          | -191.7             | 191.7           | -215.8C            | 198.7                       | -208.8             | 174.5           | -232.9             |
| OPER        | 359.7C          | -319.4             | 319.4           | -359.7C            | 331.1                       | -348.0             | 290.9           | -388.2             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 108.85 L     | 83.73              | -9.00  | 0.0                 | 71.41    | 54.93       | 5.00               |        |                |              |
|           |           | -12.51 R     | -9.62              | 58.00  | 0.0                 | -9.24    | -7.11       | 35.00              | 0.00   |                |              |
| OPER      | 5C1T      | 90.16 R      | 69.35              | 108.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -11.77 R     | -9.06              | 134.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 1.83            | 16.69                     | 1.60         | 18.62              | HS 32.07     | 57.7                 |
| 5C1T        | 3.67            | 29.56                     | 3.23         | 32.98              | 0.00         | 387.2                |

## SHEAR RATING REPORT

Rating Types and Vehicles  
 INV. OPER POST SPEC  
 Structure I. D. HAM500  
 Member I. D. S03  
 Check Point I. D. 1.200  
 HS20 5C1T

Dead Load Superimposed Dead Load  
 Shear (-) Shear (+) Shear  
 0.4 0.0 3.4

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 103.3             | -81.7                  | 77.1                  |
| OPER      | 172.1             | -136.2                 | 128.6                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -5.87                 | 21.77 | -4.52    | 16.75 | -5.76                | 17.86 | -4.43    | 13.74 |
| OPER      | 5C1T      | -5.81                 | 18.03 | -4.47    | 13.87 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 13.91      | 3.54       | HS 70.87     | 127.6                |
| 5C1T   | 23.43      | 7.13       | 0.00         | 855.6                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 1.200Dead Load Moment 2.8  
Superimposed Dead Load Moment 25.8

| Rating Veh. ber | Moment Capacity top fiber |        | Moment Capacity bottom fiber |        | Available Capacity for LL+I |        |           |   |
|-----------------|---------------------------|--------|------------------------------|--------|-----------------------------|--------|-----------|---|
|                 | +bend                     | -bend  | +bend                        | -bend  | top fiber                   | -bend  | bottom fi |   |
| INV. 216.5      | 210.7                     | -187.9 | 210.7                        | -187.9 | 182.2                       | -216.5 | 182.2     | - |
| OPER 360.8      | 332.2                     | -332.2 | 332.2                        | -332.2 | 303.6                       | -360.8 | 303.6     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 108.85 L                | 83.73                | -9.00       | 0.0       | 71.41                   | 54.93                  | 5.00   |        |
|           |            | -12.51 R                | -9.62                | 58.00       | 0.0       | -9.24                   | -7.11                  | 35.00  | 0.00   |
| OPER      | 5C1T       | 90.16 R                 | 69.35                | 108.00      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -11.77 R                | -9.06                | 134.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor top fiber |       | Rating Factor bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-------------------------|-------|----------------------------|-------|--------------|----------------------|
|             | +bend                   | -bend | +bend                      | -bend |              |                      |
| HS20        | 1.67                    | 17.30 | 1.67                       | 17.30 | HS 33.47     | 60.3                 |
| 5C1T        | 3.37                    | 30.64 | 3.37                       | 30.64 | 0.00         | 404.2                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 1.300

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |
| 21.2           | 19.76     | 0.460 | bott | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.50         | 21.50    | 10.60        | 10.60 | 1600.0            | 1600.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 151.0                | 151.0                  | 151.0                | 151.0                  | 467.60                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 1.300

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.210 | 0.01     | 0.01  | 43.43 | 21.66 |
| bott | 3.92 | 0.74 | 11.210 | 150.00   | 82.81 |       | 21.66 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.75 | 35.20 | 35.20 | 2.861 | 999999.000 | 94.285 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 467.60 | 109.1                   |
| bott | 22.62            |                   | 0.00 |        | 109.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 172.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 1.300

Dead Load Superimposed Dead Load  
Moment Moment  
3.5 32.2

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 215.8C             | -191.7                | 191.7              | -215.8C               | 194.4                       | -213.1                | 170.2              | -237.2                |
| OPER        | 359.7C             | -319.4                | 319.4              | -359.7C               | 324.0                       | -355.1                | 283.7              | -395.4                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 128.35 L     | 98.73              | -6.50  | 0.0                 | 91.13    | 70.10       | 7.50               |        |                |              |
|           |           | -18.76 R     | -14.43             | 58.00  | 0.0                 | -13.86   | -10.66      | 35.00              | 0.00   |                |              |
| OPER      | 5C1T      | 109.03 R     | 83.87              | 110.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -17.66 R     | -13.58             | 134.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 1.51               | 11.35                        | 1.33            | 12.64                 | HS 26.53     | 47.7                 |
| 5C1T        | 2.97               | 20.11                        | 2.60            | 22.39                 | 0.00         | 312.3                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 1.300Dead Load Superimposed Dead Load  
Shear (-) Shear (+) Shear

0.2 0.0 1.7

Rat. Shear Capacity Available Capacity for LL+I  
Veh. VU (-) (+)INV. 103.3 -80.6 78.3  
OPER 172.1 -134.3 130.5

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Rat.<br>Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|--------------|--------------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|              |              | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|              |              | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.         | HS20         | -8.72                 | 17.11 | -6.71    | 13.16 | -8.44                | 14.73 | -6.49    | 11.33 |
| OPER         | 5C1T         | -8.57                 | 14.54 | -6.60    | 11.18 | 0.00                 | 0.00  | 0.00     | 0.00  |

## Rating Shear

| Veh. | Rating<br>(-) | Factor<br>(+) | Rating<br>Value | Load<br>Capacity<br>(tons) |
|------|---------------|---------------|-----------------|----------------------------|
| HS20 | 9.24          | 4.57          | HS 91.49        | 164.7                      |
| 5C1T | 15.66         | 8.98          | 0.00            | 999.0                      |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 1.300

Dead Load Moment 3.5  
Superimposed Dead Load Moment 32.2

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 220.7      | 213.6           | -185.0 | 213.6        | -185.0 | 177.9                       | -220.7 | 177.9     | - |
| OPER 367.9      | 332.2           | -332.2 | 332.2        | -332.2 | 296.5                       | -367.9 | 296.5     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 128.35 L                | 98.73           | -6.50                   | 0.0       | 91.13                   | 70.10           | 7.50                 |        |
|           |            | -18.76 R                | -14.43          | 58.00                   | 0.0       | -13.86                  | -10.66          | 35.00                | 0.00   |
| OPER      | 5C1T       | 109.03 R                | 83.87           | 110.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -17.66 R                | -13.58          | 134.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.39            | 11.76           | 1.39               | 11.76              | HS 27.72     | 49.9                 |
| 5C1T        | 2.72            | 20.83           | 2.72               | 20.83              | 0.00         | 326.3                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 1.400

|               |                             |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Allowable stress (fs) (psi) |           |         |         |
| RATIO/Inv.    | 0.00                        | 0.00      | 0.00    | 0.00    |
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

|                |           |       |      |      |       |       |      |      |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
| H              | D         | tw    | top  | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |
| 21.2           | 19.76     | 0.460 | bott | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |

## Hybrid Section Properties:

|                         |                  |                       |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

|               |          |              |       |                   |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.50         | 21.50    | 10.60        | 10.60 | 1600.0            | 1600.0           |

|                  |                  |             |       |                 |
|------------------|------------------|-------------|-------|-----------------|
| Section Modulus  |                  |             |       | Plastic Section |
| Positive Bending | Negative Bending | Modulus - Z |       |                 |
| Top              | Bott.            | Top         | Bott. | (Fy * Z)        |
| 151.0            | 151.0            | 151.0       | 151.0 | 467.60          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 1.400

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.210 | 0.01     | 0.01  | 43.43 | 21.66 |
| bott | 3.92 | 0.74 | 11.210 | 150.00   | 82.81 |       | 21.66 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.75 | 35.20 | 35.20 | 2.861 | 999999.000 | 94.285 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 467.60 | 109.1                   |
| bott | 22.62            |                   | 0.00 |        | 109.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 172.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 1.400

Dead Load Moment 3.7  
Superimposed Dead Load Moment 34.4

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 215.8C          | -191.7             | 191.7           | -215.8C            | 193.0                       | -214.5             | 168.8           | -238.7             |
| OPER        | 359.7C          | -319.4             | 319.4           | -359.7C            | 321.6                       | -357.5             | 281.3           | -397.8             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Load Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Load Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|-------------|---------------------|----------|-------------|--------------------|-------------|----------------|--------------|
| INV.      | HS20      | 128.61 L     | 98.93              | -4.00       | 0.0                 | 99.47    | 76.51       | 10.00              |             |                |              |
|           |           | -25.02 R     | -19.25             | 58.00       | 0.0                 | -18.49   | -14.22      | 35.00              | 0.00        |                |              |
| OPER      | 5C1T      | 115.53 R     | 88.87              | 109.00      | 0.0                 | 0.00     | 0.00        | 0.00               |             |                |              |
|           |           | -23.55 R     | -18.11             | 134.00      | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00        | 0.00           |              |

## Moment

| Rating Veh. | Rating Factor   |                    |                 |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|-----------------|--------------------|--------------|----------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend |              |                      |
| HS20        | 1.50            | 8.57               | 1.31            | 9.54               | HS 26.25     | 47.2                 |
| 5C1T        | 2.78            | 15.18              | 2.43            | 16.89              | 0.00         | 292.2                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 1.400

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear     | (-) Shear (+) Shear    |
| 0.0       | -0.1 0.0               |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 103.3             | -79.4                           | 79.4  |
| OPER      | 172.1             | -132.4                          | 132.4 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |      | Lane Live Load Shear |       |          |      |
|-----------|-----------|-----------------------|-------|----------|------|----------------------|-------|----------|------|
|           |           | w/imp.                |       | w/o imp. |      | w/imp.               |       | w/o imp. |      |
|           |           | (-)                   | (+)   | (-)      | (+)  | (-)                  | (+)   | (-)      | (+)  |
| INV.      | HS20      | -11.47                | 12.86 | -8.82    | 9.89 | -11.17               | 11.81 | -8.59    | 9.09 |
| OPER      | 5C1T      | -11.15                | 11.39 | -8.57    | 8.76 | 0.00                 | 0.00  | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 6.93       | 6.18       | HS 123.51    | 222.3                |
| 5C1T   | 11.88      | 11.62      | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 1.400

Dead Load Moment 3.7  
Superimposed Dead Load Moment 34.4

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 222.2      | 214.6           | -184.1 | 214.6        | -184.1 | 176.5                       | -222.2 | 176.5     | - |
| OPER 370.3      | 332.2           | -332.2 | 332.2        | -332.2 | 294.1                       | -370.3 | 294.1     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 128.61 L                | 98.93                | -4.00       | 0.0       | 99.47                   | 76.51                  | 10.00  |        |
|           |            | -25.02 R                | -19.25               | 58.00       | 0.0       | -18.49                  | -14.22                 | 35.00  | 0.00   |
| OPER      | 5C1T       | 115.53 R                | 88.87                | 109.00      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -23.55 R                | -18.11               | 134.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.37            | 8.88            | 1.37               | 8.88               | HS 27.44     | 49.4                 |
| 5C1T        | 2.55            | 15.73           | 2.55               | 15.73              | 0.00         | 305.5                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 1.500

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |
| 21.2           | 19.76     | 0.460 | bott | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.50         | 21.50    | 10.60        | 10.60 | 1600.0            | 1600.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 151.0                | 151.0                  | 151.0                | 151.0                  | 467.60                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 1.500

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.210 | 0.01     | 0.01  | 43.43 | 21.66 |
| bott | 3.92 | 0.74 | 11.210 | 150.00   | 82.81 |       | 21.66 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.67 | 35.20 | 35.20 | 2.861      |
|      |       |       | 999999.000 |
|      |       |       | 90.090     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 467.60 | 109.1                   |
| bott | 22.62            |                   | 17.47 |        | 106.6                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 172.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 1.500

Dead Load Moment 3.5  
Superimposed Dead Load Moment 32.2

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 215.8C          | -191.7             | 191.7           | -215.8C            | 194.4                       | -213.1             | 170.2           | -237.2             |
| OPER        | 359.7C          | -319.4             | 319.4           | -359.7C            | 324.0                       | -355.1             | 283.7           | -395.4             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 121.30 L     | 93.31              | -15.50 | 0.0                 | 99.09    | 76.22       | 12.50              |        |                |              |
|           |           | -31.27 R     | -24.06             | 58.00  | 0.0                 | -23.11   | -17.77      | 35.00              | 0.00   |                |              |
| OPER      | 5C1T      | 114.31 R     | 87.93              | 111.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -29.43 R     | -22.64             | 134.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 1.60            | 6.81                      | 1.40                      | 7.59               | HS 28.07     | 50.5                 |
| 5C1T        | 2.83            | 12.07                     | 2.48                      | 13.44              | 0.00         | 297.8                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 1.500

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.2      | -1.8         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 103.3             | -78.3                  | 80.6                  |
| OPER      | 172.1             | -130.5                 | 134.3                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -15.07                | 9.70 | -11.59   | 7.46 | -13.93               | 9.15 | -10.71   | 7.04 |
| OPER      | 5C1T      | -13.55                | 8.82 | -10.42   | 6.78 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 5.20       | 8.30       | HS 103.92    | 187.1                |
| 5C1T   | 9.63       | 15.23      | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 1.500

Dead Load Moment 3.5  
Superimposed Dead Load Moment 32.2

| Rating Veh. ber | Moment Capacity top fiber |        | Moment Capacity bottom fiber |        | Available Capacity for LL+I |                 |                 |                 |
|-----------------|---------------------------|--------|------------------------------|--------|-----------------------------|-----------------|-----------------|-----------------|
|                 | +bend                     | -bend  | +bend                        | -bend  | top fiber +bend             | top fiber -bend | bottom fi +bend | bottom fi -bend |
| INV. 220.7      | 213.6                     | -185.0 | 213.6                        | -185.0 | 177.9                       | -220.7          | 177.9           | -               |
| OPER 367.9      | 332.2                     | -332.2 | 332.2                        | -332.2 | 296.5                       | -367.9          | 296.5           | -               |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Live Load Moment w/o imp. | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-------------------------|---------------------------|-----------|-------------------------|----------------------|--------|
| INV.      | HS20       | 121.30 L                | 93.31                   | -15.50                    | 0.0       | 99.09                   | 76.22                | 12.50  |
|           |            | -31.27 R                | -24.06                  | 58.00                     | 0.0       | -23.11                  | -17.77               | 35.00  |
| OPER      | 5C1T       | 114.31 R                | 87.93                   | 111.50                    | 0.0       | 0.00                    | 0.00                 | 0.00   |
|           |            | -29.43 R                | -22.64                  | 134.00                    | 0.0       | 0.00                    | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating top fiber +bend | Rating top fiber -bend | Factor bottom fiber +bend | Factor bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|------------------------|------------------------|---------------------------|---------------------------|--------------|----------------------|
| HS20        | 1.47                   | 7.06                   | 1.47                      | 7.06                      | HS 29.33     | 52.8                 |
| 5C1T        | 2.59                   | 12.50                  | 2.59                      | 12.50                     | 0.00         | 311.2                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 1.600

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |
| 21.2           | 19.76     | 0.460 | bott | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.50         | 21.50    | 10.60        | 10.60 | 1600.0            | 1600.0           |

| Section Modulus  |                  |       |       | Plastic Section |
|------------------|------------------|-------|-------|-----------------|
| Positive Bending | Negative Bending |       |       | Modulus - Z     |
| Top              | Bott.            | Top   | Bott. | (Fy * Z)        |
| 151.0            | 151.0            | 151.0 | 151.0 | 467.60          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 1.600

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.210 | 0.01     | 0.01  | 43.43 | 21.66 |
| bott | 3.92 | 0.74 | 11.210 | 150.00   | 82.81 |       | 21.66 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.67 | 35.20 | 35.20 | 2.861      |
|      |       |       | 999999.000 |
|      |       |       | 90.090     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 467.60 | 109.1                   |
| bott | 22.62            |                   | 17.47 |        | 106.6                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 172.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 1.600

Dead Load Moment 2.8  
Superimposed Dead Load Moment 25.4

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 215.8C          | -191.7             | 191.7           | -215.8C            | 198.9                       | -208.6             | 174.7           | -232.8             |
| OPER        | 359.7C          | -319.4             | 319.4           | -359.7C            | 331.4                       | -347.7             | 291.2           | -387.9             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment  | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|---------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 115.16 L     | 88.59              | -13.00  | 0.0                 | 88.90    | 68.38       | 15.00              |        |                |              |
|           |           | -37.53 R     | -28.87             | 58.00   | 0.0                 | -27.73   | -21.33      | 35.00              | 0.00   |                |              |
| OPER      | 5C1T      | 104.59 L     | 80.45              | -123.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -35.32 R     | -27.17             | 134.00  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 1.73            | 5.56                      | 1.52                      | 6.20               | HS 30.34     | 54.6                 |
| 5C1T        | 3.17            | 9.84                      | 2.78                      | 10.98              | 0.00         | 334.1                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 1.600

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.4      | -3.6         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 103.3             | -77.1                  | 81.8                  |
| OPER      | 172.1             | -128.4                 | 136.3                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -18.19                | 6.09 | -14.00   | 4.69 | -16.67               | 6.75 | -12.82   | 5.19 |
| OPER      | 5C1T      | -15.81                | 6.39 | -12.16   | 4.92 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 4.24       | 12.12      | HS 84.71     | 152.5                |  |
| 5C1T   | 8.12       | 21.33      | 0.00         | 974.6                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 1.600

Dead Load Moment 2.8  
Superimposed Dead Load Moment 25.4

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 216.3      | 210.6           | -188.0 | 210.6        | -188.0 | 182.4                       | -216.3 | 182.4     | - |
| OPER 360.5      | 332.2           | -332.2 | 332.2        | -332.2 | 303.9                       | -360.5 | 303.9     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |       |
|-----------|------------|-------------------------|-------------------------|-----------|-------------------------|----------------------|--------|-------|
| INV.      | HS20       | 115.16 L                | 88.59                   | -13.00    | 0.0                     | 88.90                | 68.38  | 15.00 |
|           |            | -37.53 R                | -28.87                  | 58.00     | 0.0                     | -27.73               | -21.33 | 35.00 |
| OPER      | 5C1T       | 104.59 L                | 80.45                   | -123.00   | 0.0                     | 0.00                 | 0.00   | 0.00  |
|           |            | -35.32 R                | -27.17                  | 134.00    | 0.0                     | 0.00                 | 0.00   | 0.00  |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.58            | 5.76            | 1.58               | 5.76               | HS 31.67     | 57.0                 |
| 5C1T        | 2.91            | 10.21           | 2.91               | 10.21              | 0.00         | 348.7                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 1.700

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |
| 21.2           | 19.76     | 0.460 | bott | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.50         | 21.50    | 10.60        | 10.60 | 1600.0            | 1600.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 151.0                | 151.0                  | 151.0                | 151.0                  | 467.60                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 1.700

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.210 | 0.01     | 0.01  | 43.43 | 21.66 |
| bott | 3.92 | 0.74 | 11.210 | 150.00   | 82.81 |       | 21.66 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.67 | 35.20 | 35.20 | 2.861      |
|      |       |       | 999999.000 |
|      |       |       | 90.090     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 467.60 | 109.1                   |
| bott | 22.62            |                   | 17.47 |        | 106.6                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 172.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 1.700

Dead Load Moment 1.7  
Superimposed Dead Load Moment 14.4

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 215.8C             | -191.7                | 191.7              | -215.8C               | 206.2                       | -201.3                | 182.0              | -225.4                |
| OPER        | 359.7C             | -319.4                | 319.4              | -359.7C               | 343.6                       | -335.5                | 303.4              | -375.7                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load w/imp. | Load Moment w/o imp. | Loc. of Front Wheel | Ax. Dis. | Lane Live Load w/imp. | Load Moment w/o imp. | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|------------------------|----------------------|---------------------|----------|-----------------------|----------------------|----------------|--------------|
| INV.      | HS20      | 99.53 L                | 76.56                | -10.50              | 0.0      | 71.95                 | 55.35                | 17.50          |              |
|           |           | -43.78 R               | -33.68               | 58.00               | 0.0      | -33.80                | -26.00               | 35.00          | 85.00        |
| OPER      | 5C1T      | 86.28 L                | 66.37                | -120.50             | 0.0      | 0.00                  | 0.00                 | 0.00           |              |
|           |           | -41.20 R               | -31.70               | 134.00              | 0.0      | 0.00                  | 0.00                 | 0.00           | 0.00         |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 2.07               | 4.60                         | 1.83            | 5.15                  | HS 36.58     | 65.8                 |
| 5C1T        | 3.98               | 8.14                         | 3.52            | 9.12                  | 0.00         | 421.9                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 1.700

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.5      | -5.3         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 103.3             | -75.9                  | 82.9                  |
| OPER      | 172.1             | -126.5                 | 138.2                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -23.31                | 3.02 | -17.93   | 2.32 | -19.35               | 4.64 | -14.88   | 3.57 |
| OPER      | 5C1T      | -18.62                | 4.32 | -14.32   | 3.33 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 3.26       | 17.88      | HS 65.15     | 117.3                |  |
| 5C1T   | 6.80       | 31.97      | 0.00         | 815.6                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 1.700

Dead Load Moment 1.7  
Superimposed Dead Load Moment 14.4

| Rating Veh. ber | Moment Capacity top fiber |        | Moment Capacity bottom fiber |        | Available Capacity for LL+I |        |           |   |
|-----------------|---------------------------|--------|------------------------------|--------|-----------------------------|--------|-----------|---|
|                 | +bend                     | -bend  | +bend                        | -bend  | top fiber                   | -bend  | bottom fi |   |
| INV. 208.9      | 205.7                     | -192.9 | 205.7                        | -192.9 | 189.7                       | -208.9 | 189.7     | - |
| OPER 348.2      | 332.2                     | -332.2 | 332.2                        | -332.2 | 316.2                       | -348.2 | 316.2     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 99.53 L                 | 76.56           | -10.50                  | 0.0       | 71.95                   | 55.35           | 17.50                |        |
|           |            | -43.78 R                | -33.68          | 58.00                   | 0.0       | -33.80                  | -26.00          | 35.00                | 85.00  |
| OPER      | 5C1T       | 86.28 L                 | 66.37           | -120.50                 | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -41.20 R                | -31.70          | 134.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor top fiber |       | Rating Factor bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-------------------------|-------|----------------------------|-------|--------------|----------------------|
|             | +bend                   | -bend | +bend                      | -bend |              |                      |
| HS20        | 1.91                    | 4.77  | 1.91                       | 4.77  | HS 38.12     | 68.6                 |
| 5C1T        | 3.66                    | 8.45  | 3.66                       | 8.45  | 0.00         | 439.7                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 1.800

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |
| 21.2           | 19.76     | 0.460 | bott | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.50         | 21.50    | 10.60        | 10.60 | 1600.0            | 1600.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 151.0                | 151.0                  | 151.0                | 151.0                  | 467.60                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 1.800

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.210 | 0.01     | 0.01  | 43.43 | 21.66 |
| bott | 3.92 | 0.74 | 11.210 | 150.00   | 82.81 |       | 21.66 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.67 | 35.20 | 35.20 | 2.861      |
|      |       |       | 999999.000 |
|      |       |       | 90.090     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 467.60 | 109.1                   |
| bott | 22.62            |                   | 17.47 |        | 106.6                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 172.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 1.800

Dead Load Moment      Superimposed Dead Load Moment  
0.1                      -1.0

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 215.8C             | -191.7                | 191.7              | -215.8C               | 216.4                       | -191.1                | 192.2              | -215.3                |
| OPER        | 359.7C             | -319.4                | 319.4              | -359.7C               | 360.6                       | -318.5                | 320.3              | -358.8                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 63.96 L      | 49.20              | -8.00  | 0.0                 | 47.55    | 36.58       | 20.00              |        |                |              |
|           |           | -50.04 R     | -38.49             | 58.00  | 0.0                 | -38.63   | -29.72      | 35.00              |        | 85.00          |              |
| OPER      | 5C1T      | 59.03 R      | 45.40              | 154.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -47.09 R     | -36.22             | 134.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 3.38               | 3.82                         | 3.01                               | 4.30         | HS 60.10 108.2       |
| 5C1T        | 6.11               | 6.76                         | 5.43                               | 7.62         | 0.00 651.3           |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 1.800

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.7      | -7.0         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 103.3             | -74.8                  | 84.1                  |
| OPER      | 172.1             | -124.6                 | 140.1                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -28.22                | 0.97 | -21.70   | 0.75 | -21.94               | 2.83 | -16.88   | 2.18 |
| OPER      | 5C1T      | -21.72                | 2.55 | -16.71   | 1.96 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 2.65       | 29.72      | HS 53.01     | 95.4                 |
| 5C1T   | 5.74       | 54.87      | 0.00         | 688.6                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 1.800

Dead Load Moment      Superimposed Dead Load Moment  
0.1                      -1.0

| Rating Veh. ber | Moment Capacity top fiber |        | Moment Capacity bottom fiber |        | Available Capacity for LL+I |                 |                 |                 |
|-----------------|---------------------------|--------|------------------------------|--------|-----------------------------|-----------------|-----------------|-----------------|
|                 | +bend                     | -bend  | +bend                        | -bend  | top fiber +bend             | top fiber -bend | bottom fi +bend | bottom fi -bend |
| INV. 198.8      | 199.0                     | -199.7 | 199.0                        | -199.7 | 199.9                       | -198.8          | 199.9           | -               |
| OPER 331.3      | 332.2                     | -332.2 | 332.2                        | -332.2 | 333.1                       | -331.3          | 333.1           | -               |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Live Load Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Live Load Moment w/o imp. | Loc. of Conc. Load 1 | Loc. of Conc. Load 2 |
|-----------|------------|-------------------------|---------------------------|-------------------------|-----------|-------------------------|---------------------------|----------------------|----------------------|
| INV.      | HS20       | 63.96 L                 | 49.20                     | -8.00                   | 0.0       | 47.55                   | 36.58                     | 20.00                |                      |
|           |            | -50.04 R                | -38.49                    | 58.00                   | 0.0       | -38.63                  | -29.72                    | 35.00                | 85.00                |
| OPER      | 5C1T       | 59.03 R                 | 45.40                     | 154.00                  | 0.0       | 0.00                    | 0.00                      | 0.00                 |                      |
|           |            | -47.09 R                | -36.22                    | 134.00                  | 0.0       | 0.00                    | 0.00                      | 0.00                 | 0.00                 |

## Serviceability

| Rating Veh. | Rating Factor top fiber |       | Rating Factor bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-------------------------|-------|----------------------------|-------|--------------|----------------------|
|             | +bend                   | -bend | +bend                      | -bend |              |                      |
| HS20        | 3.12                    | 3.97  | 3.12                       | 3.97  | HS 62.49     | 112.5                |
| 5C1T        | 5.64                    | 7.03  | 5.64                       | 7.03  | 0.00         | 677.2                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 1.900

|               |                             |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Allowable stress (fs) (psi) |           |         |         |
| RATIO/Inv.    | 0.00                        | 0.00      | 0.00    | 0.00    |
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

|                |           |       |      |      |       |       |      |      |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
| H              | D         | tw    | top  | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |
| 21.2           | 19.76     | 0.460 | bott | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |

## Hybrid Section Properties:

|                         |                  |                       |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

|               |          |              |       |                   |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.50         | 21.50    | 10.60        | 10.60 | 1600.0            | 1600.0           |

|                  |                  |             |       |                 |
|------------------|------------------|-------------|-------|-----------------|
| Section Modulus  |                  |             |       | Plastic Section |
| Positive Bending | Negative Bending | Modulus - Z |       |                 |
| Top              | Bott.            | Top         | Bott. | (Fy * Z)        |
| 151.0            | 151.0            | 151.0       | 151.0 | 467.60          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 1.900

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.210 | 0.01     | 0.01  | 43.43 | 21.66 |
| bott | 3.92 | 0.74 | 11.210 | 150.00   | 82.81 |       | 21.66 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.67 | 35.20 | 35.20 | 2.861      |
|      |       |       | 999999.000 |
|      |       |       | 90.090     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 467.60 | 109.1                   |
| bott | 22.62            |                   | 17.47 |        | 106.6                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 172.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 1.900

Dead Load Moment      Superimposed Dead Load Moment  
-2.0                      -20.7

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 215.8C             | -191.7                | 191.7              | -215.8C               | 229.4                       | -178.1                | 205.2              | -202.2                |
| OPER        | 359.7C             | -319.4                | 319.4              | -359.7C               | 382.3                       | -296.8                | 342.1              | -337.0                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 12.56 R      | 9.66               | 88.00  | 0.0                 | 23.61    | 18.16       | 22.50              |        |                |              |
|           |           | -62.02 L     | -47.71             | 16.00  | 0.0                 | -57.83   | -44.49      | 35.00              | 10.00  |                |              |
| OPER      | 5C1T      | 30.15 R      | 23.19              | 156.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -55.00 L     | -42.31             | -96.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 9.72               | 2.87                         | 8.69            | 3.26                  | HS 57.42     | 103.4                |
| 5C1T        | 12.68              | 5.40                         | 11.35           | 6.13                  | 0.00         | 647.5                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 1.900

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.9      | -8.7         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 103.3             | -73.6                  | 85.2                  |
| OPER      | 172.1             | -122.7                 | 142.0                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -32.71                | 0.64 | -25.16   | 0.49 | -24.40               | 1.34 | -18.77   | 1.03 |
| OPER      | 5C1T      | -24.64                | 1.04 | -18.95   | 0.80 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 2.25       | 63.50      | HS 45.03     | 81.1                 |
| 5C1T   | 4.98       | 137.02     | 0.00         | 597.7                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 1.900

Dead Load Moment      Superimposed Dead Load Moment  
-2.0                      -20.7

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 185.7      | 190.3           | -208.4 | 190.3        | -208.4 | 212.9                       | -185.7 | 212.9     | - |
| OPER 309.6      | 332.2           | -332.2 | 332.2        | -332.2 | 354.8                       | -309.6 | 354.8     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 12.56 R                 | 9.66            | 88.00                   | 0.0       | 23.61                   | 18.16           | 22.50                |        |
|           |            | -62.02 L                | -47.71          | 16.00                   | 0.0       | -57.83                  | -44.49          | 35.00                | 10.00  |
| OPER      | 5C1T       | 30.15 R                 | 23.19           | 156.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -55.00 L                | -42.31          | -96.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 9.02            | 2.99  | 9.02         | 2.99  | HS 59.89     | 107.8                |
| 5C1T        | 11.77           | 5.63  | 11.77        | 5.63  | 0.00         | 675.4                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 2.000

|               |                             |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Allowable stress (fs) (psi) |           |         |         |
| RATIO/Inv.    | 0.00                        | 0.00      | 0.00    | 0.00    |
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

|                |           |       |      |      |       |       |      |      |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
| H              | D         | tw    | top  | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |
| 21.2           | 19.76     | 0.460 | bott | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |

## Hybrid Section Properties:

|                         |                  |                       |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

|               |          |              |       |                   |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.50         | 21.50    | 10.60        | 10.60 | 1600.0            | 1600.0           |

|                  |                  |             |       |                 |
|------------------|------------------|-------------|-------|-----------------|
| Section Modulus  |                  |             |       | Plastic Section |
| Positive Bending | Negative Bending | Modulus - Z |       |                 |
| Top              | Bott.            | Top         | Bott. | (Fy * Z)        |
| 151.0            | 151.0            | 151.0       | 151.0 | 467.60          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 2.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.210 | 0.01     | 0.01  | 43.43 | 21.66 |
| bott | 3.92 | 0.74 | 11.210 | 150.00   | 82.81 |       | 21.66 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.67 | 35.20 | 35.20 | 2.861      |
|      |       |       | 999999.000 |
|      |       |       | 90.090     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 467.60 | 109.1                   |
| bott | 22.62            |                   | 17.47 |        | 106.6                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 172.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 2.000

Dead Load Superimposed Dead Load  
Moment Moment  
-4.5 -44.7

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 209.9                       | -131.7                | 190.7              | -150.9                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 349.8                       | -219.5                | 317.8              | -251.5                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.76 R      | 12.89              | 83.00  | 0.0                 | 12.38    | 9.53        | 60.00              |        |                |              |
|           |           | -103.95 L    | -79.96             | 4.50   | 0.0                 | -95.84   | -73.73      | 15.00              |        | 35.00          |              |
| OPER      | 5C1T      | 12.96 R      | 9.97               | 285.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -76.72 L     | -59.02             | -94.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 12.52              | 1.27                         | 11.38                              | 1.45         | HS 25.34 45.6        |
| 5C1T        | 27.00              | 2.86                         | 24.53                              | 3.28         | 0.00 343.4           |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 2.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.9      | -1.1      | -8.7                   | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I |       |
|-----------|-------------------|-----------------------------|-------|
|           |                   | (-)                         | (+)   |
| INV.      | 90.8              | -72.5                       | 63.9  |
| OPER      | 151.3             | -120.8                      | 106.4 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -32.71                | 34.96 | -25.16   | 26.89 | -24.40               | 26.43 | -18.77   | 20.33 |
| OPER      | 5C1T      | -24.64                | 27.13 | -18.95   | 20.87 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.97       | 1.83       | HS 36.53     | 65.8                 |
| 5C1T   | 4.42       | 3.92       | 0.00         | 470.6                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 2.000

Dead Load Moment      Superimposed Dead Load Moment  
-4.5                      -44.7

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
|                 | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| bend            |                 |        |              |        |                             |        |           |   |
| INV. 138.2      | 148.0           | -187.3 | 148.0        | -187.3 | 197.1                       | -138.2 | 197.1     | - |
| OPER 230.3      | 279.4           | -279.4 | 279.4        | -279.4 | 328.5                       | -230.3 | 328.5     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|------------------|-----------------|-------------------------|-----------|------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 16.76 R          | 12.89           | 83.00                   | 0.0       | 12.38            | 9.53            | 60.00                |        |
|           |            | -103.95 L        | -79.96          | 4.50                    | 0.0       | -95.84           | -73.73          | 15.00                | 35.00  |
| OPER      | 5C1T       | 12.96 R          | 9.97            | 285.00                  | 0.0       | 0.00             | 0.00            | 0.00                 |        |
|           |            | -76.72 L         | -59.02          | -94.00                  | 0.0       | 0.00             | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 11.76           | 1.33            | 11.76              | 1.33               | HS 26.58     | 47.8                 |
| 5C1T        | 25.36           | 3.00            | 25.36              | 3.00               | 0.00         | 360.2                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 2.000

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 2.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.67 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 83.561     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 35.74 |        | 103.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 2.000

Dead Load Superimposed Dead Load  
Moment Moment  
-4.5 -44.7

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 209.9                       | -131.7                | 190.7              | -150.9                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 349.8                       | -219.5                | 317.8              | -251.5                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.76 R      | 12.89              | 83.00  | 0.0                 | 12.38    | 9.53        | 60.00              |        |                |              |
|           |           | -103.95 L    | -79.96             | 4.50   | 0.0                 | -95.84   | -73.73      | 15.00              |        | 35.00          |              |
| OPER      | 5C1T      | 12.96 R      | 9.97               | 285.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -76.72 L     | -59.02             | -94.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|--------|--------------|----------------------|
| HS20        | 12.52              | 1.27                         | 11.38  | 1.45         | HS 25.34             |
| 5C1T        | 27.00              | 2.86                         | 24.53  | 3.28         | 0.00                 |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 2.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -1.1      | 0.8       | -10.4                  | 9.1       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I |       |
|-----------|-------------------|-----------------------------|-------|
|           |                   | (-)                         | (+)   |
| INV.      | 90.8              | -72.5                       | 63.9  |
| OPER      | 151.3             | -120.8                      | 106.4 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -36.72                | 34.96 | -28.25   | 26.89 | -26.68               | 26.43 | -20.52   | 20.33 |
| OPER      | 5C1T      | -27.33                | 27.13 | -21.02   | 20.87 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.97       | 1.83       | HS 36.53     | 65.8                 |
| 5C1T   | 4.42       | 3.92       | 0.00         | 470.6                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 2.000

Dead Load Moment      Superimposed Dead Load Moment  
-4.5                      -44.7

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 138.2      | 148.0           | -187.3 | 148.0        | -187.3 | 197.1                       | -138.2 | 197.1     | - |
| OPER 230.3      | 279.4           | -279.4 | 279.4        | -279.4 | 328.5                       | -230.3 | 328.5     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 16.76 R                 | 12.89           | 83.00                   | 0.0       | 12.38                   | 9.53            | 60.00                |        |
|           |            | -103.95 L               | -79.96          | 4.50                    | 0.0       | -95.84                  | -73.73          | 15.00                | 35.00  |
| OPER      | 5C1T       | 12.96 R                 | 9.97            | 285.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -76.72 L                | -59.02          | -94.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 11.76           | 1.33  | 11.76        | 1.33  | HS 26.58     | 47.8                 |
| 5C1T        | 25.36           | 3.00  | 25.36        | 3.00  | 0.00         | 360.2                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 2.100

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |               |                      |               | Plastic Section Modulus - Z |
|----------------------|---------------|----------------------|---------------|-----------------------------|
| Positive Bending Top | Bending Bott. | Negative Bending Top | Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0         | 127.0                | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 2.100

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.93 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 96.721     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 35.74 |        | 103.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 2.100

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -2.6                | -24.0                            |

| Rating<br>Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|----------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|                | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.           | 180.4C             | -161.2                | 161.2              | -180.4C               | 196.3                       | -145.2                | 177.1              | -164.4                |
| OPER           | 300.6C             | -268.7                | 268.7              | -300.6C               | 327.2                       | -242.1                | 295.2              | -274.0                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Rat.<br>Veh. | Truck<br>w/imp. | Live Load<br>w/o imp. | Moment | Loc. of<br>Front<br>Wheel | Ax.<br>Dis. | Lane<br>w/imp. | Live Load<br>w/o imp. | Moment | Loc. of<br>Load 1 | Conc.<br>Load 2 |
|--------------|--------------|-----------------|-----------------------|--------|---------------------------|-------------|----------------|-----------------------|--------|-------------------|-----------------|
| INV.         | HS20         | 15.19 R         | 11.69                 | 55.50  | 0.0                       | 21.49       | 16.53          | 27.50                 |        |                   |                 |
|              |              | -67.93 R        | -52.25                | 34.00  | 0.0                       | -58.59      | -45.07         | 15.00                 |        | 37.50             |                 |
| OPER         | 5C1T         | 21.91 R         | 16.85                 | 252.50 | 0.0                       | 0.00        | 0.00           | 0.00                  |        |                   |                 |
|              |              | -56.28 L        | -43.29                | -3.50  | 0.0                       | 0.00        | 0.00           | 0.00                  |        | 0.00              |                 |

## Moment

| Rating<br>Veh. | top fiber<br>+bend | Rating<br>bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------------|---------------------------------|-----------------|-----------------------|-----------------|----------------------------|
| HS20           | 9.14               | 2.14                            | 8.24            | 2.42                  | HS 42.76        | 77.0                       |
| 5C1T           | 14.94              | 4.30                            | 13.48           | 4.87                  | 0.00            | 516.1                      |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 2.100

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear     | (-) Shear (+) Shear    |
| 0.7       | 0.0 7.4                |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 90.8              | -74.7                           | 65.0  |
| OPER      | 151.3             | -124.4                          | 108.3 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -2.99                 | 30.26 | -2.30    | 23.28 | -3.00                | 23.88 | -2.30    | 18.37 |
| OPER      | 5C1T      | -3.34                 | 24.05 | -2.57    | 18.50 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 24.93      | 2.15       | HS 42.94     | 77.3                 |
| 5C1T   | 37.31      | 4.50       | 0.00         | 540.4                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 2.100

Dead Load Moment      Superimposed Dead Load Moment  
-2.6                      -24.0

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 151.7      | 157.0           | -178.3 | 157.0        | -178.3 | 183.6                       | -151.7 | 183.6     | - |
| OPER 252.8      | 279.4           | -279.4 | 279.4        | -279.4 | 306.0                       | -252.8 | 306.0     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 15.19 R                 | 11.69                | 55.50       | 0.0       | 21.49                   | 16.53                  | 27.50  |        |
|           |            | -67.93 R                | -52.25               | 34.00       | 0.0       | -58.59                  | -45.07                 | 15.00  | 37.50  |
| OPER      | 5C1T       | 21.91 R                 | 16.85                | 252.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -56.28 L                | -43.29               | -3.50       | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 8.54            | 2.23  | 8.54         | 2.23  | HS 44.66     | 80.4                 |
| 5C1T        | 13.97           | 4.49  | 13.97        | 4.49  | 0.00         | 539.0                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 2.200

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus  |                  |       |       | Plastic Section |
|------------------|------------------|-------|-------|-----------------|
| Positive Bending | Negative Bending |       |       | Modulus - Z     |
| Top              | Bott.            | Top   | Bott. | (Fy * Z)        |
| 127.0            | 127.0            | 127.0 | 127.0 | 390.83          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 2.200

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.93 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 96.721     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 35.74 |        | 103.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 2.200

Dead Load Moment      Superimposed Dead Load Moment  
-1.0                      -7.7

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 185.6                       | -155.9                | 166.4              | -175.1                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 309.4                       | -259.9                | 277.4              | -291.9                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 58.49 R      | 45.00              | 58.00  | 0.0                 | 40.87    | 31.44       | 30.00              |        |                |              |
|           |           | -55.67 L     | -42.82             | -8.00  | 0.0                 | -37.45   | -28.81      | 15.00              |        | 47.50          |              |
| OPER      | 5C1T      | 46.46 R      | 35.74              | 255.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -44.88 L     | -34.52             | 3.00   | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 3.17               | 2.80                         | 2.85                               | 3.15         | 56.03                |
| 5C1T        | 6.66               | 5.79                         | 5.97                               | 6.50         | 0.00                 |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 2.200

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear     | (-) Shear (+) Shear    |
| 0.5       | 0.0 5.7                |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 90.8              | -73.5                           | 66.1  |
| OPER      | 151.3             | -122.6                          | 110.2 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -2.99                 | 25.52 | -2.30    | 19.63 | -4.19                | 21.08 | -3.22    | 16.22 |
| OPER      | 5C1T      | -4.89                 | 20.74 | -3.76    | 15.96 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 17.54      | 2.59       | HS 51.80     | 93.2                 |
| 5C1T   | 25.05      | 5.31       | 0.00         | 637.3                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 2.200

Dead Load Moment      Superimposed Dead Load Moment  
-1.0                      -7.7

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 162.4      | 164.1           | -171.1 | 164.1        | -171.1 | 172.9                       | -162.4 | 172.9     | - |
| OPER 270.6      | 279.4           | -279.4 | 279.4        | -279.4 | 288.2                       | -270.6 | 288.2     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 58.49 R                 | 45.00                | 58.00       | 0.0       | 40.87                   | 31.44                  | 30.00  |        |
|           |            | -55.67 L                | -42.82               | -8.00       | 0.0       | -37.45                  | -28.81                 | 15.00  | 47.50  |
| OPER      | 5C1T       | 46.46 R                 | 35.74                | 255.00      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -44.88 L                | -34.52               | 3.00        | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 2.96            | 2.92            | 2.96               | 2.92               | HS 58.34     | 105.0                |
| 5C1T        | 6.20            | 6.03            | 6.20               | 6.03               | 0.00         | 723.7                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 2.300

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus  |                  |       |       | Plastic Section |
|------------------|------------------|-------|-------|-----------------|
| Positive Bending | Negative Bending |       |       | Modulus - Z     |
| Top              | Bott.            | Top   | Bott. | (Fy * Z)        |
| 127.0            | 127.0            | 127.0 | 127.0 | 390.83          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 2.300

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.93 | 28.67 | 28.67 | 1.699 | 999999.000 | 96.721 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 35.74 |        | 103.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 2.300

Dead Load Moment 0.1  
Superimposed Dead Load Moment 4.3

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 177.7                       | -163.8             | 158.6           | -183.0             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 296.2                       | -273.1             | 264.3           | -305.0             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment  | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|---------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 85.73 R      | 65.95              | 60.50   | 0.0                 | 61.84    | 47.57       | 32.50              |        |                |              |
|           |           | -46.21 L     | -35.55             | -8.00   | 0.0                 | -32.60   | -25.07      | 15.00              |        | 0.00           |              |
| OPER      | 5C1T      | 68.20 R      | 52.46              | 135.50  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -40.61 L     | -31.24             | -121.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 2.07            | 3.55                      | 1.85                      | 3.96               | HS 36.99     | 66.6                 |
| 5C1T        | 4.34            | 6.72                      | 3.88                      | 7.51               | 0.00         | 465.0                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 2.300

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear     | (-) Shear (+) Shear    |
| 0.4       | 0.0 4.0                |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -72.4                  | 67.2         |
| OPER      | 151.3             | -120.7                 | 112.0        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -4.35                 | 20.66 | -3.35    | 15.90 | -6.46                | 18.14 | -4.97    | 13.95 |
| OPER      | 5C1T      | -6.71                 | 17.47 | -5.16    | 13.44 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 11.21      | 3.25       | HS 65.07     | 117.1                |
| 5C1T   | 18.00      | 6.41       | 0.00         | 769.6                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 2.300

Dead Load Moment 0.1  
Superimposed Dead Load Moment 4.3

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 170.3      | 169.4           | -165.9 | 169.4        | -165.9 | 165.0                       | -170.3 | 165.0     | - |
| OPER 283.8      | 279.4           | -279.4 | 279.4        | -279.4 | 275.0                       | -283.8 | 275.0     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |        |       |      |
|-----------|------------|-------------------------|-------------------------|------------------------------|----------------------|--------|--------|-------|------|
| INV.      | HS20       | 85.73 R                 | 65.95                   | 60.50                        | 0.0                  | 61.84  | 47.57  | 32.50 |      |
|           |            | -46.21 L                | -35.55                  | -8.00                        | 0.0                  | -32.60 | -25.07 | 15.00 | 0.00 |
| OPER      | 5C1T       | 68.20 R                 | 52.46                   | 135.50                       | 0.0                  | 0.00   | 0.00   | 0.00  |      |
|           |            | -40.61 L                | -31.24                  | -121.50                      | 0.0                  | 0.00   | 0.00   | 0.00  | 0.00 |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.92            | 3.68  | 1.92         | 3.68  | HS 38.49     | 69.3                 |
| 5C1T        | 4.03            | 6.99  | 4.03         | 6.99  | 0.00         | 483.9                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 2.400

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 127.0           | 127.0         | 127.0        | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 2.400

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.93 | 28.67 | 28.67 | 1.699 | 999999.000 | 96.721 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 35.74 |        | 103.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 2.400

Dead Load Moment 0.8  
Superimposed Dead Load Moment 12.0

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 172.7                       | -168.9             | 153.5           | -188.1             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 287.8                       | -281.5             | 255.8           | -313.5             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment  | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|---------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 96.49 R      | 74.22              | 63.00   | 0.0                 | 74.80    | 57.54       | 35.00              |        |                |              |
|           |           | -36.75 L     | -28.27             | -8.00   | 0.0                 | -28.46   | -21.89      | 15.00              |        | 0.00           |              |
| OPER      | 5C1T      | 84.02 R      | 64.63              | 134.00  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -39.21 L     | -30.16             | -121.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | bottom fiber -bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|--------|--------------|----------------------|
| HS20        | 1.79            | 4.60               | 1.59   | 5.12         | 57.3                 |
| 5C1T        | 3.42            | 7.18               | 3.04   | 7.99         | 365.3                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 2.400

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.2       | 0.0          | 2.2       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -71.3                  | 68.4                  |
| OPER      | 151.3             | -118.8                 | 113.9                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -8.92                 | 16.99 | -6.86    | 13.07 | -9.03                | 15.15 | -6.94    | 11.65 |
| OPER      | 5C1T      | -8.75                 | 14.86 | -6.73    | 11.43 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 7.90       | 4.02       | HS 80.47     | 144.8                |
| 5C1T   | 13.58      | 7.66       | 0.00         | 919.8                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 2.400

Dead Load Moment 0.8  
Superimposed Dead Load Moment 12.0

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 175.4      | 172.8           | -162.5 | 172.8        | -162.5 | 159.9                       | -175.4 | 159.9     | - |
| OPER 292.3      | 279.4           | -279.4 | 279.4        | -279.4 | 266.5                       | -292.3 | 266.5     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 96.49 R                 | 74.22                | 63.00       | 0.0       | 74.80                   | 57.54                  | 35.00  |        |
|           |            | -36.75 L                | -28.27               | -8.00       | 0.0       | -28.46                  | -21.89                 | 15.00  | 0.00   |
| OPER      | 5C1T       | 84.02 R                 | 64.63                | 134.00      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -39.21 L                | -30.16               | -121.50     | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.66            | 4.77            | 1.66               | 4.77               | HS 33.15     | 59.7                 |
| 5C1T        | 3.17            | 7.45            | 3.17               | 7.45               | 0.00         | 380.7                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 2.500

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 127.0           | 127.0         | 127.0        | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 2.500

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.82 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 90.975     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 13.97 |        | 106.7                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 2.500

Dead Load Moment 1.2  
Superimposed Dead Load Moment 15.5

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 170.4                       | -171.2             | 151.2           | -190.4             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 284.0                       | -285.3             | 252.0           | -317.3             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment  | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|---------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 94.36 L      | 72.58              | 23.50   | 0.0                 | 80.36    | 61.82       | 37.50              |        |                |              |
|           |           | -27.30 L     | -21.00             | -8.00   | 0.0                 | -24.32   | -18.71      | 15.00              |        | 0.00           |              |
| OPER      | 5C1T      | 87.72 R      | 67.48              | 136.50  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -37.81 L     | -29.08             | -121.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | bottom fiber -bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|--------|--------------|----------------------|
| HS20        | 1.81            | 6.27               | 1.60   | 32.05        | 57.7                 |
| 5C1T        | 3.24            | 7.55               | 2.87   | 0.00         | 344.7                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 2.500Dead Load Superimposed Dead Load  
Shear (-) Shear (+) Shear

0.1 0.0 0.5

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -70.2                  | 69.5                  |
| OPER      | 151.3             | -116.9                 | 115.8                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |      |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |      |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)  |
| INV.      | HS20      | -13.08                | 13.29 | -10.06   | 10.22 | -11.82               | 12.21 | -9.09    | 9.39 |
| OPER      | 5C1T      | -10.98                | 12.29 | -8.45    | 9.46  | 0.00                 | 0.00  | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 5.36       | 5.23       | HS 104.56    | 188.2                |
| 5C1T   | 10.65      | 9.42       | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 2.500

Dead Load Moment 1.2  
Superimposed Dead Load Moment 15.5

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 177.6      | 174.3           | -161.0 | 174.3        | -161.0 | 157.7                       | -177.6 | 157.7     | - |
| OPER 296.0      | 279.4           | -279.4 | 279.4        | -279.4 | 262.8                       | -296.0 | 262.8     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 94.36 L                 | 72.58                | 23.50       | 0.0       | 80.36                   | 61.82                  | 37.50  |        |
|           |            | -27.30 L                | -21.00               | -8.00       | 0.0       | -24.32                  | -18.71                 | 15.00  | 0.00   |
| OPER      | 5C1T       | 87.72 R                 | 67.48                | 136.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -37.81 L                | -29.08               | -121.50     | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.67            | 6.51  | 1.67         | 6.51  | HS 33.42     | 60.2                 |
| 5C1T        | 2.99            | 7.83  | 2.99         | 7.83  | 0.00         | 359.4                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 2.600

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 127.0           | 127.0         | 127.0        | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 2.600

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.82 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 90.975     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 13.97 |        | 106.7                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 2.600

Dead Load Moment 1.1  
Superimposed Dead Load Moment 14.3

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 171.1                       | -170.4             | 152.0           | -189.6             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 285.2                       | -284.1             | 253.3           | -316.0             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Load Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Load Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|-------------|---------------------|----------|-------------|--------------------|-------------|----------------|--------------|
| INV.      | HS20      | 96.30 L      | 74.08              | 12.00       | 0.0                 | 76.22    | 58.63       | 40.00              |             |                |              |
|           |           | -30.13 R     | -23.17             | 83.00       | 0.0                 | -26.61   | -20.47      | 60.00              | 0.00        |                |              |
| OPER      | 5C1T      | 84.08 L      | 64.68              | -98.00      | 0.0                 | 0.00     | 0.00        | 0.00               |             |                |              |
|           |           | -36.44 R     | -28.03             | 109.50      | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00        | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 1.78            | 5.66                      | 1.58                      | 6.29               | HS 31.56     | 56.8                 |
| 5C1T        | 3.39            | 7.80                      | 3.01                      | 8.67               | 0.00         | 361.4                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 2.600

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.1      | -1.3         | 0.0       |

| Rat. | Shear Capacity | Available Capacity for LL+I |
|------|----------------|-----------------------------|
| Veh. | VU             | (-) (+)                     |
| INV. | 90.8           | -69.0 70.7                  |
| OPER | 151.3          | -114.9 117.8                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. | Rat. | Truck Live Load Shear |       |          |      | Lane Live Load Shear |      |          |      |
|------|------|-----------------------|-------|----------|------|----------------------|------|----------|------|
|      |      | w/imp.                |       | w/o imp. |      | w/imp.               |      | w/o imp. |      |
| Typ. | Veh. | (-)                   | (+)   | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV. | HS20 | -16.75                | 9.12  | -12.88   | 7.02 | -14.76               | 9.40 | -11.35   | 7.23 |
| OPER | 5C1T | -13.49                | 10.04 | -10.38   | 7.72 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |        | Shear  |                      |
|--------|--------|--------|----------------------|
| Veh.   | Rating | Factor | Rating               |
|        | (-)    | (+)    | Value                |
|        |        |        | Load Capacity (tons) |
| HS20   | 4.12   | 7.52   | HS 82.35 148.2       |
| 5C1T   | 8.52   | 11.74  | 0.00 999.0           |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 2.600

Dead Load Moment 1.1  
Superimposed Dead Load Moment 14.3

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 176.9      | 173.8           | -161.5 | 173.8        | -161.5 | 158.4                       | -176.9 | 158.4     | - |
| OPER 294.8      | 279.4           | -279.4 | 279.4        | -279.4 | 264.0                       | -294.8 | 264.0     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 96.30 L                 | 74.08                | 12.00       | 0.0       | 76.22                   | 58.63                  | 40.00  |        |
|           |            | -30.13 R                | -23.17               | 83.00       | 0.0       | -26.61                  | -20.47                 | 60.00  | 0.00   |
| OPER      | 5C1T       | 84.08 L                 | 64.68                | -98.00      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -36.44 R                | -28.03               | 109.50      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.64            | 5.87  | 1.64         | 5.87  | HS 32.90     | 59.2                 |
| 5C1T        | 3.14            | 8.09  | 3.14         | 8.09  | 0.00         | 376.8                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 2.700

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 127.0           | 127.0         | 127.0        | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 2.700

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.82 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 90.975     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 13.97 |        | 106.7                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 2.700

Dead Load Moment 0.7  
Superimposed Dead Load Moment 8.8

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 174.7                       | -166.9             | 155.5           | -186.1             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 291.2                       | -278.1             | 259.2           | -310.1             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 86.17 L      | 66.29              | 14.50  | 0.0                 | 64.63    | 49.71       | 42.50              |        |                |              |
|           |           | -37.94 R     | -29.19             | 83.00  | 0.0                 | -30.08   | -23.14      | 60.00              | 0.00   |                |              |
| OPER      | 5C1T      | 73.27 L      | 56.36              | -95.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -38.42 R     | -29.55             | 158.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 2.03            | 4.40                      | 1.80                      | 4.90               | HS 36.09     | 65.0                 |
| 5C1T        | 3.97            | 7.24                      | 3.54                      | 8.07               | 0.00         | 424.5                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 2.700

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| -0.2      | -3.1                   |
|           | 0.0                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 90.8              | -67.8                           | 71.8  |
| OPER      | 151.3             | -113.1                          | 119.7 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |              |      | Lane Live Load Shear |      |              |      |
|-----------|-----------|-----------------------|------|--------------|------|----------------------|------|--------------|------|
|           |           | w/imp. (-)            | (+)  | w/o imp. (-) | (+)  | w/imp. (-)           | (+)  | w/o imp. (-) | (+)  |
| INV.      | HS20      | -20.51                | 4.55 | -15.77       | 3.50 | -17.75               | 6.82 | -13.66       | 5.25 |
| OPER      | 5C1T      | -16.51                | 7.79 | -12.70       | 5.99 | 0.00                 | 0.00 | 0.00         | 0.00 |

| Rating |            | Shear      |                      |
|--------|------------|------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value         |
| HS20   | 3.31       | 10.52      | HS 66.16             |
| 5C1T   | 6.85       | 15.36      | 0.00                 |
|        |            |            | Load Capacity (tons) |
|        |            |            | 119.1                |
|        |            |            | 822.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 2.700

Dead Load Moment 0.7  
Superimposed Dead Load Moment 8.8

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 173.3      | 171.4           | -163.9 | 171.4        | -163.9 | 162.0                       | -173.3 | 162.0     | - |
| OPER 288.9      | 279.4           | -279.4 | 279.4        | -279.4 | 269.9                       | -288.9 | 269.9     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |        |       |      |
|-----------|------------|-------------------------|-------------------------|------------------------------|----------------------|--------|--------|-------|------|
| INV.      | HS20       | 86.17 L                 | 66.29                   | 14.50                        | 0.0                  | 64.63  | 49.71  | 42.50 |      |
|           |            | -37.94 R                | -29.19                  | 83.00                        | 0.0                  | -30.08 | -23.14 | 60.00 | 0.00 |
| OPER      | 5C1T       | 73.27 L                 | 56.36                   | -95.50                       | 0.0                  | 0.00   | 0.00   | 0.00  |      |
|           |            | -38.42 R                | -29.55                  | 158.00                       | 0.0                  | 0.00   | 0.00   | 0.00  | 0.00 |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.88            | 4.57            | 1.88               | 4.57               | HS 37.59     | 67.7                 |
| 5C1T        | 3.68            | 7.52            | 3.68               | 7.52               | 0.00         | 442.1                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 2.800

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus  |                  |       |       | Plastic Section |
|------------------|------------------|-------|-------|-----------------|
| Positive Bending | Negative Bending |       |       | Modulus - Z     |
| Top              | Bott.            | Top   | Bott. | (Fy * Z)        |
| 127.0            | 127.0            | 127.0 | 127.0 | 390.83          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 2.800

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.82 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 90.975     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 13.97 |        | 106.7                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 2.800

Dead Load Moment      Superimposed Dead Load Moment  
-0.1                      -1.0

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 181.1                       | -160.5                | 161.9              | -179.7                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 301.8                       | -267.5                | 269.8              | -299.5                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 59.46 L      | 45.74              | 17.00  | 0.0                 | 45.30    | 34.84       | 45.00              |        |                |              |
|           |           | -45.76 R     | -35.20             | 83.00  | 0.0                 | -35.35   | -27.19      | 60.00              | 110.00 |                |              |
| OPER      | 5C1T      | 55.30 L      | 42.54              | -93.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -42.79 R     | -32.92             | 159.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 3.05               | 3.51                         | 2.72 3.93                          | HS 54.45     | 98.0                 |
| 5C1T        | 5.46               | 6.25                         | 4.88 7.00                          | 0.00         | 585.5                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 2.800

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.4      | -4.8         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -66.7                  | 72.9                  |
| OPER      | 151.3             | -111.2                 | 121.6                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -25.34                | 3.64 | -19.49   | 2.80 | -20.71               | 4.54 | -15.93   | 3.49 |
| OPER      | 5C1T      | -19.67                | 5.65 | -15.13   | 4.35 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 2.63       | 16.07      | HS 52.66     | 94.8                 |  |
| 5C1T   | 5.65       | 21.51      | 0.00         | 678.1                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 2.800

Dead Load Moment      Superimposed Dead Load Moment  
-0.1                      -1.0

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 167.0      | 167.2           | -168.1 | 167.2        | -168.1 | 168.3                       | -167.0 | 168.3     | - |
| OPER 278.3      | 279.4           | -279.4 | 279.4        | -279.4 | 280.5                       | -278.3 | 280.5     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 59.46 L                 | 45.74                | 17.00       | 0.0       | 45.30                   | 34.84                  | 45.00  |        |
|           |            | -45.76 R                | -35.20               | 83.00       | 0.0       | -35.35                  | -27.19                 | 60.00  | 110.00 |
| OPER      | 5C1T       | 55.30 L                 | 42.54                | -93.00      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -42.79 R                | -32.92               | 159.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 2.83            | 3.65  | 2.83         | 3.65  | HS 56.61     | 101.9                |
| 5C1T        | 5.07            | 6.50  | 5.07         | 6.50  | 0.00         | 608.8                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 2.900

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |               |                      |               | Plastic Section Modulus - Z |
|----------------------|---------------|----------------------|---------------|-----------------------------|
| Positive Bending Top | Bending Bott. | Negative Bending Top | Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0         | 127.0                | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 2.900

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.82 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 90.975     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 13.97 |        | 106.7                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 2.900

Dead Load Superimposed Dead Load  
Moment Moment  
-1.3 -15.1

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 190.3                       | -151.3                | 171.1              | -170.5                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 317.1                       | -252.2                | 285.1              | -284.2                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.43 L      | 12.64              | 19.50  | 0.0                 | 25.46    | 19.58       | 47.50              |        |                |              |
|           |           | -59.00 L     | -45.39             | 41.00  | 0.0                 | -53.33   | -41.03      | 60.00              |        | 37.50          |              |
| OPER      | 5C1T      | 31.33 L      | 24.10              | -3.50  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -49.71 R     | -38.24             | 161.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 7.47               | 2.57                         | 6.72            | 2.89                  | HS 51.29     | 92.3                 |
| 5C1T        | 10.12              | 5.07                         | 9.10            | 5.72                  | 0.00         | 608.8                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 2.900

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.6      | -6.5         | 0.0       |

| Rat. | Shear | Capacity | Available Capacity for LL+I |
|------|-------|----------|-----------------------------|
| Veh. |       | VU       | (-) (+)                     |
| INV. | 90.8  |          | -65.6 74.1                  |
| OPER | 151.3 |          | -109.3 123.4                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. | Rat. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|------|------|-----------------------|------|----------|------|----------------------|------|----------|------|
|      |      | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
| Typ. | Veh. | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV. | HS20 | -30.06                | 3.78 | -23.12   | 2.91 | -23.53               | 3.50 | -18.10   | 2.69 |
| OPER | 5C1T | -22.87                | 3.75 | -17.59   | 2.88 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |        | Shear  |          |          |
|--------|--------|--------|----------|----------|
| Veh.   | Rating | Factor | Rating   | Load     |
|        | (-)    | (+)    | Value    | Capacity |
|        |        |        |          | (tons)   |
| HS20   | 2.18   | 19.58  | HS 43.64 | 78.6     |
| 5C1T   | 4.78   | 32.95  | 0.00     | 573.6    |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 2.900

Dead Load Moment      Superimposed Dead Load Moment  
-1.3                      -15.1

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 157.8      | 161.1           | -174.2 | 161.1        | -174.2 | 177.5                       | -157.8 | 177.5     | - |
| OPER 262.9      | 279.4           | -279.4 | 279.4        | -279.4 | 295.9                       | -262.9 | 295.9     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 16.43 L                 | 12.64                | 19.50       | 0.0       | 25.46                   | 19.58                  | 47.50  |        |
|           |            | -59.00 L                | -45.39               | 41.00       | 0.0       | -53.33                  | -41.03                 | 60.00  | 37.50  |
| OPER      | 5C1T       | 31.33 L                 | 24.10                | -3.50       | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -49.71 R                | -38.24               | 161.50      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 6.97            | 2.67  | 6.97         | 2.67  | HS 53.48     | 96.3                 |
| 5C1T        | 9.44            | 5.29  | 9.44         | 5.29  | 0.00         | 634.7                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 3.000

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 127.0           | 127.0         | 127.0        | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 3.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.82 | 28.67 | 28.67 | 1.699 | 999999.000 | 90.975 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 13.97 |        | 106.7                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 3.000

Dead Load Superimposed Dead Load  
Moment Moment  
-2.9 -33.5

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 202.3                       | -139.3                | 183.1              | -158.5                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 337.1                       | -232.2                | 305.1              | -264.2                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment  | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|---------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 19.98 L      | 15.37              | -8.00   | 0.0                 | 17.84    | 13.72       | 15.00              |        |                |              |
|           |           | -98.43 L     | -75.72             | 29.50   | 0.0                 | -89.21   | -68.63      | 60.00              |        | 40.00          |              |
| OPER      | 5C1T      | 15.39 L      | 11.84              | -208.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -61.54 L     | -47.34             | -69.00  | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 10.12              | 1.41                         | 9.16            | 1.61                  | HS 28.31     | 51.0                 |
| 5C1T        | 21.90              | 3.77                         | 19.83           | 4.29                  | 0.00         | 452.8                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 3.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.6      | -0.7      | -6.5                   | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -64.5                  | 64.2         |
| OPER      | 151.3             | -107.4                 | 107.1        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -30.06                | 34.53 | -23.12   | 26.56 | -23.53               | 26.28 | -18.10   | 20.22 |
| OPER      | 5C1T      | -22.87                | 26.22 | -17.59   | 20.17 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.87       | 1.86       | HS 37.21     | 67.0                 |
| 5C1T   | 4.14       | 4.08       | 0.00         | 490.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 3.000

Dead Load Moment      Superimposed Dead Load Moment  
-2.9                      -33.5

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 145.8      | 153.1           | -182.2 | 153.1        | -182.2 | 189.5                       | -145.8 | 189.5     | - |
| OPER 243.0      | 279.4           | -279.4 | 279.4        | -279.4 | 315.8                       | -243.0 | 315.8     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|------------------|-----------------|-------------------------|-----------|------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 19.98 L          | 15.37           | -8.00                   | 0.0       | 17.84            | 13.72           | 15.00                |        |
|           |            | -98.43 L         | -75.72          | 29.50                   | 0.0       | -89.21           | -68.63          | 60.00                | 40.00  |
| OPER      | 5C1T       | 15.39 L          | 11.84           | -208.50                 | 0.0       | 0.00             | 0.00            | 0.00                 |        |
|           |            | -61.54 L         | -47.34          | -69.00                  | 0.0       | 0.00             | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 9.48            | 1.48            | 9.48               | 1.48               | HS 29.62     | 53.3                 |
| 5C1T        | 20.52           | 3.95            | 20.52              | 3.95               | 0.00         | 473.8                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 3.000

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 3.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.82 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 90.772     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 13.97 |        | 106.7                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
 INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
 Check Point I. D. 3.000

Dead Load Superimposed Dead Load  
 Moment Moment  
 -2.9 -33.5

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 202.3                       | -139.3                | 183.1              | -158.5                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 337.1                       | -232.2                | 305.1              | -264.2                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 19.98        | L                  | 15.37  | -8.00               | 0.0      | 17.84       | 13.72              | 15.00  |                |              |
|           |           | -98.43       | L                  | -75.72 | 29.50               | 0.0      | -89.21      | -68.63             | 60.00  | 40.00          |              |
| OPER      | 5C1T      | 15.39        | L                  | 11.84  | -208.50             | 0.0      | 0.00        | 0.00               | 0.00   |                |              |
|           |           | -61.54       | L                  | -47.34 | -69.00              | 0.0      | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | Rating Factor      |                       |                    |                       | Rating Value | Load Capacity (tons) |
|-------------|--------------------|-----------------------|--------------------|-----------------------|--------------|----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |              |                      |
| HS20        | 10.12              | 1.41                  | 9.16               | 1.61                  | HS 28.31     | 51.0                 |
| 5C1T        | 21.90              | 3.77                  | 19.83              | 4.29                  | 0.00         | 452.8                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 3.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.7      | 0.8       | -8.2                   | 8.6       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I |       |
|-----------|-------------------|-----------------------------|-------|
|           |                   | (-)                         | (+)   |
| INV.      | 90.8              | -64.5                       | 64.2  |
| OPER      | 151.3             | -107.4                      | 107.1 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -34.48                | 34.53 | -26.52   | 26.56 | -26.11               | 26.28 | -20.08   | 20.22 |
| OPER      | 5C1T      | -25.93                | 26.22 | -19.95   | 20.17 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.87       | 1.86       | HS 37.21     | 67.0                 |
| 5C1T   | 4.14       | 4.08       | 0.00         | 490.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 3.000

Dead Load Moment      Superimposed Dead Load Moment  
-2.9                      -33.5

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 145.8      | 153.1           | -182.2 | 153.1        | -182.2 | 189.5                       | -145.8 | 189.5     | - |
| OPER 243.0      | 279.4           | -279.4 | 279.4        | -279.4 | 315.8                       | -243.0 | 315.8     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 19.98 L                 | 15.37                | -8.00       | 0.0       | 17.84                   | 13.72                  | 15.00  |        |
|           |            | -98.43 L                | -75.72               | 29.50       | 0.0       | -89.21                  | -68.63                 | 60.00  | 40.00  |
| OPER      | 5C1T       | 15.39 L                 | 11.84                | -208.50     | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -61.54 L                | -47.34               | -69.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 9.48            | 1.48            | 9.48               | 1.48               | HS 29.62     | 53.3                 |
| 5C1T        | 20.52           | 3.95            | 20.52              | 3.95               | 0.00         | 473.8                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 3.100

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 127.0           | 127.0         | 127.0        | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 3.100

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.82 | 28.67 | 28.67 | 1.699 | 999999.000 | 90.772 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 13.97 |        | 106.7                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 3.100

Dead Load Moment      Superimposed Dead Load Moment  
-1.2                      -14.3

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 189.7                       | -151.9             | 170.5           | -171.1             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 316.2                       | -253.1             | 284.2           | -285.1             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.13 R      | 12.41              | 80.50  | 0.0                 | 25.97    | 19.97       | 52.50              |        |                |              |
|           |           | -58.69 R     | -45.15             | 59.00  | 0.0                 | -52.89   | -40.68      | 40.00              |        | 62.50          |              |
| OPER      | 5C1T      | 30.53 R      | 23.48              | 190.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -47.24 L     | -36.34             | 25.50  | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 7.30            | 2.59                      | 6.57         | 2.91               | HS 51.76     | 93.2                 |
| 5C1T        | 10.36           | 5.36                      | 9.31         | 6.04               | 0.00         | 643.0                |

## SHEAR RATING REPORT

Rating Types and Vehicles  
 INV. OPER POST SPEC  
 Structure I. D. HAM500  
 Member I. D. S03  
 Check Point I. D. 3.100  
 HS20 5C1T

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.6       | 0.0          | 6.8       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -74.3                  | 65.4         |
| OPER      | 151.3             | -123.8                 | 108.9        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -2.98                 | 30.12 | -2.29    | 23.17 | -3.23                | 23.71 | -2.48    | 18.24 |
| OPER      | 5C1T      | -3.64                 | 23.40 | -2.80    | 18.00 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 23.01      | 2.17       | HS 43.41     | 78.1                 |
| 5C1T   | 34.06      | 4.66       | 0.00         | 558.8                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 3.100

Dead Load Moment      Superimposed Dead Load Moment  
-1.2                      -14.3

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 158.3      | 161.4           | -173.8 | 161.4        | -173.8 | 177.0                       | -158.3 | 177.0     | - |
| OPER 263.9      | 279.4           | -279.4 | 279.4        | -279.4 | 294.9                       | -263.9 | 294.9     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 16.13 R                 | 12.41           | 80.50                   | 0.0       | 25.97                   | 19.97           | 52.50                |        |
|           |            | -58.69 R                | -45.15          | 59.00                   | 0.0       | -52.89                  | -40.68          | 40.00                | 62.50  |
| OPER      | 5C1T       | 30.53 R                 | 23.48           | 190.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -47.24 L                | -36.34          | 25.50                   | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 6.82            | 2.70            | 6.82               | 2.70               | HS 53.95     | 97.1                 |
| 5C1T        | 9.66            | 5.59            | 9.66               | 5.59               | 0.00         | 670.3                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 3.200

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 127.0           | 127.0         | 127.0        | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 3.200

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.82 | 28.67 | 28.67 | 1.699 | 999999.000 | 90.772 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 13.97 |        | 106.7                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 3.200

Dead Load Moment 0.1  
Superimposed Dead Load Moment 0.6

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 180.0                       | -161.6             | 160.8           | -180.8             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 299.9                       | -269.4             | 267.9           | -301.3             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 59.37 R      | 45.67              | 83.00  | 0.0                 | 44.98    | 34.60       | 55.00              |        |                |              |
|           |           | -45.31 L     | -34.85             | 17.00  | 0.0                 | -33.04   | -25.42      | 40.00              | 72.50  |                |              |
| OPER      | 5C1T      | 56.26 R      | 43.27              | 193.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -40.12 L     | -30.86             | 28.00  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber +bend | bottom fiber -bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|--------|--------------|----------------------|
| HS20        | 3.03            | 3.57               | 2.71   | 54.16        | 97.5                 |
| 5C1T        | 5.33            | 6.72               | 4.76   | 0.00         | 571.6                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 3.200

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.5       | 0.0          | 5.1       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -73.2                  | 66.5                  |
| OPER      | 151.3             | -121.9                 | 110.8                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -2.98                 | 25.40 | -2.29    | 19.54 | -4.47                | 20.91 | -3.44    | 16.08 |
| OPER      | 5C1T      | -5.32                 | 20.31 | -4.09    | 15.63 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 16.37      | 2.62       | HS 52.35     | 94.2                 |
| 5C1T   | 22.94      | 5.45       | 0.00         | 654.6                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 3.200

Dead Load Moment 0.1  
Superimposed Dead Load Moment 0.6

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 168.1      | 167.9           | -167.4 | 167.9        | -167.4 | 167.2                       | -168.1 | 167.2     | - |
| OPER 280.1      | 279.4           | -279.4 | 279.4        | -279.4 | 278.7                       | -280.1 | 278.7     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 59.37 R                 | 45.67                | 83.00       | 0.0       | 44.98                   | 34.60                  | 55.00  |        |
|           |            | -45.31 L                | -34.85               | 17.00       | 0.0       | -33.04                  | -25.42                 | 40.00  | 72.50  |
| OPER      | 5C1T       | 56.26 R                 | 43.27                | 193.00      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -40.12 L                | -30.86               | 28.00       | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 2.82            | 3.71            | 2.82               | 3.71               | HS 56.33     | 101.4                |
| 5C1T        | 4.95            | 6.98            | 4.95               | 6.98               | 0.00         | 594.5                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 3.300

|               |                             |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Allowable stress (fs) (psi) |           |         |         |
| RATIO/Inv.    | 0.00                        | 0.00      | 0.00    | 0.00    |
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

|                |           |       |      |      |       |       |      |      |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

|                         |                  |                       |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

|               |          |              |       |                   |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

|                  |                  |             |       |                 |
|------------------|------------------|-------------|-------|-----------------|
| Section Modulus  |                  |             |       | Plastic Section |
| Positive Bending | Negative Bending | Modulus - Z |       |                 |
| Top              | Bott.            | Top         | Bott. | (Fy * Z)        |
| 127.0            | 127.0            | 127.0       | 127.0 | 390.83          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 3.300

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.82 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 90.772     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 13.97 |        | 106.7                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 3.300

Dead Load Moment 1.0  
Superimposed Dead Load Moment 11.2

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 173.0                       | -168.5             | 153.8           | -187.7             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 288.4                       | -280.9             | 256.4           | -312.9             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment  | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|---------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 86.43 R      | 66.48              | 85.50   | 0.0                 | 65.39    | 50.30       | 57.50              |        |                |              |
|           |           | -37.61 L     | -28.93             | 17.00   | 0.0                 | -29.08   | -22.37      | 40.00              | 0.00   |                |              |
| OPER      | 5C1T      | 76.13 R      | 58.56              | 108.50  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -36.19 L     | -27.84             | -145.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 2.00            | 4.48                      | 1.78         | 4.99               | HS 35.60     | 64.1                 |
| 5C1T        | 3.79            | 7.76                      | 3.37         | 8.65               | 0.00         | 404.1                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 3.300

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| 0.3       | 0.0                    |
|           | 3.4                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -72.0                  | 67.6                  |
| OPER      | 151.3             | -120.1                 | 112.7                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |            |              |              | Lane Live Load Shear |            |              |              |
|-----------|-----------|-----------------------|------------|--------------|--------------|----------------------|------------|--------------|--------------|
|           |           | w/imp. (-)            | w/imp. (+) | w/o imp. (-) | w/o imp. (+) | w/imp. (-)           | w/imp. (+) | w/o imp. (-) | w/o imp. (+) |
| INV.      | HS20      | -4.41                 | 20.57      | -3.39        | 15.82        | -6.74                | 17.96      | -5.19        | 13.81        |
| OPER      | 5C1T      | -7.28                 | 17.15      | -5.60        | 13.19        | 0.00                 | 0.00       | 0.00         | 0.00         |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 10.68      | 3.29       | HS 65.74     | 118.3                |
| 5C1T   | 16.49      | 6.57       | 0.00         | 788.6                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 3.300

Dead Load Moment 1.0  
Superimposed Dead Load Moment 11.2

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 175.0      | 172.5           | -162.7 | 172.5        | -162.7 | 160.3                       | -175.0 | 160.3     | - |
| OPER 291.7      | 279.4           | -279.4 | 279.4        | -279.4 | 267.1                       | -291.7 | 267.1     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 86.43 R                 | 66.48                | 85.50       | 0.0       | 65.39                   | 50.30                  | 57.50  |        |
|           |            | -37.61 L                | -28.93               | 17.00       | 0.0       | -29.08                  | -22.37                 | 40.00  | 0.00   |
| OPER      | 5C1T       | 76.13 R                 | 58.56                | 108.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -36.19 L                | -27.84               | -145.00     | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.86            | 4.65  | 1.86         | 4.65  | HS 37.09     | 66.8                 |
| 5C1T        | 3.51            | 8.06  | 3.51         | 8.06  | 0.00         | 421.1                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 3.400

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 127.0           | 127.0         | 127.0        | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 3.400

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.82 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 90.772     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 13.97 |        | 106.7                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 3.400

Dead Load Moment 1.6  
Superimposed Dead Load Moment 17.5

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 168.9                       | -172.7             | 149.7           | -191.8             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 281.5                       | -287.8             | 249.5           | -319.7             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment  | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|---------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 96.97 R      | 74.59              | 88.00   | 0.0                 | 77.63    | 59.72       | 60.00              |        |                |              |
|           |           | -29.91 L     | -23.01             | 17.00   | 0.0                 | -25.66   | -19.74      | 40.00              | 0.00   |                |              |
| OPER      | 5C1T      | 88.02 R      | 67.71              | 111.00  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -33.75 L     | -25.96             | -143.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 1.74            | 5.77                      | 1.54                      | 6.41               | HS 30.88     | 55.6                 |
| 5C1T        | 3.20            | 8.53                      | 2.84                      | 9.48               | 0.00         | 340.2                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 3.400Dead Load Superimposed Dead Load  
Shear (-) Shear (+) Shear

0.1 0.0 1.7

Rat. Shear Capacity Available Capacity for LL+I  
Veh. VU (-) (+)INV. 90.8 -70.9 68.7  
OPER 151.3 -118.2 114.6

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Rat.<br>Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|--------------|--------------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|              |              | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|              |              | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.         | HS20         | -8.97                 | 16.78 | -6.90    | 12.90 | -9.31                | 14.97 | -7.17    | 11.51 |
| OPER         | 5C1T         | -9.47                 | 14.06 | -7.28    | 10.81 | 0.00                 | 0.00  | 0.00     | 0.00  |

## Rating Shear

| Veh. | Rating<br>(-) | Factor<br>(+) | Rating<br>Value | Load<br>Capacity<br>(tons) |
|------|---------------|---------------|-----------------|----------------------------|
| HS20 | 7.61          | 4.10          | HS 81.95        | 147.5                      |
| 5C1T | 12.48         | 8.15          | 0.00            | 978.0                      |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 3.400

Dead Load Moment 1.6  
Superimposed Dead Load Moment 17.5

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 179.1      | 175.3           | -160.0 | 175.3        | -160.0 | 156.2                       | -179.1 | 156.2     | - |
| OPER 298.5      | 279.4           | -279.4 | 279.4        | -279.4 | 260.3                       | -298.5 | 260.3     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 96.97 R                 | 74.59                | 88.00       | 0.0       | 77.63                   | 59.72                  | 60.00  |        |
|           |            | -29.91 L                | -23.01               | 17.00       | 0.0       | -25.66                  | -19.74                 | 40.00  | 0.00   |
| OPER      | 5C1T       | 88.02 R                 | 67.71                | 111.00      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -33.75 L                | -25.96               | -143.50     | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.61            | 5.99  | 1.61         | 5.99  | HS 32.21     | 58.0                 |
| 5C1T        | 2.96            | 8.85  | 2.96         | 8.85  | 0.00         | 354.8                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 3.500

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 127.0           | 127.0         | 127.0        | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 3.500

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.82 | 28.67 | 28.67 | 1.699 | 999999.000 | 90.772 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 24.24 |        | 105.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 3.500

Dead Load Moment 1.7  
Superimposed Dead Load Moment 19.5

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 167.6                       | -174.0             | 148.4           | -193.1             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 279.4                       | -289.9             | 247.4           | -321.9             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment  | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|---------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 94.67 R      | 72.82              | 76.50   | 0.0                 | 82.45    | 63.42       | 62.50              |        |                |              |
|           |           | -22.43 R     | -17.25             | 108.00  | 0.0                 | -22.28   | -17.14      | 85.00              | 0.00   |                |              |
| OPER      | 5C1T      | 90.81 L      | 69.86              | -123.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -33.69 R     | -25.92             | 134.50  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 1.77            | 7.76                      | 1.57         | 8.61               | HS 31.36     | 56.4                 |
| 5C1T        | 3.08            | 8.60                      | 2.72         | 9.55               | 0.00         | 326.9                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 3.500

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear     | (-) Shear (+) Shear    |
| 0.0       | -0.1 0.1               |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 90.8              | -69.8                           | 69.9  |
| OPER      | 151.3             | -116.3                          | 116.4 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |      |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |      |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)  |
| INV.      | HS20      | -13.12                | 13.12 | -10.09   | 10.09 | -12.11               | 12.03 | -9.32    | 9.26 |
| OPER      | 5C1T      | -11.77                | 11.58 | -9.05    | 8.91  | 0.00                 | 0.00  | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 5.32       | 5.32       | HS 106.36    | 191.4                |
| 5C1T   | 9.88       | 10.06      | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 3.500

Dead Load Moment 1.7  
Superimposed Dead Load Moment 19.5

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 180.4      | 176.2           | -159.1 | 176.2        | -159.1 | 154.9                       | -180.4 | 154.9     | - |
| OPER 300.7      | 279.4           | -279.4 | 279.4        | -279.4 | 258.1                       | -300.7 | 258.1     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 94.67 R                 | 72.82                | 76.50       | 0.0       | 82.45                   | 63.42                  | 62.50  |        |
|           |            | -22.43 R                | -17.25               | 108.00      | 0.0       | -22.28                  | -17.14                 | 85.00  | 0.00   |
| OPER      | 5C1T       | 90.81 L                 | 69.86                | -123.50     | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -33.69 R                | -25.92               | 134.50      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.64            | 8.04  | 1.64         | 8.04  | HS 32.72     | 58.9                 |
| 5C1T        | 2.84            | 8.92  | 2.84         | 8.92  | 0.00         | 341.1                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 3.600

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 127.0           | 127.0         | 127.0        | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 3.600

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.87 | 28.67 | 28.67 | 1.699 | 999999.000 | 93.285 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 24.24 |        | 105.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 3.600

Dead Load Moment 1.5  
Superimposed Dead Load Moment 16.9

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 169.3                       | -172.3             | 150.1           | -191.4             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 282.2                       | -287.1             | 250.2           | -319.1             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment  | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|---------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 97.00 L      | 74.62              | 37.00   | 0.0                 | 77.56    | 59.66       | 65.00              |        |                |              |
|           |           | -30.20 R     | -23.23             | 108.00  | 0.0                 | -26.05   | -20.04      | 85.00              | 0.00   |                |              |
| OPER      | 5C1T      | 87.63 L      | 67.41              | -121.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -35.29 R     | -27.15             | 268.50  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber +bend | bottom fiber -bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|--------|--------------|----------------------|
| HS20        | 1.75            | 5.70               | 1.55   | 30.95        | 55.7                 |
| 5C1T        | 3.22            | 8.14               | 2.86   | 0.00         | 342.6                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 3.600

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.2      | -1.9         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -68.6                  | 71.1         |
| OPER      | 151.3             | -114.3                 | 118.4        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -16.78                | 8.97 | -12.91   | 6.90 | -15.05               | 9.24 | -11.57   | 7.11 |
| OPER      | 5C1T      | -14.26                | 9.27 | -10.97   | 7.13 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 4.09       | 7.69       | HS 81.75     | 147.2                |  |
| 5C1T   | 8.02       | 12.78      | 0.00         | 962.1                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 3.600

Dead Load Moment 1.5  
Superimposed Dead Load Moment 16.9

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 178.7      | 175.0           | -160.3 | 175.0        | -160.3 | 156.6                       | -178.7 | 156.6     | - |
| OPER 297.8      | 279.4           | -279.4 | 279.4        | -279.4 | 261.0                       | -297.8 | 261.0     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |        |       |      |
|-----------|------------|-------------------------|-------------------------|------------------------------|----------------------|--------|--------|-------|------|
| INV.      | HS20       | 97.00 L                 | 74.62                   | 37.00                        | 0.0                  | 77.56  | 59.66  | 65.00 |      |
|           |            | -30.20 R                | -23.23                  | 108.00                       | 0.0                  | -26.05 | -20.04 | 85.00 | 0.00 |
| OPER      | 5C1T       | 87.63 L                 | 67.41                   | -121.00                      | 0.0                  | 0.00   | 0.00   | 0.00  |      |
|           |            | -35.29 R                | -27.15                  | 268.50                       | 0.0                  | 0.00   | 0.00   | 0.00  | 0.00 |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.61            | 5.92  | 1.61         | 5.92  | HS 32.28     | 58.1                 |
| 5C1T        | 2.98            | 8.44  | 2.98         | 8.44  | 0.00         | 357.4                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 3.700

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |               |                      |               | Plastic Section Modulus - Z |
|----------------------|---------------|----------------------|---------------|-----------------------------|
| Positive Bending Top | Bending Bott. | Negative Bending Top | Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0         | 127.0                | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 3.700

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.87 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 93.285     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 24.24 |        | 105.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 3.700

Dead Load Moment 0.9  
Superimposed Dead Load Moment 10.0

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 173.8                       | -167.7             | 154.7           | -186.9             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 289.7                       | -279.5             | 257.8           | -311.5             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 86.47 L      | 66.52              | 39.50  | 0.0                 | 65.25    | 50.19       | 67.50              |        |                |              |
|           |           | -37.98 R     | -29.21             | 108.00 | 0.0                 | -29.81   | -22.93      | 85.00              | 0.00   |                |              |
| OPER      | 5C1T      | 74.93 L      | 57.64              | -70.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -38.35 R     | -29.50             | 270.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 2.01            | 4.42                      | 1.79         | 4.92               | HS 35.77     | 64.4                 |
| 5C1T        | 3.87            | 7.29                      | 3.44         | 8.12               | 0.00         | 412.8                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 3.700

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.3      | -3.6         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -67.5                  | 72.2         |
| OPER      | 151.3             | -112.4                 | 120.3        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |            |              |              | Lane Live Load Shear |            |              |              |
|-----------|-----------|-----------------------|------------|--------------|--------------|----------------------|------------|--------------|--------------|
|           |           | (-) w/imp.            | (+) w/imp. | (-) w/o imp. | (+) w/o imp. | (-) w/imp.           | (+) w/imp. | (-) w/o imp. | (+) w/o imp. |
| INV.      | HS20      | -20.56                | 4.42       | -15.82       | 3.40         | -18.03               | 6.66       | -13.87       | 5.13         |
| OPER      | 5C1T      | -17.32                | 7.09       | -13.33       | 5.45         | 0.00                 | 0.00       | 0.00         | 0.00         |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 3.28       | 10.83      | HS 65.60     | 118.1                |  |
| 5C1T   | 6.49       | 16.98      | 0.00         | 778.7                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 3.700

Dead Load Moment 0.9  
Superimposed Dead Load Moment 10.0

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 174.2      | 172.0           | -163.3 | 172.0        | -163.3 | 161.1                       | -174.2 | 161.1     | - |
| OPER 290.3      | 279.4           | -279.4 | 279.4        | -279.4 | 268.5                       | -290.3 | 268.5     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 86.47 L                 | 66.52                | 39.50       | 0.0       | 65.25                   | 50.19                  | 67.50  |        |
|           |            | -37.98 R                | -29.21               | 108.00      | 0.0       | -29.81                  | -22.93                 | 85.00  | 0.00   |
| OPER      | 5C1T       | 74.93 L                 | 57.64                | -70.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -38.35 R                | -29.50               | 270.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.86            | 4.59  | 1.86         | 4.59  | HS 37.26     | 67.1                 |
| 5C1T        | 3.58            | 7.57  | 3.58         | 7.57  | 0.00         | 430.0                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 3.800

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |               |                      |               | Plastic Section Modulus - Z |
|----------------------|---------------|----------------------|---------------|-----------------------------|
| Positive Bending Top | Bending Bott. | Negative Bending Top | Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0         | 127.0                | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 3.800

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.87 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 93.285     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 24.24 |        | 105.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 3.800

Dead Load Moment      Superimposed Dead Load Moment  
-0.1                      -1.2

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 181.2                       | -160.4                | 162.0              | -179.6                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 302.0                       | -267.3                | 270.0              | -299.3                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 59.43 L      | 45.72              | 42.00  | 0.0                 | 45.25    | 34.81       | 70.00              |        |                |              |
|           |           | -45.75 R     | -35.19             | 108.00 | 0.0                 | -35.42   | -27.25      | 85.00              | 135.00 |                |              |
| OPER      | 5C1T      | 55.09 L      | 42.38              | -68.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -42.86 R     | -32.97             | 184.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 3.05               | 3.51                         | 2.73                               | 3.92         | 54.51                |
| 5C1T        | 5.48               | 6.24                         | 4.90                               | 6.98         | 0.00                 |

## SHEAR RATING REPORT

Rating Types and Vehicles  
 INV. OPER POST SPEC  
 Structure I. D. HAM500  
 Member I. D. S03  
 Check Point I. D. 3.800  
 HS20 5C1T  
 Dead Load Superimposed Dead Load  
 Shear (-) Shear (+) Shear  
 -0.5 -5.3 0.0

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 90.8              | -66.3                           | 73.3  |
| OPER      | 151.3             | -110.5                          | 122.2 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -25.39                | 2.94 | -19.53   | 2.26 | -20.98               | 4.39 | -16.14   | 3.38 |
| OPER      | 5C1T      | -20.48                | 5.11 | -15.75   | 3.93 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 2.61       | 16.70      | HS 52.24     | 94.0                 |  |
| 5C1T   | 5.40       | 23.90      | 0.00         | 647.8                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 3.800

Dead Load Moment      Superimposed Dead Load Moment  
-0.1                      -1.2

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 166.8      | 167.1           | -168.2 | 167.1        | -168.2 | 168.4                       | -166.8 | 168.4     | - |
| OPER 278.1      | 279.4           | -279.4 | 279.4        | -279.4 | 280.7                       | -278.1 | 280.7     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 59.43 L                 | 45.72                | 42.00       | 0.0       | 45.25                   | 34.81                  | 70.00  |        |
|           |            | -45.75 R                | -35.19               | 108.00      | 0.0       | -35.42                  | -27.25                 | 85.00  | 135.00 |
| OPER      | 5C1T       | 55.09 L                 | 42.38                | -68.00      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -42.86 R                | -32.97               | 184.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 2.83            | 3.65            | 2.83               | 3.65               | HS 56.68     | 102.0                |
| 5C1T        | 5.10            | 6.49            | 5.10               | 6.49               | 0.00         | 611.5                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 3.900

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 3.900

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.87 | 28.67 | 28.67 | 1.699 | 999999.000 | 93.285 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 24.24 |        | 105.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 3.900

Dead Load Moment      Superimposed Dead Load Moment  
-1.5                      -16.7

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 191.3                       | -150.2                | 172.1              | -169.4                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 318.9                       | -250.4                | 286.9              | -282.4                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.21 L      | 12.47              | 44.50  | 0.0                 | 25.07    | 19.29       | 72.50              |        |                |              |
|           |           | -58.98 L     | -45.37             | 66.00  | 0.0                 | -54.10   | -41.62      | 85.00              |        | 62.50          |              |
| OPER      | 5C1T      | 29.53 L      | 22.72              | 21.50  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -50.55 R     | -38.88             | 186.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 7.63               | 2.55                         | 6.87                               | 2.87         | HS 50.95 91.7        |
| 5C1T        | 10.80              | 4.95                         | 9.72                               | 5.59         | 0.00 594.5           |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 3.900

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| -0.6      | -7.1                   |
|           | 0.0                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -65.2                  | 74.4                  |
| OPER      | 151.3             | -108.7                 | 124.1                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -30.11                | 3.08 | -23.16   | 2.37 | -23.79               | 3.13 | -18.30   | 2.41 |
| OPER      | 5C1T      | -23.57                | 3.40 | -18.13   | 2.61 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 2.16       | 23.75      | HS 43.31     | 78.0                 |
| 5C1T   | 4.61       | 36.53      | 0.00         | 553.2                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 3.900

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -1.5                | -16.7                            |

| Rating<br>Veh.<br>ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                       | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend                  | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV.<br>156.7         | 160.3           | -174.9 | 160.3        | -174.9 | 178.6                       | -156.7 | 178.6     | - |
| OPER<br>261.2         | 279.4           | -279.4 | 279.4        | -279.4 | 297.6                       | -261.2 | 297.6     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Truck<br>Veh. | Live Load Moment<br>w/imp. | Moment<br>w/o imp. | Loc. of Ax.<br>Front<br>Wheel | Lane<br>Dis. | Live Load Moment<br>w/imp. | Moment<br>w/o imp. | Loc. of Conc.<br>Load 1 | Load 2 |
|--------------|---------------|----------------------------|--------------------|-------------------------------|--------------|----------------------------|--------------------|-------------------------|--------|
| INV.         | HS20          | 16.21 L                    | 12.47              | 44.50                         | 0.0          | 25.07                      | 19.29              | 72.50                   |        |
|              |               | -58.98 L                   | -45.37             | 66.00                         | 0.0          | -54.10                     | -41.62             | 85.00                   | 62.50  |
| OPER         | 5C1T          | 29.53 L                    | 22.72              | 21.50                         | 0.0          | 0.00                       | 0.00               | 0.00                    |        |
|              |               | -50.55 R                   | -38.88             | 186.50                        | 0.0          | 0.00                       | 0.00               | 0.00                    | 0.00   |

## Serviceability

| Rating<br>Veh. | Rating       |                | Factor          |                | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------|----------------|-----------------|----------------|-----------------|----------------------------|
|                | top<br>+bend | fiber<br>-bend | bottom<br>+bend | fiber<br>-bend |                 |                            |
| HS20           | 7.12         | 2.66           | 7.12            | 2.66           | HS 53.13        | 95.6                       |
| 5C1T           | 10.08        | 5.17           | 10.08           | 5.17           | 0.00            | 620.0                      |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 4.000

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 4.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.87 | 28.67 | 28.67 | 1.699 | 999999.000 | 93.285 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 24.24 |        | 105.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 4.000

Dead Load Moment      Superimposed Dead Load Moment  
-3.3                      -36.5

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 204.3                       | -137.3                | 185.1              | -156.5                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 340.5                       | -228.8                | 308.5              | -260.8                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.43 R      | 12.63              | 133.00 | 0.0                 | 16.32    | 12.55       | 110.00             |        |                |              |
|           |           | -98.55 L     | -75.80             | 54.50  | 0.0                 | -90.65   | -69.73      | 85.00              | 65.00  |                |              |
| OPER      | 5C1T      | 12.70 R      | 9.77               | 335.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -64.62 R     | -49.71             | 193.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 12.44              | 1.39                         | 11.27                              | 1.59         | HS 27.86             |
| 5C1T        | 26.82              | 3.54                         | 24.30                              | 4.04         | 0.00 424.9           |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 4.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.6      | -0.8      | -7.1                   | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -64.1                  | 64.1         |
| OPER      | 151.3             | -106.8                 | 106.9        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -30.11                | 34.53 | -23.16   | 26.56 | -23.79               | 26.35 | -18.30   | 20.27 |
| OPER      | 5C1T      | -23.57                | 26.31 | -18.13   | 20.23 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.86       | 1.86       | HS 37.12     | 66.8                 |
| 5C1T   | 4.04       | 4.06       | 0.00         | 484.7                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 4.000

Dead Load Moment      Superimposed Dead Load Moment  
-3.3                      -36.5

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 143.7      | 151.7           | -183.6 | 151.7        | -183.6 | 191.6                       | -143.7 | 191.6     | - |
| OPER 239.5      | 279.4           | -279.4 | 279.4        | -279.4 | 319.3                       | -239.5 | 319.3     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 16.43 R                 | 12.63           | 133.00                  | 0.0       | 16.32                   | 12.55           | 110.00               |        |
|           |            | -98.55 L                | -75.80          | 54.50                   | 0.0       | -90.65                  | -69.73          | 85.00                | 65.00  |
| OPER      | 5C1T       | 12.70 R                 | 9.77            | 335.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -64.62 R                | -49.71          | 193.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 11.66           | 1.46  | 11.66        | 1.46  | HS 29.17     | 52.5                 |
| 5C1T        | 25.14           | 3.71  | 25.14        | 3.71  | 0.00         | 444.8                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 4.000

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |               |                      |               | Plastic Section Modulus - Z |
|----------------------|---------------|----------------------|---------------|-----------------------------|
| Positive Bending Top | Bending Bott. | Negative Bending Top | Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0         | 127.0                | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 4.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.87 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 93.285     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 24.24 |        | 105.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 4.000

Dead Load Superimposed Dead Load  
Moment Moment  
-3.3 -36.5

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 204.3                       | -137.3                | 185.1              | -156.5                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 340.5                       | -228.8                | 308.5              | -260.8                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.43 R      | 12.63              | 133.00 | 0.0                 | 16.32    | 12.55       | 110.00             |        |                |              |
|           |           | -98.55 L     | -75.80             | 54.50  | 0.0                 | -90.65   | -69.73      | 85.00              | 65.00  |                |              |
| OPER      | 5C1T      | 12.70 R      | 9.77               | 335.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -64.62 R     | -49.71             | 193.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|--------|--------------|----------------------|
| HS20        | 12.44              | 1.39                         | 11.27  | 1.59         | 50.2                 |
| 5C1T        | 26.82              | 3.54                         | 24.30  | 4.04         | 424.9                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 4.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.8      | 0.8       | -8.8                   | 8.7       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -64.1                  | 64.1         |
| OPER      | 151.3             | -106.8                 | 106.9        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -34.52                | 34.53 | -26.56   | 26.56 | -26.36               | 26.35 | -20.28   | 20.27 |
| OPER      | 5C1T      | -26.44                | 26.31 | -20.34   | 20.23 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.86       | 1.86       | HS 37.12     | 66.8                 |
| 5C1T   | 4.04       | 4.06       | 0.00         | 484.7                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 4.000

Dead Load Moment      Superimposed Dead Load Moment  
-3.3                      -36.5

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 143.7      | 151.7           | -183.6 | 151.7        | -183.6 | 191.6                       | -143.7 | 191.6     | - |
| OPER 239.5      | 279.4           | -279.4 | 279.4        | -279.4 | 319.3                       | -239.5 | 319.3     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|------------------|-----------------|-------------------------|-----------|------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 16.43 R          | 12.63           | 133.00                  | 0.0       | 16.32            | 12.55           | 110.00               |        |
|           |            | -98.55 L         | -75.80          | 54.50                   | 0.0       | -90.65           | -69.73          | 85.00                | 65.00  |
| OPER      | 5C1T       | 12.70 R          | 9.77            | 335.00                  | 0.0       | 0.00             | 0.00            | 0.00                 |        |
|           |            | -64.62 R         | -49.71          | 193.00                  | 0.0       | 0.00             | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 11.66           | 1.46            | 11.66              | 1.46               | HS 29.17     | 52.5                 |
| 5C1T        | 25.14           | 3.71            | 25.14              | 3.71               | 0.00         | 444.8                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 4.100

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 4.100

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.87 | 28.67 | 28.67 | 1.699 | 999999.000 | 93.380 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 24.24 |        | 105.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 4.100

Dead Load Moment      Superimposed Dead Load Moment  
-1.6                      -16.9

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 191.5                       | -150.1                | 172.3              | -169.3                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 319.1                       | -250.2                | 287.1              | -282.1                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.19 R      | 12.46              | 105.50 | 0.0                 | 25.38    | 19.52       | 77.50              |        |                |              |
|           |           | -58.96 R     | -45.35             | 84.00  | 0.0                 | -54.15   | -41.66      | 65.00              |        | 87.50          |              |
| OPER      | 5C1T      | 29.07 R      | 22.36              | 215.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -50.95 L     | -39.19             | -36.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 7.55               | 2.55                         | 6.79                               | 2.87         | HS 50.92 91.7        |
| 5C1T        | 10.98              | 4.91                         | 9.88                               | 5.54         | 0.00 589.2           |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 4.100

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| 0.6       | 0.0                    |
|           | 7.0                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -74.4                  | 65.3         |
| OPER      | 151.3             | -124.0                 | 108.8        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -2.98                 | 30.12 | -2.29    | 23.17 | -3.19                | 23.78 | -2.46    | 18.29 |
| OPER      | 5C1T      | -3.53                 | 23.47 | -2.71    | 18.05 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 23.30      | 2.17       | HS 43.34     | 78.0                 |
| 5C1T   | 35.16      | 4.63       | 0.00         | 556.1                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 4.100

Dead Load Moment      Superimposed Dead Load Moment  
-1.6                      -16.9

| Rating Veh.<br>ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|--------------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                    | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend               | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV.<br>156.5      | 160.2           | -175.0 | 160.2        | -175.0 | 178.7                       | -156.5 | 178.7     | - |
| OPER<br>260.9      | 279.4           | -279.4 | 279.4        | -279.4 | 297.9                       | -260.9 | 297.9     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 16.19 R                 | 12.46           | 105.50                  | 0.0       | 25.38                   | 19.52           | 77.50                |        |
|           |            | -58.96 R                | -45.35          | 84.00                   | 0.0       | -54.15                  | -41.66          | 65.00                | 87.50  |
| OPER      | 5C1T       | 29.07 R                 | 22.36           | 215.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -50.95 L                | -39.19          | -36.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 7.04            | 2.65  | 7.04         | 2.65  | HS 53.10     | 95.6                 |
| 5C1T        | 10.25           | 5.12  | 10.25        | 5.12  | 0.00         | 614.5                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 4.200

|               |                             |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Allowable stress (fs) (psi) |           |         |         |
| RATIO/Inv.    | 0.00                        | 0.00      | 0.00    | 0.00    |
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

|                |           |       |      |      |       |       |      |      |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

|                         |                  |                       |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

|               |          |              |       |                   |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

|                  |                  |             |       |                 |
|------------------|------------------|-------------|-------|-----------------|
| Section Modulus  |                  |             |       | Plastic Section |
| Positive Bending | Negative Bending | Modulus - Z |       |                 |
| Top              | Bott.            | Top         | Bott. | (Fy * Z)        |
| 127.0            | 127.0            | 127.0       | 127.0 | 390.83          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 4.200

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.87 | 28.67 | 28.67 | 1.699 | 999999.000 | 93.380 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 24.24 |        | 105.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 4.200

Dead Load Moment      Superimposed Dead Load Moment  
-0.2                      -1.6

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 181.5                       | -160.1             | 162.3           | -179.3             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 302.5                       | -266.8             | 270.5           | -298.8             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Load Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Load Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|-------------|---------------------|----------|-------------|--------------------|-------------|----------------|--------------|
| INV.      | HS20      | 59.43 R      | 45.71              | 108.00      | 0.0                 | 44.49    | 34.23       | 80.00              |             |                |              |
|           |           | -45.74 L     | -35.19             | 42.00       | 0.0                 | -35.63   | -27.41      | 65.00              | 15.00       |                |              |
| OPER      | 5C1T      | 54.49 R      | 41.92              | 218.00      | 0.0                 | 0.00     | 0.00        | 0.00               |             |                |              |
|           |           | -43.35 L     | -33.35             | -34.00      | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00        |                |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 3.05            | 3.50                      | 2.73                      | 3.92               | HS 54.62     | 98.3                 |
| 5C1T        | 5.55            | 6.16                      | 4.96                      | 6.89               | 0.00         | 595.6                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 4.200

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| 0.5       | 0.0                    |
|           | 5.3                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -73.3                  | 66.4         |
| OPER      | 151.3             | -122.1                 | 110.6        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -2.98                 | 25.40 | -2.29    | 19.54 | -4.44                | 20.97 | -3.41    | 16.13 |
| OPER      | 5C1T      | -5.22                 | 20.38 | -4.02    | 15.68 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 16.51      | 2.61       | HS 52.28     | 94.1                 |
| 5C1T   | 23.37      | 5.43       | 0.00         | 651.4                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 4.200

Dead Load Moment      Superimposed Dead Load Moment  
-0.2                      -1.6

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 166.5      | 166.9           | -168.4 | 166.9        | -168.4 | 168.7                       | -166.5 | 168.7     | - |
| OPER 277.6      | 279.4           | -279.4 | 279.4        | -279.4 | 281.2                       | -277.6 | 281.2     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 59.43 R                 | 45.71           | 108.00                  | 0.0       | 44.49                   | 34.23           | 80.00                |        |
|           |            | -45.74 L                | -35.19          | 42.00                   | 0.0       | -35.63                  | -27.41          | 65.00                | 15.00  |
| OPER      | 5C1T       | 54.49 R                 | 41.92           | 218.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -43.35 L                | -33.35          | -34.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 2.84            | 3.64  | 2.84         | 3.64  | HS 56.79     | 102.2                |
| 5C1T        | 5.16            | 6.40  | 5.16         | 6.40  | 0.00         | 619.3                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 4.300

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 127.0           | 127.0         | 127.0        | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 4.300

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.87 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 93.380     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 24.24 |        | 105.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 4.300

Dead Load Moment 0.8  
Superimposed Dead Load Moment 9.4

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 174.3                       | -167.3             | 155.1           | -186.5             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 290.5                       | -278.8             | 258.5           | -310.8             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment  | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|---------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 86.47 R      | 66.52              | 110.50  | 0.0                 | 65.00    | 50.00       | 82.50              |        |                |              |
|           |           | -37.97 L     | -29.21             | 42.00   | 0.0                 | -30.01   | -23.08      | 65.00              | 0.00   |                |              |
| OPER      | 5C1T      | 74.55 R      | 57.34              | 133.50  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -38.82 L     | -29.86             | -120.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | Rating Factor   |                    |                 |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|-----------------|--------------------|--------------|----------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend |              |                      |
| HS20        | 2.02            | 4.41               | 1.79            | 4.91               | HS 35.87     | 64.6                 |
| 5C1T        | 3.90            | 7.18               | 3.47            | 8.01               | 0.00         | 416.1                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 4.300Dead Load Superimposed Dead Load  
Shear (-) Shear (+) Shear

0.3 0.0 3.5

Rat. Shear Capacity Available Capacity for LL+I  
Veh. VU (-) (+)INV. 90.8 -72.1 67.5  
OPER 151.3 -120.2 112.5

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Rat.<br>Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|--------------|--------------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|              |              | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|              |              | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.         | HS20         | -4.41                 | 20.57 | -3.40    | 15.82 | -6.71                | 18.02 | -5.16    | 13.86 |
| OPER         | 5C1T         | -7.18                 | 17.22 | -5.52    | 13.25 | 0.00                 | 0.00  | 0.00     | 0.00  |

## Rating Shear

| Veh. | Rating<br>(-) | Factor<br>(+) | Rating<br>Value | Load<br>Capacity<br>(tons) |
|------|---------------|---------------|-----------------|----------------------------|
| HS20 | 10.75         | 3.28          | HS 65.65        | 118.2                      |
| 5C1T | 16.74         | 6.53          | 0.00            | 784.1                      |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 4.300

Dead Load Moment 0.8  
Superimposed Dead Load Moment 9.4

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 173.7      | 171.7           | -163.6 | 171.7        | -163.6 | 161.5                       | -173.7 | 161.5     | - |
| OPER 289.6      | 279.4           | -279.4 | 279.4        | -279.4 | 269.2                       | -289.6 | 269.2     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 86.47 R                 | 66.52                | 110.50      | 0.0       | 65.00                   | 50.00                  | 82.50  |        |
|           |            | -37.97 L                | -29.21               | 42.00       | 0.0       | -30.01                  | -23.08                 | 65.00  | 0.00   |
| OPER      | 5C1T       | 74.55 R                 | 57.34                | 133.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -38.82 L                | -29.86               | -120.00     | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.87            | 4.57  | 1.87         | 4.57  | HS 37.36     | 67.3                 |
| 5C1T        | 3.61            | 7.46  | 3.61         | 7.46  | 0.00         | 433.4                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 4.400

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |               |                      |               | Plastic Section Modulus - Z |
|----------------------|---------------|----------------------|---------------|-----------------------------|
| Positive Bending Top | Bending Bott. | Negative Bending Top | Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0         | 127.0                | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 4.400

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.87 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 93.380     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 24.24 |        | 105.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 4.400

Dead Load Moment 1.4  
Superimposed Dead Load Moment 16.1

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 169.9                       | -171.7             | 150.7           | -190.8             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 283.2                       | -286.1             | 251.2           | -318.1             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment  | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|---------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 97.00 R      | 74.62              | 113.00  | 0.0                 | 77.32    | 59.48       | 85.00              |        |                |              |
|           |           | -30.20 L     | -23.23             | 42.00   | 0.0                 | -26.40   | -20.31      | 65.00              | 0.00   |                |              |
| OPER      | 5C1T      | 86.98 R      | 66.91              | 271.00  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -35.71 L     | -27.47             | -118.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 1.75            | 5.68                      | 1.55         | 6.32               | HS 31.08     | 55.9                 |
| 5C1T        | 3.26            | 8.01                      | 2.89         | 8.91               | 0.00         | 346.6                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 4.400

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| 0.2       | 0.0                    |
|           | 1.8                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -71.0                  | 68.6                  |
| OPER      | 151.3             | -118.3                 | 114.4                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |            |              |              | Lane Live Load Shear |            |              |              |
|-----------|-----------|-----------------------|------------|--------------|--------------|----------------------|------------|--------------|--------------|
|           |           | w/imp. (-)            | w/imp. (+) | w/o imp. (-) | w/o imp. (+) | w/imp. (-)           | w/imp. (+) | w/o imp. (-) | w/o imp. (+) |
| INV.      | HS20      | -8.97                 | 16.78      | -6.90        | 12.91        | -9.28                | 15.04      | -7.14        | 11.57        |
| OPER      | 5C1T      | -9.34                 | 14.16      | -7.19        | 10.89        | 0.00                 | 0.00       | 0.00         | 0.00         |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 7.65       | 4.09       | HS 81.81     | 147.3                |  |
| 5C1T   | 12.67      | 8.08       | 0.00         | 969.7                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 4.400

Dead Load Moment 1.4  
Superimposed Dead Load Moment 16.1

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 178.1      | 174.6           | -160.7 | 174.6        | -160.7 | 157.2                       | -178.1 | 157.2     | - |
| OPER 296.8      | 279.4           | -279.4 | 279.4        | -279.4 | 262.0                       | -296.8 | 262.0     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Live Load Moment w/o imp. | Loc. of Conc. Load 1 | Live Load Moment w/imp. | Loc. of Conc. Load 2 |
|-----------|------------|-------------------------|-------------------------|---------------------------|----------------------|-------------------------|----------------------|
| INV.      | HS20       | 97.00 R                 | 74.62                   | 113.00                    | 0.0                  | 77.32                   | 59.48                |
|           |            | -30.20 L                | -23.23                  | 42.00                     | 0.0                  | -26.40                  | -20.31               |
| OPER      | 5C1T       | 86.98 R                 | 66.91                   | 271.00                    | 0.0                  | 0.00                    | 0.00                 |
|           |            | -35.71 L                | -27.47                  | -118.50                   | 0.0                  | 0.00                    | 0.00                 |

## Serviceability

| Rating Veh. | Rating Factor   |                    | Load Capacity (tons) |                    |
|-------------|-----------------|--------------------|----------------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend      | bottom fiber -bend |
| HS20        | 1.62            | 5.90               | 1.62                 | 5.90               |
| 5C1T        | 3.01            | 8.31               | 3.01                 | 8.31               |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 4.500

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 4.500

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.86 | 28.67 | 28.67 | 1.699 | 999999.000 | 93.065 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 22.99 |        | 105.2                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 4.500

Dead Load Moment 1.6  
Superimposed Dead Load Moment 18.5

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 168.4                       | -173.2             | 149.2           | -192.4             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 280.6                       | -288.7             | 248.6           | -320.7             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 94.68 R      | 72.83              | 101.50 | 0.0                 | 82.22    | 63.25       | 87.50              |        |                |              |
|           |           | -22.43 R     | -17.26             | 133.00 | 0.0                 | -22.80   | -17.53      | 110.00             | 0.00   |                |              |
| OPER      | 5C1T      | 89.93 R      | 69.18              | 273.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -34.36 L     | -26.43             | -71.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 1.78            | 7.60                      | 1.58         | 8.44               | HS 31.51     | 56.7                 |
| 5C1T        | 3.12            | 8.40                      | 2.76         | 9.33               | 0.00         | 331.7                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 4.500

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.0       | 0.0          | 0.1       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -69.9                  | 69.8                  |
| OPER      | 151.3             | -116.5                 | 116.3                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |      |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |      |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)  |
| INV.      | HS20      | -13.12                | 13.12 | -10.10   | 10.10 | -12.08               | 12.10 | -9.29    | 9.31 |
| OPER      | 5C1T      | -11.64                | 11.66 | -8.95    | 8.97  | 0.00                 | 0.00  | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 5.32       | 5.32       | HS 106.31    | 191.4                |
| 5C1T   | 10.01      | 9.97       | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 4.500

Dead Load Moment 1.6  
Superimposed Dead Load Moment 18.5

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 179.7      | 175.7           | -159.6 | 175.7        | -159.6 | 155.6                       | -179.7 | 155.6     | - |
| OPER 299.4      | 279.4           | -279.4 | 279.4        | -279.4 | 259.4                       | -299.4 | 259.4     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 94.68 R                 | 72.83           | 101.50                  | 0.0       | 82.22                   | 63.25           | 87.50                |        |
|           |            | -22.43 R                | -17.26          | 133.00                  | 0.0       | -22.80                  | -17.53          | 110.00               | 0.00   |
| OPER      | 5C1T       | 89.93 R                 | 69.18           | 273.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -34.36 L                | -26.43          | -71.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.64            | 7.88            | 1.64               | 7.88               | HS 32.87     | 59.2                 |
| 5C1T        | 2.88            | 8.72            | 2.88               | 8.72               | 0.00         | 346.1                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 4.600

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 4.600

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.86 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 93.065     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 22.99 |        | 105.2                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 4.600

Dead Load Moment 1.4  
Superimposed Dead Load Moment 16.2

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 169.8                       | -171.8             | 150.6           | -191.0             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 283.0                       | -286.3             | 251.0           | -318.3             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Load Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Load Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|-------------|---------------------|----------|-------------|--------------------|-------------|----------------|--------------|
| INV.      | HS20      | 97.01 L      | 74.62              | 62.00       | 0.0                 | 77.41    | 59.55       | 90.00              |             |                |              |
|           |           | -30.21 R     | -23.24             | 133.00      | 0.0                 | -26.38   | -20.29      | 110.00             | 0.00        |                |              |
| OPER      | 5C1T      | 86.79 L      | 66.76              | 39.00       | 0.0                 | 0.00     | 0.00        | 0.00               |             |                |              |
|           |           | -35.45 R     | -27.27             | 206.50      | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00        | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 1.75            | 5.69                      | 1.55                      | 6.32               | HS 31.05     | 55.9                 |
| 5C1T        | 3.26            | 8.08                      | 2.89                      | 8.98               | 0.00         | 347.1                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 4.600

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| -0.2      | -1.8                   |
|           | 0.0                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 90.8              | -68.7                           | 71.0  |
| OPER      | 151.3             | -114.5                          | 118.3 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -16.78                | 8.97 | -12.91   | 6.90 | -15.01               | 9.31 | -11.55   | 7.16 |
| OPER      | 5C1T      | -14.11                | 9.40 | -10.85   | 7.23 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |                      |
|--------|------------|------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value         |
| HS20   | 4.09       | 7.63       | 81.87                |
| 5C1T   | 8.11       | 12.59      | 0.00                 |
|        |            |            | Load Capacity (tons) |
|        |            |            | 147.4                |
|        |            |            | 973.8                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 4.600

Dead Load Moment 1.4  
Superimposed Dead Load Moment 16.2

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 178.2      | 174.7           | -160.6 | 174.7        | -160.6 | 157.1                       | -178.2 | 157.1     | - |
| OPER 297.0      | 279.4           | -279.4 | 279.4        | -279.4 | 261.8                       | -297.0 | 261.8     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |        |
|-----------|------------|-------------------------|-------------------------|-----------|-------------------------|----------------------|--------|--------|
| INV.      | HS20       | 97.01 L                 | 74.62                   | 62.00     | 0.0                     | 77.41                | 59.55  | 90.00  |
|           |            | -30.21 R                | -23.24                  | 133.00    | 0.0                     | -26.38               | -20.29 | 110.00 |
| OPER      | 5C1T       | 86.79 L                 | 66.76                   | 39.00     | 0.0                     | 0.00                 | 0.00   | 0.00   |
|           |            | -35.45 R                | -27.27                  | 206.50    | 0.0                     | 0.00                 | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.62            | 5.90            | 1.62               | 5.90               | HS 32.38     | 58.3                 |
| 5C1T        | 3.02            | 8.38            | 3.02               | 8.38               | 0.00         | 361.9                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 4.700

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 127.0           | 127.0         | 127.0        | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 4.700

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.86 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 93.065     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 22.99 |        | 105.2                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 4.700

Dead Load Moment 0.8  
Superimposed Dead Load Moment 9.7

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 174.1                       | -167.5             | 154.9           | -186.7             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 290.1                       | -279.2             | 258.1           | -311.2             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 86.48 L      | 66.52              | 64.50  | 0.0                 | 65.18    | 50.14       | 92.50              |        |                |              |
|           |           | -37.98 R     | -29.21             | 133.00 | 0.0                 | -29.97   | -23.05      | 110.00             | 0.00   |                |              |
| OPER      | 5C1T      | 74.85 L      | 57.58              | 41.50  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -38.35 R     | -29.50             | 295.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | Rating Factor   |                    |                 |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|-----------------|--------------------|--------------|----------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend |              |                      |
| HS20        | 2.01            | 4.41               | 1.79            | 4.92               | HS 35.82     | 64.5                 |
| 5C1T        | 3.88            | 7.28               | 3.45            | 8.11               | 0.00         | 413.8                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 4.700

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.3      | -3.5         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -67.6                  | 72.1                  |
| OPER      | 151.3             | -112.6                 | 120.2                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -20.57                | 4.41 | -15.82   | 3.40 | -18.00               | 6.73 | -13.85   | 5.18 |
| OPER      | 5C1T      | -17.15                | 7.25 | -13.20   | 5.58 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 3.29       | 10.71      | HS 65.69     | 118.2                |  |
| 5C1T   | 6.56       | 16.57      | 0.00         | 787.6                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 4.700Dead Load Moment 0.8  
Superimposed Dead Load Moment 9.7

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 174.0      | 171.8           | -163.4 | 171.8        | -163.4 | 161.3                       | -174.0 | 161.3     | - |
| OPER 289.9      | 279.4           | -279.4 | 279.4        | -279.4 | 268.9                       | -289.9 | 268.9     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 86.48 L                 | 66.52                | 64.50       | 0.0       | 65.18                   | 50.14                  | 92.50  |        |
|           |            | -37.98 R                | -29.21               | 133.00      | 0.0       | -29.97                  | -23.05                 | 110.00 | 0.00   |
| OPER      | 5C1T       | 74.85 L                 | 57.58                | 41.50       | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -38.35 R                | -29.50               | 295.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.87            | 4.58  | 1.87         | 4.58  | HS 37.31     | 67.2                 |
| 5C1T        | 3.59            | 7.56  | 3.59         | 7.56  | 0.00         | 431.0                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 4.800

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 4.800

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.86 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 93.065     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 22.99 |        | 105.2                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 4.800

|                     |                                  |
|---------------------|----------------------------------|
| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
| -0.1                | -1.1                             |

| Rating<br>Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|----------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|                | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.           | 180.4C             | -161.2                | 161.2              | -180.4C               | 181.1                       | -160.4                | 162.0              | -179.6                |
| OPER           | 300.6C             | -268.7                | 268.7              | -300.6C               | 301.9                       | -267.4                | 269.9              | -299.4                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Rat.<br>Veh. | Truck<br>w/imp. | Live Load<br>w/o imp. | Moment | Loc. of<br>Front<br>Wheel | Ax.<br>Dis. | Lane<br>w/imp. | Live Load<br>w/o imp. | Moment | Loc. of<br>Load 1 | Conc.<br>Load 2 |
|--------------|--------------|-----------------|-----------------------|--------|---------------------------|-------------|----------------|-----------------------|--------|-------------------|-----------------|
| INV.         | HS20         | 59.43 L         | 45.72                 | 67.00  | 0.0                       | 45.27       | 34.83          | 95.00                 |        |                   |                 |
|              |              | -45.75 R        | -35.19                | 133.00 | 0.0                       | -35.40      | -27.23         | 110.00                | 160.00 |                   |                 |
| OPER         | 5C1T         | 55.13 L         | 42.41                 | -43.00 | 0.0                       | 0.00        | 0.00           | 0.00                  |        |                   |                 |
|              |              | -42.81 R        | -32.93                | 209.00 | 0.0                       | 0.00        | 0.00           | 0.00                  | 0.00   |                   |                 |

## Moment

| Rating<br>Veh. | top fiber<br>+bend | Rating<br>bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------------|---------------------------------|-----------------|-----------------------|-----------------|----------------------------|
| HS20           | 3.05               | 3.51                            | 2.72            | 3.93                  | HS 54.50        | 98.1                       |
| 5C1T           | 5.48               | 6.24                            | 4.90            | 6.99                  | 0.00            | 587.5                      |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 4.800

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.5      | -5.2         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -66.4                  | 73.2         |
| OPER      | 151.3             | -110.7                 | 122.0        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -25.40                | 2.98 | -19.54   | 2.29 | -20.95               | 4.46 | -16.12   | 3.43 |
| OPER      | 5C1T      | -20.29                | 5.31 | -15.61   | 4.08 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 2.62       | 16.42      | HS 52.31     | 94.2                 |
| 5C1T   | 5.46       | 23.00      | 0.00         | 654.9                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 4.800

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -0.1                | -1.1                             |

| Rating<br>Veh.<br>ber | Moment Capacity |              | Available Capacity for LL+I |           |       |        |       |   |
|-----------------------|-----------------|--------------|-----------------------------|-----------|-------|--------|-------|---|
|                       | top fiber       | bottom fiber | top fiber                   | bottom fi |       |        |       |   |
| bend                  | +bend           | -bend        | +bend                       | -bend     | +bend | -bend  | +bend | - |
| INV.                  | 167.1           | -168.1       | 167.1                       | -168.1    | 168.4 | -166.9 | 168.4 | - |
| 166.9                 |                 |              |                             |           |       |        |       |   |
| OPER                  | 279.4           | -279.4       | 279.4                       | -279.4    | 280.7 | -278.1 | 280.7 | - |
| 278.1                 |                 |              |                             |           |       |        |       |   |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Truck<br>Veh. | Live Load Moment<br>w/imp. | Loc. of Ax.<br>w/o imp. | Front<br>Wheel | Lane<br>Dis. | Live Load Moment<br>w/imp. | Loc. of Conc.<br>w/o imp. | Load 1 | Load 2 |
|--------------|---------------|----------------------------|-------------------------|----------------|--------------|----------------------------|---------------------------|--------|--------|
| INV.         | HS20          | 59.43 L                    | 45.72                   | 67.00          | 0.0          | 45.27                      | 34.83                     | 95.00  |        |
|              |               | -45.75 R                   | -35.19                  | 133.00         | 0.0          | -35.40                     | -27.23                    | 110.00 | 160.00 |
| OPER         | 5C1T          | 55.13 L                    | 42.41                   | -43.00         | 0.0          | 0.00                       | 0.00                      | 0.00   |        |
|              |               | -42.81 R                   | -32.93                  | 209.00         | 0.0          | 0.00                       | 0.00                      | 0.00   | 0.00   |

## Serviceability

| Rating<br>Veh. | Rating    |              | Factor    |              | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|-----------|--------------|-----------|--------------|-----------------|----------------------------|
|                | top fiber | bottom fiber | top fiber | bottom fiber |                 |                            |
|                | +bend     | -bend        | +bend     | -bend        |                 |                            |
| HS20           | 2.83      | 3.65         | 2.83      | 3.65         | HS 56.67        | 102.0                      |
| 5C1T           | 5.09      | 6.50         | 5.09      | 6.50         | 0.00            | 610.9                      |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 4.900

|               |                             |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Allowable stress (fs) (psi) |           |         |         |
| RATIO/Inv.    | 0.00                        | 0.00      | 0.00    | 0.00    |
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

|                |           |       |      |      |       |       |      |      |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

|                         |                  |                       |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

|               |          |              |       |                   |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

|                  |                  |             |       |                 |
|------------------|------------------|-------------|-------|-----------------|
| Section Modulus  |                  |             |       | Plastic Section |
| Positive Bending | Negative Bending | Modulus - Z |       |                 |
| Top              | Bott.            | Top         | Bott. | (Fy * Z)        |
| 127.0            | 127.0            | 127.0       | 127.0 | 390.83          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 4.900

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.86 | 28.67 | 28.67 | 1.699 | 999999.000 | 93.065 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 22.99 |        | 105.2                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 4.900

Dead Load Moment      Superimposed Dead Load Moment  
-1.5                      -16.3

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 191.0                       | -150.5                | 171.8              | -169.7                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 318.4                       | -250.9                | 286.4              | -282.9                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.20 L      | 12.46              | 69.50  | 0.0                 | 25.27    | 19.44       | 97.50              |        |                |              |
|           |           | -58.98 L     | -45.37             | 91.00  | 0.0                 | -54.00   | -41.54      | 110.00             |        | 87.50          |              |
| OPER      | 5C1T      | 30.01 L      | 23.09              | -40.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -50.24 R     | -38.65             | 211.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 7.56               | 2.55                         | 6.80            | 2.88                  | HS 51.05     | 91.9                 |
| 5C1T        | 10.61              | 4.99                         | 9.54            | 5.63                  | 0.00         | 599.2                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 4.900

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.6      | -6.9         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -65.3                  | 74.3         |
| OPER      | 151.3             | -108.8                 | 123.9        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -30.11                | 3.11 | -23.17   | 2.39 | -23.76               | 3.21 | -18.28   | 2.47 |
| OPER      | 5C1T      | -23.37                | 3.61 | -17.98   | 2.78 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 2.17       | 23.13      | HS 43.37     | 78.1                 |
| 5C1T   | 4.66       | 34.33      | 0.00         | 558.9                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 4.900

Dead Load Moment      Superimposed Dead Load Moment  
-1.5                      -16.3

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 157.0      | 160.5           | -174.7 | 160.5        | -174.7 | 178.3                       | -157.0 | 178.3     | - |
| OPER 261.6      | 279.4           | -279.4 | 279.4        | -279.4 | 297.2                       | -261.6 | 297.2     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 16.20 L                 | 12.46           | 69.50                   | 0.0       | 25.27                   | 19.44           | 97.50                |        |
|           |            | -58.98 L                | -45.37          | 91.00                   | 0.0       | -54.00                  | -41.54          | 110.00               | 87.50  |
| OPER      | 5C1T       | 30.01 L                 | 23.09           | -40.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -50.24 R                | -38.65          | 211.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 7.06            | 2.66            | 7.06               | 2.66               | HS 53.24     | 95.8                 |
| 5C1T        | 9.90            | 5.21            | 9.90               | 5.21               | 0.00         | 624.9                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 5.000

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 127.0           | 127.0         | 127.0        | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 5.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.86 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 93.065     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 22.99 |        | 105.2                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 5.000

Dead Load Moment      Superimposed Dead Load Moment  
-3.2                      -35.7

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 203.7                       | -137.8                | 184.5              | -157.0                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 339.6                       | -229.7                | 307.6              | -261.7                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.42 R      | 12.63              | 158.00 | 0.0                 | 16.69    | 12.84       | 135.00             |        |                |              |
|           |           | -98.55 L     | -75.81             | 79.50  | 0.0                 | -90.47   | -69.59      | 110.00             | 90.00  |                |              |
| OPER      | 5C1T      | 12.72 R      | 9.78               | 360.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -63.99 R     | -49.22             | 218.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 12.21              | 1.40                         | 11.06                              | 1.59         | HS 27.97             |
| 5C1T        | 26.70              | 3.59                         | 24.18                              | 4.09         | 0.00                 |

## SHEAR RATING REPORT

Rating Types and Vehicles  
 INV. OPER POST SPEC

Structure I. D. HAM500

Member I. D. S03  
 Check Point I. D. 5.000

HS20 5C1T

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.6      | -0.8      | -6.9                   | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I |       |
|-----------|-------------------|-----------------------------|-------|
|           |                   | (-)                         | (+)   |
| INV.      | 90.8              | -64.2                       | 64.2  |
| OPER      | 151.3             | -107.0                      | 106.9 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -30.11                | 34.53 | -23.17   | 26.56 | -23.76               | 26.34 | -18.28   | 20.26 |
| OPER      | 5C1T      | -23.37                | 26.26 | -17.98   | 20.20 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.86       | 1.86       | HS 37.17     | 66.9                 |
| 5C1T   | 4.08       | 4.07       | 0.00         | 488.7                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 5.000

Dead Load Moment      Superimposed Dead Load Moment  
-3.2                      -35.7

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 144.3      | 152.1           | -183.2 | 152.1        | -183.2 | 191.0                       | -144.3 | 191.0     | - |
| OPER 240.5      | 279.4           | -279.4 | 279.4        | -279.4 | 318.3                       | -240.5 | 318.3     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 16.42 R                 | 12.63           | 158.00                  | 0.0       | 16.69                   | 12.84           | 135.00               |        |
|           |            | -98.55 L                | -75.81          | 79.50                   | 0.0       | -90.47                  | -69.59          | 110.00               | 90.00  |
| OPER      | 5C1T       | 12.72 R                 | 9.78            | 360.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -63.99 R                | -49.22          | 218.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 11.44           | 1.46  | 11.44        | 1.46  | HS 29.28     | 52.7                 |
| 5C1T        | 25.03           | 3.76  | 25.03        | 3.76  | 0.00         | 451.0                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 5.000

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |               |                      |               | Plastic Section Modulus - Z |
|----------------------|---------------|----------------------|---------------|-----------------------------|
| Positive Bending Top | Bending Bott. | Negative Bending Top | Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0         | 127.0                | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 5.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.86 | 28.67 | 28.67 | 1.699 | 999999.000 | 93.053 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 22.99 |        | 105.2                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 5.000

Dead Load Superimposed Dead Load  
Moment Moment  
-3.2 -35.7

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 203.7                       | -137.8                | 184.5              | -157.0                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 339.6                       | -229.7                | 307.6              | -261.7                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.42 R      | 12.63              | 158.00 | 0.0                 | 16.69    | 12.84       | 135.00             |        |                |              |
|           |           | -98.55 L     | -75.81             | 79.50  | 0.0                 | -90.47   | -69.59      | 110.00             | 90.00  |                |              |
| OPER      | 5C1T      | 12.72 R      | 9.78               | 360.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -63.99 R     | -49.22             | 218.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 12.21              | 1.40                         | 11.06           | 1.59                  | HS 27.97     | 50.3                 |
| 5C1T        | 26.70              | 3.59                         | 24.18           | 4.09                  | 0.00         | 430.8                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 5.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.8      | 0.8       | -8.6                   | 8.6       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I |       |
|-----------|-------------------|-----------------------------|-------|
|           |                   | (-)                         | (+)   |
| INV.      | 90.8              | -64.2                       | 64.2  |
| OPER      | 151.3             | -107.0                      | 106.9 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -34.53                | 34.53 | -26.56   | 26.56 | -26.33               | 26.34 | -20.25   | 20.26 |
| OPER      | 5C1T      | -26.23                | 26.26 | -20.18   | 20.20 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.86       | 1.86       | HS 37.17     | 66.9                 |
| 5C1T   | 4.08       | 4.07       | 0.00         | 488.7                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 5.000

Dead Load Moment      Superimposed Dead Load Moment  
-3.2                      -35.7

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 144.3      | 152.1           | -183.2 | 152.1        | -183.2 | 191.0                       | -144.3 | 191.0     | - |
| OPER 240.5      | 279.4           | -279.4 | 279.4        | -279.4 | 318.3                       | -240.5 | 318.3     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 16.42 R                 | 12.63                | 158.00      | 0.0       | 16.69                   | 12.84                  | 135.00 |        |
|           |            | -98.55 L                | -75.81               | 79.50       | 0.0       | -90.47                  | -69.59                 | 110.00 | 90.00  |
| OPER      | 5C1T       | 12.72 R                 | 9.78                 | 360.00      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -63.99 R                | -49.22               | 218.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 11.44           | 1.46            | 11.44              | 1.46               | HS 29.28     | 52.7                 |
| 5C1T        | 25.03           | 3.76            | 25.03              | 3.76               | 0.00         | 451.0                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 5.100

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 5.100

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.86 | 28.67 | 28.67 | 1.699 | 999999.000 | 93.053 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 22.99 |        | 105.2                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 5.100

Dead Load Superimposed Dead Load  
Moment Moment  
-1.5 -16.2

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 191.0                       | -150.6                | 171.8              | -169.8                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 318.3                       | -251.0                | 286.3              | -282.9                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.20 R      | 12.46              | 130.50 | 0.0                 | 25.71    | 19.77       | 102.50             |        |                |              |
|           |           | -58.98 R     | -45.37             | 109.00 | 0.0                 | -54.00   | -41.54      | 90.00              | 112.50 |                |              |
| OPER      | 5C1T      | 30.00 R      | 23.08              | 240.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -50.21 L     | -38.62             | -11.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 7.43               | 2.55                         | 6.68                               | 2.88         | HS 51.06 91.9        |
| 5C1T        | 10.61              | 5.00                         | 9.55                               | 5.64         | 0.00 599.8           |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 5.100

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear     | (-) Shear (+) Shear    |
| 0.6       | 0.0 6.9                |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 90.8              | -74.4                           | 65.3  |
| OPER      | 151.3             | -123.9                          | 108.8 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -2.98                 | 30.12 | -2.29    | 23.17 | -3.21                | 23.77 | -2.47    | 18.29 |
| OPER      | 5C1T      | -3.58                 | 23.41 | -2.76    | 18.01 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 23.15      | 2.17       | HS 43.36     | 78.0                 |
| 5C1T   | 34.57      | 4.65       | 0.00         | 557.8                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 5.100

Dead Load Moment      Superimposed Dead Load Moment  
-1.5                      -16.2

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 157.0      | 160.6           | -174.7 | 160.6        | -174.7 | 178.3                       | -157.0 | 178.3     | - |
| OPER 261.7      | 279.4           | -279.4 | 279.4        | -279.4 | 297.1                       | -261.7 | 297.1     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 16.20 R                 | 12.46           | 130.50                  | 0.0       | 25.71                   | 19.77           | 102.50               |        |
|           |            | -58.98 R                | -45.37          | 109.00                  | 0.0       | -54.00                  | -41.54          | 90.00                | 112.50 |
| OPER      | 5C1T       | 30.00 R                 | 23.08           | 240.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -50.21 L                | -38.62          | -11.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 6.93            | 2.66  | 6.93         | 2.66  | HS 53.25     | 95.9                 |
| 5C1T        | 9.90            | 5.21  | 9.90         | 5.21  | 0.00         | 625.5                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 5.200

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 127.0           | 127.0         | 127.0        | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 5.200

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.86 | 28.67 | 28.67 | 1.699 | 999999.000 | 93.053 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 22.99 |        | 105.2                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 5.200

Dead Load Moment      Superimposed Dead Load Moment  
-0.1                      -1.0

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 181.1                       | -160.5                | 161.9              | -179.7                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 301.8                       | -267.5                | 269.8              | -299.5                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 59.43 R      | 45.72              | 133.00 | 0.0                 | 44.77    | 34.44       | 105.00             |        |                |              |
|           |           | -45.75 L     | -35.19             | 67.00  | 0.0                 | -35.33   | -27.18      | 90.00              | 40.00  |                |              |
| OPER      | 5C1T      | 55.14 R      | 42.42              | 243.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -42.63 L     | -32.79             | -9.00  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 3.05               | 3.51                         | 2.72            | 3.93                  | HS 54.48     | 98.1                 |
| 5C1T        | 5.47               | 6.28                         | 4.89            | 7.03                  | 0.00         | 587.1                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 5.200

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.5       | 0.0          | 5.2       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -73.2                  | 66.4         |
| OPER      | 151.3             | -122.1                 | 110.7        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -2.98                 | 25.40 | -2.29    | 19.54 | -4.46                | 20.96 | -3.43    | 16.12 |
| OPER      | 5C1T      | -5.28                 | 20.33 | -4.06    | 15.64 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 16.43      | 2.62       | HS 52.30     | 94.1                 |
| 5C1T   | 23.11      | 5.45       | 0.00         | 653.4                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 5.200

Dead Load Moment      Superimposed Dead Load Moment  
-0.1                      -1.0

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 167.0      | 167.2           | -168.1 | 167.2        | -168.1 | 168.3                       | -167.0 | 168.3     | - |
| OPER 278.3      | 279.4           | -279.4 | 279.4        | -279.4 | 280.5                       | -278.3 | 280.5     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 59.43 R                 | 45.72                | 133.00      | 0.0       | 44.77                   | 34.44                  | 105.00 |        |
|           |            | -45.75 L                | -35.19               | 67.00       | 0.0       | -35.33                  | -27.18                 | 90.00  | 40.00  |
| OPER      | 5C1T       | 55.14 R                 | 42.42                | 243.00      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -42.63 L                | -32.79               | -9.00       | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 2.83            | 3.65            | 2.83               | 3.65               | HS 56.65     | 102.0                |
| 5C1T        | 5.09            | 6.53            | 5.09               | 6.53               | 0.00         | 610.5                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 5.300

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 5.300

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.86 | 28.67 | 28.67 | 1.699 | 999999.000 | 93.053 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 22.99 |        | 105.2                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 5.300

Dead Load Moment 0.9  
Superimposed Dead Load Moment 9.9

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 174.0                       | -167.6             | 154.8           | -186.8             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 289.9                       | -279.4             | 257.9           | -311.3             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 86.48 R      | 66.52              | 135.50 | 0.0                 | 65.23    | 50.17       | 107.50             |        |                |              |
|           |           | -37.98 L     | -29.21             | 67.00  | 0.0                 | -29.90   | -23.00      | 90.00              | 0.00   |                |              |
| OPER      | 5C1T      | 74.87 R      | 57.59              | 158.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -38.20 L     | -29.39             | -95.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber +bend | bottom fiber -bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|--------|--------------|----------------------|
| HS20        | 2.01            | 4.41               | 1.79   | 35.79        | 64.4                 |
| 5C1T        | 3.87            | 7.31               | 3.44   | 0.00         | 413.4                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 5.300

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.3       | 0.0          | 3.5       |

| Rat. | Shear Capacity | Available Capacity for LL+I |
|------|----------------|-----------------------------|
| Veh. | VU             | (-) (+)                     |
| INV. | 90.8           | -72.1 67.5                  |
| OPER | 151.3          | -120.2 112.6                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. | Rat. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|------|------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|      |      | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
| Typ. | Veh. | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV. | HS20 | -4.41                 | 20.57 | -3.40    | 15.82 | -6.73                | 18.01 | -5.18    | 13.86 |
| OPER | 5C1T | -7.23                 | 17.18 | -5.56    | 13.22 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 10.71      | 3.28       | HS 65.68     | 118.2                |
| 5C1T   | 16.62      | 6.55       | 0.00         | 786.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 5.300Dead Load Moment 0.9  
Superimposed Dead Load Moment 9.9

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 174.1      | 171.9           | -163.4 | 171.9        | -163.4 | 161.2                       | -174.1 | 161.2     | - |
| OPER 290.1      | 279.4           | -279.4 | 279.4        | -279.4 | 268.7                       | -290.1 | 268.7     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Live Load Moment w/o imp. | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-------------------------|---------------------------|-----------|-------------------------|----------------------|--------|
| INV.      | HS20       | 86.48 R                 | 66.52                   | 135.50                    | 0.0       | 65.23                   | 50.17                | 107.50 |
|           |            | -37.98 L                | -29.21                  | 67.00                     | 0.0       | -29.90                  | -23.00               | 90.00  |
| OPER      | 5C1T       | 74.87 R                 | 57.59                   | 158.50                    | 0.0       | 0.00                    | 0.00                 | 0.00   |
|           |            | -38.20 L                | -29.39                  | -95.00                    | 0.0       | 0.00                    | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.86            | 4.58            | 1.86               | 4.58               | HS 37.28     | 67.1                 |
| 5C1T        | 3.59            | 7.59            | 3.59               | 7.59               | 0.00         | 430.6                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 5.400

|               |                             |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Allowable stress (fs) (psi) |           |         |         |
| RATIO/Inv.    | 0.00                        | 0.00      | 0.00    | 0.00    |
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

|                |           |       |      |      |       |       |      |      |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

|                         |                  |                       |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

|               |          |              |       |                   |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

|                  |                  |             |       |                 |
|------------------|------------------|-------------|-------|-----------------|
| Section Modulus  |                  |             |       | Plastic Section |
| Positive Bending | Negative Bending | Modulus - Z |       |                 |
| Top              | Bott.            | Top         | Bott. | (Fy * Z)        |
| 127.0            | 127.0            | 127.0       | 127.0 | 390.83          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 5.400

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.86 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 93.053     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 22.99 |        | 105.2                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 5.400

Dead Load Moment      Superimposed Dead Load Moment  
1.4                      16.4

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 169.7                       | -171.9                | 150.5              | -191.1                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 282.8                       | -286.5                | 250.8              | -318.5                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 97.01 R      | 74.62              | 138.00 | 0.0                 | 77.50    | 59.62       | 110.00             |        |                |              |
|           |           | -30.21 L     | -23.24             | 67.00  | 0.0                 | -26.32   | -20.25      | 90.00              | 0.00   |                |              |
| OPER      | 5C1T      | 86.98 R      | 66.91              | 296.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -35.20 L     | -27.08             | -93.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|--------|--------------|----------------------|
| HS20        | 1.75               | 5.69                         | 1.55   | 31.02        | 55.8                 |
| 5C1T        | 3.25               | 8.14                         | 2.88   | 0.00         | 346.0                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 5.400

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.2       | 0.0          | 1.8       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -71.0                  | 68.7                  |
| OPER      | 151.3             | -118.3                 | 114.4                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -8.97                 | 16.78 | -6.90    | 12.91 | -9.30                | 15.03 | -7.16    | 11.56 |
| OPER      | 5C1T      | -9.38                 | 14.13 | -7.22    | 10.87 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 7.63       | 4.09       | HS 81.85     | 147.3                |  |
| 5C1T   | 12.61      | 8.10       | 0.00         | 972.0                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 5.400

Dead Load Moment 1.4  
Superimposed Dead Load Moment 16.4

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 178.4      | 174.8           | -160.5 | 174.8        | -160.5 | 156.9                       | -178.4 | 156.9     | - |
| OPER 297.3      | 279.4           | -279.4 | 279.4        | -279.4 | 261.5                       | -297.3 | 261.5     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 97.01 R                 | 74.62                | 138.00      | 0.0       | 77.50                   | 59.62                  | 110.00 |        |
|           |            | -30.21 L                | -23.24               | 67.00       | 0.0       | -26.32                  | -20.25                 | 90.00  | 0.00   |
| OPER      | 5C1T       | 86.98 R                 | 66.91                | 296.00      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -35.20 L                | -27.08               | -93.50      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.62            | 5.91  | 1.62         | 5.91  | HS 32.35     | 58.2                 |
| 5C1T        | 3.01            | 8.45  | 3.01         | 8.45  | 0.00         | 360.8                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 5.500

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 5.500

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.86 | 28.67 | 28.67 | 1.699 | 999999.000 | 93.053 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 23.44 |        | 105.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 5.500

Dead Load Moment 1.6  
Superimposed Dead Load Moment 18.7

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 168.2                       | -173.4             | 149.0           | -192.6             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 280.3                       | -289.0             | 248.3           | -321.0             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 94.68 L      | 72.83              | 98.50  | 0.0                 | 82.35    | 63.34       | 112.50             |        |                |              |
|           |           | -22.43 R     | -17.26             | 158.00 | 0.0                 | -22.73   | -17.49      | 135.00             | 0.00   |                |              |
| OPER      | 5C1T      | 89.96 L      | 69.20              | -73.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -34.25 L     | -26.34             | 40.50  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | Rating Factor   |                    | Load Capacity (tons) |                    | Rating Value |
|-------------|-----------------|--------------------|----------------------|--------------------|--------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend      | bottom fiber -bend |              |
| HS20        | 1.78            | 7.63               | 1.57                 | 8.47               | HS 31.47     |
| 5C1T        | 3.12            | 8.44               | 2.76                 | 9.37               | 0.00 331.2   |

## SHEAR RATING REPORT

Rating Types and Vehicles  
 INV. OPER POST SPEC  
 Structure I. D. HAM500  
 Member I. D. S03  
 Check Point I. D. 5.500  
 HS20 5C1T

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| 0.0       | 0.0                    |
|           | 0.1                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -69.9                  | 69.8                  |
| OPER      | 151.3             | -116.4                 | 116.3                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |            |              |              | Lane Live Load Shear |            |              |              |
|-----------|-----------|-----------------------|------------|--------------|--------------|----------------------|------------|--------------|--------------|
|           |           | w/imp. (-)            | w/imp. (+) | w/o imp. (-) | w/o imp. (+) | w/imp. (-)           | w/imp. (+) | w/o imp. (-) | w/o imp. (+) |
| INV.      | HS20      | -13.12                | 13.12      | -10.10       | 10.10        | -12.10               | 12.09      | -9.31        | 9.30         |
| OPER      | 5C1T      | -11.66                | 11.65      | -8.97        | 8.96         | 0.00                 | 0.00       | 0.00         | 0.00         |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 5.32       | 5.32       | HS 106.35    | 191.4                |
| 5C1T   | 9.98       | 9.99       | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 5.500

Dead Load Moment 1.6  
Superimposed Dead Load Moment 18.7

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 179.9      | 175.8           | -159.5 | 175.8        | -159.5 | 155.4                       | -179.9 | 155.4     | - |
| OPER 299.8      | 279.4           | -279.4 | 279.4        | -279.4 | 259.0                       | -299.8 | 259.0     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 94.68 L                 | 72.83                | 98.50       | 0.0       | 82.35                   | 63.34                  | 112.50 |        |
|           |            | -22.43 R                | -17.26               | 158.00      | 0.0       | -22.73                  | -17.49                 | 135.00 | 0.00   |
| OPER      | 5C1T       | 89.96 L                 | 69.20                | -73.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -34.25 L                | -26.34               | 40.50       | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.64            | 7.91  | 1.64         | 7.91  | HS 32.83     | 59.1                 |
| 5C1T        | 2.88            | 8.75  | 2.88         | 8.75  | 0.00         | 345.6                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 5.600

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 5.600

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.86 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 93.168     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 23.44 |        | 105.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 5.600

Dead Load Moment 1.4  
Superimposed Dead Load Moment 16.4

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 169.7                       | -171.9             | 150.5           | -191.1             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 282.8                       | -286.5             | 250.8           | -318.5             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 97.01 L      | 74.62              | 87.00  | 0.0                 | 77.49    | 59.61       | 115.00             |        |                |              |
|           |           | -30.21 R     | -23.24             | 158.00 | 0.0                 | -26.34   | -20.27      | 135.00             | 0.00   |                |              |
| OPER      | 5C1T      | 87.02 L      | 66.94              | -71.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -35.34 R     | -27.19             | 318.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 1.75            | 5.69                      | 1.55                      | 6.32               | HS 31.03     | 55.9                 |
| 5C1T        | 3.25            | 8.11                      | 2.88                      | 9.01               | 0.00         | 345.9                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 5.600

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.2      | -1.8         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -68.7                  | 71.0                  |
| OPER      | 151.3             | -114.4                 | 118.3                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -16.78                | 8.97 | -12.91   | 6.90 | -15.03               | 9.29 | -11.56   | 7.15 |
| OPER      | 5C1T      | -14.15                | 9.37 | -10.88   | 7.20 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 4.09       | 7.64       | HS 81.83     | 147.3                |
| 5C1T   | 8.09       | 12.63      | 0.00         | 970.5                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 5.600Dead Load Moment 1.4  
Superimposed Dead Load Moment 16.4

| Rating Veh. ber | Moment Capacity top fiber |        | Moment Capacity bottom fiber |        | Available Capacity for LL+I |        |           |   |
|-----------------|---------------------------|--------|------------------------------|--------|-----------------------------|--------|-----------|---|
|                 | +bend                     | -bend  | +bend                        | -bend  | top fiber                   | -bend  | bottom fi |   |
| INV. 178.3      | 174.8                     | -160.5 | 174.8                        | -160.5 | 157.0                       | -178.3 | 157.0     | - |
| OPER 297.2      | 279.4                     | -279.4 | 279.4                        | -279.4 | 261.6                       | -297.2 | 261.6     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |        |        |      |
|-----------|------------|-------------------------|-------------------------|------------------------------|----------------------|--------|--------|--------|------|
| INV.      | HS20       | 97.01 L                 | 74.62                   | 87.00                        | 0.0                  | 77.49  | 59.61  | 115.00 |      |
|           |            | -30.21 R                | -23.24                  | 158.00                       | 0.0                  | -26.34 | -20.27 | 135.00 | 0.00 |
| OPER      | 5C1T       | 87.02 L                 | 66.94                   | -71.00                       | 0.0                  | 0.00   | 0.00   | 0.00   |      |
|           |            | -35.34 R                | -27.19                  | 318.50                       | 0.0                  | 0.00   | 0.00   | 0.00   | 0.00 |

## Serviceability

| Rating Veh. | Rating top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | Factor bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|------------------------|---------------------------|---------------------------|---------------------------|--------------|----------------------|
| HS20        | 1.62                   | 5.90                      | 1.62                      | 5.90                      | HS 32.36     | 58.2                 |
| 5C1T        | 3.01                   | 8.41                      | 3.01                      | 8.41                      | 0.00         | 360.7                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 5.700

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 5.700

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.86 | 28.67 | 28.67 | 1.699 | 999999.000 | 93.168 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 23.44 |        | 105.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 5.700

Dead Load Moment 0.8  
Superimposed Dead Load Moment 9.7

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 174.0                       | -167.5             | 154.8           | -186.7             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 290.1                       | -279.2             | 258.1           | -311.2             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 86.48 L      | 66.52              | 89.50  | 0.0                 | 65.20    | 50.15       | 117.50             |        |                |              |
|           |           | -37.98 R     | -29.21             | 158.00 | 0.0                 | -29.95   | -23.04      | 135.00             | 0.00   |                |              |
| OPER      | 5C1T      | 74.81 L      | 57.55              | 66.50  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -38.38 R     | -29.52             | 320.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | bottom fiber -bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|--------|--------------|----------------------|
| HS20        | 2.01            | 4.41               | 1.79   | 35.81        | 64.5                 |
| 5C1T        | 3.88            | 7.28               | 3.45   | 0.00         | 414.0                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 5.700

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| -0.3      | -3.5                   |
|           | 0.0                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 90.8              | -67.5                           | 72.1  |
| OPER      | 151.3             | -112.5                          | 120.2 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |              |      | Lane Live Load Shear |      |              |      |
|-----------|-----------|-----------------------|------|--------------|------|----------------------|------|--------------|------|
|           |           | w/imp. (-)            | (+)  | w/o imp. (-) | (+)  | w/imp. (-)           | (+)  | w/o imp. (-) | (+)  |
| INV.      | HS20      | -20.57                | 4.41 | -15.82       | 3.40 | -18.02               | 6.72 | -13.86       | 5.17 |
| OPER      | 5C1T      | -17.20                | 7.22 | -13.23       | 5.55 | 0.00                 | 0.00 | 0.00         | 0.00 |

| Rating |            | Shear      |                      |
|--------|------------|------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value         |
| HS20   | 3.28       | 10.73      | HS 65.66             |
| 5C1T   | 6.54       | 16.65      | 0.00                 |
|        |            |            | Load Capacity (tons) |
|        |            |            | 118.2                |
|        |            |            | 785.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 5.700Dead Load Moment 0.8  
Superimposed Dead Load Moment 9.7

| Rating Veh. ber | Moment Capacity top fiber |        | Moment Capacity bottom fiber |        | Available Capacity for LL+I |        |           |   |
|-----------------|---------------------------|--------|------------------------------|--------|-----------------------------|--------|-----------|---|
|                 | +bend                     | -bend  | +bend                        | -bend  | top fiber                   |        | bottom fi |   |
| INV. 174.0      | 171.9                     | -163.4 | 171.9                        | -163.4 | 161.3                       | -174.0 | 161.3     | - |
| OPER 290.0      | 279.4                     | -279.4 | 279.4                        | -279.4 | 268.8                       | -290.0 | 268.8     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Live Load Moment w/o imp. | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-------------------------|---------------------------|-----------|-------------------------|----------------------|--------|
| INV.      | HS20       | 86.48 L                 | 66.52                   | 89.50                     | 0.0       | 65.20                   | 50.15                | 117.50 |
|           |            | -37.98 R                | -29.21                  | 158.00                    | 0.0       | -29.95                  | -23.04               | 135.00 |
| OPER      | 5C1T       | 74.81 L                 | 57.55                   | 66.50                     | 0.0       | 0.00                    | 0.00                 | 0.00   |
|           |            | -38.38 R                | -29.52                  | 320.00                    | 0.0       | 0.00                    | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor top fiber |       | Rating Factor bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-------------------------|-------|----------------------------|-------|--------------|----------------------|
|             | +bend                   | -bend | +bend                      | -bend |              |                      |
| HS20        | 1.87                    | 4.58  | 1.87                       | 4.58  | HS 37.30     | 67.1                 |
| 5C1T        | 3.59                    | 7.55  | 3.59                       | 7.55  | 0.00         | 431.2                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 5.800

|               |                             |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Allowable stress (fs) (psi) |           |         |         |
| RATIO/Inv.    | 0.00                        | 0.00      | 0.00    | 0.00    |
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

|                |           |       |      |      |       |       |      |      |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

|                         |                  |                       |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

|               |          |              |       |                   |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

|                  |                  |             |       |                 |
|------------------|------------------|-------------|-------|-----------------|
| Section Modulus  |                  |             |       | Plastic Section |
| Positive Bending | Negative Bending | Modulus - Z |       |                 |
| Top              | Bott.            | Top         | Bott. | (Fy * Z)        |
| 127.0            | 127.0            | 127.0       | 127.0 | 390.83          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 5.800

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.86 | 28.67 | 28.67 | 1.699 | 999999.000 | 93.168 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 23.44 |        | 105.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 5.800

Dead Load Moment      Superimposed Dead Load Moment  
-0.1                      -1.2

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 181.2                       | -160.4                | 162.0              | -179.6                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 302.0                       | -267.3                | 270.0              | -299.3                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 59.43 L      | 45.72              | 92.00  | 0.0                 | 45.25    | 34.81       | 120.00             |        |                |              |
|           |           | -45.75 R     | -35.19             | 158.00 | 0.0                 | -35.42   | -27.24      | 135.00             |        | 185.00         |              |
| OPER      | 5C1T      | 55.12 L      | 42.40              | -18.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -42.84 R     | -32.95             | 234.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 3.05               | 3.51                         | 2.73                               | 3.92         | HS 54.51 98.1        |
| 5C1T        | 5.48               | 6.24                         | 4.90                               | 6.99         | 0.00 587.8           |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 5.800

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.5      | -5.2         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -66.4                  | 73.2         |
| OPER      | 151.3             | -110.7                 | 122.1        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -25.40                | 2.98 | -19.54   | 2.29 | -20.97               | 4.45 | -16.13   | 3.42 |
| OPER      | 5C1T      | -20.35                | 5.27 | -15.65   | 4.05 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 2.61       | 16.47      | HS 52.29     | 94.1                 |  |
| 5C1T   | 5.44       | 23.18      | 0.00         | 652.7                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 5.800

Dead Load Moment      Superimposed Dead Load Moment  
-0.1                      -1.2

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 166.8      | 167.1           | -168.2 | 167.1        | -168.2 | 168.4                       | -166.8 | 168.4     | - |
| OPER 278.1      | 279.4           | -279.4 | 279.4        | -279.4 | 280.7                       | -278.1 | 280.7     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|------------------|-----------------|-------------------------|-----------|------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 59.43 L          | 45.72           | 92.00                   | 0.0       | 45.25            | 34.81           | 120.00               |        |
|           |            | -45.75 R         | -35.19          | 158.00                  | 0.0       | -35.42           | -27.24          | 135.00               | 185.00 |
| OPER      | 5C1T       | 55.12 L          | 42.40           | -18.00                  | 0.0       | 0.00             | 0.00            | 0.00                 |        |
|           |            | -42.84 R         | -32.95          | 234.00                  | 0.0       | 0.00             | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 2.83            | 3.65            | 2.83               | 3.65               | HS 56.68     | 102.0                |
| 5C1T        | 5.09            | 6.49            | 5.09               | 6.49               | 0.00         | 611.2                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 5.900

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 127.0           | 127.0         | 127.0        | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 5.900

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.86 | 28.67 | 28.67 | 1.699 | 999999.000 | 93.168 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 23.44 |        | 105.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 5.900

|                     |                                  |
|---------------------|----------------------------------|
| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
| -1.5                | -16.4                            |

| Rating<br>Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|----------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|                | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.           | 180.4C             | -161.2                | 161.2              | -180.4C               | 191.1                       | -150.4                | 172.0              | -169.6                |
| OPER           | 300.6C             | -268.7                | 268.7              | -300.6C               | 318.6                       | -250.7                | 286.6              | -282.7                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Rat.<br>Veh. | Truck<br>w/imp. | Live Load<br>w/o imp. | Moment | Loc. of<br>Front<br>Wheel | Ax.<br>Dis. | Lane<br>w/imp. | Live Load<br>w/o imp. | Moment | Loc. of<br>Load 1 | Conc.<br>Load 2 |
|--------------|--------------|-----------------|-----------------------|--------|---------------------------|-------------|----------------|-----------------------|--------|-------------------|-----------------|
| INV.         | HS20         | 16.20 L         | 12.46                 | 94.50  | 0.0                       | 25.22       | 19.40          | 122.50                |        |                   |                 |
|              |              | -58.98 L        | -45.37                | 116.00 | 0.0                       | -54.07      | -41.59         | 135.00                | 112.50 |                   |                 |
| OPER         | 5C1T         | 29.91 L         | 23.01                 | -15.50 | 0.0                       | 0.00        | 0.00           | 0.00                  |        |                   |                 |
|              |              | -50.42 R        | -38.78                | 236.50 | 0.0                       | 0.00        | 0.00           | 0.00                  | 0.00   |                   |                 |

## Moment

| Rating<br>Veh. | top fiber<br>+bend | Rating<br>bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------------|---------------------------------|-----------------|-----------------------|-----------------|----------------------------|
| HS20           | 7.58               | 2.55                            | 6.82            | 2.88                  | HS 51.01        | 91.8                       |
| 5C1T           | 10.65              | 4.97                            | 9.58            | 5.61                  | 0.00            | 596.7                      |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 5.900

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.6      | -7.0         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -65.3                  | 74.4                  |
| OPER      | 151.3             | -108.8                 | 124.0                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -30.12                | 3.11 | -23.17   | 2.39 | -23.78               | 3.20 | -18.29   | 2.46 |
| OPER      | 5C1T      | -23.42                | 3.57 | -18.02   | 2.74 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 2.17       | 23.21      | HS 43.35     | 78.0                 |
| 5C1T   | 4.64       | 34.75      | 0.00         | 557.4                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 5.900

Dead Load Moment      Superimposed Dead Load Moment  
-1.5                      -16.4

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 156.9      | 160.5           | -174.8 | 160.5        | -174.8 | 178.4                       | -156.9 | 178.4     | - |
| OPER 261.5      | 279.4           | -279.4 | 279.4        | -279.4 | 297.3                       | -261.5 | 297.3     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 16.20 L                 | 12.46           | 94.50                   | 0.0       | 25.22                   | 19.40           | 122.50               |        |
|           |            | -58.98 L                | -45.37          | 116.00                  | 0.0       | -54.07                  | -41.59          | 135.00               | 112.50 |
| OPER      | 5C1T       | 29.91 L                 | 23.01           | -15.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -50.42 R                | -38.78          | 236.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 7.07            | 2.66  | 7.07         | 2.66  | HS 53.20     | 95.8                 |
| 5C1T        | 9.94            | 5.19  | 9.94         | 5.19  | 0.00         | 622.3                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 6.000

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 127.0           | 127.0         | 127.0        | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 6.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.86 | 28.67 | 28.67 | 1.699 | 999999.000 | 93.168 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 23.44 |        | 105.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 6.000

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -3.3                | -36.0                            |

| Rating<br>Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|----------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|                | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.           | 180.4C             | -161.2                | 161.2              | -180.4C               | 203.9                       | -137.7                | 184.7              | -156.8                |
| OPER           | 300.6C             | -268.7                | 268.7              | -300.6C               | 339.9                       | -229.4                | 307.9              | -261.4                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Rat.<br>Veh. | Truck Live<br>w/imp. | Load Moment<br>w/o imp. | Loc. of<br>Front<br>Wheel | Ax.<br>Dis. | Lane Live<br>w/imp. | Load Moment<br>w/o imp. | Loc. of<br>Load 1 | Conc.<br>Load 2 |
|--------------|--------------|----------------------|-------------------------|---------------------------|-------------|---------------------|-------------------------|-------------------|-----------------|
| INV.         | HS20         | 16.42 L              | 12.63                   | 67.00                     | 0.0         | 16.62               | 12.78                   | 90.00             |                 |
|              |              | -98.55 R             | -75.81                  | 145.50                    | 0.0         | -90.58              | -69.68                  | 115.00            | 135.00          |
| OPER         | 5C1T         | 12.69 L              | 9.76                    | -135.00                   | 0.0         | 0.00                | 0.00                    | 0.00              |                 |
|              |              | -64.25 L             | -49.42                  | 7.00                      | 0.0         | 0.00                | 0.00                    | 0.00              | 0.00            |

## Moment

| Rating<br>Veh. | top fiber<br>+bend | Rating<br>bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------------|---------------------------------|-----------------|-----------------------|-----------------|----------------------------|
| HS20           | 12.27              | 1.40                            | 11.12           | 1.59                  | HS 27.93        | 50.3                       |
| 5C1T           | 26.78              | 3.57                            | 24.26           | 4.07                  | 0.00            | 428.5                      |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 6.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.6      | -0.8      | -7.0                   | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 90.8              | -64.1                           | 64.1  |
| OPER      | 151.3             | -106.9                          | 106.9 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -30.12                | 34.53 | -23.17   | 26.56 | -23.78               | 26.35 | -18.29   | 20.27 |
| OPER      | 5C1T      | -23.42                | 26.27 | -18.02   | 20.21 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.86       | 1.86       | HS 37.16     | 66.9                 |
| 5C1T   | 4.07       | 4.07       | 0.00         | 488.3                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 6.000

Dead Load Moment      Superimposed Dead Load Moment  
-3.3                      -36.0

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 144.1      | 151.9           | -183.3 | 151.9        | -183.3 | 191.2                       | -144.1 | 191.2     | - |
| OPER 240.2      | 279.4           | -279.4 | 279.4        | -279.4 | 318.6                       | -240.2 | 318.6     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 16.42 L                 | 12.63                | 67.00       | 0.0       | 16.62                   | 12.78                  | 90.00  |        |
|           |            | -98.55 R                | -75.81               | 145.50      | 0.0       | -90.58                  | -69.68                 | 115.00 | 135.00 |
| OPER      | 5C1T       | 12.69 L                 | 9.76                 | -135.00     | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -64.25 L                | -49.42               | 7.00        | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 11.51           | 1.46  | 11.51        | 1.46  | HS 29.24     | 52.6                 |
| 5C1T        | 25.10           | 3.74  | 25.10        | 3.74  | 0.00         | 448.6                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 6.000

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus  |                  |       |       | Plastic Section |
|------------------|------------------|-------|-------|-----------------|
| Positive Bending | Negative Bending |       |       | Modulus - Z     |
| Top              | Bott.            | Top   | Bott. | (Fy * Z)        |
| 127.0            | 127.0            | 127.0 | 127.0 | 390.83          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 6.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.86 | 28.67 | 28.67 | 1.699 | 999999.000 | 93.168 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 23.44 |        | 105.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 6.000

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -3.3                | -36.0                            |

| Rating<br>Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|----------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|                | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.           | 180.4C             | -161.2                | 161.2              | -180.4C               | 203.9                       | -137.7                | 184.7              | -156.8                |
| OPER           | 300.6C             | -268.7                | 268.7              | -300.6C               | 339.9                       | -229.4                | 307.9              | -261.4                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Rat.<br>Veh. | Truck<br>w/imp. | Live Load<br>w/o imp. | Moment  | Loc. of<br>Front<br>Wheel | Ax.<br>Dis. | Lane<br>w/imp. | Live Load<br>w/o imp. | Moment | Loc. of<br>Load 1 | Conc.<br>Load 2 |
|--------------|--------------|-----------------|-----------------------|---------|---------------------------|-------------|----------------|-----------------------|--------|-------------------|-----------------|
| INV.         | HS20         | 16.42 L         | 12.63                 | 67.00   | 0.0                       | 16.62       | 12.78          | 90.00                 |        |                   |                 |
|              |              | -98.55 R        | -75.81                | 145.50  | 0.0                       | -90.58      | -69.68         | 115.00                | 135.00 |                   |                 |
| OPER         | 5C1T         | 12.69 L         | 9.76                  | -135.00 | 0.0                       | 0.00        | 0.00           | 0.00                  |        |                   |                 |
|              |              | -64.25 L        | -49.42                | 7.00    | 0.0                       | 0.00        | 0.00           | 0.00                  | 0.00   |                   |                 |

## Moment

| Rating<br>Veh. | top fiber<br>+bend | Rating<br>bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------------|---------------------------------|-----------------|-----------------------|-----------------|----------------------------|
| HS20           | 12.27              | 1.40                            | 11.12           | 1.59                  | HS 27.93        | 50.3                       |
| 5C1T           | 26.78              | 3.57                            | 24.26           | 4.07                  | 0.00            | 428.5                      |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 6.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.8      | 0.8       | -8.7                   | 8.7       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I |       |
|-----------|-------------------|-----------------------------|-------|
|           |                   | (-)                         | (+)   |
| INV.      | 90.8              | -64.1                       | 64.1  |
| OPER      | 151.3             | -106.9                      | 106.9 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -34.53                | 34.53 | -26.56   | 26.56 | -26.35               | 26.35 | -20.27   | 20.27 |
| OPER      | 5C1T      | -26.27                | 26.27 | -20.21   | 20.21 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.86       | 1.86       | HS 37.16     | 66.9                 |
| 5C1T   | 4.07       | 4.07       | 0.00         | 488.3                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 6.000

Dead Load Moment      Superimposed Dead Load Moment  
-3.3                      -36.0

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 144.1      | 151.9           | -183.3 | 151.9        | -183.3 | 191.2                       | -144.1 | 191.2     | - |
| OPER 240.2      | 279.4           | -279.4 | 279.4        | -279.4 | 318.6                       | -240.2 | 318.6     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 16.42 L                 | 12.63                | 67.00       | 0.0       | 16.62                   | 12.78                  | 90.00  |        |
|           |            | -98.55 R                | -75.81               | 145.50      | 0.0       | -90.58                  | -69.68                 | 115.00 | 135.00 |
| OPER      | 5C1T       | 12.69 L                 | 9.76                 | -135.00     | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -64.25 L                | -49.42               | 7.00        | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 11.51           | 1.46  | 11.51        | 1.46  | HS 29.24     | 52.6                 |
| 5C1T        | 25.10           | 3.74  | 25.10        | 3.74  | 0.00         | 448.6                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 6.100

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 127.0           | 127.0         | 127.0        | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 6.100

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.86 | 28.67 | 28.67 | 1.699 | 999999.000 | 93.168 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 23.44 |        | 105.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 6.100

Dead Load Moment      Superimposed Dead Load Moment  
-1.5                      -16.4

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 191.1                       | -150.4                | 172.0              | -169.6                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 318.6                       | -250.7                | 286.6              | -282.7                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.20 R      | 12.46              | 155.50 | 0.0                 | 25.65    | 19.73       | 127.50             |        |                |              |
|           |           | -58.98 R     | -45.37             | 134.00 | 0.0                 | -54.09   | -41.61      | 115.00             |        | 137.50         |              |
| OPER      | 5C1T      | 29.91 R      | 23.01              | 265.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -50.42 L     | -38.78             | 13.50  | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 7.45               | 2.55                         | 6.70            | 2.88                  | HS 51.01     | 91.8                 |
| 5C1T        | 10.65              | 4.97                         | 9.58            | 5.61                  | 0.00         | 596.7                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 6.100

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear     | (-) Shear (+) Shear    |
| 0.6       | 0.0 7.0                |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 90.8              | -74.4                           | 65.3  |
| OPER      | 151.3             | -124.0                          | 108.8 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -2.98                 | 30.12 | -2.29    | 23.17 | -3.20                | 23.78 | -2.46    | 18.29 |
| OPER      | 5C1T      | -3.57                 | 23.42 | -2.74    | 18.02 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 23.21      | 2.17       | HS 43.35     | 78.0                 |
| 5C1T   | 34.75      | 4.64       | 0.00         | 557.4                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 6.100

Dead Load Moment      Superimposed Dead Load Moment  
-1.5                      -16.4

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 156.9      | 160.5           | -174.8 | 160.5        | -174.8 | 178.4                       | -156.9 | 178.4     | - |
| OPER 261.5      | 279.4           | -279.4 | 279.4        | -279.4 | 297.3                       | -261.5 | 297.3     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 16.20 R                 | 12.46                | 155.50      | 0.0       | 25.65                   | 19.73                  | 127.50 |        |
|           |            | -58.98 R                | -45.37               | 134.00      | 0.0       | -54.09                  | -41.61                 | 115.00 | 137.50 |
| OPER      | 5C1T       | 29.91 R                 | 23.01                | 265.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -50.42 L                | -38.78               | 13.50       | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 6.95            | 2.66  | 6.95         | 2.66  | HS 53.20     | 95.8                 |
| 5C1T        | 9.94            | 5.19  | 9.94         | 5.19  | 0.00         | 622.3                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 6.200

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 127.0           | 127.0         | 127.0        | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 6.200

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.86 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 93.168     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 23.44 |        | 105.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 6.200

Dead Load Moment      Superimposed Dead Load Moment  
-0.1                      -1.2

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 181.2                       | -160.4             | 162.0           | -179.6             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 302.0                       | -267.3             | 270.0           | -299.3             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 59.43 R      | 45.72              | 158.00 | 0.0                 | 44.74    | 34.41       | 130.00             |        |                |              |
|           |           | -45.75 L     | -35.19             | 92.00  | 0.0                 | -35.41   | -27.24      | 115.00             | 65.00  |                |              |
| OPER      | 5C1T      | 55.12 R      | 42.40              | 268.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -42.84 L     | -32.95             | 16.00  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 3.05            | 3.51                      | 2.73         | 3.92               | HS 54.51     | 98.1                 |
| 5C1T        | 5.48            | 6.24                      | 4.90         | 6.99               | 0.00         | 587.8                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 6.200

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.5       | 0.0          | 5.2       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -73.2                  | 66.4         |
| OPER      | 151.3             | -122.1                 | 110.7        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -2.98                 | 25.40 | -2.29    | 19.54 | -4.45                | 20.97 | -3.42    | 16.13 |
| OPER      | 5C1T      | -5.27                 | 20.35 | -4.05    | 15.65 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 16.47      | 2.61       | HS 52.29     | 94.1                 |
| 5C1T   | 23.18      | 5.44       | 0.00         | 652.7                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 6.200

Dead Load Moment      Superimposed Dead Load Moment  
-0.1                      -1.2

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 166.8      | 167.1           | -168.2 | 167.1        | -168.2 | 168.4                       | -166.8 | 168.4     | - |
| OPER 278.1      | 279.4           | -279.4 | 279.4        | -279.4 | 280.7                       | -278.1 | 280.7     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |        |        |       |
|-----------|------------|-------------------------|-------------------------|------------------------------|----------------------|--------|--------|--------|-------|
| INV.      | HS20       | 59.43 R                 | 45.72                   | 158.00                       | 0.0                  | 44.74  | 34.41  | 130.00 |       |
|           |            | -45.75 L                | -35.19                  | 92.00                        | 0.0                  | -35.41 | -27.24 | 115.00 | 65.00 |
| OPER      | 5C1T       | 55.12 R                 | 42.40                   | 268.00                       | 0.0                  | 0.00   | 0.00   | 0.00   |       |
|           |            | -42.84 L                | -32.95                  | 16.00                        | 0.0                  | 0.00   | 0.00   | 0.00   | 0.00  |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 2.83            | 3.65            | 2.83               | 3.65               | HS 56.68     | 102.0                |
| 5C1T        | 5.09            | 6.49            | 5.09               | 6.49               | 0.00         | 611.2                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 6.300

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 127.0           | 127.0         | 127.0        | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 6.300

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.86 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 93.168     |

## LFD - Moment Values

| Compact Values (C) |                   |        | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|--------------------|-------------------|--------|-------|--------|-------------------------|
| 4110/<br>sqrt Fy   | 19230/<br>sqrt Fy |        |       |        |                         |
| top                | 22.62             | 105.86 | 0.00  | 390.83 | 109.1                   |
| bott               | 22.62             |        | 23.44 |        | 105.1                   |

## Braced Non Compact Values (B)

| 24 / | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------------------|------------------------|
| top  | 24.00             | 200.93                 |
| bott | 24.00             |                        |
|      |                   | 0.00                   |
|      |                   | 0.00                   |

## Non Compact Values (N)

| Cb   | lambda | Rb | Mr    | Lp   | Lr  |
|------|--------|----|-------|------|-----|
| top  | 0.00   | 0. | 0.000 | 0.00 | 0.0 |
| bott | 0.00   | 0. | 0.000 | 0.00 | 0.0 |
|      |        |    |       |      |     |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 6.300

Dead Load Moment 0.8  
Superimposed Dead Load Moment 9.7

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 174.0                       | -167.5             | 154.8           | -186.7             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 290.1                       | -279.2             | 258.1           | -311.2             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 86.48 R      | 66.52              | 160.50 | 0.0                 | 65.20    | 50.15       | 132.50             |        |                |              |
|           |           | -37.98 L     | -29.21             | 92.00  | 0.0                 | -29.96   | -23.04      | 115.00             | 0.00   |                |              |
| OPER      | 5C1T      | 74.81 R      | 57.55              | 183.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -38.38 L     | -29.52             | -70.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber +bend | bottom fiber -bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|--------|--------------|----------------------|
| HS20        | 2.01            | 4.41               | 1.79   | 35.81        | 64.5                 |
| 5C1T        | 3.88            | 7.28               | 3.45   | 0.00         | 414.0                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 6.300

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.3       | 0.0          | 3.5       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -72.1                  | 67.5                  |
| OPER      | 151.3             | -120.2                 | 112.5                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -4.41                 | 20.57 | -3.40    | 15.82 | -6.72                | 18.02 | -5.17    | 13.86 |
| OPER      | 5C1T      | -7.22                 | 17.20 | -5.55    | 13.23 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 10.73      | 3.28       | HS 65.66     | 118.2                |
| 5C1T   | 16.65      | 6.54       | 0.00         | 785.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 6.300

Dead Load Moment 0.8  
Superimposed Dead Load Moment 9.7

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 174.0      | 171.9           | -163.4 | 171.9        | -163.4 | 161.3                       | -174.0 | 161.3     | - |
| OPER 290.0      | 279.4           | -279.4 | 279.4        | -279.4 | 268.8                       | -290.0 | 268.8     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 86.48 R                 | 66.52                | 160.50      | 0.0       | 65.20                   | 50.15                  | 132.50 |        |
|           |            | -37.98 L                | -29.21               | 92.00       | 0.0       | -29.96                  | -23.04                 | 115.00 | 0.00   |
| OPER      | 5C1T       | 74.81 R                 | 57.55                | 183.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -38.38 L                | -29.52               | -70.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.87            | 4.58            | 1.87               | 4.58               | HS 37.30     | 67.1                 |
| 5C1T        | 3.59            | 7.55            | 3.59               | 7.55               | 0.00         | 431.2                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 6.400

|               |                             |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Allowable stress (fs) (psi) |           |         |         |
| RATIO/Inv.    | 0.00                        | 0.00      | 0.00    |         |
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

|                |           |       |      |      |       |       |      |      |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

|                         |                  |                       |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

|               |          |              |       |                   |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

|                  |                  |             |       |                 |
|------------------|------------------|-------------|-------|-----------------|
| Section Modulus  |                  |             |       | Plastic Section |
| Positive Bending | Negative Bending | Modulus - Z |       |                 |
| Top              | Bott.            | Top         | Bott. | (Fy * Z)        |
| 127.0            | 127.0            | 127.0       | 127.0 | 390.83          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 6.400

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.86 | 28.67 | 28.67 | 1.699 | 999999.000 | 93.168 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 23.44 |        | 105.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 6.400

Dead Load Moment      Superimposed Dead Load Moment  
1.4                      16.4

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 169.7                       | -171.9             | 150.5           | -191.1             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 282.8                       | -286.5             | 250.8           | -318.5             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 97.01 R      | 74.62              | 163.00 | 0.0                 | 77.49    | 59.61       | 135.00             |        |                |              |
|           |           | -30.21 L     | -23.24             | 92.00  | 0.0                 | -26.35   | -20.27      | 115.00             | 0.00   |                |              |
| OPER      | 5C1T      | 87.02 R      | 66.94              | 321.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -35.34 L     | -27.19             | -68.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 1.75            | 5.69                      | 1.55                      | 6.32               | HS 31.03     | 55.9                 |
| 5C1T        | 3.25            | 8.11                      | 2.88                      | 9.01               | 0.00         | 345.9                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 6.400

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| 0.2       | 0.0                    |
|           | 1.8                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -71.0                  | 68.7                  |
| OPER      | 151.3             | -118.3                 | 114.4                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |            |              |              | Lane Live Load Shear |            |              |              |
|-----------|-----------|-----------------------|------------|--------------|--------------|----------------------|------------|--------------|--------------|
|           |           | w/imp. (-)            | w/imp. (+) | w/o imp. (-) | w/o imp. (+) | w/imp. (-)           | w/imp. (+) | w/o imp. (-) | w/o imp. (+) |
| INV.      | HS20      | -8.97                 | 16.78      | -6.90        | 12.91        | -9.29                | 15.03      | -7.15        | 11.56        |
| OPER      | 5C1T      | -9.37                 | 14.15      | -7.20        | 10.88        | 0.00                 | 0.00       | 0.00         | 0.00         |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 7.64       | 4.09       | HS 81.83     | 147.3                |  |
| 5C1T   | 12.63      | 8.09       | 0.00         | 970.5                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 6.400Dead Load Moment 1.4  
Superimposed Dead Load Moment 16.4

| Rating Veh. ber | Moment Capacity top fiber |        | Moment Capacity bottom fiber |        | Available Capacity for LL+I |                 |                 |                 |
|-----------------|---------------------------|--------|------------------------------|--------|-----------------------------|-----------------|-----------------|-----------------|
|                 | +bend                     | -bend  | +bend                        | -bend  | top fiber +bend             | top fiber -bend | bottom fi +bend | bottom fi -bend |
| INV. 178.3      | 174.8                     | -160.5 | 174.8                        | -160.5 | 157.0                       | -178.3          | 157.0           | -               |
| OPER 297.2      | 279.4                     | -279.4 | 279.4                        | -279.4 | 261.6                       | -297.2          | 261.6           | -               |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Live Load Moment w/o imp. | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-------------------------|---------------------------|-----------|-------------------------|----------------------|--------|
| INV.      | HS20       | 97.01 R                 | 74.62                   | 163.00                    | 0.0       | 77.49                   | 59.61                | 135.00 |
|           |            | -30.21 L                | -23.24                  | 92.00                     | 0.0       | -26.35                  | -20.27               | 115.00 |
| OPER      | 5C1T       | 87.02 R                 | 66.94                   | 321.00                    | 0.0       | 0.00                    | 0.00                 | 0.00   |
|           |            | -35.34 L                | -27.19                  | -68.50                    | 0.0       | 0.00                    | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating top fiber +bend | Rating top fiber -bend | Factor bottom fiber +bend | Factor bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|------------------------|------------------------|---------------------------|---------------------------|--------------|----------------------|
| HS20        | 1.62                   | 5.90                   | 1.62                      | 5.90                      | HS 32.36     | 58.2                 |
| 5C1T        | 3.01                   | 8.41                   | 3.01                      | 8.41                      | 0.00         | 360.7                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 6.500

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 127.0           | 127.0         | 127.0        | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 6.500

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.86 | 28.67 | 28.67 | 1.699 | 999999.000 | 93.009 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 22.81 |        | 105.2                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 6.500

Dead Load Moment 1.6  
Superimposed Dead Load Moment 18.7

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 168.2                       | -173.4             | 149.0           | -192.6             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 280.3                       | -289.0             | 248.3           | -321.0             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 94.68 L      | 72.83              | 123.50 | 0.0                 | 82.35    | 63.34       | 137.50             |        |                |              |
|           |           | -22.44 L     | -17.26             | 92.00  | 0.0                 | -22.73   | -17.49      | 115.00             | 0.00   |                |              |
| OPER      | 5C1T      | 89.96 R      | 69.20              | 323.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -34.25 R     | -26.34             | 209.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 1.78            | 7.63                      | 1.57         | 8.47               | HS 31.47     | 56.6                 |
| 5C1T        | 3.12            | 8.44                      | 2.76         | 9.37               | 0.00         | 331.2                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 6.500

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| 0.0       | 0.0                    |
|           | 0.1                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -69.9                  | 69.8                  |
| OPER      | 151.3             | -116.4                 | 116.3                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |            |              |              | Lane Live Load Shear |            |              |              |
|-----------|-----------|-----------------------|------------|--------------|--------------|----------------------|------------|--------------|--------------|
|           |           | w/imp. (-)            | w/imp. (+) | w/o imp. (-) | w/o imp. (+) | w/imp. (-)           | w/imp. (+) | w/o imp. (-) | w/o imp. (+) |
| INV.      | HS20      | -13.12                | 13.12      | -10.10       | 10.10        | -12.09               | 12.10      | -9.30        | 9.31         |
| OPER      | 5C1T      | -11.65                | 11.66      | -8.96        | 8.97         | 0.00                 | 0.00       | 0.00         | 0.00         |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 5.32       | 5.32       | HS 106.33    | 191.4                |
| 5C1T   | 10.00      | 9.97       | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 6.500

Dead Load Moment      Superimposed Dead Load Moment  
1.6                      18.7

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 179.9      | 175.8           | -159.5 | 175.8        | -159.5 | 155.4                       | -179.9 | 155.4     | - |
| OPER 299.8      | 279.4           | -279.4 | 279.4        | -279.4 | 259.0                       | -299.8 | 259.0     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 94.68 L                 | 72.83                | 123.50      | 0.0       | 82.35                   | 63.34                  | 137.50 |        |
|           |            | -22.44 L                | -17.26               | 92.00       | 0.0       | -22.73                  | -17.49                 | 115.00 | 0.00   |
| OPER      | 5C1T       | 89.96 R                 | 69.20                | 323.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -34.25 R                | -26.34               | 209.50      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.64            | 7.91            | 1.64               | 7.91               | HS 32.83     | 59.1                 |
| 5C1T        | 2.88            | 8.75            | 2.88               | 8.75               | 0.00         | 345.6                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 6.600

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 127.0           | 127.0         | 127.0        | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 6.600

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.86 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 93.009     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 22.81 |        | 105.2                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 6.600

Dead Load Moment      Superimposed Dead Load Moment  
1.4                      16.4

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 169.7                       | -171.9             | 150.5           | -191.1             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 282.8                       | -286.5             | 250.8           | -318.5             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 97.01 L      | 74.62              | 112.00 | 0.0                 | 77.50    | 59.62       | 140.00             |        |                |              |
|           |           | -30.21 R     | -23.24             | 183.00 | 0.0                 | -26.32   | -20.25      | 160.00             | 0.00   |                |              |
| OPER      | 5C1T      | 86.98 L      | 66.91              | -46.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -35.20 R     | -27.08             | 343.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 1.75            | 5.69                      | 1.55         | 6.33               | HS 31.02     | 55.8                 |
| 5C1T        | 3.25            | 8.14                      | 2.88         | 9.05               | 0.00         | 346.0                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 6.600

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.2      | -1.8         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -68.7                  | 71.0         |
| OPER      | 151.3             | -114.4                 | 118.3        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -16.78                | 8.97 | -12.91   | 6.90 | -15.03               | 9.30 | -11.56   | 7.16 |
| OPER      | 5C1T      | -14.13                | 9.38 | -10.87   | 7.22 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 4.09       | 7.63       | HS 81.85     | 147.3                |  |
| 5C1T   | 8.10       | 12.61      | 0.00         | 972.0                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 6.600

Dead Load Moment 1.4  
Superimposed Dead Load Moment 16.4

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 178.4      | 174.8           | -160.5 | 174.8        | -160.5 | 156.9                       | -178.4 | 156.9     | - |
| OPER 297.3      | 279.4           | -279.4 | 279.4        | -279.4 | 261.5                       | -297.3 | 261.5     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |        |
|-----------|------------|-------------------------|-------------------------|-----------|-------------------------|----------------------|--------|--------|
| INV.      | HS20       | 97.01 L                 | 74.62                   | 112.00    | 0.0                     | 77.50                | 59.62  | 140.00 |
|           |            | -30.21 R                | -23.24                  | 183.00    | 0.0                     | -26.32               | -20.25 | 160.00 |
| OPER      | 5C1T       | 86.98 L                 | 66.91                   | -46.00    | 0.0                     | 0.00                 | 0.00   | 0.00   |
|           |            | -35.20 R                | -27.08                  | 343.50    | 0.0                     | 0.00                 | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.62            | 5.91  | 1.62         | 5.91  | HS 32.35     | 58.2                 |
| 5C1T        | 3.01            | 8.45  | 3.01         | 8.45  | 0.00         | 360.8                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 6.700

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 127.0           | 127.0         | 127.0        | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 6.700

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.86 | 28.67 | 28.67 | 1.699 | 999999.000 | 93.009 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 22.81 |        | 105.2                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 6.700

Dead Load Moment 0.9  
Superimposed Dead Load Moment 9.9

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 174.0                       | -167.6             | 154.8           | -186.8             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 289.9                       | -279.4             | 257.9           | -311.3             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 86.48 L      | 66.52              | 114.50 | 0.0                 | 65.23    | 50.17       | 142.50             |        |                |              |
|           |           | -37.98 R     | -29.21             | 183.00 | 0.0                 | -29.90   | -23.00      | 160.00             | 0.00   |                |              |
| OPER      | 5C1T      | 74.87 L      | 57.59              | 91.50  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -38.20 R     | -29.39             | 345.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | bottom fiber -bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|--------|--------------|----------------------|
| HS20        | 2.01            | 4.41               | 1.79   | HS 35.79     | 64.4                 |
| 5C1T        | 3.87            | 7.31               | 3.44   | 0.00         | 413.4                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 6.700

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.3      | -3.5         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -67.5                  | 72.1         |
| OPER      | 151.3             | -112.6                 | 120.2        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |            |              |              | Lane Live Load Shear |            |              |              |
|-----------|-----------|-----------------------|------------|--------------|--------------|----------------------|------------|--------------|--------------|
|           |           | (-) w/imp.            | (+) w/imp. | (-) w/o imp. | (+) w/o imp. | (-) w/imp.           | (+) w/imp. | (-) w/o imp. | (+) w/o imp. |
| INV.      | HS20      | -20.57                | 4.41       | -15.82       | 3.40         | -18.01               | 6.73       | -13.86       | 5.18         |
| OPER      | 5C1T      | -17.19                | 7.23       | -13.22       | 5.56         | 0.00                 | 0.00       | 0.00         | 0.00         |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 3.28       | 10.71      | HS 65.68     | 118.2                |  |
| 5C1T   | 6.55       | 16.62      | 0.00         | 786.0                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 6.700

Dead Load Moment 0.9  
Superimposed Dead Load Moment 9.9

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 174.1      | 171.9           | -163.4 | 171.9        | -163.4 | 161.2                       | -174.1 | 161.2     | - |
| OPER 290.1      | 279.4           | -279.4 | 279.4        | -279.4 | 268.7                       | -290.1 | 268.7     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 86.48 L                 | 66.52                | 114.50      | 0.0       | 65.23                   | 50.17                  | 142.50 |        |
|           |            | -37.98 R                | -29.21               | 183.00      | 0.0       | -29.90                  | -23.00                 | 160.00 | 0.00   |
| OPER      | 5C1T       | 74.87 L                 | 57.59                | 91.50       | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -38.20 R                | -29.39               | 345.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.86            | 4.58  | 1.86         | 4.58  | HS 37.28     | 67.1                 |
| 5C1T        | 3.59            | 7.59  | 3.59         | 7.59  | 0.00         | 430.6                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 6.800

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus  |                  |       |       | Plastic Section |
|------------------|------------------|-------|-------|-----------------|
| Positive Bending | Negative Bending |       |       | Modulus - Z     |
| Top              | Bott.            | Top   | Bott. | (Fy * Z)        |
| 127.0            | 127.0            | 127.0 | 127.0 | 390.83          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 6.800

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.86 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 93.009     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 22.81 |        | 105.2                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 6.800

Dead Load Moment      Superimposed Dead Load Moment  
-0.1                      -1.0

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 181.1                       | -160.5             | 161.9           | -179.7             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 301.8                       | -267.5             | 269.8           | -299.5             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Load Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Load Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|-------------|---------------------|----------|-------------|--------------------|-------------|----------------|--------------|
| INV.      | HS20      | 59.43 L      | 45.72              | 117.00      | 0.0                 | 45.29    | 34.84       | 145.00             |             |                |              |
|           |           | -45.75 R     | -35.19             | 183.00      | 0.0                 | -35.34   | -27.18      | 160.00             | 210.00      |                |              |
| OPER      | 5C1T      | 55.14 L      | 42.42              | 7.00        | 0.0                 | 0.00     | 0.00        | 0.00               |             |                |              |
|           |           | -42.63 R     | -32.79             | 259.00      | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00        | 0.00           |              |

## Moment

| Rating Veh. | Rating Factor   |                    |                 |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|-----------------|--------------------|--------------|----------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 3.05            | 3.51               | 2.72            | 3.93               | HS 54.48     | 98.1                 |
| 5C1T        | 5.47            | 6.28               | 4.89            | 7.03               | 0.00         | 587.1                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 6.800

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.5      | -5.2         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -66.4                  | 73.2         |
| OPER      | 151.3             | -110.7                 | 122.1        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -25.40                | 2.98 | -19.54   | 2.29 | -20.96               | 4.46 | -16.12   | 3.43 |
| OPER      | 5C1T      | -20.33                | 5.28 | -15.64   | 4.06 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 2.62       | 16.43      | HS 52.30     | 94.1                 |  |
| 5C1T   | 5.45       | 23.11      | 0.00         | 653.4                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 6.800

Dead Load Moment      Superimposed Dead Load Moment  
-0.1                      -1.0

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 167.0      | 167.2           | -168.1 | 167.2        | -168.1 | 168.3                       | -167.0 | 168.3     | - |
| OPER 278.3      | 279.4           | -279.4 | 279.4        | -279.4 | 280.5                       | -278.3 | 280.5     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 59.43 L                 | 45.72                | 117.00      | 0.0       | 45.29                   | 34.84                  | 145.00 |        |
|           |            | -45.75 R                | -35.19               | 183.00      | 0.0       | -35.34                  | -27.18                 | 160.00 | 210.00 |
| OPER      | 5C1T       | 55.14 L                 | 42.42                | 7.00        | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -42.63 R                | -32.79               | 259.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 2.83            | 3.65            | 2.83               | 3.65               | HS 56.65     | 102.0                |
| 5C1T        | 5.09            | 6.53            | 5.09               | 6.53               | 0.00         | 610.5                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 6.900

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 6.900

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.86 | 28.67 | 28.67 | 1.699 | 999999.000 | 93.009 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 22.81 |        | 105.2                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 6.900

Dead Load Moment      Superimposed Dead Load Moment  
-1.5                      -16.2

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 191.0                       | -150.6                | 171.8              | -169.8                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 318.3                       | -251.0                | 286.3              | -282.9                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.20 L      | 12.46              | 119.50 | 0.0                 | 25.28    | 19.44       | 147.50             |        |                |              |
|           |           | -58.98 L     | -45.37             | 141.00 | 0.0                 | -53.97   | -41.52      | 160.00             | 137.50 |                |              |
| OPER      | 5C1T      | 30.00 L      | 23.07              | 9.50   | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -50.21 R     | -38.62             | 261.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 7.56               | 2.55                         | 6.80                               | 2.88         | HS 51.06 91.9        |
| 5C1T        | 10.61              | 5.00                         | 9.55                               | 5.64         | 0.00 599.8           |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 6.900

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.6      | -6.9         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -65.3                  | 74.4         |
| OPER      | 151.3             | -108.8                 | 123.9        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -30.12                | 3.11 | -23.17   | 2.39 | -23.77               | 3.21 | -18.29   | 2.47 |
| OPER      | 5C1T      | -23.41                | 3.58 | -18.01   | 2.76 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 2.17       | 23.15      | HS 43.36     | 78.0                 |
| 5C1T   | 4.65       | 34.57      | 0.00         | 557.8                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 6.900

Dead Load Moment      Superimposed Dead Load Moment  
-1.5                      -16.2

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 157.0      | 160.6           | -174.7 | 160.6        | -174.7 | 178.3                       | -157.0 | 178.3     | - |
| OPER 261.7      | 279.4           | -279.4 | 279.4        | -279.4 | 297.1                       | -261.7 | 297.1     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 16.20 L                 | 12.46                | 119.50      | 0.0       | 25.28                   | 19.44                  | 147.50 |        |
|           |            | -58.98 L                | -45.37               | 141.00      | 0.0       | -53.97                  | -41.52                 | 160.00 | 137.50 |
| OPER      | 5C1T       | 30.00 L                 | 23.07                | 9.50        | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -50.21 R                | -38.62               | 261.50      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 7.05            | 2.66  | 7.05         | 2.66  | HS 53.25     | 95.9                 |
| 5C1T        | 9.90            | 5.21  | 9.90         | 5.21  | 0.00         | 625.5                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 7.000

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus  |                  |       |       | Plastic Section |
|------------------|------------------|-------|-------|-----------------|
| Positive Bending | Negative Bending |       |       | Modulus - Z     |
| Top              | Bott.            | Top   | Bott. | (Fy * Z)        |
| 127.0            | 127.0            | 127.0 | 127.0 | 390.83          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 7.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.86 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 93.009     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 22.81 |        | 105.2                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 7.000

Dead Load Superimposed Dead Load  
Moment Moment  
-3.2 -35.7

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 203.7                       | -137.8                | 184.5              | -157.0                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 339.6                       | -229.7                | 307.6              | -261.7                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.42 L      | 12.63              | 92.00  | 0.0                 | 16.69    | 12.84       | 115.00             |        |                |              |
|           |           | -98.55 L     | -75.81             | 129.50 | 0.0                 | -90.47   | -69.59      | 140.00             |        | 160.00         |              |
| OPER      | 5C1T      | 12.80 R      | 9.85               | 408.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -64.03 R     | -49.26             | 266.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 12.21              | 1.40                         | 11.06           | 1.59                  | HS 27.97     | 50.3                 |
| 5C1T        | 26.53              | 3.59                         | 24.03           | 4.09                  | 0.00         | 430.5                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 7.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.6      | -0.8      | -6.9                   | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 90.8              | -64.2                           | 64.2  |
| OPER      | 151.3             | -106.9                          | 107.0 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -30.12                | 34.53 | -23.17   | 26.56 | -23.77               | 26.33 | -18.29   | 20.25 |
| OPER      | 5C1T      | -23.41                | 26.23 | -18.01   | 20.18 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.86       | 1.86       | HS 37.17     | 66.9                 |
| 5C1T   | 4.07       | 4.08       | 0.00         | 488.7                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 7.000

Dead Load Moment      Superimposed Dead Load Moment  
-3.2                      -35.7

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 144.3      | 152.1           | -183.2 | 152.1        | -183.2 | 191.0                       | -144.3 | 191.0     | - |
| OPER 240.5      | 279.4           | -279.4 | 279.4        | -279.4 | 318.3                       | -240.5 | 318.3     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 16.42 L                 | 12.63           | 92.00                   | 0.0       | 16.69                   | 12.84           | 115.00               |        |
|           |            | -98.55 L                | -75.81          | 129.50                  | 0.0       | -90.47                  | -69.59          | 140.00               | 160.00 |
| OPER      | 5C1T       | 12.80 R                 | 9.85            | 408.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -64.03 R                | -49.26          | 266.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 11.44           | 1.46            | 11.44              | 1.46               | HS 29.28     | 52.7                 |
| 5C1T        | 24.87           | 3.76            | 24.87              | 3.76               | 0.00         | 450.7                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 7.000

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 7.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.86 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 93.009     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 22.81 |        | 105.2                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 7.000

Dead Load Superimposed Dead Load  
Moment Moment  
-3.2 -35.7

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 203.7                       | -137.8                | 184.5              | -157.0                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 339.6                       | -229.7                | 307.6              | -261.7                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.42 L      | 12.63              | 92.00  | 0.0                 | 16.69    | 12.84       | 115.00             |        |                |              |
|           |           | -98.55 L     | -75.81             | 129.50 | 0.0                 | -90.47   | -69.59      | 140.00             |        | 160.00         |              |
| OPER      | 5C1T      | 12.80 R      | 9.85               | 408.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -64.03 R     | -49.26             | 266.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 12.21              | 1.40                         | 11.06                              | 1.59         | HS 27.97             |
| 5C1T        | 26.53              | 3.59                         | 24.03                              | 4.09         | 0.00                 |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 7.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.8      | 0.8       | -8.6                   | 8.6       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I |       |
|-----------|-------------------|-----------------------------|-------|
|           |                   | (-)                         | (+)   |
| INV.      | 90.8              | -64.2                       | 64.2  |
| OPER      | 151.3             | -106.9                      | 107.0 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -34.53                | 34.53 | -26.56   | 26.56 | -26.34               | 26.33 | -20.26   | 20.25 |
| OPER      | 5C1T      | -26.26                | 26.23 | -20.20   | 20.18 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.86       | 1.86       | HS 37.17     | 66.9                 |
| 5C1T   | 4.07       | 4.08       | 0.00         | 488.7                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 7.000

Dead Load Moment      Superimposed Dead Load Moment  
-3.2                      -35.7

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 144.3      | 152.1           | -183.2 | 152.1        | -183.2 | 191.0                       | -144.3 | 191.0     | - |
| OPER 240.5      | 279.4           | -279.4 | 279.4        | -279.4 | 318.3                       | -240.5 | 318.3     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 16.42 L                 | 12.63                | 92.00       | 0.0       | 16.69                   | 12.84                  | 115.00 |        |
|           |            | -98.55 L                | -75.81               | 129.50      | 0.0       | -90.47                  | -69.59                 | 140.00 | 160.00 |
| OPER      | 5C1T       | 12.80 R                 | 9.85                 | 408.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -64.03 R                | -49.26               | 266.50      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 11.44           | 1.46  | 11.44        | 1.46  | HS 29.28     | 52.7                 |
| 5C1T        | 24.87           | 3.76  | 24.87        | 3.76  | 0.00         | 450.7                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 7.100

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 7.100

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.86 | 28.67 | 28.67 | 1.699 | 999999.000 | 93.021 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 22.81 |        | 105.2                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 7.100

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -1.5                | -16.3                            |

| Rating<br>Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|----------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|                | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.           | 180.4C             | -161.2                | 161.2              | -180.4C               | 191.0                       | -150.5                | 171.8              | -169.7                |
| OPER           | 300.6C             | -268.7                | 268.7              | -300.6C               | 318.4                       | -250.9                | 286.4              | -282.9                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Rat.<br>Veh. | Truck<br>w/imp. | Live Load<br>w/o imp. | Moment | Loc. of<br>Front<br>Wheel | Ax.<br>Dis. | Lane<br>w/imp. | Live Load<br>w/o imp. | Moment | Loc. of<br>Load 1 | Conc.<br>Load 2 |
|--------------|--------------|-----------------|-----------------------|--------|---------------------------|-------------|----------------|-----------------------|--------|-------------------|-----------------|
| INV.         | HS20         | 16.20 R         | 12.46                 | 180.50 | 0.0                       | 25.70       | 19.77          | 152.50                |        |                   |                 |
|              |              | -58.98 R        | -45.37                | 159.00 | 0.0                       | -54.03      | -41.56         | 140.00                | 162.50 |                   |                 |
| OPER         | 5C1T         | 30.01 R         | 23.09                 | 290.50 | 0.0                       | 0.00        | 0.00           | 0.00                  |        |                   |                 |
|              |              | -50.24 L        | -38.65                | 38.50  | 0.0                       | 0.00        | 0.00           | 0.00                  | 0.00   |                   |                 |

## Moment

| Rating<br>Veh. | top fiber<br>+bend | Rating<br>bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------------|---------------------------------|-----------------|-----------------------|-----------------|----------------------------|
| HS20           | 7.43               | 2.55                            | 6.69            | 2.88                  | HS 51.05        | 91.9                       |
| 5C1T           | 10.61              | 4.99                            | 9.54            | 5.63                  | 0.00            | 599.2                      |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 7.100

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear     | (-) Shear (+) Shear    |
| 0.6       | 0.0 6.9                |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 90.8              | -74.3                           | 65.3  |
| OPER      | 151.3             | -123.9                          | 108.8 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -2.98                 | 30.11 | -2.29    | 23.17 | -3.21                | 23.76 | -2.47    | 18.28 |
| OPER      | 5C1T      | -3.61                 | 23.37 | -2.78    | 17.98 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 23.13      | 2.17       | HS 43.37     | 78.1                 |
| 5C1T   | 34.33      | 4.66       | 0.00         | 558.9                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 7.100

Dead Load Moment      Superimposed Dead Load Moment  
-1.5                      -16.3

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 157.0      | 160.5           | -174.7 | 160.5        | -174.7 | 178.3                       | -157.0 | 178.3     | - |
| OPER 261.6      | 279.4           | -279.4 | 279.4        | -279.4 | 297.2                       | -261.6 | 297.2     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 16.20 R                 | 12.46           | 180.50                  | 0.0       | 25.70                   | 19.77           | 152.50               |        |
|           |            | -58.98 R                | -45.37          | 159.00                  | 0.0       | -54.03                  | -41.56          | 140.00               | 162.50 |
| OPER      | 5C1T       | 30.01 R                 | 23.09           | 290.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -50.24 L                | -38.65          | 38.50                   | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 6.94            | 2.66            | 6.94               | 2.66               | HS 53.24     | 95.8                 |
| 5C1T        | 9.90            | 5.21            | 9.90               | 5.21               | 0.00         | 624.9                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 7.200

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 7.200

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.86 | 28.67 | 28.67 | 1.699 | 999999.000 | 93.021 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 22.81 |        | 105.2                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 7.200

Dead Load Moment      Superimposed Dead Load Moment  
-0.1                      -1.1

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 181.1                       | -160.4                | 162.0              | -179.6                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 301.9                       | -267.4                | 269.9              | -299.4                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 59.43 R      | 45.72              | 183.00 | 0.0                 | 44.76    | 34.43       | 155.00             |        |                |              |
|           |           | -45.75 L     | -35.19             | 117.00 | 0.0                 | -35.40   | -27.23      | 140.00             | 90.00  |                |              |
| OPER      | 5C1T      | 55.13 R      | 42.41              | 293.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -42.81 L     | -32.93             | 41.00  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 3.05               | 3.51                         | 2.72            | 3.93                  | HS 54.50     | 98.1                 |
| 5C1T        | 5.48               | 6.24                         | 4.90            | 6.99                  | 0.00         | 587.5                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 7.200

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| 0.5       | 0.0                    |
|           | 5.2                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -73.2                  | 66.4         |
| OPER      | 151.3             | -122.0                 | 110.7        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |            |              |              | Lane Live Load Shear |            |              |              |
|-----------|-----------|-----------------------|------------|--------------|--------------|----------------------|------------|--------------|--------------|
|           |           | w/imp. (-)            | w/imp. (+) | w/o imp. (-) | w/o imp. (+) | w/imp. (-)           | w/imp. (+) | w/o imp. (-) | w/o imp. (+) |
| INV.      | HS20      | -2.98                 | 25.40      | -2.29        | 19.54        | -4.46                | 20.95      | -3.43        | 16.12        |
| OPER      | 5C1T      | -5.31                 | 20.29      | -4.08        | 15.61        | 0.00                 | 0.00       | 0.00         | 0.00         |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 16.42      | 2.62       | HS 52.31     | 94.2                 |
| 5C1T   | 23.00      | 5.46       | 0.00         | 654.9                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 7.200

Dead Load Moment      Superimposed Dead Load Moment  
-0.1                      -1.1

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 166.9      | 167.1           | -168.1 | 167.1        | -168.1 | 168.4                       | -166.9 | 168.4     | - |
| OPER 278.1      | 279.4           | -279.4 | 279.4        | -279.4 | 280.7                       | -278.1 | 280.7     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |        |
|-----------|------------|-------------------------|-------------------------|-----------|-------------------------|----------------------|--------|--------|
| INV.      | HS20       | 59.43 R                 | 45.72                   | 183.00    | 0.0                     | 44.76                | 34.43  | 155.00 |
|           |            | -45.75 L                | -35.19                  | 117.00    | 0.0                     | -35.40               | -27.23 | 140.00 |
| OPER      | 5C1T       | 55.13 R                 | 42.41                   | 293.00    | 0.0                     | 0.00                 | 0.00   | 0.00   |
|           |            | -42.81 L                | -32.93                  | 41.00     | 0.0                     | 0.00                 | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 2.83            | 3.65  | 2.83         | 3.65  | HS 56.67     | 102.0                |
| 5C1T        | 5.09            | 6.50  | 5.09         | 6.50  | 0.00         | 610.9                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 7.300

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |               |                      |               | Plastic Section Modulus - Z |
|----------------------|---------------|----------------------|---------------|-----------------------------|
| Positive Bending Top | Bending Bott. | Negative Bending Top | Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0         | 127.0                | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 7.300

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.86 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 93.021     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 22.81 |        | 105.2                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 7.300

Dead Load Moment 0.8  
Superimposed Dead Load Moment 9.7

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 174.1                       | -167.5             | 154.9           | -186.7             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 290.1                       | -279.2             | 258.1           | -311.2             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 86.48 R      | 66.52              | 185.50 | 0.0                 | 65.18    | 50.14       | 157.50             |        |                |              |
|           |           | -37.98 L     | -29.21             | 117.00 | 0.0                 | -29.97   | -23.05      | 140.00             | 0.00   |                |              |
| OPER      | 5C1T      | 74.85 R      | 57.58              | 208.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -38.35 L     | -29.50             | -45.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 2.01            | 4.41                      | 1.79                      | 4.92               | HS 35.82     | 64.5                 |
| 5C1T        | 3.88            | 7.28                      | 3.45                      | 8.11               | 0.00         | 413.8                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 7.300

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear     | (-) Shear (+) Shear    |
| 0.3       | 0.0 3.5                |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 90.8              | -72.1                           | 67.6  |
| OPER      | 151.3             | -120.2                          | 112.6 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -4.41                 | 20.57 | -3.40    | 15.82 | -6.73                | 18.00 | -5.18    | 13.85 |
| OPER      | 5C1T      | -7.25                 | 17.15 | -5.58    | 13.20 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 10.71      | 3.29       | HS 65.69     | 118.2                |
| 5C1T   | 16.57      | 6.56       | 0.00         | 787.6                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 7.300Dead Load Moment 0.8  
Superimposed Dead Load Moment 9.7

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 174.0      | 171.8           | -163.4 | 171.8        | -163.4 | 161.3                       | -174.0 | 161.3     | - |
| OPER 289.9      | 279.4           | -279.4 | 279.4        | -279.4 | 268.9                       | -289.9 | 268.9     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Live Load Moment w/o imp. | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-------------------------|---------------------------|-----------|-------------------------|----------------------|--------|
| INV.      | HS20       | 86.48 R                 | 66.52                   | 185.50                    | 0.0       | 65.18                   | 50.14                | 157.50 |
|           |            | -37.98 L                | -29.21                  | 117.00                    | 0.0       | -29.97                  | -23.05               | 140.00 |
| OPER      | 5C1T       | 74.85 R                 | 57.58                   | 208.50                    | 0.0       | 0.00                    | 0.00                 | 0.00   |
|           |            | -38.35 L                | -29.50                  | -45.00                    | 0.0       | 0.00                    | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.87            | 4.58            | 1.87               | 4.58               | HS 37.31     | 67.2                 |
| 5C1T        | 3.59            | 7.56            | 3.59               | 7.56               | 0.00         | 431.0                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 7.400

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 127.0           | 127.0         | 127.0        | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 7.400

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.86 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 93.021     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 22.81 |        | 105.2                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 7.400

Dead Load Moment 1.4  
Superimposed Dead Load Moment 16.2

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 169.8                       | -171.8             | 150.6           | -191.0             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 283.0                       | -286.3             | 251.0           | -318.3             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 97.01 R      | 74.62              | 188.00 | 0.0                 | 77.41    | 59.55       | 160.00             |        |                |              |
|           |           | -30.21 L     | -23.24             | 117.00 | 0.0                 | -26.38   | -20.29      | 140.00             | 0.00   |                |              |
| OPER      | 5C1T      | 86.79 R      | 66.76              | 211.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -35.45 L     | -27.27             | 43.50  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 1.75            | 5.69                      | 1.55         | 6.32               | HS 31.05     | 55.9                 |
| 5C1T        | 3.26            | 8.08                      | 2.89         | 8.98               | 0.00         | 347.1                |

## SHEAR RATING REPORT

Rating Types and Vehicles  
 INV. OPER POST SPEC  
 Structure I. D. HAM500  
 Member I. D. S03  
 Check Point I. D. 7.400  
 HS20 5C1T

Dead Load Superimposed Dead Load  
 Shear (-) Shear (+) Shear  
 0.2 0.0 1.8

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -71.0                  | 68.7                  |
| OPER      | 151.3             | -118.3                 | 114.5                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -8.97                 | 16.78 | -6.90    | 12.91 | -9.31                | 15.01 | -7.16    | 11.55 |
| OPER      | 5C1T      | -9.40                 | 14.11 | -7.23    | 10.85 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 7.63       | 4.09       | HS 81.87     | 147.4                |
| 5C1T   | 12.59      | 8.11       | 0.00         | 973.8                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 7.400

Dead Load Moment 1.4  
Superimposed Dead Load Moment 16.2

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 178.2      | 174.7           | -160.6 | 174.7        | -160.6 | 157.1                       | -178.2 | 157.1     | - |
| OPER 297.0      | 279.4           | -279.4 | 279.4        | -279.4 | 261.8                       | -297.0 | 261.8     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Live Load Moment w/o imp. | Loc. of Conc. Load 1 | Live Load Moment w/imp. | Loc. of Conc. Load 2 |
|-----------|------------|-------------------------|-------------------------|---------------------------|----------------------|-------------------------|----------------------|
| INV.      | HS20       | 97.01 R                 | 74.62                   | 188.00                    | 0.0                  | 77.41                   | 59.55                |
|           |            | -30.21 L                | -23.24                  | 117.00                    | 0.0                  | -26.38                  | -20.29               |
| OPER      | 5C1T       | 86.79 R                 | 66.76                   | 211.00                    | 0.0                  | 0.00                    | 0.00                 |
|           |            | -35.45 L                | -27.27                  | 43.50                     | 0.0                  | 0.00                    | 0.00                 |

## Serviceability

| Rating Veh. | Rating Factor   |                    | Load Capacity (tons) |                    |
|-------------|-----------------|--------------------|----------------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend      | bottom fiber -bend |
| HS20        | 1.62            | 5.90               | 1.62                 | 5.90               |
| 5C1T        | 3.02            | 8.38               | 3.02                 | 8.38               |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 7.500

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 7.500

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.86 | 28.67 | 28.67 | 1.699 | 999999.000 | 93.021 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 24.24 |        | 105.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 7.500

Dead Load Moment 1.6  
Superimposed Dead Load Moment 18.5

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 168.4                       | -173.2             | 149.2           | -192.4             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 280.6                       | -288.7             | 248.6           | -320.7             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 94.68 L      | 72.83              | 148.50 | 0.0                 | 82.22    | 63.25       | 162.50             |        |                |              |
|           |           | -22.43 L     | -17.26             | 117.00 | 0.0                 | -22.80   | -17.54      | 140.00             |        | 0.00           |              |
| OPER      | 5C1T      | 89.93 L      | 69.18              | -23.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -34.36 R     | -26.43             | 321.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 1.78            | 7.60                      | 1.58         | 8.44               | HS 31.51     | 56.7                 |
| 5C1T        | 3.12            | 8.40                      | 2.76         | 9.33               | 0.00         | 331.7                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 7.500

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| 0.0       | 0.0                    |
|           | 0.1                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -69.8                  | 69.8                  |
| OPER      | 151.3             | -116.4                 | 116.3                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |            |              |              | Lane Live Load Shear |            |              |              |
|-----------|-----------|-----------------------|------------|--------------|--------------|----------------------|------------|--------------|--------------|
|           |           | w/imp. (-)            | w/imp. (+) | w/o imp. (-) | w/o imp. (+) | w/imp. (-)           | w/imp. (+) | w/o imp. (-) | w/o imp. (+) |
| INV.      | HS20      | -13.12                | 13.12      | -10.10       | 10.10        | -12.10               | 12.08      | -9.31        | 9.29         |
| OPER      | 5C1T      | -11.66                | 11.64      | -8.97        | 8.95         | 0.00                 | 0.00       | 0.00         | 0.00         |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 5.32       | 5.32       | HS 106.38    | 191.5                |
| 5C1T   | 9.98       | 10.00      | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 7.500

Dead Load Moment 1.6  
Superimposed Dead Load Moment 18.5

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 179.7      | 175.7           | -159.6 | 175.7        | -159.6 | 155.6                       | -179.7 | 155.6     | - |
| OPER 299.4      | 279.4           | -279.4 | 279.4        | -279.4 | 259.4                       | -299.4 | 259.4     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 94.68 L                 | 72.83           | 148.50                  | 0.0       | 82.22                   | 63.25           | 162.50               |        |
|           |            | -22.43 L                | -17.26          | 117.00                  | 0.0       | -22.80                  | -17.54          | 140.00               | 0.00   |
| OPER      | 5C1T       | 89.93 L                 | 69.18           | -23.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -34.36 R                | -26.43          | 321.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.64            | 7.88  | 1.64         | 7.88  | HS 32.87     | 59.2                 |
| 5C1T        | 2.88            | 8.72  | 2.88         | 8.72  | 0.00         | 346.1                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 7.600

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 7.600

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.87 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 93.380     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 24.24 |        | 105.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 7.600

Dead Load Moment 1.4  
Superimposed Dead Load Moment 16.1

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 169.9                       | -171.7             | 150.7           | -190.8             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 283.2                       | -286.1             | 251.2           | -318.1             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 97.00 L      | 74.62              | 137.00 | 0.0                 | 77.32    | 59.48       | 165.00             |        |                |              |
|           |           | -30.20 R     | -23.23             | 208.00 | 0.0                 | -26.40   | -20.31      | 185.00             | 0.00   |                |              |
| OPER      | 5C1T      | 86.98 L      | 66.91              | -21.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -35.71 R     | -27.47             | 368.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 1.75            | 5.68                      | 1.55         | 6.32               | HS 31.08     | 55.9                 |
| 5C1T        | 3.26            | 8.01                      | 2.89         | 8.91               | 0.00         | 346.6                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 7.600

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| -0.2      | -1.8                   |
|           | 0.0                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 90.8              | -68.6                           | 71.0  |
| OPER      | 151.3             | -114.4                          | 118.3 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -16.78                | 8.97 | -12.91   | 6.90 | -15.04               | 9.28 | -11.57   | 7.14 |
| OPER      | 5C1T      | -14.16                | 9.34 | -10.89   | 7.19 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |                      |
|--------|------------|------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value         |
| HS20   | 4.09       | 7.65       | 81.81                |
| 5C1T   | 8.08       | 12.67      | 0.00                 |
|        |            |            | Load Capacity (tons) |
|        |            |            | 147.3                |
|        |            |            | 969.7                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 7.600

Dead Load Moment 1.4  
Superimposed Dead Load Moment 16.1

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 178.1      | 174.6           | -160.7 | 174.6        | -160.7 | 157.2                       | -178.1 | 157.2     | - |
| OPER 296.8      | 279.4           | -279.4 | 279.4        | -279.4 | 262.0                       | -296.8 | 262.0     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |        |        |      |
|-----------|------------|-------------------------|-------------------------|------------------------------|----------------------|--------|--------|--------|------|
| INV.      | HS20       | 97.00 L                 | 74.62                   | 137.00                       | 0.0                  | 77.32  | 59.48  | 165.00 |      |
|           |            | -30.20 R                | -23.23                  | 208.00                       | 0.0                  | -26.40 | -20.31 | 185.00 | 0.00 |
| OPER      | 5C1T       | 86.98 L                 | 66.91                   | -21.00                       | 0.0                  | 0.00   | 0.00   | 0.00   |      |
|           |            | -35.71 R                | -27.47                  | 368.50                       | 0.0                  | 0.00   | 0.00   | 0.00   | 0.00 |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.62            | 5.90  | 1.62         | 5.90  | HS 32.41     | 58.3                 |
| 5C1T        | 3.01            | 8.31  | 3.01         | 8.31  | 0.00         | 361.4                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 7.700

|               |                             |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Allowable stress (fs) (psi) |           |         |         |
| RATIO/Inv.    | 0.00                        | 0.00      | 0.00    | 0.00    |
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

|                |           |       |      |      |       |       |      |      |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

|                         |                  |                       |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

|               |          |              |       |                   |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

|                  |                  |             |       |                 |
|------------------|------------------|-------------|-------|-----------------|
| Section Modulus  |                  |             |       | Plastic Section |
| Positive Bending | Negative Bending | Modulus - Z |       |                 |
| Top              | Bott.            | Top         | Bott. | (Fy * Z)        |
| 127.0            | 127.0            | 127.0       | 127.0 | 390.83          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 7.700

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.87 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 93.380     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 24.24 |        | 105.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 7.700

Dead Load Moment 0.8  
Superimposed Dead Load Moment 9.4

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 174.3                       | -167.3             | 155.1           | -186.5             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 290.5                       | -278.8             | 258.5           | -310.8             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 86.47 L      | 66.52              | 139.50 | 0.0                 | 65.00    | 50.00       | 167.50             |        |                |              |
|           |           | -37.97 R     | -29.21             | 208.00 | 0.0                 | -30.01   | -23.08      | 185.00             |        | 0.00           |              |
| OPER      | 5C1T      | 74.55 L      | 57.34              | 116.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -38.82 R     | -29.86             | 370.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | bottom fiber -bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|--------|--------------|----------------------|
| HS20        | 2.02            | 4.41               | 1.79   | 35.87        | 64.6                 |
| 5C1T        | 3.90            | 7.18               | 3.47   | 0.00         | 416.1                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 7.700

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.3      | -3.5         | 0.0       |

| Rat. | Shear | Capacity | Available Capacity for LL+I |
|------|-------|----------|-----------------------------|
| Veh. |       | VU       | (-) (+)                     |
| INV. | 90.8  |          | -67.5 72.1                  |
| OPER | 151.3 |          | -112.5 120.2                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. | Rat. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|------|------|-----------------------|------|----------|------|----------------------|------|----------|------|
|      |      | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
| Typ. | Veh. | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV. | HS20 | -20.57                | 4.41 | -15.82   | 3.40 | -18.02               | 6.71 | -13.86   | 5.16 |
| OPER | 5C1T | -17.22                | 7.18 | -13.25   | 5.52 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |        | Shear  |          |          |  |
|--------|--------|--------|----------|----------|--|
| Veh.   | Rating | Factor | Rating   | Load     |  |
|        | (-)    | (+)    | Value    | Capacity |  |
|        |        |        |          | (tons)   |  |
| HS20   | 3.28   | 10.75  | HS 65.65 | 118.2    |  |
| 5C1T   | 6.53   | 16.74  | 0.00     | 784.1    |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 7.700

Dead Load Moment 0.8  
Superimposed Dead Load Moment 9.4

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 173.7      | 171.7           | -163.6 | 171.7        | -163.6 | 161.5                       | -173.7 | 161.5     | - |
| OPER 289.6      | 279.4           | -279.4 | 279.4        | -279.4 | 269.2                       | -289.6 | 269.2     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 86.47 L                 | 66.52                | 139.50      | 0.0       | 65.00                   | 50.00                  | 167.50 |        |
|           |            | -37.97 R                | -29.21               | 208.00      | 0.0       | -30.01                  | -23.08                 | 185.00 | 0.00   |
| OPER      | 5C1T       | 74.55 L                 | 57.34                | 116.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -38.82 R                | -29.86               | 370.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.87            | 4.57            | 1.87               | 4.57               | HS 37.36     | 67.3                 |
| 5C1T        | 3.61            | 7.46            | 3.61               | 7.46               | 0.00         | 433.4                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 7.800

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |               |                      |               | Plastic Section Modulus - Z |
|----------------------|---------------|----------------------|---------------|-----------------------------|
| Positive Bending Top | Bending Bott. | Negative Bending Top | Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0         | 127.0                | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 7.800

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.87 | 28.67 | 28.67 | 1.699 | 999999.000 | 93.380 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 24.24 |        | 105.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 7.800

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -0.2                | -1.6                             |

| Rating<br>Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|----------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|                | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.           | 180.4C             | -161.2                | 161.2              | -180.4C               | 181.5                       | -160.1                | 162.3              | -179.3                |
| OPER           | 300.6C             | -268.7                | 268.7              | -300.6C               | 302.5                       | -266.8                | 270.5              | -298.8                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Rat.<br>Veh. | Truck<br>w/imp. | Live Load<br>w/o imp. | Moment | Loc. of<br>Front<br>Wheel | Ax.<br>Dis. | Lane<br>w/imp. | Live Load<br>w/o imp. | Moment | Loc. of<br>Load 1 | Conc.<br>Load 2 |
|--------------|--------------|-----------------|-----------------------|--------|---------------------------|-------------|----------------|-----------------------|--------|-------------------|-----------------|
| INV.         | HS20         | 59.43 L         | 45.71                 | 142.00 | 0.0                       | 45.01       | 34.62          | 170.00                |        |                   |                 |
|              |              | -45.74 R        | -35.19                | 208.00 | 0.0                       | -35.64      | -27.41         | 185.00                |        | 235.00            |                 |
| OPER         | 5C1T         | 54.49 L         | 41.92                 | 32.00  | 0.0                       | 0.00        | 0.00           | 0.00                  |        |                   |                 |
|              |              | -43.35 R        | -33.35                | 284.00 | 0.0                       | 0.00        | 0.00           | 0.00                  |        | 0.00              |                 |

## Moment

| Rating<br>Veh. | top fiber<br>+bend | Rating<br>bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------------|---------------------------------|-----------------|-----------------------|-----------------|----------------------------|
| HS20           | 3.05               | 3.50                            | 2.73            | 3.92                  | HS 54.62        | 98.3                       |
| 5C1T           | 5.55               | 6.16                            | 4.96            | 6.89                  | 0.00            | 595.6                      |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 7.800

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.5      | -5.3         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -66.4                  | 73.3         |
| OPER      | 151.3             | -110.6                 | 122.1        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -25.40                | 2.98 | -19.54   | 2.29 | -20.97               | 4.44 | -16.13   | 3.41 |
| OPER      | 5C1T      | -20.38                | 5.22 | -15.68   | 4.02 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 2.61       | 16.51      | HS 52.28     | 94.1                 |  |
| 5C1T   | 5.43       | 23.37      | 0.00         | 651.4                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 7.800

Dead Load Moment      Superimposed Dead Load Moment  
-0.2                      -1.6

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 166.5      | 166.9           | -168.4 | 166.9        | -168.4 | 168.7                       | -166.5 | 168.7     | - |
| OPER 277.6      | 279.4           | -279.4 | 279.4        | -279.4 | 281.2                       | -277.6 | 281.2     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 59.43 L                 | 45.71                | 142.00      | 0.0       | 45.01                   | 34.62                  | 170.00 |        |
|           |            | -45.74 R                | -35.19               | 208.00      | 0.0       | -35.64                  | -27.41                 | 185.00 | 235.00 |
| OPER      | 5C1T       | 54.49 L                 | 41.92                | 32.00       | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -43.35 R                | -33.35               | 284.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 2.84            | 3.64            | 2.84               | 3.64               | HS 56.79     | 102.2                |
| 5C1T        | 5.16            | 6.40            | 5.16               | 6.40               | 0.00         | 619.3                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 7.900

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 127.0           | 127.0         | 127.0        | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 7.900

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.87 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 93.380     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 24.24 |        | 105.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 7.900

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -1.6                | -16.9                            |

| Rating<br>Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|----------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|                | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.           | 180.4C             | -161.2                | 161.2              | -180.4C               | 191.5                       | -150.1                | 172.3              | -169.3                |
| OPER           | 300.6C             | -268.7                | 268.7              | -300.6C               | 319.1                       | -250.2                | 287.1              | -282.1                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Rat.<br>Veh. | Truck<br>w/imp. | Live Load<br>w/o imp. | Moment | Loc. of<br>Front<br>Wheel | Ax.<br>Dis. | Lane<br>w/imp. | Live Load<br>w/o imp. | Moment | Loc. of<br>Load 1 | Conc.<br>Load 2 |
|--------------|--------------|-----------------|-----------------------|--------|---------------------------|-------------|----------------|-----------------------|--------|-------------------|-----------------|
| INV.         | HS20         | 16.19 L         | 12.46                 | 144.50 | 0.0                       | 24.95       | 19.19          | 172.50                |        |                   |                 |
|              |              | -58.96 L        | -45.35                | 166.00 | 0.0                       | -54.13      | -41.64         | 185.00                | 162.50 |                   |                 |
| OPER         | 5C1T         | 29.07 L         | 22.36                 | 34.50  | 0.0                       | 0.00        | 0.00           | 0.00                  |        |                   |                 |
|              |              | -50.95 R        | -39.19                | 286.50 | 0.0                       | 0.00        | 0.00           | 0.00                  | 0.00   | 0.00              |                 |

## Moment

| Rating<br>Veh. | top fiber<br>+bend | Rating<br>bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------------|---------------------------------|-----------------|-----------------------|-----------------|----------------------------|
| HS20           | 7.68               | 2.55                            | 6.91            | 2.87                  | HS 50.92        | 91.7                       |
| 5C1T           | 10.98              | 4.91                            | 9.88            | 5.54                  | 0.00            | 589.2                      |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 7.900

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.6      | -7.0         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -65.3                  | 74.4                  |
| OPER      | 151.3             | -108.8                 | 124.0                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -30.12                | 3.11 | -23.17   | 2.39 | -23.78               | 3.19 | -18.29   | 2.46 |
| OPER      | 5C1T      | -23.47                | 3.53 | -18.05   | 2.71 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 2.17       | 23.30      | HS 43.34     | 78.0                 |  |
| 5C1T   | 4.63       | 35.16      | 0.00         | 556.1                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 7.900

Dead Load Moment      Superimposed Dead Load Moment  
-1.6                      -16.9

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 156.5      | 160.2           | -175.0 | 160.2        | -175.0 | 178.7                       | -156.5 | 178.7     | - |
| OPER 260.9      | 279.4           | -279.4 | 279.4        | -279.4 | 297.9                       | -260.9 | 297.9     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 16.19 L                 | 12.46                | 144.50      | 0.0       | 24.95                   | 19.19                  | 172.50 |        |
|           |            | -58.96 L                | -45.35               | 166.00      | 0.0       | -54.13                  | -41.64                 | 185.00 | 162.50 |
| OPER      | 5C1T       | 29.07 L                 | 22.36                | 34.50       | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -50.95 R                | -39.19               | 286.50      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 7.16            | 2.65  | 7.16         | 2.65  | HS 53.10     | 95.6                 |
| 5C1T        | 10.25           | 5.12  | 10.25        | 5.12  | 0.00         | 614.5                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 8.000

|               |                             |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Allowable stress (fs) (psi) |           |         |         |
| RATIO/Inv.    | 0.00                        | 0.00      | 0.00    | 0.00    |
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

|                |           |       |      |      |       |       |      |      |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

|                         |                  |                       |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

|               |          |              |       |                   |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

|                  |                  |             |       |                 |
|------------------|------------------|-------------|-------|-----------------|
| Section Modulus  |                  |             |       | Plastic Section |
| Positive Bending | Negative Bending | Modulus - Z |       |                 |
| Top              | Bott.            | Top         | Bott. | (Fy * Z)        |
| 127.0            | 127.0            | 127.0       | 127.0 | 390.83          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 8.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.87 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 93.380     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 24.24 |        | 105.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 8.000

Dead Load Moment      Superimposed Dead Load Moment  
-3.3                      -36.5

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 204.3                       | -137.3                | 185.1              | -156.5                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 340.5                       | -228.8                | 308.5              | -260.8                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.43 L      | 12.63              | 117.00 | 0.0                 | 16.32    | 12.55       | 140.00             |        |                |              |
|           |           | -98.55 R     | -75.80             | 195.50 | 0.0                 | -90.65   | -69.73      | 165.00             | 185.00 |                |              |
| OPER      | 5C1T      | 12.70 L      | 9.77               | -85.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -64.71 R     | -49.78             | 291.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 12.44              | 1.39                         | 11.27                              | 1.59         | HS 27.86             |
| 5C1T        | 26.82              | 3.54                         | 24.30                              | 4.03         | 0.00 424.3           |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 8.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.6      | -0.8      | -7.0                   | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 90.8              | -64.1                           | 64.1  |
| OPER      | 151.3             | -106.9                          | 106.8 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -30.12                | 34.52 | -23.17   | 26.56 | -23.78               | 26.36 | -18.29   | 20.28 |
| OPER      | 5C1T      | -23.47                | 26.44 | -18.05   | 20.34 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.86       | 1.86       | HS 37.12     | 66.8                 |
| 5C1T   | 4.06       | 4.04       | 0.00         | 484.7                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 8.000

Dead Load Moment      Superimposed Dead Load Moment  
-3.3                      -36.5

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 143.7      | 151.7           | -183.6 | 151.7        | -183.6 | 191.6                       | -143.7 | 191.6     | - |
| OPER 239.5      | 279.4           | -279.4 | 279.4        | -279.4 | 319.3                       | -239.5 | 319.3     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|------------------|-----------------|-------------------------|-----------|------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 16.43 L          | 12.63           | 117.00                  | 0.0       | 16.32            | 12.55           | 140.00               |        |
|           |            | -98.55 R         | -75.80          | 195.50                  | 0.0       | -90.65           | -69.73          | 165.00               | 185.00 |
| OPER      | 5C1T       | 12.70 L          | 9.77            | -85.00                  | 0.0       | 0.00             | 0.00            | 0.00                 |        |
|           |            | -64.71 R         | -49.78          | 291.50                  | 0.0       | 0.00             | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 11.66           | 1.46            | 11.66              | 1.46               | HS 29.17     | 52.5                 |
| 5C1T        | 25.14           | 3.70            | 25.14              | 3.70               | 0.00         | 444.2                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 8.000

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 8.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.87 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 93.285     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 24.24 |        | 105.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 8.000

Dead Load Moment      Superimposed Dead Load Moment  
-3.3                      -36.5

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 204.3                       | -137.3                | 185.1              | -156.5                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 340.5                       | -228.8                | 308.5              | -260.8                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.43 L      | 12.63              | 117.00 | 0.0                 | 16.32    | 12.55       | 140.00             |        |                |              |
|           |           | -98.55 R     | -75.80             | 195.50 | 0.0                 | -90.65   | -69.73      | 165.00             |        | 185.00         |              |
| OPER      | 5C1T      | 12.70 L      | 9.77               | -85.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -64.71 R     | -49.78             | 291.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 12.44              | 1.39                         | 11.27           | 1.59                  | HS 27.86     | 50.2                 |
| 5C1T        | 26.82              | 3.54                         | 24.30           | 4.03                  | 0.00         | 424.3                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 8.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.8      | 0.8       | -8.7                   | 8.8       |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 90.8              | -64.1                           | 64.1  |
| OPER      | 151.3             | -106.9                          | 106.8 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -34.53                | 34.52 | -26.56   | 26.56 | -26.35               | 26.36 | -20.27   | 20.28 |
| OPER      | 5C1T      | -26.31                | 26.44 | -20.23   | 20.34 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.86       | 1.86       | HS 37.12     | 66.8                 |
| 5C1T   | 4.06       | 4.04       | 0.00         | 484.7                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 8.000

Dead Load Moment      Superimposed Dead Load Moment  
-3.3                      -36.5

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 143.7      | 151.7           | -183.6 | 151.7        | -183.6 | 191.6                       | -143.7 | 191.6     | - |
| OPER 239.5      | 279.4           | -279.4 | 279.4        | -279.4 | 319.3                       | -239.5 | 319.3     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|------------------|-----------------|-------------------------|-----------|------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 16.43 L          | 12.63           | 117.00                  | 0.0       | 16.32            | 12.55           | 140.00               |        |
|           |            | -98.55 R         | -75.80          | 195.50                  | 0.0       | -90.65           | -69.73          | 165.00               | 185.00 |
| OPER      | 5C1T       | 12.70 L          | 9.77            | -85.00                  | 0.0       | 0.00             | 0.00            | 0.00                 |        |
|           |            | -64.71 R         | -49.78          | 291.50                  | 0.0       | 0.00             | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 11.66           | 1.46  | 11.66        | 1.46  | HS 29.17     | 52.5                 |
| 5C1T        | 25.14           | 3.70  | 25.14        | 3.70  | 0.00         | 444.2                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 8.100

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 127.0           | 127.0         | 127.0        | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 8.100

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.87 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 93.285     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 24.24 |        | 105.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 8.100

Dead Load Superimposed Dead Load  
Moment Moment  
-1.5 -16.7

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 191.3                       | -150.2             | 172.1           | -169.4             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 318.9                       | -250.4             | 286.9           | -282.4             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.21 R      | 12.47              | 205.50 | 0.0                 | 25.50    | 19.62       | 177.50             |        |                |              |
|           |           | -58.98 R     | -45.37             | 184.00 | 0.0                 | -54.13   | -41.64      | 165.00             | 187.50 |                |              |
| OPER      | 5C1T      | 29.53 R      | 22.72              | 228.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -50.55 L     | -38.88             | 63.50  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 7.50            | 2.55                      | 6.75         | 2.87               | HS 50.95     | 91.7                 |
| 5C1T        | 10.80           | 4.95                      | 9.71         | 5.59               | 0.00         | 594.5                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 8.100

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.6       | 0.0          | 7.1       |

| Rat. | Shear Capacity | Available Capacity for LL+I |
|------|----------------|-----------------------------|
| Veh. | VU             | (-) (+)                     |
| INV. | 90.8           | -74.4 65.2                  |
| OPER | 151.3          | -124.1 108.7                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. | Rat. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|------|------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|      |      | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
| Typ. | Veh. | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV. | HS20 | -2.94                 | 30.11 | -2.26    | 23.16 | -3.13                | 23.79 | -2.41    | 18.30 |
| OPER | 5C1T | -3.40                 | 23.57 | -2.61    | 18.13 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 23.75      | 2.16       | HS 43.31     | 78.0                 |
| 5C1T   | 36.53      | 4.61       | 0.00         | 553.2                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 8.100

Dead Load Moment      Superimposed Dead Load Moment  
-1.5                      -16.7

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 156.7      | 160.3           | -174.9 | 160.3        | -174.9 | 178.6                       | -156.7 | 178.6     | - |
| OPER 261.2      | 279.4           | -279.4 | 279.4        | -279.4 | 297.6                       | -261.2 | 297.6     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 16.21 R                 | 12.47           | 205.50                  | 0.0       | 25.50                   | 19.62           | 177.50               |        |
|           |            | -58.98 R                | -45.37          | 184.00                  | 0.0       | -54.13                  | -41.64          | 165.00               | 187.50 |
| OPER      | 5C1T       | 29.53 R                 | 22.72           | 228.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -50.55 L                | -38.88          | 63.50                   | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 7.00            | 2.66  | 7.00         | 2.66  | HS 53.13     | 95.6                 |
| 5C1T        | 10.08           | 5.17  | 10.08        | 5.17  | 0.00         | 620.0                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 8.200

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 8.200

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.87 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 93.285     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 24.24 |        | 105.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 8.200

Dead Load Moment      Superimposed Dead Load Moment  
-0.1                      -1.2

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 181.2                       | -160.4                | 162.0              | -179.6                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 302.0                       | -267.3                | 270.0              | -299.3                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 59.43 R      | 45.72              | 208.00 | 0.0                 | 44.74    | 34.41       | 180.00             |        |                |              |
|           |           | -45.75 L     | -35.19             | 142.00 | 0.0                 | -35.41   | -27.24      | 165.00             |        | 115.00         |              |
| OPER      | 5C1T      | 55.09 R      | 42.38              | 318.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -42.86 L     | -32.97             | 66.00  | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 3.05               | 3.51                         | 2.73                               | 3.92         | HS 54.51 98.1        |
| 5C1T        | 5.48               | 6.24                         | 4.90                               | 6.98         | 0.00 588.1           |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 8.200

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.5       | 0.0          | 5.3       |

| Rat. | Shear Capacity | Available Capacity for LL+I |
|------|----------------|-----------------------------|
| Veh. | VU             | (-) (+)                     |
| INV. | 90.8           | -73.3 66.3                  |
| OPER | 151.3          | -122.2 110.5                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. | Rat. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|------|------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|      |      | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
| Typ. | Veh. | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV. | HS20 | -2.94                 | 25.39 | -2.26    | 19.53 | -4.39                | 20.98 | -3.38    | 16.14 |
| OPER | 5C1T | -5.11                 | 20.48 | -3.93    | 15.75 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 16.70      | 2.61       | HS 52.24     | 94.0                 |
| 5C1T   | 23.90      | 5.40       | 0.00         | 647.8                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 8.200

Dead Load Moment      Superimposed Dead Load Moment  
-0.1                      -1.2

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 166.8      | 167.1           | -168.2 | 167.1        | -168.2 | 168.4                       | -166.8 | 168.4     | - |
| OPER 278.1      | 279.4           | -279.4 | 279.4        | -279.4 | 280.7                       | -278.1 | 280.7     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 59.43 R                 | 45.72                | 208.00      | 0.0       | 44.74                   | 34.41                  | 180.00 |        |
|           |            | -45.75 L                | -35.19               | 142.00      | 0.0       | -35.41                  | -27.24                 | 165.00 | 115.00 |
| OPER      | 5C1T       | 55.09 R                 | 42.38                | 318.00      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -42.86 L                | -32.97               | 66.00       | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 2.83            | 3.65  | 2.83         | 3.65  | HS 56.68     | 102.0                |
| 5C1T        | 5.10            | 6.49  | 5.10         | 6.49  | 0.00         | 611.5                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 8.300

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 127.0           | 127.0         | 127.0        | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 8.300

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.87 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 93.285     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 24.24 |        | 105.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 8.300

Dead Load Moment 0.9  
Superimposed Dead Load Moment 10.0

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 173.8                       | -167.7             | 154.7           | -186.9             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 289.7                       | -279.5             | 257.8           | -311.5             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment w/o imp. | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment w/o imp. | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|-----------------|---------------------|----------|-------------|--------------------|-----------------|----------------|--------------|
| INV.      | HS20      | 86.47 R      | 66.52              | 210.50          | 0.0                 | 65.25    | 50.19       | 182.50             |                 |                |              |
|           |           | -37.98 L     | -29.21             | 142.00          | 0.0                 | -29.81   | -22.93      | 165.00             | 0.00            |                |              |
| OPER      | 5C1T      | 74.93 R      | 57.64              | 320.50          | 0.0                 | 0.00     | 0.00        | 0.00               |                 |                |              |
|           |           | -38.35 L     | -29.50             | -20.00          | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00            | 0.00           |              |

## Moment

| Rating Veh. | Rating Factor   |                    |                 |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|-----------------|--------------------|--------------|----------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend |              |                      |
| HS20        | 2.01            | 4.42               | 1.79            | 4.92               | HS 35.77     | 64.4                 |
| 5C1T        | 3.87            | 7.29               | 3.44            | 8.12               | 0.00         | 412.8                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 8.300

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.3       | 0.0          | 3.6       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -72.2                  | 67.5                  |
| OPER      | 151.3             | -120.3                 | 112.4                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -4.42                 | 20.56 | -3.40    | 15.82 | -6.66                | 18.03 | -5.13    | 13.87 |
| OPER      | 5C1T      | -7.09                 | 17.32 | -5.45    | 13.33 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 10.83      | 3.28       | HS 65.60     | 118.1                |
| 5C1T   | 16.98      | 6.49       | 0.00         | 778.7                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 8.300Dead Load Moment 0.9  
Superimposed Dead Load Moment 10.0

| Rating Veh. ber | Moment Capacity top fiber |        | Moment Capacity bottom fiber |        | Available Capacity for LL+I |                 |                 |                 |
|-----------------|---------------------------|--------|------------------------------|--------|-----------------------------|-----------------|-----------------|-----------------|
|                 | +bend                     | -bend  | +bend                        | -bend  | top fiber +bend             | top fiber -bend | bottom fi +bend | bottom fi -bend |
| INV. 174.2      | 172.0                     | -163.3 | 172.0                        | -163.3 | 161.1                       | -174.2          | 161.1           | -               |
| OPER 290.3      | 279.4                     | -279.4 | 279.4                        | -279.4 | 268.5                       | -290.3          | 268.5           | -               |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Live Load Moment w/o imp. | Loc. of Conc. Load 1 | Live Load Moment w/imp. | Loc. of Conc. Load 2 |
|-----------|------------|-------------------------|-------------------------|---------------------------|----------------------|-------------------------|----------------------|
| INV.      | HS20       | 86.47 R                 | 66.52                   | 210.50                    | 0.0                  | 65.25                   | 50.19                |
|           |            | -37.98 L                | -29.21                  | 142.00                    | 0.0                  | -29.81                  | -22.93               |
| OPER      | 5C1T       | 74.93 R                 | 57.64                   | 320.50                    | 0.0                  | 0.00                    | 0.00                 |
|           |            | -38.35 L                | -29.50                  | -20.00                    | 0.0                  | 0.00                    | 0.00                 |

## Serviceability

| Rating Veh. | Rating top fiber +bend | Rating top fiber -bend | Factor bottom fiber +bend | Factor bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|------------------------|------------------------|---------------------------|---------------------------|--------------|----------------------|
| HS20        | 1.86                   | 4.59                   | 1.86                      | 4.59                      | HS 37.26     | 67.1                 |
| 5C1T        | 3.58                   | 7.57                   | 3.58                      | 7.57                      | 0.00         | 430.0                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 8.400

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 8.400

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.87 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 93.285     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 24.24 |        | 105.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 8.400

Dead Load Moment 1.5  
Superimposed Dead Load Moment 16.9

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 169.3                       | -172.3             | 150.1           | -191.4             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 282.2                       | -287.1             | 250.2           | -319.1             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 97.01 R      | 74.62              | 213.00 | 0.0                 | 77.56    | 59.66       | 185.00             |        |                |              |
|           |           | -30.20 L     | -23.23             | 142.00 | 0.0                 | -26.05   | -20.04      | 165.00             | 0.00   |                |              |
| OPER      | 5C1T      | 87.63 R      | 67.41              | 371.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -35.29 L     | -27.15             | -18.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 1.75            | 5.70                      | 1.55         | 6.34               | HS 30.95     | 55.7                 |
| 5C1T        | 3.22            | 8.14                      | 2.86         | 9.04               | 0.00         | 342.6                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 8.400Dead Load Superimposed Dead Load  
Shear (-) Shear (+) Shear

0.2 0.0 1.9

Rat. Shear Capacity Available Capacity for LL+I  
Veh. VU (-) (+)INV. 90.8 -71.1 68.6  
OPER 151.3 -118.4 114.3

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Rat.<br>Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|--------------|--------------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|              |              | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|              |              | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.         | HS20         | -8.97                 | 16.78 | -6.90    | 12.91 | -9.24                | 15.05 | -7.11    | 11.57 |
| OPER         | 5C1T         | -9.27                 | 14.26 | -7.13    | 10.97 | 0.00                 | 0.00  | 0.00     | 0.00  |

## Rating Shear

| Veh. | Rating<br>(-) | Factor<br>(+) | Rating<br>Value | Load<br>Capacity<br>(tons) |
|------|---------------|---------------|-----------------|----------------------------|
| HS20 | 7.69          | 4.09          | HS 81.75        | 147.2                      |
| 5C1T | 12.78         | 8.02          | 0.00            | 962.1                      |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 8.400Dead Load Moment 1.5  
Superimposed Dead Load Moment 16.9

| Rating Veh. ber | Moment Capacity top fiber |        | Moment Capacity bottom fiber |        | Available Capacity for LL+I |        |           |   |
|-----------------|---------------------------|--------|------------------------------|--------|-----------------------------|--------|-----------|---|
|                 | +bend                     | -bend  | +bend                        | -bend  | top fiber                   | -bend  | bottom fi |   |
| INV. 178.7      | 175.0                     | -160.3 | 175.0                        | -160.3 | 156.6                       | -178.7 | 156.6     | - |
| OPER 297.8      | 279.4                     | -279.4 | 279.4                        | -279.4 | 261.0                       | -297.8 | 261.0     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |        |        |      |
|-----------|------------|-------------------------|-------------------------|------------------------------|----------------------|--------|--------|--------|------|
| INV.      | HS20       | 97.01 R                 | 74.62                   | 213.00                       | 0.0                  | 77.56  | 59.66  | 185.00 |      |
|           |            | -30.20 L                | -23.23                  | 142.00                       | 0.0                  | -26.05 | -20.04 | 165.00 | 0.00 |
| OPER      | 5C1T       | 87.63 R                 | 67.41                   | 371.00                       | 0.0                  | 0.00   | 0.00   | 0.00   |      |
|           |            | -35.29 L                | -27.15                  | -18.50                       | 0.0                  | 0.00   | 0.00   | 0.00   | 0.00 |

## Serviceability

| Rating Veh. | Rating top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | Factor bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|------------------------|---------------------------|---------------------------|---------------------------|--------------|----------------------|
| HS20        | 1.61                   | 5.92                      | 1.61                      | 5.92                      | HS 32.28     | 58.1                 |
| 5C1T        | 2.98                   | 8.44                      | 2.98                      | 8.44                      | 0.00         | 357.4                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 8.500

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |               |                      |               | Plastic Section Modulus - Z |
|----------------------|---------------|----------------------|---------------|-----------------------------|
| Positive Bending Top | Bending Bott. | Negative Bending Top | Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0         | 127.0                | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 8.500

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.82 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 90.772     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 13.97 |        | 106.7                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 8.500

Dead Load Moment 1.7  
Superimposed Dead Load Moment 19.5

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 167.6                       | -174.0             | 148.4           | -193.1             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 279.4                       | -289.9             | 247.4           | -321.9             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 94.67 L      | 72.82              | 173.50 | 0.0                 | 82.45    | 63.42       | 187.50             |        |                |              |
|           |           | -22.43 L     | -17.25             | 142.00 | 0.0                 | -22.28   | -17.14      | 165.00             |        | 0.00           |              |
| OPER      | 5C1T      | 90.81 R      | 69.86              | 373.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -33.69 L     | -25.92             | 115.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 1.77            | 7.76                      | 1.57         | 8.61               | HS 31.36     | 56.4                 |
| 5C1T        | 3.08            | 8.60                      | 2.72         | 9.55               | 0.00         | 326.9                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 8.500

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear     | (-) Shear (+) Shear    |
| 0.0       | 0.0 0.2                |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -69.9                  | 69.7         |
| OPER      | 151.3             | -116.6                 | 116.2        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |      |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |      |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)  |
| INV.      | HS20      | -13.12                | 13.12 | -10.09   | 10.09 | -12.03               | 12.11 | -9.26    | 9.32 |
| OPER      | 5C1T      | -11.58                | 11.77 | -8.91    | 9.05  | 0.00                 | 0.00  | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 5.33       | 5.31       | HS 106.24    | 191.2                |
| 5C1T   | 10.07      | 9.87       | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 8.500

Dead Load Moment 1.7  
Superimposed Dead Load Moment 19.5

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 180.4      | 176.2           | -159.1 | 176.2        | -159.1 | 154.9                       | -180.4 | 154.9     | - |
| OPER 300.7      | 279.4           | -279.4 | 279.4        | -279.4 | 258.1                       | -300.7 | 258.1     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |        |
|-----------|------------|-------------------------|-------------------------|-----------|-------------------------|----------------------|--------|--------|
| INV.      | HS20       | 94.67 L                 | 72.82                   | 173.50    | 0.0                     | 82.45                | 63.42  | 187.50 |
|           |            | -22.43 L                | -17.25                  | 142.00    | 0.0                     | -22.28               | -17.14 | 165.00 |
| OPER      | 5C1T       | 90.81 R                 | 69.86                   | 373.50    | 0.0                     | 0.00                 | 0.00   | 0.00   |
|           |            | -33.69 L                | -25.92                  | 115.50    | 0.0                     | 0.00                 | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 1.64            | 8.04  | 1.64         | 8.04  | HS 32.72     | 58.9                 |
| 5C1T        | 2.84            | 8.92  | 2.84         | 8.92  | 0.00         | 341.1                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 8.600

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 8.600

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.82 | 28.67 | 28.67 | 1.699 | 999999.000 | 90.772 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 13.97 |        | 106.7                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 8.600

Dead Load Moment 1.6  
Superimposed Dead Load Moment 17.5

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 168.9                       | -172.7             | 149.7           | -191.8             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 281.5                       | -287.8             | 249.5           | -319.7             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 96.97 L      | 74.59              | 162.00 | 0.0                 | 77.63    | 59.72       | 190.00             |        |                |              |
|           |           | -29.91 R     | -23.01             | 233.00 | 0.0                 | -25.66   | -19.74      | 210.00             | 0.00   |                |              |
| OPER      | 5C1T      | 88.02 L      | 67.71              | 139.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -33.75 R     | -25.96             | 393.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 1.74            | 5.77                      | 1.54                      | 6.41               | HS 30.88     | 55.6                 |
| 5C1T        | 3.20            | 8.53                      | 2.84                      | 9.48               | 0.00         | 340.2                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 8.600

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| -0.1      | -1.7                   |
|           | 0.0                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 90.8              | -68.7                           | 70.9  |
| OPER      | 151.3             | -114.6                          | 118.2 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |              |      | Lane Live Load Shear |      |              |      |
|-----------|-----------|-----------------------|------|--------------|------|----------------------|------|--------------|------|
|           |           | w/imp. (-)            | (+)  | w/o imp. (-) | (+)  | w/imp. (-)           | (+)  | w/o imp. (-) | (+)  |
| INV.      | HS20      | -16.78                | 8.97 | -12.90       | 6.90 | -14.97               | 9.31 | -11.51       | 7.16 |
| OPER      | 5C1T      | -14.06                | 9.47 | -10.81       | 7.28 | 0.00                 | 0.00 | 0.00         | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 4.10       | 7.61       | HS 81.95     | 147.5                |  |
| 5C1T   | 8.15       | 12.48      | 0.00         | 978.0                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 8.600

Dead Load Moment 1.6  
Superimposed Dead Load Moment 17.5

| Rating Veh. ber | Moment Capacity top fiber |        | Moment Capacity bottom fiber |        | Available Capacity for LL+I |                 |                 |                 |
|-----------------|---------------------------|--------|------------------------------|--------|-----------------------------|-----------------|-----------------|-----------------|
|                 | +bend                     | -bend  | +bend                        | -bend  | top fiber +bend             | top fiber -bend | bottom fi +bend | bottom fi -bend |
| INV. 179.1      | 175.3                     | -160.0 | 175.3                        | -160.0 | 156.2                       | -179.1          | 156.2           | -               |
| OPER 298.5      | 279.4                     | -279.4 | 279.4                        | -279.4 | 260.3                       | -298.5          | 260.3           | -               |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Live Load Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Live Load Moment w/o imp. | Loc. of Conc. Load 1 | Loc. of Conc. Load 2 |
|-----------|------------|-------------------------|---------------------------|-------------------------|-----------|-------------------------|---------------------------|----------------------|----------------------|
| INV.      | HS20       | 96.97 L                 | 74.59                     | 162.00                  | 0.0       | 77.63                   | 59.72                     | 190.00               |                      |
|           |            | -29.91 R                | -23.01                    | 233.00                  | 0.0       | -25.66                  | -19.74                    | 210.00               | 0.00                 |
| OPER      | 5C1T       | 88.02 L                 | 67.71                     | 139.00                  | 0.0       | 0.00                    | 0.00                      | 0.00                 |                      |
|           |            | -33.75 R                | -25.96                    | 393.50                  | 0.0       | 0.00                    | 0.00                      | 0.00                 | 0.00                 |

## Serviceability

| Rating Veh. | Rating Factor top fiber |       | Rating Factor bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-------------------------|-------|----------------------------|-------|--------------|----------------------|
|             | +bend                   | -bend | +bend                      | -bend |              |                      |
| HS20        | 1.61                    | 5.99  | 1.61                       | 5.99  | HS 32.21     | 58.0                 |
| 5C1T        | 2.96                    | 8.85  | 2.96                       | 8.85  | 0.00         | 354.8                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 8.700

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 8.700

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.82 | 28.67 | 28.67 | 1.699 | 999999.000 | 90.772 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 13.97 |        | 106.7                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 8.700

Dead Load Moment 1.0  
Superimposed Dead Load Moment 11.2

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 173.0                       | -168.5             | 153.8           | -187.7             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 288.4                       | -280.9             | 256.4           | -312.9             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 86.43 L      | 66.48              | 164.50 | 0.0                 | 65.39    | 50.30       | 192.50             |        |                |              |
|           |           | -37.61 R     | -28.93             | 233.00 | 0.0                 | -29.08   | -22.37      | 210.00             |        | 0.00           |              |
| OPER      | 5C1T      | 76.13 L      | 58.56              | 141.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -36.19 R     | -27.84             | 395.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | bottom fiber -bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|--------|--------------|----------------------|
| HS20        | 2.00            | 4.48               | 1.78   | 35.60        | 64.1                 |
| 5C1T        | 3.79            | 7.76               | 3.37   | 0.00         | 404.1                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 8.700

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.3      | -3.4         | 0.0       |

| Rat. | Shear | Capacity | Available Capacity for LL+I |
|------|-------|----------|-----------------------------|
| Veh. |       | VU       | (-) (+)                     |
| INV. | 90.8  |          | -67.6 72.0                  |
| OPER | 151.3 |          | -112.7 120.1                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. | Rat. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|------|------|-----------------------|------|----------|------|----------------------|------|----------|------|
|      |      | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
| Typ. | Veh. | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV. | HS20 | -20.57                | 4.41 | -15.82   | 3.39 | -17.96               | 6.74 | -13.81   | 5.19 |
| OPER | 5C1T | -17.15                | 7.28 | -13.19   | 5.60 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |        | Shear  |          |          |  |
|--------|--------|--------|----------|----------|--|
| Veh.   | Rating | Factor | Rating   | Load     |  |
|        | (-)    | (+)    | Value    | Capacity |  |
|        |        |        |          | (tons)   |  |
| HS20   | 3.29   | 10.68  | HS 65.74 | 118.3    |  |
| 5C1T   | 6.57   | 16.49  | 0.00     | 788.6    |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 8.700

Dead Load Moment 1.0  
Superimposed Dead Load Moment 11.2

| Rating Veh. ber | Moment Capacity top fiber |        | Moment Capacity bottom fiber |        | Available Capacity for LL+I |        |           |   |
|-----------------|---------------------------|--------|------------------------------|--------|-----------------------------|--------|-----------|---|
|                 | +bend                     | -bend  | +bend                        | -bend  | top fiber                   | -bend  | bottom fi |   |
| INV. 175.0      | 172.5                     | -162.7 | 172.5                        | -162.7 | 160.3                       | -175.0 | 160.3     | - |
| OPER 291.7      | 279.4                     | -279.4 | 279.4                        | -279.4 | 267.1                       | -291.7 | 267.1     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Live Load Moment w/o imp. | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-------------------------|---------------------------|-----------|-------------------------|----------------------|--------|
| INV.      | HS20       | 86.43 L                 | 66.48                   | 164.50                    | 0.0       | 65.39                   | 50.30                | 192.50 |
|           |            | -37.61 R                | -28.93                  | 233.00                    | 0.0       | -29.08                  | -22.37               | 210.00 |
| OPER      | 5C1T       | 76.13 L                 | 58.56                   | 141.50                    | 0.0       | 0.00                    | 0.00                 | 0.00   |
|           |            | -36.19 R                | -27.84                  | 395.00                    | 0.0       | 0.00                    | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor top fiber |       | Rating Factor bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-------------------------|-------|----------------------------|-------|--------------|----------------------|
|             | +bend                   | -bend | +bend                      | -bend |              |                      |
| HS20        | 1.86                    | 4.65  | 1.86                       | 4.65  | HS 37.09     | 66.8                 |
| 5C1T        | 3.51                    | 8.06  | 3.51                       | 8.06  | 0.00         | 421.1                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 8.800

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 8.800

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.82 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 90.772     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 13.97 |        | 106.7                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 8.800

Dead Load Moment 0.1  
Superimposed Dead Load Moment 0.6

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 180.0                       | -161.6             | 160.8           | -180.8             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 299.9                       | -269.4             | 267.9           | -301.3             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 59.36 L      | 45.67              | 167.00 | 0.0                 | 45.49    | 34.99       | 195.00             |        |                |              |
|           |           | -45.31 R     | -34.85             | 233.00 | 0.0                 | -33.05   | -25.42      | 210.00             | 177.50 |                |              |
| OPER      | 5C1T      | 56.26 L      | 43.27              | 57.00  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -40.12 R     | -30.86             | 222.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | bottom fiber -bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|--------|--------------|----------------------|
| HS20        | 3.03            | 3.57               | 2.71   | 54.16        | 97.5                 |
| 5C1T        | 5.33            | 6.72               | 4.76   | 0.00         | 571.6                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 8.800

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.5      | -5.1         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -66.5                  | 73.2         |
| OPER      | 151.3             | -110.8                 | 121.9        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -25.40                | 2.98 | -19.54   | 2.29 | -20.91               | 4.47 | -16.08   | 3.44 |
| OPER      | 5C1T      | -20.31                | 5.32 | -15.63   | 4.09 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 2.62       | 16.37      | HS 52.35     | 94.2                 |  |
| 5C1T   | 5.45       | 22.94      | 0.00         | 654.6                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 8.800Dead Load Moment 0.1  
Superimposed Dead Load Moment 0.6

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 168.1      | 167.9           | -167.4 | 167.9        | -167.4 | 167.2                       | -168.1 | 167.2     | - |
| OPER 280.1      | 279.4           | -279.4 | 279.4        | -279.4 | 278.7                       | -280.1 | 278.7     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 59.36 L                 | 45.67                | 167.00      | 0.0       | 45.49                   | 34.99                  | 195.00 |        |
|           |            | -45.31 R                | -34.85               | 233.00      | 0.0       | -33.05                  | -25.42                 | 210.00 | 177.50 |
| OPER      | 5C1T       | 56.26 L                 | 43.27                | 57.00       | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -40.12 R                | -30.86               | 222.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 2.82            | 3.71            | 2.82               | 3.71               | HS 56.33     | 101.4                |
| 5C1T        | 4.95            | 6.98            | 4.95               | 6.98               | 0.00         | 594.5                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 8.900

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 8.900

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.82 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 90.772     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 13.97 |        | 106.7                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 8.900

Dead Load Superimposed Dead Load  
Moment Moment  
-1.2 -14.3

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 189.7                       | -151.9                | 170.5              | -171.1                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 316.2                       | -253.1                | 284.2              | -285.1                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.13 L      | 12.41              | 169.50 | 0.0                 | 25.54    | 19.64       | 197.50             |        |                |              |
|           |           | -58.69 L     | -45.15             | 191.00 | 0.0                 | -52.86   | -40.66      | 210.00             | 187.50 |                |              |
| OPER      | 5C1T      | 30.53 L      | 23.48              | 59.50  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -47.24 R     | -36.34             | 224.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 7.43               | 2.59                         | 6.68            | 2.91                  | HS 51.76     | 93.2                 |
| 5C1T        | 10.36              | 5.36                         | 9.31            | 6.04                  | 0.00         | 643.0                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 8.900

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.6      | -6.8         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -65.4                  | 74.3                  |
| OPER      | 151.3             | -108.9                 | 123.8                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -30.12                | 3.11 | -23.17   | 2.39 | -23.71               | 3.23 | -18.24   | 2.48 |
| OPER      | 5C1T      | -23.40                | 3.64 | -18.00   | 2.80 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 2.17       | 23.01      | HS 43.41     | 78.1                 |
| 5C1T   | 4.66       | 34.06      | 0.00         | 558.8                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 8.900

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -1.2                | -14.3                            |

| Rating<br>Veh.<br>ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                       | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend                  | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV.<br>158.3         | 161.4           | -173.8 | 161.4        | -173.8 | 177.0                       | -158.3 | 177.0     | - |
| OPER<br>263.9         | 279.4           | -279.4 | 279.4        | -279.4 | 294.9                       | -263.9 | 294.9     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Truck<br>Veh. | Live Load Moment<br>w/imp. | Loc. of Ax.<br>w/o imp. | Front<br>Wheel | Lane Dis. | Live Load Moment<br>w/imp. | Loc. of Conc.<br>w/o imp. | Load 1 | Load 2 |
|--------------|---------------|----------------------------|-------------------------|----------------|-----------|----------------------------|---------------------------|--------|--------|
| INV.         | HS20          | 16.13 L                    | 12.41                   | 169.50         | 0.0       | 25.54                      | 19.64                     | 197.50 |        |
|              |               | -58.69 L                   | -45.15                  | 191.00         | 0.0       | -52.86                     | -40.66                    | 210.00 | 187.50 |
| OPER         | 5C1T          | 30.53 L                    | 23.48                   | 59.50          | 0.0       | 0.00                       | 0.00                      | 0.00   |        |
|              |               | -47.24 R                   | -36.34                  | 224.50         | 0.0       | 0.00                       | 0.00                      | 0.00   | 0.00   |

## Serviceability

| Rating<br>Veh. | Rating       |                | Factor          |                | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------|----------------|-----------------|----------------|-----------------|----------------------------|
|                | top<br>+bend | fiber<br>-bend | bottom<br>+bend | fiber<br>-bend |                 |                            |
| HS20           | 6.93         | 2.70           | 6.93            | 2.70           | HS 53.95        | 97.1                       |
| 5C1T           | 9.66         | 5.59           | 9.66            | 5.59           | 0.00            | 670.3                      |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 9.000

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 9.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.82 | 28.67 | 28.67 | 1.699 | 999999.000 | 90.772 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 13.97 |        | 106.7                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 9.000

Dead Load Moment      Superimposed Dead Load Moment  
-2.9                      -33.5

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 202.3                       | -139.3                | 183.1              | -158.5                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 337.1                       | -232.2                | 305.1              | -264.2                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 19.98 R      | 15.37              | 258.00 | 0.0                 | 17.84    | 13.72       | 235.00             |        |                |              |
|           |           | -98.43 R     | -75.72             | 220.50 | 0.0                 | -89.21   | -68.63      | 190.00             | 210.00 |                |              |
| OPER      | 5C1T      | 15.39 R      | 11.84              | 458.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -61.73 R     | -47.48             | 318.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 10.12              | 1.41                         | 9.16            | 1.61                  | HS 28.31     | 51.0                 |
| 5C1T        | 21.90              | 3.76                         | 19.83           | 4.28                  | 0.00         | 451.4                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 9.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.6      | -0.8      | -6.8                   | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -64.2                  | 64.5         |
| OPER      | 151.3             | -107.1                 | 107.4        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -30.12                | 34.48 | -23.17   | 26.52 | -23.71               | 26.11 | -18.24   | 20.08 |
| OPER      | 5C1T      | -23.40                | 25.93 | -18.00   | 19.95 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.86       | 1.87       | HS 37.21     | 67.0                 |
| 5C1T   | 4.08       | 4.14       | 0.00         | 490.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 9.000

Dead Load Moment      Superimposed Dead Load Moment  
-2.9                      -33.5

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 145.8      | 153.1           | -182.2 | 153.1        | -182.2 | 189.5                       | -145.8 | 189.5     | - |
| OPER 243.0      | 279.4           | -279.4 | 279.4        | -279.4 | 315.8                       | -243.0 | 315.8     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 19.98 R                 | 15.37                | 258.00      | 0.0       | 17.84                   | 13.72                  | 235.00 |        |
|           |            | -98.43 R                | -75.72               | 220.50      | 0.0       | -89.21                  | -68.63                 | 190.00 | 210.00 |
| OPER      | 5C1T       | 15.39 R                 | 11.84                | 458.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -61.73 R                | -47.48               | 318.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 9.48            | 1.48            | 9.48               | 1.48               | HS 29.62     | 53.3                 |
| 5C1T        | 20.52           | 3.94            | 20.52              | 3.94               | 0.00         | 472.3                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 9.000

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |               |                      |               | Plastic Section Modulus - Z |
|----------------------|---------------|----------------------|---------------|-----------------------------|
| Positive Bending Top | Bending Bott. | Negative Bending Top | Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0         | 127.0                | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 9.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.82 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 90.772     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 13.97 |        | 106.7                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 9.000

Dead Load Moment      Superimposed Dead Load Moment  
-2.9                      -33.5

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 202.3                       | -139.3                | 183.1              | -158.5                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 337.1                       | -232.2                | 305.1              | -264.2                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 19.98 R      | 15.37              | 258.00 | 0.0                 | 17.84    | 13.72       | 235.00             |        |                |              |
|           |           | -98.43 R     | -75.72             | 220.50 | 0.0                 | -89.21   | -68.63      | 190.00             |        | 210.00         |              |
| OPER      | 5C1T      | 15.39 R      | 11.84              | 458.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -61.73 R     | -47.48             | 318.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 10.12              | 1.41                         | 9.16            | 1.61                  | HS 28.31     | 51.0                 |
| 5C1T        | 21.90              | 3.76                         | 19.83           | 4.28                  | 0.00         | 451.4                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 9.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.8      | 0.7       | -8.6                   | 8.2       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -64.2                  | 64.5         |
| OPER      | 151.3             | -107.1                 | 107.4        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -34.53                | 34.48 | -26.56   | 26.52 | -26.28               | 26.11 | -20.22   | 20.08 |
| OPER      | 5C1T      | -26.22                | 25.93 | -20.17   | 19.95 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.86       | 1.87       | HS 37.21     | 67.0                 |
| 5C1T   | 4.08       | 4.14       | 0.00         | 490.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 9.000

Dead Load Moment      Superimposed Dead Load Moment  
-2.9                      -33.5

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 145.8      | 153.1           | -182.2 | 153.1        | -182.2 | 189.5                       | -145.8 | 189.5     | - |
| OPER 243.0      | 279.4           | -279.4 | 279.4        | -279.4 | 315.8                       | -243.0 | 315.8     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|------------------|-----------------|-------------------------|-----------|------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 19.98 R          | 15.37           | 258.00                  | 0.0       | 17.84            | 13.72           | 235.00               |        |
|           |            | -98.43 R         | -75.72          | 220.50                  | 0.0       | -89.21           | -68.63          | 190.00               | 210.00 |
| OPER      | 5C1T       | 15.39 R          | 11.84           | 458.50                  | 0.0       | 0.00             | 0.00            | 0.00                 |        |
|           |            | -61.73 R         | -47.48          | 318.00                  | 0.0       | 0.00             | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 9.48            | 1.48            | 9.48               | 1.48               | HS 29.62     | 53.3                 |
| 5C1T        | 20.52           | 3.94            | 20.52              | 3.94               | 0.00         | 472.3                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 9.100

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 9.100

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.82 | 28.67 | 28.67 | 1.699 | 999999.000 | 90.975 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 13.97 |        | 106.7                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 9.100

Dead Load Moment      Superimposed Dead Load Moment  
-1.3                      -15.1

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 190.3                       | -151.3             | 171.1           | -170.5             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 317.1                       | -252.2             | 285.1           | -284.2             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.43 R      | 12.64              | 230.50 | 0.0                 | 25.89    | 19.91       | 202.50             |        |                |              |
|           |           | -59.00 R     | -45.39             | 209.00 | 0.0                 | -53.36   | -41.05      | 190.00             |        | 212.50         |              |
| OPER      | 5C1T      | 31.33 R      | 24.10              | 253.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -49.71 L     | -38.24             | 88.50  | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 7.35            | 2.57                      | 6.61                      | 2.89               | HS 51.29     | 92.3                 |
| 5C1T        | 10.12           | 5.07                      | 9.10                      | 5.72               | 0.00         | 608.8                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 9.100

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| 0.6       | 0.0                    |
|           | 6.5                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -74.1                  | 65.6         |
| OPER      | 151.3             | -123.4                 | 109.3        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -3.64                 | 30.06 | -2.80    | 23.12 | -3.50                | 23.53 | -2.69    | 18.10 |
| OPER      | 5C1T      | -3.75                 | 22.87 | -2.88    | 17.59 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 20.34      | 2.18       | HS 43.64     | 78.6                 |
| 5C1T   | 32.95      | 4.78       | 0.00         | 573.6                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 9.100

Dead Load Moment      Superimposed Dead Load Moment  
-1.3                      -15.1

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 157.8      | 161.1           | -174.2 | 161.1        | -174.2 | 177.5                       | -157.8 | 177.5     | - |
| OPER 262.9      | 279.4           | -279.4 | 279.4        | -279.4 | 295.9                       | -262.9 | 295.9     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |        |        |        |
|-----------|------------|-------------------------|-------------------------|------------------------------|----------------------|--------|--------|--------|--------|
| INV.      | HS20       | 16.43 R                 | 12.64                   | 230.50                       | 0.0                  | 25.89  | 19.91  | 202.50 |        |
|           |            | -59.00 R                | -45.39                  | 209.00                       | 0.0                  | -53.36 | -41.05 | 190.00 | 212.50 |
| OPER      | 5C1T       | 31.33 R                 | 24.10                   | 253.50                       | 0.0                  | 0.00   | 0.00   | 0.00   |        |
|           |            | -49.71 L                | -38.24                  | 88.50                        | 0.0                  | 0.00   | 0.00   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 6.86            | 2.67  | 6.86         | 2.67  | HS 53.48     | 96.3                 |
| 5C1T        | 9.44            | 5.29  | 9.44         | 5.29  | 0.00         | 634.7                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 9.200

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |               |                      |               | Plastic Section Modulus - Z |
|----------------------|---------------|----------------------|---------------|-----------------------------|
| Positive Bending Top | Bending Bott. | Negative Bending Top | Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0         | 127.0                | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
 Check Point I. D. 9.200

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.82 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 90.975     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 13.97 |        | 106.7                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 9.200

Dead Load Moment      Superimposed Dead Load Moment  
-0.1                      -1.0

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 181.1                       | -160.5             | 161.9           | -179.7             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 301.8                       | -267.5             | 269.8           | -299.5             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 59.46 R      | 45.74              | 233.00 | 0.0                 | 44.78    | 34.45       | 205.00             |        |                |              |
|           |           | -45.76 L     | -35.20             | 167.00 | 0.0                 | -35.35   | -27.19      | 190.00             | 140.00 |                |              |
| OPER      | 5C1T      | 55.30 R      | 42.54              | 343.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -42.79 L     | -32.92             | 91.00  | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 3.05            | 3.51                      | 2.72         | 3.93               | HS 54.45     | 98.0                 |
| 5C1T        | 5.46            | 6.25                      | 4.88         | 7.00               | 0.00         | 585.4                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 9.200

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.4       | 0.0          | 4.8       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -72.9                  | 66.7                  |
| OPER      | 151.3             | -121.6                 | 111.2                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -3.64                 | 25.34 | -2.80    | 19.49 | -4.54                | 20.71 | -3.49    | 15.93 |
| OPER      | 5C1T      | -5.65                 | 19.67 | -4.35    | 15.13 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 16.07      | 2.63       | HS 52.66     | 94.8                 |
| 5C1T   | 21.51      | 5.65       | 0.00         | 678.1                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 9.200

Dead Load Moment      Superimposed Dead Load Moment  
-0.1                      -1.0

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 167.0      | 167.2           | -168.1 | 167.2        | -168.1 | 168.3                       | -167.0 | 168.3     | - |
| OPER 278.3      | 279.4           | -279.4 | 279.4        | -279.4 | 280.5                       | -278.3 | 280.5     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 59.46 R                 | 45.74                | 233.00      | 0.0       | 44.78                   | 34.45                  | 205.00 |        |
|           |            | -45.76 L                | -35.20               | 167.00      | 0.0       | -35.35                  | -27.19                 | 190.00 | 140.00 |
| OPER      | 5C1T       | 55.30 R                 | 42.54                | 343.00      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -42.79 L                | -32.92               | 91.00       | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 2.83            | 3.65  | 2.83         | 3.65  | HS 56.61     | 101.9                |
| 5C1T        | 5.07            | 6.50  | 5.07         | 6.50  | 0.00         | 608.8                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 9.300

|               | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
| RATIO/Inv.    | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus |               |              |               | Plastic Section Modulus - Z |
|-----------------|---------------|--------------|---------------|-----------------------------|
| Positive Top    | Bending Bott. | Negative Top | Bending Bott. | (Fy * Z)                    |
| 127.0           | 127.0         | 127.0        | 127.0         | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 9.300

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.82 | 28.67 | 28.67 | 1.699 | 999999.000 | 90.975 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 13.97 |        | 106.7                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 9.300

Dead Load Moment 0.7  
Superimposed Dead Load Moment 8.8

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 174.7                       | -166.9             | 155.5           | -186.1             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 291.2                       | -278.1             | 259.2           | -310.1             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 86.17 R      | 66.29              | 235.50 | 0.0                 | 64.63    | 49.71       | 207.50             |        |                |              |
|           |           | -37.94 L     | -29.19             | 167.00 | 0.0                 | -30.08   | -23.14      | 190.00             |        | 0.00           |              |
| OPER      | 5C1T      | 73.27 R      | 56.36              | 345.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -38.42 L     | -29.56             | 92.00  | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 2.03            | 4.40                      | 1.80         | 4.90               | HS 36.09     | 65.0                 |
| 5C1T        | 3.97            | 7.24                      | 3.54         | 8.07               | 0.00         | 424.5                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 9.300

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear (-) | Shear (+)              |
| 0.2       | 0.0                    |
|           | 3.1                    |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -71.8                  | 67.8                  |
| OPER      | 151.3             | -119.7                 | 113.1                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -4.55                 | 20.51 | -3.50    | 15.77 | -6.82                | 17.75 | -5.25    | 13.66 |
| OPER      | 5C1T      | -7.79                 | 16.51 | -5.99    | 12.70 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 10.52      | 3.31       | HS 66.16     | 119.1                |
| 5C1T   | 15.36      | 6.85       | 0.00         | 822.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 9.300

Dead Load Moment 0.7  
Superimposed Dead Load Moment 8.8

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 173.3      | 171.4           | -163.9 | 171.4        | -163.9 | 162.0                       | -173.3 | 162.0     | - |
| OPER 288.9      | 279.4           | -279.4 | 279.4        | -279.4 | 269.9                       | -288.9 | 269.9     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 86.17 R                 | 66.29                | 235.50      | 0.0       | 64.63                   | 49.71                  | 207.50 |        |
|           |            | -37.94 L                | -29.19               | 167.00      | 0.0       | -30.08                  | -23.14                 | 190.00 | 0.00   |
| OPER      | 5C1T       | 73.27 R                 | 56.36                | 345.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -38.42 L                | -29.56               | 92.00       | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.88            | 4.57            | 1.88               | 4.57               | HS 37.59     | 67.7                 |
| 5C1T        | 3.68            | 7.52            | 3.68               | 7.52               | 0.00         | 442.1                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 9.400

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 9.400

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.82 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 90.975     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 13.97 |        | 106.7                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 9.400

Dead Load Moment 1.1  
Superimposed Dead Load Moment 14.3

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 171.1                       | -170.4             | 152.0           | -189.6             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 285.2                       | -284.1             | 253.3           | -316.0             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 96.30 R      | 74.08              | 238.00 | 0.0                 | 76.22    | 58.63       | 210.00             |        |                |              |
|           |           | -30.13 L     | -23.17             | 167.00 | 0.0                 | -26.61   | -20.47      | 190.00             | 0.00   |                |              |
| OPER      | 5C1T      | 84.08 R      | 64.68              | 348.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -36.44 L     | -28.03             | 140.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 1.78            | 5.66                      | 1.58                      | 6.29               | HS 31.56     | 56.8                 |
| 5C1T        | 3.39            | 7.80                      | 3.01                      | 8.67               | 0.00         | 361.4                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 9.400

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.1       | 0.0          | 1.3       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -70.7                  | 69.0                  |
| OPER      | 151.3             | -117.8                 | 114.9                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -9.12                 | 16.75 | -7.02    | 12.88 | -9.40                | 14.76 | -7.23    | 11.35 |
| OPER      | 5C1T      | -10.04                | 13.49 | -7.72    | 10.38 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 7.52       | 4.12       | HS 82.35     | 148.2                |
| 5C1T   | 11.74      | 8.52       | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 9.400Dead Load Moment 1.1  
Superimposed Dead Load Moment 14.3

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
|                 | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 176.9      | 173.8           | -161.5 | 173.8        | -161.5 | 158.4                       | -176.9 | 158.4     | - |
| OPER 294.8      | 279.4           | -279.4 | 279.4        | -279.4 | 264.0                       | -294.8 | 264.0     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Live Load Moment w/o imp. | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-------------------------|---------------------------|-----------|-------------------------|----------------------|--------|
| INV.      | HS20       | 96.30 R                 | 74.08                   | 238.00                    | 0.0       | 76.22                   | 58.63                | 210.00 |
|           |            | -30.13 L                | -23.17                  | 167.00                    | 0.0       | -26.61                  | -20.47               | 190.00 |
| OPER      | 5C1T       | 84.08 R                 | 64.68                   | 348.00                    | 0.0       | 0.00                    | 0.00                 | 0.00   |
|           |            | -36.44 L                | -28.03                  | 140.50                    | 0.0       | 0.00                    | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.64            | 5.87            | 1.64               | 5.87               | HS 32.90     | 59.2                 |
| 5C1T        | 3.14            | 8.09            | 3.14               | 8.09               | 0.00         | 376.8                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 9.500

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 9.500

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.82 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 90.975     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 35.74 |        | 103.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 9.500

Dead Load Moment 1.2  
Superimposed Dead Load Moment 15.5

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 170.4                       | -171.2             | 151.2           | -190.4             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 284.0                       | -285.3             | 252.0           | -317.3             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 94.36 R      | 72.58              | 226.50 | 0.0                 | 80.36    | 61.82       | 212.50             |        |                |              |
|           |           | -27.30 R     | -21.00             | 258.00 | 0.0                 | -24.32   | -18.71      | 235.00             |        | 0.00           |              |
| OPER      | 5C1T      | 87.72 L      | 67.48              | 113.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -37.81 R     | -29.08             | 371.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | bottom fiber -bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|--------|--------------|----------------------|
| HS20        | 1.81            | 6.27               | 1.60   | 32.05        | 57.7                 |
| 5C1T        | 3.24            | 7.55               | 2.87   | 0.00         | 344.7                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 9.500

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.1      | -0.4         | 0.1       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -69.6                  | 70.1         |
| OPER      | 151.3             | -115.9                 | 116.8        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |      |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |      |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)  |
| INV.      | HS20      | -13.29                | 13.08 | -10.22   | 10.06 | -12.21               | 11.82 | -9.39    | 9.09 |
| OPER      | 5C1T      | -12.29                | 10.98 | -9.46    | 8.45  | 0.00                 | 0.00  | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 5.23       | 5.36       | HS 104.67    | 188.4                |
| 5C1T   | 9.43       | 10.63      | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 9.500

Dead Load Moment 1.2  
Superimposed Dead Load Moment 15.5

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 177.6      | 174.3           | -161.0 | 174.3        | -161.0 | 157.7                       | -177.6 | 157.7     | - |
| OPER 296.0      | 279.4           | -279.4 | 279.4        | -279.4 | 262.8                       | -296.0 | 262.8     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |        |
|-----------|------------|-------------------------|-------------------------|-----------|-------------------------|----------------------|--------|--------|
| INV.      | HS20       | 94.36 R                 | 72.58                   | 226.50    | 0.0                     | 80.36                | 61.82  | 212.50 |
|           |            | -27.30 R                | -21.00                  | 258.00    | 0.0                     | -24.32               | -18.71 | 235.00 |
| OPER      | 5C1T       | 87.72 L                 | 67.48                   | 113.50    | 0.0                     | 0.00                 | 0.00   | 0.00   |
|           |            | -37.81 R                | -29.08                  | 371.50    | 0.0                     | 0.00                 | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.67            | 6.51            | 1.67               | 6.51               | HS 33.42     | 60.2                 |
| 5C1T        | 2.99            | 7.83            | 2.99               | 7.83               | 0.00         | 359.4                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 9.600

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 9.600

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.93 | 28.67 | 28.67 | 1.699 | 999999.000 | 96.720 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 35.74 |        | 103.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 9.600

Dead Load Moment 0.8  
Superimposed Dead Load Moment 12.0

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 172.7                       | -168.9             | 153.5           | -188.1             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 287.8                       | -281.5             | 255.8           | -313.5             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 96.49 L      | 74.22              | 187.00 | 0.0                 | 74.80    | 57.54       | 215.00             |        |                |              |
|           |           | -36.75 R     | -28.27             | 258.00 | 0.0                 | -28.46   | -21.89      | 235.00             |        | 0.00           |              |
| OPER      | 5C1T      | 84.02 L      | 64.63              | 116.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -39.21 R     | -30.16             | 371.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | bottom fiber -bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|--------|--------------|----------------------|
| HS20        | 1.79            | 4.60               | 1.59   | 31.81        | 57.3                 |
| 5C1T        | 3.42            | 7.18               | 3.04   | 0.00         | 365.3                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 9.600

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.2      | -2.2         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -68.4                  | 71.3         |
| OPER      | 151.3             | -113.9                 | 118.8        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -16.99                | 8.92 | -13.07   | 6.86 | -15.15               | 9.03 | -11.65   | 6.94 |
| OPER      | 5C1T      | -14.48                | 8.75 | -11.13   | 6.73 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 4.02       | 7.90       | HS 80.47     | 144.8                |  |
| 5C1T   | 7.87       | 13.58      | 0.00         | 944.4                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 9.600

Dead Load Moment 0.8  
Superimposed Dead Load Moment 12.0

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 175.4      | 172.8           | -162.5 | 172.8        | -162.5 | 159.9                       | -175.4 | 159.9     | - |
| OPER 292.3      | 279.4           | -279.4 | 279.4        | -279.4 | 266.5                       | -292.3 | 266.5     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |        |
|-----------|------------|-------------------------|-------------------------|-----------|-------------------------|----------------------|--------|--------|
| INV.      | HS20       | 96.49 L                 | 74.22                   | 187.00    | 0.0                     | 74.80                | 57.54  | 215.00 |
|           |            | -36.75 R                | -28.27                  | 258.00    | 0.0                     | -28.46               | -21.89 | 235.00 |
| OPER      | 5C1T       | 84.02 L                 | 64.63                   | 116.00    | 0.0                     | 0.00                 | 0.00   | 0.00   |
|           |            | -39.21 R                | -30.16                  | 371.50    | 0.0                     | 0.00                 | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.66            | 4.77            | 1.66               | 4.77               | HS 33.15     | 59.7                 |
| 5C1T        | 3.17            | 7.45            | 3.17               | 7.45               | 0.00         | 380.7                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 9.700

|               |                             |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Allowable stress (fs) (psi) |           |         |         |
| RATIO/Inv.    | 0.00                        | 0.00      | 0.00    | 0.00    |
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

|                |           |       |      |      |       |       |      |      |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

|                         |                  |                       |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

|               |          |              |       |                   |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

|                  |                  |             |       |                 |
|------------------|------------------|-------------|-------|-----------------|
| Section Modulus  |                  |             |       | Plastic Section |
| Positive Bending | Negative Bending | Modulus - Z |       |                 |
| Top              | Bott.            | Top         | Bott. | (Fy * Z)        |
| 127.0            | 127.0            | 127.0       | 127.0 | 390.83          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 9.700

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.93 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 96.720     |

## LFD - Moment Values

| Compact Values (C) | M1            | Mu    | 3.6-2.2(M1/Mu)E6/Fy |
|--------------------|---------------|-------|---------------------|
| 4110/sqrt Fy       | 19230/sqrt Fy |       |                     |
| top 22.62          | 105.86        | 0.00  | 390.83              |
| bott 22.62         |               | 35.74 | 109.1               |
|                    |               |       | 103.0               |

## Braced Non Compact Values (B)

| 24 /       | 36500/sqrt Fy | 20,000,000 Af/Fy d |
|------------|---------------|--------------------|
| top 24.00  | 200.93        | 0.00               |
| bott 24.00 |               | 0.00               |

## Non Compact Values (N)

| Cb        | lambda | Rb    | Mr   | Lp  | Lr   |
|-----------|--------|-------|------|-----|------|
| top 0.00  | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0 (ft) | C    | Fyweb  | 6000 sqrt(k)/sqrt Fy | 7500 sqrt(k)/sqrt Fy | ASD Fv | LFD Vp |
|------|---------|------|--------|----------------------|----------------------|--------|--------|
| 5.00 | 12.50   | 1.00 | 33000. | 73.86                | 0.00                 | 11.0   | 151.3  |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 9.700

Dead Load Moment 0.1  
Superimposed Dead Load Moment 4.3

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 180.4C          | -161.2             | 161.2           | -180.4C            | 177.7                       | -163.8             | 158.6           | -183.0             |
| OPER        | 300.6C          | -268.7             | 268.7           | -300.6C            | 296.2                       | -273.1             | 264.3           | -305.0             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Load Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Load Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|-------------|---------------------|----------|-------------|--------------------|-------------|----------------|--------------|
| INV.      | HS20      | 85.73 L      | 65.95              | 189.50      | 0.0                 | 61.84    | 47.57       | 217.50             |             |                |              |
|           |           | -46.21 R     | -35.55             | 258.00      | 0.0                 | -32.60   | -25.07      | 235.00             | 0.00        |                |              |
| OPER      | 5C1T      | 68.20 L      | 52.46              | 114.50      | 0.0                 | 0.00     | 0.00        | 0.00               |             |                |              |
|           |           | -40.61 R     | -31.24             | 371.50      | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00        | 0.00           |              |

## Moment

| Rating Veh. | Rating Factor   |                    | Load Capacity (tons) |                    |
|-------------|-----------------|--------------------|----------------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend      | bottom fiber -bend |
| HS20        | 2.07            | 3.55               | 1.85                 | 3.96               |
| 5C1T        | 4.34            | 6.72               | 3.88                 | 7.51               |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 9.700

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.4      | -4.0         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -67.2                  | 72.4         |
| OPER      | 151.3             | -112.0                 | 120.7        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -20.66                | 4.35 | -15.90   | 3.35 | -18.14               | 6.46 | -13.95   | 4.97 |
| OPER      | 5C1T      | -17.47                | 6.71 | -13.44   | 5.16 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 3.25       | 11.21      | HS 65.07     | 117.1                |  |
| 5C1T   | 6.41       | 18.00      | 0.00         | 769.6                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 9.700

Dead Load Moment 0.1  
Superimposed Dead Load Moment 4.3

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 170.3      | 169.4           | -165.9 | 169.4        | -165.9 | 165.0                       | -170.3 | 165.0     | - |
| OPER 283.8      | 279.4           | -279.4 | 279.4        | -279.4 | 275.0                       | -283.8 | 275.0     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 85.73 L                 | 65.95                | 189.50      | 0.0       | 61.84                   | 47.57                  | 217.50 |        |
|           |            | -46.21 R                | -35.55               | 258.00      | 0.0       | -32.60                  | -25.07                 | 235.00 | 0.00   |
| OPER      | 5C1T       | 68.20 L                 | 52.46                | 114.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -40.61 R                | -31.24               | 371.50      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.92            | 3.68            | 1.92               | 3.68               | HS 38.49     | 69.3                 |
| 5C1T        | 4.03            | 6.99            | 4.03               | 6.99               | 0.00         | 483.9                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 9.800

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
 Check Point I. D. 9.800

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.93 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 96.720     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 35.74 |        | 103.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 9.800

Dead Load Moment      Superimposed Dead Load Moment  
-1.0                      -7.7

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 185.6                       | -155.9                | 166.4              | -175.1                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 309.4                       | -259.9                | 277.4              | -291.9                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 58.49 L      | 45.00              | 192.00 | 0.0                 | 41.39    | 31.84       | 220.00             |        |                |              |
|           |           | -55.67 R     | -42.82             | 258.00 | 0.0                 | -37.46   | -28.81      | 235.00             | 202.50 |                |              |
| OPER      | 5C1T      | 46.46 L      | 35.74              | -5.00  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -44.90 R     | -34.54             | 247.50 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 3.17               | 2.80                         | 2.85                               | 3.15         | 56.03                |
| 5C1T        | 6.66               | 5.79                         | 5.97                               | 6.50         | 0.00                 |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 9.800

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.5      | -5.7         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 90.8              | -66.1                  | 73.5         |
| OPER      | 151.3             | -110.2                 | 122.6        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -25.52                | 2.99 | -19.63   | 2.30 | -21.08               | 4.19 | -16.22   | 3.22 |
| OPER      | 5C1T      | -20.74                | 4.89 | -15.96   | 3.76 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 2.59       | 17.54      | HS 51.80     | 93.2                 |
| 5C1T   | 5.31       | 25.05      | 0.00         | 637.3                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 9.800

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -1.0                | -7.7                             |

| Rating<br>Veh.<br>ber | Moment Capacity |              |           |           | Available Capacity for LL+I |           |           |           |
|-----------------------|-----------------|--------------|-----------|-----------|-----------------------------|-----------|-----------|-----------|
|                       | top fiber       | bottom fiber | top fiber | bottom fi | top fiber                   | bottom fi | top fiber | bottom fi |
|                       | +bend           | -bend        | +bend     | -bend     | +bend                       | -bend     | +bend     | -         |
| INV.                  | 164.1           | -171.1       | 164.1     | -171.1    | 172.9                       | -162.4    | 172.9     | -         |
| 162.4                 |                 |              |           |           |                             |           |           |           |
| OPER                  | 279.4           | -279.4       | 279.4     | -279.4    | 288.2                       | -270.6    | 288.2     | -         |
| 270.6                 |                 |              |           |           |                             |           |           |           |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Truck<br>Veh. | Live Load Moment<br>w/imp. | Loc. of Ax.<br>w/o imp. | Front<br>Wheel | Lane Dis. | Live Load Moment<br>w/imp. | Loc. of Conc.<br>w/o imp. | Load 1 | Load 2 |
|--------------|---------------|----------------------------|-------------------------|----------------|-----------|----------------------------|---------------------------|--------|--------|
| INV.         | HS20          | 58.49 L                    | 45.00                   | 192.00         | 0.0       | 41.39                      | 31.84                     | 220.00 |        |
|              |               | -55.67 R                   | -42.82                  | 258.00         | 0.0       | -37.46                     | -28.81                    | 235.00 | 202.50 |
| OPER         | 5C1T          | 46.46 L                    | 35.74                   | -5.00          | 0.0       | 0.00                       | 0.00                      | 0.00   |        |
|              |               | -44.90 R                   | -34.54                  | 247.50         | 0.0       | 0.00                       | 0.00                      | 0.00   | 0.00   |

## Serviceability

| Rating<br>Veh. | Rating    |              | Factor    |              | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|-----------|--------------|-----------|--------------|-----------------|----------------------------|
|                | top fiber | bottom fiber | top fiber | bottom fiber |                 |                            |
|                | +bend     | -bend        | +bend     | -bend        |                 |                            |
| HS20           | 2.96      | 2.92         | 2.96      | 2.92         | HS 58.34        | 105.0                      |
| 5C1T           | 6.20      | 6.03         | 6.20      | 6.03         | 0.00            | 723.3                      |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 9.900

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus  |                  |       |       | Plastic Section |
|------------------|------------------|-------|-------|-----------------|
| Positive Bending | Negative Bending |       |       | Modulus - Z     |
| Top              | Bott.            | Top   | Bott. | (Fy * Z)        |
| 127.0            | 127.0            | 127.0 | 127.0 | 390.83          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 9.900

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.93 | 28.67 | 28.67 | 1.699      |
|      |       |       | 999999.000 |
|      |       |       | 96.720     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 35.74 |        | 103.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 9.900

Dead Load Moment      Superimposed Dead Load Moment  
-2.6                      -24.0

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 180.4C             | -161.2                | 161.2              | -180.4C               | 196.3                       | -145.2                | 177.1              | -164.4                |
| OPER        | 300.6C             | -268.7                | 268.7              | -300.6C               | 327.2                       | -242.1                | 295.2              | -274.0                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 15.19 L      | 11.69              | 194.50 | 0.0                 | 21.07    | 16.20       | 222.50             |        |                |              |
|           |           | -67.93 L     | -52.25             | 216.00 | 0.0                 | -58.56   | -45.05      | 235.00             |        | 212.50         |              |
| OPER      | 5C1T      | 21.91 L      | 16.85              | -2.50  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -56.28 R     | -43.29             | 253.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 9.32               | 2.14                         | 8.41            | 2.42                  | HS 42.76     | 77.0                 |
| 5C1T        | 14.94              | 4.30                         | 13.48           | 4.87                  | 0.00         | 516.1                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 9.900

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.7      | -7.4         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 90.8              | -65.0                  | 74.7                  |
| OPER      | 151.3             | -108.3                 | 124.4                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -30.26                | 3.13 | -23.28   | 2.40 | -23.88               | 3.00 | -18.37   | 2.30 |
| OPER      | 5C1T      | -24.05                | 3.34 | -18.50   | 2.57 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 2.15       | 23.89      | HS 42.94     | 77.3                 |
| 5C1T   | 4.50       | 37.31      | 0.00         | 540.4                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 9.900

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -2.6                | -24.0                            |

| Rating<br>Veh.<br>ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                       | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend                  | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV.<br>151.7         | 157.0           | -178.3 | 157.0        | -178.3 | 183.6                       | -151.7 | 183.6     | - |
| OPER<br>252.8         | 279.4           | -279.4 | 279.4        | -279.4 | 306.0                       | -252.8 | 306.0     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Truck<br>Veh. | Live Load Moment<br>w/imp. | Moment<br>w/o imp. | Loc. of Ax.<br>Front<br>Wheel | Lane<br>Dis. | Live Load Moment<br>w/imp. | Moment<br>w/o imp. | Loc. of Conc.<br>Load 1 | Load 2 |
|--------------|---------------|----------------------------|--------------------|-------------------------------|--------------|----------------------------|--------------------|-------------------------|--------|
| INV.         | HS20          | 15.19 L                    | 11.69              | 194.50                        | 0.0          | 21.07                      | 16.20              | 222.50                  |        |
|              |               | -67.93 L                   | -52.25             | 216.00                        | 0.0          | -58.56                     | -45.05             | 235.00                  | 212.50 |
| OPER         | 5C1T          | 21.91 L                    | 16.85              | -2.50                         | 0.0          | 0.00                       | 0.00               | 0.00                    |        |
|              |               | -56.28 R                   | -43.29             | 253.50                        | 0.0          | 0.00                       | 0.00               | 0.00                    | 0.00   |

## Serviceability

| Rating<br>Veh. | Rating       |                | Factor          |                | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|--------------|----------------|-----------------|----------------|-----------------|----------------------------|
|                | top<br>+bend | fiber<br>-bend | bottom<br>+bend | fiber<br>-bend |                 |                            |
| HS20           | 8.72         | 2.23           | 8.72            | 2.23           | HS 44.66        | 80.4                       |
| 5C1T           | 13.97        | 4.49           | 13.97           | 4.49           | 0.00            | 539.0                      |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 10.000

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |
| 21.0           | 19.76     | 0.400 | bott | 9.86 | 8.24  | 8.24  | 0.62 | 1.77 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 18.30         | 18.30    | 10.47        | 10.47 | 1330.0            | 1330.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 390.83                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 10.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.62 | 13.400 | 0.01     | 0.01  | 49.40 | 24.64 |
| bott | 3.92 | 0.62 | 13.400 | 150.00   | 84.66 |       | 24.64 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.93 | 28.67 | 28.67 | 1.699 | 999999.000 | 96.720 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 390.83 | 109.1                   |
| bott | 22.62            |                   | 35.74 |        | 103.0                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 151.3     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 10.000

Dead Load Superimposed Dead Load  
Moment Moment  
-4.5 -44.7

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 215.8C             | -161.2                | 161.2              | -215.8C               | 245.3                       | -131.7                | 190.7              | -186.3                |
| OPER        | 359.7C             | -268.7                | 268.7              | -359.7C               | 408.8                       | -219.5                | 317.8              | -310.6                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.76 L      | 12.89              | 167.00 | 0.0                 | 12.38    | 9.53        | 190.00             |        |                |              |
|           |           | -103.30 R    | -79.46             | 246.50 | 0.0                 | -95.85   | -73.73      | 235.00             |        | 215.00         |              |
| OPER      | 5C1T      | 12.96 L      | 9.97               | -35.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -76.72 R     | -59.02             | 344.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|--------|--------------|----------------------|
| HS20        | 14.64              | 1.27                         | 11.38  | HS 25.50     | 45.9                 |
| 5C1T        | 31.55              | 2.86                         | 24.53  | 0.00         | 343.4                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 10.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.7      | -0.8      | -7.4                   | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 103.3             | -63.9                  | 72.5                  |
| OPER      | 172.1             | -106.4                 | 120.8                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -30.26                | 36.72 | -23.28   | 28.25 | -23.88               | 26.68 | -18.37   | 20.52 |
| OPER      | 5C1T      | -24.05                | 27.33 | -18.50   | 21.02 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.84       | 1.97       | HS 36.83     | 66.3                 |
| 5C1T   | 3.94       | 4.42       | 0.00         | 473.2                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 10.000

Dead Load Moment      Superimposed Dead Load Moment  
-4.5                      -44.7

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 138.2      | 148.0           | -187.3 | 148.0        | -187.3 | 197.1                       | -138.2 | 197.1     | - |
| OPER 230.3      | 279.4           | -279.4 | 279.4        | -279.4 | 328.5                       | -230.3 | 328.5     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|------------------|-----------------|-------------------------|-----------|------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 16.76 L          | 12.89           | 167.00                  | 0.0       | 12.38            | 9.53            | 190.00               |        |
|           |            | -103.30 R        | -79.46          | 246.50                  | 0.0       | -95.85           | -73.73          | 235.00               | 215.00 |
| OPER      | 5C1T       | 12.96 L          | 9.97            | -35.00                  | 0.0       | 0.00             | 0.00            | 0.00                 |        |
|           |            | -76.72 R         | -59.02          | 344.00                  | 0.0       | 0.00             | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |       | bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-------|--------------|-------|--------------|----------------------|
|             | top fiber +bend | -bend | +bend        | -bend |              |                      |
| HS20        | 11.76           | 1.34  | 11.76        | 1.34  | HS 26.75     | 48.1                 |
| 5C1T        | 25.36           | 3.00  | 25.36        | 3.00  | 0.00         | 360.2                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 10.000

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |
| 21.2           | 19.76     | 0.460 | bott | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.50         | 21.50    | 10.60        | 10.60 | 1600.0            | 1600.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 127.0                | 127.0                  | 127.0                | 127.0                  | 467.60                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 10.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.210 | 0.01     | 0.01  | 43.43 | 21.66 |
| bott | 3.92 | 0.74 | 11.210 | 150.00   | 82.81 |       | 21.66 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |         |
|------|-------|-------|-------|------------|---------|
|      | top   | bott  |       | top        | bott    |
| 1.67 | 35.20 | 35.20 | 2.861 | 999999.000 | 107.114 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 467.60 | 109.1                   |
| bott | 22.62            |                   | 17.47 |        | 106.6                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 172.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 10.000

Dead Load Superimposed Dead Load  
Moment Moment  
-4.5 -44.7

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 215.8C             | -161.2                | 161.2              | -215.8C               | 245.3                       | -131.7                | 190.7              | -186.3                |
| OPER        | 359.7C             | -268.7                | 268.7              | -359.7C               | 408.8                       | -219.5                | 317.8              | -310.6                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 16.76 L      | 12.89              | 167.00 | 0.0                 | 12.38    | 9.53        | 190.00             |        |                |              |
|           |           | -103.30 R    | -79.46             | 246.50 | 0.0                 | -95.85   | -73.73      | 235.00             |        | 215.00         |              |
| OPER      | 5C1T      | 12.96 L      | 9.97               | -35.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -76.72 R     | -59.02             | 344.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor<br>+bend | bottom fiber<br>-bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|-----------------|-----------------------|--------------|----------------------|
| HS20        | 14.64              | 1.27                         | 11.38           | 1.80                  | HS 25.50     | 45.9                 |
| 5C1T        | 31.55              | 2.86                         | 24.53           | 4.05                  | 0.00         | 343.4                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 10.000

| Dead Load |           | Superimposed Dead Load |           |
|-----------|-----------|------------------------|-----------|
| (-) Shear | (+) Shear | (-) Shear              | (+) Shear |
| -0.8      | 1.1       | -9.1                   | 10.4      |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | for LL+I (+) |
|-----------|-------------------|------------------------|--------------|
| INV.      | 103.3             | -63.9                  | 72.5         |
| OPER      | 172.1             | -106.4                 | 120.8        |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -34.68                | 36.72 | -26.68   | 28.25 | -26.43               | 26.68 | -20.33   | 20.52 |
| OPER      | 5C1T      | -26.99                | 27.33 | -20.76   | 21.02 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 1.84       | 1.97       | HS 36.83     | 66.3                 |
| 5C1T   | 3.94       | 4.42       | 0.00         | 473.2                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 10.000

| Dead Load<br>Moment | Superimposed Dead Load<br>Moment |
|---------------------|----------------------------------|
| -4.5                | -44.7                            |

| Rating<br>Veh.<br>ber | Moment Capacity |              | Available Capacity for LL+I |           |       |        |       |   |
|-----------------------|-----------------|--------------|-----------------------------|-----------|-------|--------|-------|---|
|                       | top fiber       | bottom fiber | top fiber                   | bottom fi |       |        |       |   |
|                       | +bend           | -bend        | +bend                       | -bend     | +bend | -bend  | +bend | - |
| INV.                  | 148.0           | -187.3       | 148.0                       | -187.3    | 197.1 | -138.2 | 197.1 | - |
| 138.2                 |                 |              |                             |           |       |        |       |   |
| OPER                  | 279.4           | -279.4       | 279.4                       | -279.4    | 328.5 | -230.3 | 328.5 | - |
| 230.3                 |                 |              |                             |           |       |        |       |   |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Truck<br>Veh. | Live Load Moment<br>w/imp. | Moment<br>w/o imp. | Loc. of Ax.<br>Front<br>Wheel | Lane<br>Dis. | Live Load Moment<br>w/imp. | Moment<br>w/o imp. | Loc. of Conc.<br>Load 1 | Load 2 |
|--------------|---------------|----------------------------|--------------------|-------------------------------|--------------|----------------------------|--------------------|-------------------------|--------|
| INV.         | HS20          | 16.76 L                    | 12.89              | 167.00                        | 0.0          | 12.38                      | 9.53               | 190.00                  |        |
|              |               | -103.30 R                  | -79.46             | 246.50                        | 0.0          | -95.85                     | -73.73             | 235.00                  | 215.00 |
| OPER         | 5C1T          | 12.96 L                    | 9.97               | -35.00                        | 0.0          | 0.00                       | 0.00               | 0.00                    |        |
|              |               | -76.72 R                   | -59.02             | 344.00                        | 0.0          | 0.00                       | 0.00               | 0.00                    | 0.00   |

## Serviceability

| Rating<br>Veh. | Rating    |              | Factor    |              | Rating<br>Value | Load<br>Capacity<br>(tons) |
|----------------|-----------|--------------|-----------|--------------|-----------------|----------------------------|
|                | top fiber | bottom fiber | top fiber | bottom fiber |                 |                            |
|                | +bend     | -bend        | +bend     | -bend        |                 |                            |
| HS20           | 11.76     | 1.34         | 11.76     | 1.34         | HS 26.75        | 48.1                       |
| 5C1T           | 25.36     | 3.00         | 25.36     | 3.00         | 0.00            | 360.2                      |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 10.100

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |
| 21.2           | 19.76     | 0.460 | bott | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.50         | 21.50    | 10.60        | 10.60 | 1600.0            | 1600.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 151.0                | 151.0                  | 151.0                | 151.0                  | 467.60                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 10.100

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.210 | 0.01     | 0.01  | 43.43 | 21.66 |
| bott | 3.92 | 0.74 | 11.210 | 150.00   | 82.81 |       | 21.66 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.67 | 35.20 | 35.20 | 2.861      |
|      |       |       | 999999.000 |
|      |       |       | 90.089     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 467.60 | 109.1                   |
| bott | 22.62            |                   | 17.47 |        | 106.6                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 172.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 10.100

Dead Load Moment      Superimposed Dead Load Moment  
-2.0                      -20.7

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 215.8C             | -191.7                | 191.7              | -215.8C               | 229.4                       | -178.1                | 205.2              | -202.2                |
| OPER        | 359.7C             | -319.4                | 319.4              | -359.7C               | 382.3                       | -296.8                | 342.1              | -337.0                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 12.56 L      | 9.66               | 162.00 | 0.0                 | 24.05    | 18.50       | 227.50             |        |                |              |
|           |           | -62.02 R     | -47.71             | 234.00 | 0.0                 | -57.85   | -44.50      | 215.00             |        | 240.00         |              |
| OPER      | 5C1T      | 30.15 L      | 23.19              | 93.50  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -55.00 R     | -42.31             | 346.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|--------|--------------|----------------------|
| HS20        | 9.54               | 2.87                         | 8.53   | 3.26         | 57.42                |
| 5C1T        | 12.68              | 5.40                         | 11.35  | 6.13         | 0.00                 |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 10.100

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.9       | 0.0          | 8.7       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 103.3             | -85.2                  | 73.6                  |
| OPER      | 172.1             | -142.0                 | 122.7                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -0.64                 | 32.71 | -0.49    | 25.16 | -1.34                | 24.40 | -1.03    | 18.77 |
| OPER      | 5C1T      | -1.04                 | 24.64 | -0.80    | 18.95 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 63.50      | 2.25       | HS 45.03     | 81.1                 |
| 5C1T   | 137.02     | 4.98       | 0.00         | 597.7                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 10.100

Dead Load Moment      Superimposed Dead Load Moment  
-2.0                      -20.7

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 185.7      | 190.3           | -208.4 | 190.3        | -208.4 | 212.9                       | -185.7 | 212.9     | - |
| OPER 309.6      | 332.2           | -332.2 | 332.2        | -332.2 | 354.8                       | -309.6 | 354.8     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 12.56 L                 | 9.66                 | 162.00      | 0.0       | 24.05                   | 18.50                  | 227.50 |        |
|           |            | -62.02 R                | -47.71               | 234.00      | 0.0       | -57.85                  | -44.50                 | 215.00 | 240.00 |
| OPER      | 5C1T       | 30.15 L                 | 23.19                | 93.50       | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -55.00 R                | -42.31               | 346.50      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 8.85            | 2.99            | 8.85               | 2.99               | HS 59.89     | 107.8                |
| 5C1T        | 11.77           | 5.63            | 11.77              | 5.63               | 0.00         | 675.4                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 10.200

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |
| 21.2           | 19.76     | 0.460 | bott | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.50         | 21.50    | 10.60        | 10.60 | 1600.0            | 1600.0           |

| Section Modulus      |               |                      |               | Plastic Section Modulus - Z |
|----------------------|---------------|----------------------|---------------|-----------------------------|
| Positive Bending Top | Bending Bott. | Negative Bending Top | Bending Bott. | (Fy * Z)                    |
| 151.0                | 151.0         | 151.0                | 151.0         | 467.60                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 10.200

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.210 | 0.01     | 0.01  | 43.43 | 21.66 |
| bott | 3.92 | 0.74 | 11.210 | 150.00   | 82.81 |       | 21.66 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.67 | 35.20 | 35.20 | 2.861 | 999999.000 | 90.089 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 467.60 | 109.1                   |
| bott | 22.62            |                   | 17.47 |        | 106.6                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 172.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 10.200

Dead Load Moment      Superimposed Dead Load Moment  
0.1                      -1.0

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 215.8C          | -191.7             | 191.7           | -215.8C            | 216.4                       | -191.1             | 192.2           | -215.3             |
| OPER        | 359.7C          | -319.4             | 319.4           | -359.7C            | 360.6                       | -318.5             | 320.3           | -358.8             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 63.97 R      | 49.20              | 258.00 | 0.0                 | 47.55    | 36.58       | 230.00             |        |                |              |
|           |           | -50.04 L     | -38.49             | 192.00 | 0.0                 | -38.63   | -29.72      | 215.00             | 165.00 |                |              |
| OPER      | 5C1T      | 59.03 L      | 45.40              | 96.00  | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -47.09 L     | -36.22             | 116.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | Rating Factor   |                    |                 |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|-----------------|--------------------|--------------|----------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 3.38            | 3.82               | 3.01            | 4.30               | HS 60.10     | 108.2                |
| 5C1T        | 6.11            | 6.76               | 5.43            | 7.62               | 0.00         | 651.3                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 10.200

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| 0.7       | 0.0          | 7.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 103.3             | -84.1                  | 74.8                  |
| OPER      | 172.1             | -140.1                 | 124.6                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -0.97                 | 28.22 | -0.75    | 21.70 | -2.83                | 21.94 | -2.18    | 16.88 |
| OPER      | 5C1T      | -2.55                 | 21.72 | -1.96    | 16.71 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 29.72      | 2.65       | HS 53.01     | 95.4                 |
| 5C1T   | 54.87      | 5.74       | 0.00         | 688.6                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 10.200Dead Load Moment 0.1  
Superimposed Dead Load Moment -1.0

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 198.8      | 199.0           | -199.7 | 199.0        | -199.7 | 199.9                       | -198.8 | 199.9     | - |
| OPER 331.3      | 332.2           | -332.2 | 332.2        | -332.2 | 333.1                       | -331.3 | 333.1     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Live Load Moment w/o imp. | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-------------------------|---------------------------|-----------|-------------------------|----------------------|--------|
| INV.      | HS20       | 63.97 R                 | 49.20                   | 258.00                    | 0.0       | 47.55                   | 36.58                | 230.00 |
|           |            | -50.04 L                | -38.49                  | 192.00                    | 0.0       | -38.63                  | -29.72               | 215.00 |
| OPER      | 5C1T       | 59.03 L                 | 45.40                   | 96.00                     | 0.0       | 0.00                    | 0.00                 | 0.00   |
|           |            | -47.09 L                | -36.22                  | 116.00                    | 0.0       | 0.00                    | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 3.12            | 3.97            | 3.12               | 3.97               | HS 62.49     | 112.5                |
| 5C1T        | 5.64            | 7.03            | 5.64               | 7.03               | 0.00         | 677.2                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 10.300

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |
| 21.2           | 19.76     | 0.460 | bott | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.50         | 21.50    | 10.60        | 10.60 | 1600.0            | 1600.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 151.0                | 151.0                  | 151.0                | 151.0                  | 467.60                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 10.300

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.210 | 0.01     | 0.01  | 43.43 | 21.66 |
| bott | 3.92 | 0.74 | 11.210 | 150.00   | 82.81 |       | 21.66 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.67 | 35.20 | 35.20 | 2.861      |
|      |       |       | 999999.000 |
|      |       |       | 90.089     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 467.60 | 109.1                   |
| bott | 22.62            |                   | 17.47 |        | 106.6                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 172.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 10.300

Dead Load Moment 1.7  
Superimposed Dead Load Moment 14.4

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 215.8C          | -191.7             | 191.7           | -215.8C            | 206.2                       | -201.3             | 182.0           | -225.4             |
| OPER        | 359.7C          | -319.4             | 319.4           | -359.7C            | 343.6                       | -335.5             | 303.4           | -375.7             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 99.53 R      | 76.56              | 260.50 | 0.0                 | 71.95    | 55.35       | 232.50             |        |                |              |
|           |           | -43.78 L     | -33.68             | 192.00 | 0.0                 | -33.81   | -26.00      | 215.00             | 165.00 |                |              |
| OPER      | 5C1T      | 86.28 R      | 66.37              | 370.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -41.20 L     | -31.70             | 116.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | Rating Factor   |                    |                 |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|--------------------|-----------------|--------------------|--------------|----------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend |              |                      |
| HS20        | 2.07            | 4.60               | 1.83            | 5.15               | HS 36.58     | 65.8                 |
| 5C1T        | 3.98            | 8.14               | 3.52            | 9.12               | 0.00         | 421.9                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 10.300

|           |                        |
|-----------|------------------------|
| Dead Load | Superimposed Dead Load |
| Shear     | (-) Shear (+) Shear    |
| 0.5       | 0.0 5.3                |

| Rat. Veh. | Shear Capacity VU | Available Capacity for LL+I (-) | (+)   |
|-----------|-------------------|---------------------------------|-------|
| INV.      | 103.3             | -82.9                           | 75.9  |
| OPER      | 172.1             | -138.2                          | 126.5 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|-----------|-----------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|           |           | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|           |           | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.      | HS20      | -3.02                 | 23.31 | -2.32    | 17.93 | -4.64                | 19.35 | -3.57    | 14.88 |
| OPER      | 5C1T      | -4.32                 | 18.62 | -3.33    | 14.32 | 0.00                 | 0.00  | 0.00     | 0.00  |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 17.88      | 3.26       | HS 65.15     | 117.3                |
| 5C1T   | 31.97      | 6.80       | 0.00         | 815.6                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 10.300

Dead Load Moment 1.7  
Superimposed Dead Load Moment 14.4

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 208.9      | 205.7           | -192.9 | 205.7        | -192.9 | 189.7                       | -208.9 | 189.7     | - |
| OPER 348.2      | 332.2           | -332.2 | 332.2        | -332.2 | 316.2                       | -348.2 | 316.2     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. w/o imp. | Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. w/o imp. | Load 1 | Load 2 |
|-----------|------------|-------------------------|----------------------|-------------|-----------|-------------------------|------------------------|--------|--------|
| INV.      | HS20       | 99.53 R                 | 76.56                | 260.50      | 0.0       | 71.95                   | 55.35                  | 232.50 |        |
|           |            | -43.78 L                | -33.68               | 192.00      | 0.0       | -33.81                  | -26.00                 | 215.00 | 165.00 |
| OPER      | 5C1T       | 86.28 R                 | 66.37                | 370.50      | 0.0       | 0.00                    | 0.00                   | 0.00   |        |
|           |            | -41.20 L                | -31.70               | 116.00      | 0.0       | 0.00                    | 0.00                   | 0.00   | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.91            | 4.77            | 1.91               | 4.77               | HS 38.12     | 68.6                 |
| 5C1T        | 3.66            | 8.45            | 3.66               | 8.45               | 0.00         | 439.7                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 10.400

|               |                             |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Allowable stress (fs) (psi) |           |         |         |
| RATIO/Inv.    | 0.00                        | 0.00      | 0.00    | 0.00    |
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

|                |           |       |      |      |       |       |      |      |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
| H              | D         | tw    | top  | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |
| 21.2           | 19.76     | 0.460 | bott | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |

## Hybrid Section Properties:

|                         |                  |                       |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

|               |          |              |       |                   |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.50         | 21.50    | 10.60        | 10.60 | 1600.0            | 1600.0           |

|                  |                  |             |       |                 |
|------------------|------------------|-------------|-------|-----------------|
| Section Modulus  |                  |             |       | Plastic Section |
| Positive Bending | Negative Bending | Modulus - Z |       |                 |
| Top              | Bott.            | Top         | Bott. | (Fy * Z)        |
| 151.0            | 151.0            | 151.0       | 151.0 | 467.60          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 10.400

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.210 | 0.01     | 0.01  | 43.43 | 21.66 |
| bott | 3.92 | 0.74 | 11.210 | 150.00   | 82.81 |       | 21.66 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.67 | 35.20 | 35.20 | 2.861      |
|      |       |       | 999999.000 |
|      |       |       | 90.089     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1    | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|-------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00  | 467.60 | 109.1                   |
| bott | 22.62            |                   | 17.47 |        | 106.6                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 172.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 10.400

Dead Load Moment      Superimposed Dead Load Moment  
2.8                      25.4

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 215.8C          | -191.7             | 191.7           | -215.8C            | 198.9                       | -208.6             | 174.7           | -232.8             |
| OPER        | 359.7C          | -319.4             | 319.4           | -359.7C            | 331.4                       | -347.7             | 291.2           | -387.9             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 115.16 R     | 88.59              | 263.00 | 0.0                 | 88.90    | 68.38       | 235.00             |        |                |              |
|           |           | -37.53 L     | -28.87             | 192.00 | 0.0                 | -27.73   | -21.33      | 215.00             | 0.00   |                |              |
| OPER      | 5C1T      | 104.59 R     | 80.45              | 373.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -35.32 L     | -27.17             | 116.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 1.73            | 5.56                      | 1.52         | 6.20               | HS 30.34     | 54.6                 |
| 5C1T        | 3.17            | 9.84                      | 2.78         | 10.98              | 0.00         | 334.1                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 10.400Dead Load Superimposed Dead Load  
Shear (-) Shear (+) Shear

0.4 0.0 3.6

Rat. Shear Capacity Available Capacity for LL+I  
Veh. VU (-) (+)INV. 103.3 -81.8 77.1  
OPER 172.1 -136.3 128.4

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Rat.<br>Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|--------------|--------------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|              |              | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|              |              | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.         | HS20         | -6.09                 | 18.19 | -4.69    | 14.00 | -6.75                | 16.67 | -5.19    | 12.82 |
| OPER         | 5C1T         | -6.39                 | 15.81 | -4.92    | 12.16 | 0.00                 | 0.00  | 0.00     | 0.00  |

## Rating Shear

| Veh. | Rating<br>(-) | Factor<br>(+) | Rating<br>Value | Load<br>Capacity<br>(tons) |
|------|---------------|---------------|-----------------|----------------------------|
| HS20 | 12.12         | 4.24          | HS 84.71        | 152.5                      |
| 5C1T | 21.33         | 8.12          | 0.00            | 974.6                      |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 10.400Dead Load Moment 2.8  
Superimposed Dead Load Moment 25.4

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 216.3      | 210.6           | -188.0 | 210.6        | -188.0 | 182.4                       | -216.3 | 182.4     | - |
| OPER 360.5      | 332.2           | -332.2 | 332.2        | -332.2 | 303.9                       | -360.5 | 303.9     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 115.16 R                | 88.59           | 263.00                  | 0.0       | 88.90                   | 68.38           | 235.00               |        |
|           |            | -37.53 L                | -28.87          | 192.00                  | 0.0       | -27.73                  | -21.33          | 215.00               | 0.00   |
| OPER      | 5C1T       | 104.59 R                | 80.45           | 373.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -35.32 L                | -27.17          | 116.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.58            | 5.76            | 1.58               | 5.76               | HS 31.67     | 57.0                 |
| 5C1T        | 2.91            | 10.21           | 2.91               | 10.21              | 0.00         | 348.7                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 10.500

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |
| 21.2           | 19.76     | 0.460 | bott | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.50         | 21.50    | 10.60        | 10.60 | 1600.0            | 1600.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 151.0                | 151.0                  | 151.0                | 151.0                  | 467.60                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 10.500

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.210 | 0.01     | 0.01  | 43.43 | 21.66 |
| bott | 3.92 | 0.74 | 11.210 | 150.00   | 82.81 |       | 21.66 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.67 | 35.20 | 35.20 | 2.861      |
|      |       |       | 999999.000 |
|      |       |       | 90.089     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 467.60 | 109.1                   |
| bott | 22.62            |                   | 0.00 |        | 109.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 172.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 10.500

Dead Load Moment 3.5  
Superimposed Dead Load Moment 32.2

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 215.8C          | -191.7             | 191.7           | -215.8C            | 194.4                       | -213.1             | 170.2           | -237.2             |
| OPER        | 359.7C          | -319.4             | 319.4           | -359.7C            | 324.0                       | -355.1             | 283.7           | -395.4             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 121.30 R     | 93.31              | 265.50 | 0.0                 | 99.09    | 76.22       | 237.50             |        |                |              |
|           |           | -31.27 L     | -24.06             | 192.00 | 0.0                 | -23.11   | -17.77      | 215.00             | 0.00   |                |              |
| OPER      | 5C1T      | 114.31 L     | 87.93              | 138.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -29.43 L     | -22.64             | 116.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   |                |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 1.60            | 6.81                      | 1.40                      | 7.59               | HS 28.07     | 50.5                 |
| 5C1T        | 2.83            | 12.07                     | 2.48                      | 13.44              | 0.00         | 297.8                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 10.500Dead Load Superimposed Dead Load  
Shear (-) Shear (+) Shear

0.2 0.0 1.9

Rat. Shear Capacity Available Capacity for LL+I  
Veh. VU (-) (+)INV. 103.3 -80.6 78.2  
OPER 172.1 -134.4 130.3

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat.<br>Typ. | Rat.<br>Veh. | Truck Live Load Shear |       |          |       | Lane Live Load Shear |       |          |       |
|--------------|--------------|-----------------------|-------|----------|-------|----------------------|-------|----------|-------|
|              |              | w/imp.                |       | w/o imp. |       | w/imp.               |       | w/o imp. |       |
|              |              | (-)                   | (+)   | (-)      | (+)   | (-)                  | (+)   | (-)      | (+)   |
| INV.         | HS20         | -9.70                 | 15.07 | -7.46    | 11.59 | -9.15                | 13.93 | -7.04    | 10.71 |
| OPER         | 5C1T         | -8.82                 | 13.55 | -6.78    | 10.42 | 0.00                 | 0.00  | 0.00     | 0.00  |

## Rating Shear

| Veh. | Rating<br>(-) | Factor<br>(+) | Rating<br>Value | Load<br>Capacity<br>(tons) |
|------|---------------|---------------|-----------------|----------------------------|
| HS20 | 8.31          | 5.19          | HS 103.82       | 186.9                      |
| 5C1T | 15.24         | 9.62          | 0.00            | 999.0                      |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 10.500

Dead Load Moment 3.5  
Superimposed Dead Load Moment 32.2

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 220.7      | 213.6           | -185.0 | 213.6        | -185.0 | 177.9                       | -220.7 | 177.9     | - |
| OPER 367.9      | 332.2           | -332.2 | 332.2        | -332.2 | 296.5                       | -367.9 | 296.5     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |        |        |      |
|-----------|------------|-------------------------|-------------------------|------------------------------|----------------------|--------|--------|--------|------|
| INV.      | HS20       | 121.30 R                | 93.31                   | 265.50                       | 0.0                  | 99.09  | 76.22  | 237.50 |      |
|           |            | -31.27 L                | -24.06                  | 192.00                       | 0.0                  | -23.11 | -17.77 | 215.00 | 0.00 |
| OPER      | 5C1T       | 114.31 L                | 87.93                   | 138.50                       | 0.0                  | 0.00   | 0.00   | 0.00   |      |
|           |            | -29.43 L                | -22.64                  | 116.00                       | 0.0                  | 0.00   | 0.00   | 0.00   | 0.00 |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.47            | 7.06            | 1.47               | 7.06               | HS 29.33     | 52.8                 |
| 5C1T        | 2.59            | 12.50           | 2.59               | 12.50              | 0.00         | 311.2                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 10.600

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |
| 21.2           | 19.76     | 0.460 | bott | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.50         | 21.50    | 10.60        | 10.60 | 1600.0            | 1600.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 151.0                | 151.0                  | 151.0                | 151.0                  | 467.60                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 10.600

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.210 | 0.01     | 0.01  | 43.43 | 21.66 |
| bott | 3.92 | 0.74 | 11.210 | 150.00   | 82.81 |       | 21.66 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.75 | 35.20 | 35.20 | 2.861 | 999999.000 | 94.285 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 467.60 | 109.1                   |
| bott | 22.62            |                   | 0.00 |        | 109.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 172.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 10.600

Dead Load Moment 3.7  
Superimposed Dead Load Moment 34.4

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 215.8C          | -191.7             | 191.7           | -215.8C            | 193.0                       | -214.5             | 168.8           | -238.7             |
| OPER        | 359.7C          | -319.4             | 319.4           | -359.7C            | 321.6                       | -357.5             | 281.3           | -397.8             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 128.61 R     | 98.93              | 254.00 | 0.0                 | 99.47    | 76.52       | 240.00             |        |                |              |
|           |           | -25.02 L     | -19.25             | 192.00 | 0.0                 | -18.49   | -14.22      | 215.00             |        | 0.00           |              |
| OPER      | 5C1T      | 115.53 L     | 88.87              | 141.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -23.55 L     | -18.11             | 116.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 1.50            | 8.57                      | 1.31         | 9.54               | HS 26.25     | 47.2                 |
| 5C1T        | 2.78            | 15.18                     | 2.43         | 16.89              | 0.00         | 292.2                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 10.600Dead Load Superimposed Dead Load  
Shear (-) Shear (+) Shear

0.0 0.0 0.1

Rat. Shear Capacity Available Capacity for LL+I  
Veh. VU (-) (+)INV. 103.3 -79.4 79.4  
OPER 172.1 -132.4 132.4

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |       |          |      | Lane Live Load Shear |       |          |      |
|-----------|-----------|-----------------------|-------|----------|------|----------------------|-------|----------|------|
|           |           | w/imp.                |       | w/o imp. |      | w/imp.               |       | w/o imp. |      |
|           |           | (-)                   | (+)   | (-)      | (+)  | (-)                  | (+)   | (-)      | (+)  |
| INV.      | HS20      | -12.86                | 11.47 | -9.89    | 8.82 | -11.81               | 11.17 | -9.09    | 8.59 |
| OPER      | 5C1T      | -11.39                | 11.15 | -8.76    | 8.57 | 0.00                 | 0.00  | 0.00     | 0.00 |

## Rating Shear

| Veh. | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
|------|------------|------------|--------------|----------------------|
| HS20 | 6.18       | 6.93       | HS 123.51    | 222.3                |
| 5C1T | 11.62      | 11.88      | 0.00         | 999.0                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 10.600

Dead Load Moment 3.7  
Superimposed Dead Load Moment 34.4

| Rating Veh. ber | Moment Capacity |              | Available Capacity for LL+I |           |
|-----------------|-----------------|--------------|-----------------------------|-----------|
|                 | top fiber       | bottom fiber | top fiber                   | bottom fi |
| bend            | +bend           | -bend        | +bend                       | -bend     |
| INV. 222.2      | 214.6           | -184.1       | 214.6                       | -184.1    |
| OPER 370.3      | 332.2           | -332.2       | 332.2                       | -332.2    |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-------------------------|-----------|-------------------------|----------------------|--------|
| INV.      | HS20       | 128.61 R                | 98.93                   | 254.00    | 0.0                     | 99.47                | 76.52  |
|           |            | -25.02 L                | -19.25                  | 192.00    | 0.0                     | -18.49               | -14.22 |
| OPER      | 5C1T       | 115.53 L                | 88.87                   | 141.00    | 0.0                     | 0.00                 | 0.00   |
|           |            | -23.55 L                | -18.11                  | 116.00    | 0.0                     | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | Factor bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|------------------------|---------------------------|---------------------------|---------------------------|--------------|----------------------|
| HS20        | 1.37                   | 8.88                      | 1.37                      | 8.88                      | HS 27.44     | 49.4                 |
| 5C1T        | 2.55                   | 15.73                     | 2.55                      | 15.73                     | 0.00         | 305.5                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 10.700

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |
| 21.2           | 19.76     | 0.460 | bott | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.50         | 21.50    | 10.60        | 10.60 | 1600.0            | 1600.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 151.0                | 151.0                  | 151.0                | 151.0                  | 467.60                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 10.700

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.210 | 0.01     | 0.01  | 43.43 | 21.66 |
| bott | 3.92 | 0.74 | 11.210 | 150.00   | 82.81 |       | 21.66 |

## ASD - Moment Values

| Cb   | Iy    |       | J     | fb         |        |
|------|-------|-------|-------|------------|--------|
|      | top   | bott  |       | top        | bott   |
| 1.75 | 35.20 | 35.20 | 2.861 | 999999.000 | 94.285 |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 467.60 | 109.1                   |
| bott | 22.62            |                   | 0.00 |        | 109.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 172.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 10.700

Dead Load Moment 3.5  
Superimposed Dead Load Moment 32.2

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber -bend | bottom fiber +bend | top fiber +bend             | bottom fiber -bend | top fiber -bend | bottom fiber +bend |
| INV.        | 215.8C          | -191.7             | 191.7           | -215.8C            | 194.4                       | -213.1             | 170.2           | -237.2             |
| OPER        | 359.7C          | -319.4             | 319.4           | -359.7C            | 324.0                       | -355.1             | 283.7           | -395.4             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 128.35 R     | 98.73              | 256.50 | 0.0                 | 91.13    | 70.10       | 242.50             |        |                |              |
|           |           | -18.76 L     | -14.43             | 192.00 | 0.0                 | -13.86   | -10.66      | 215.00             | 0.00   |                |              |
| OPER      | 5C1T      | 109.03 L     | 83.87              | 139.50 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -17.66 L     | -13.58             | 116.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 1.51            | 11.35                     | 1.33                      | 12.64              | HS 26.53     | 47.7                 |
| 5C1T        | 2.97            | 20.11                     | 2.60                      | 22.39              | 0.00         | 312.3                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 10.700

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.2      | -1.7         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 103.3             | -78.3                  | 80.6                  |
| OPER      | 172.1             | -130.5                 | 134.3                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -17.11                | 8.72 | -13.16   | 6.71 | -14.73               | 8.44 | -11.33   | 6.49 |
| OPER      | 5C1T      | -14.54                | 8.57 | -11.18   | 6.60 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 4.57       | 9.24       | HS 91.49     | 164.7                |  |
| 5C1T   | 8.98       | 15.66      | 0.00         | 999.0                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 10.700

Dead Load Moment 3.5  
Superimposed Dead Load Moment 32.2

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 220.7      | 213.6           | -185.0 | 213.6        | -185.0 | 177.9                       | -220.7 | 177.9     | - |
| OPER 367.9      | 332.2           | -332.2 | 332.2        | -332.2 | 296.5                       | -367.9 | 296.5     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 128.35 R                | 98.73           | 256.50                  | 0.0       | 91.13                   | 70.10           | 242.50               |        |
|           |            | -18.76 L                | -14.43          | 192.00                  | 0.0       | -13.86                  | -10.66          | 215.00               | 0.00   |
| OPER      | 5C1T       | 109.03 L                | 83.87           | 139.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -17.66 L                | -13.58          | 116.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.39            | 11.76           | 1.39               | 11.76              | HS 27.72     | 49.9                 |
| 5C1T        | 2.72            | 20.83           | 2.72               | 20.83              | 0.00         | 326.3                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 10.800

|               |                             |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Allowable stress (fs) (psi) |           |         |         |
| RATIO/Inv.    | 0.00                        | 0.00      | 0.00    |         |
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

|                |           |       |      |      |       |       |      |      |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
| H              | D         | tw    | top  | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |
| 21.2           | 19.76     | 0.460 | bott | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |

## Hybrid Section Properties:

|                         |                  |                       |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

|               |          |              |       |                   |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.50         | 21.50    | 10.60        | 10.60 | 1600.0            | 1600.0           |

|                  |                  |             |       |                 |
|------------------|------------------|-------------|-------|-----------------|
| Section Modulus  |                  |             |       | Plastic Section |
| Positive Bending | Negative Bending | Modulus - Z |       |                 |
| Top              | Bott.            | Top         | Bott. | (Fy * Z)        |
| 151.0            | 151.0            | 151.0       | 151.0 | 467.60          |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 10.800

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.210 | 0.01     | 0.01  | 43.43 | 21.66 |
| bott | 3.92 | 0.74 | 11.210 | 150.00   | 82.81 |       | 21.66 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.75 | 35.20 | 35.20 | 2.861      |
|      |       |       | 999999.000 |
|      |       |       | 94.285     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 467.60 | 109.1                   |
| bott | 22.62            |                   | 0.00 |        | 109.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 172.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 10.800

Dead Load Moment      Superimposed Dead Load Moment  
2.8                      25.8

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 215.8C          | -191.7             | 191.7           | -215.8C            | 198.7                       | -208.8             | 174.5           | -232.9             |
| OPER        | 359.7C          | -319.4             | 319.4           | -359.7C            | 331.1                       | -348.0             | 290.9           | -388.2             |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 108.85 R     | 83.73              | 259.00 | 0.0                 | 71.41    | 54.93       | 245.00             |        |                |              |
|           |           | -12.51 L     | -9.62              | 192.00 | 0.0                 | -9.24    | -7.11       | 215.00             | 0.00   |                |              |
| OPER      | 5C1T      | 90.16 L      | 69.35              | 142.00 | 0.0                 | 0.00     | 0.00        | 0.00               |        |                |              |
|           |           | -11.77 L     | -9.06              | 116.00 | 0.0                 | 0.00     | 0.00        | 0.00               | 0.00   | 0.00           |              |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|--------------|--------------------|--------------|----------------------|
| HS20        | 1.83            | 16.69                     | 1.60         | 18.62              | HS 32.07     | 57.7                 |
| 5C1T        | 3.67            | 29.56                     | 3.23         | 32.98              | 0.00         | 387.2                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 10.800

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.4      | -3.4         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 103.3             | -77.1                  | 81.7                  |
| OPER      | 172.1             | -128.6                 | 136.2                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -21.77                | 5.87 | -16.75   | 4.52 | -17.86               | 5.76 | -13.74   | 4.43 |
| OPER      | 5C1T      | -18.03                | 5.81 | -13.87   | 4.47 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 3.54       | 13.91      | HS 70.87     | 127.6                |  |
| 5C1T   | 7.13       | 23.43      | 0.00         | 855.6                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 10.800Dead Load Moment 2.8  
Superimposed Dead Load Moment 25.8

| Rating Veh. ber | Moment Capacity |        |              |        | Available Capacity for LL+I |        |           |   |
|-----------------|-----------------|--------|--------------|--------|-----------------------------|--------|-----------|---|
|                 | top fiber       |        | bottom fiber |        | top fiber                   |        | bottom fi |   |
| bend            | +bend           | -bend  | +bend        | -bend  | +bend                       | -bend  | +bend     | - |
| INV. 216.5      | 210.7           | -187.9 | 210.7        | -187.9 | 182.2                       | -216.5 | 182.2     | - |
| OPER 360.8      | 332.2           | -332.2 | 332.2        | -332.2 | 303.6                       | -360.8 | 303.6     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 108.85 R                | 83.73           | 259.00                  | 0.0       | 71.41                   | 54.93           | 245.00               |        |
|           |            | -12.51 L                | -9.62           | 192.00                  | 0.0       | -9.24                   | -7.11           | 215.00               | 0.00   |
| OPER      | 5C1T       | 90.16 L                 | 69.35           | 142.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -11.77 L                | -9.06           | 116.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor   |                 | bottom fiber       |                    | Rating Value | Load Capacity (tons) |
|-------------|-----------------|-----------------|--------------------|--------------------|--------------|----------------------|
|             | top fiber +bend | top fiber -bend | bottom fiber +bend | bottom fiber -bend |              |                      |
| HS20        | 1.67            | 17.30           | 1.67               | 17.30              | HS 33.47     | 60.3                 |
| 5C1T        | 3.37            | 30.64           | 3.37               | 30.64              | 0.00         | 404.2                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 10.900

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |
| 21.2           | 19.76     | 0.460 | bott | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.50         | 21.50    | 10.60        | 10.60 | 1600.0            | 1600.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 151.0                | 151.0                  | 151.0                | 151.0                  | 467.60                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 10.900

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.210 | 0.01     | 0.01  | 43.43 | 21.66 |
| bott | 3.92 | 0.74 | 11.210 | 150.00   | 82.81 |       | 21.66 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.75 | 35.20 | 35.20 | 2.861      |
|      |       |       | 999999.000 |
|      |       |       | 94.285     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 467.60 | 109.1                   |
| bott | 22.62            |                   | 0.00 |        | 109.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 172.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 10.900

Dead Load Moment 1.6  
Superimposed Dead Load Moment 15.0

| Rating Veh. | Moment Capacity    |                       |                    |                       | Available Capacity for LL+I |                       |                    |                       |
|-------------|--------------------|-----------------------|--------------------|-----------------------|-----------------------------|-----------------------|--------------------|-----------------------|
|             | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend | top fiber<br>+bend          | bottom fiber<br>-bend | top fiber<br>+bend | bottom fiber<br>-bend |
| INV.        | 215.8C             | -191.7                | 191.7              | -215.8C               | 205.8                       | -201.6                | 181.7              | -225.8                |
| OPER        | 359.7C             | -319.4                | 319.4              | -359.7C               | 343.0                       | -336.1                | 302.8              | -376.3                |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment w/o imp. | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment w/o imp. | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|-----------------|---------------------|----------|-------------|--------------------|-----------------|----------------|--------------|
| INV.      | HS20      | 66.91 R      | 51.47              | 261.50          | 0.0                 | 41.79    | 32.15       | 247.50             |                 |                |              |
|           |           | -6.25 L      | -4.81              | 192.00          | 0.0                 | -4.62    | -3.55       | 215.00             |                 | 0.00           |              |
| OPER      | 5C1T      | 54.18 L      | 41.68              | 144.50          | 0.0                 | 0.00     | 0.00        | 0.00               |                 |                |              |
|           |           | -5.89 L      | -4.53              | 116.00          | 0.0                 | 0.00     | 0.00        | 0.00               |                 | 0.00           |              |

## Moment

| Rating Veh. | top fiber<br>+bend | Rating bottom fiber<br>-bend | Factor bottom fiber<br>+bend -bend | Rating Value | Load Capacity (tons) |
|-------------|--------------------|------------------------------|------------------------------------|--------------|----------------------|
| HS20        | 3.08               | 32.24                        | 2.71                               | 36.10        | HS 54.30 97.7        |
| 5C1T        | 6.33               | 57.09                        | 5.59                               | 63.93        | 0.00 670.5           |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 10.900

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.6      | -5.2         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 103.3             | -76.0                  | 82.9                  |
| OPER      | 172.1             | -126.7                 | 138.1                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -26.76                | 2.95 | -20.59   | 2.27 | -21.20               | 3.16 | -16.31   | 2.43 |
| OPER      | 5C1T      | -21.67                | 3.83 | -16.67   | 2.94 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |  |
|--------|------------|------------|--------------|----------------------|--|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |  |
| HS20   | 2.84       | 26.19      | HS 56.79     | 102.2                |  |
| 5C1T   | 5.84       | 36.08      | 0.00         | 701.3                |  |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 10.900

Dead Load Moment 1.6  
Superimposed Dead Load Moment 15.0

| Rating Veh. ber | Moment Capacity top fiber |        | Moment Capacity bottom fiber |        | Available Capacity for LL+I |        |           |   |
|-----------------|---------------------------|--------|------------------------------|--------|-----------------------------|--------|-----------|---|
|                 | +bend                     | -bend  | +bend                        | -bend  | top fiber                   | -bend  | bottom fi |   |
| INV. 209.3      | 206.0                     | -192.7 | 206.0                        | -192.7 | 189.3                       | -209.3 | 189.3     | - |
| OPER 348.9      | 332.2                     | -332.2 | 332.2                        | -332.2 | 315.5                       | -348.9 | 315.5     | - |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Ax. Front Wheel | Lane Dis. | Live Load Moment w/imp. | Moment w/o imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-----------------|-------------------------|-----------|-------------------------|-----------------|----------------------|--------|
| INV.      | HS20       | 66.91 R                 | 51.47           | 261.50                  | 0.0       | 41.79                   | 32.15           | 247.50               |        |
|           |            | -6.25 L                 | -4.81           | 192.00                  | 0.0       | -4.62                   | -3.55           | 215.00               | 0.00   |
| OPER      | 5C1T       | 54.18 L                 | 41.68           | 144.50                  | 0.0       | 0.00                    | 0.00            | 0.00                 |        |
|           |            | -5.89 L                 | -4.53           | 116.00                  | 0.0       | 0.00                    | 0.00            | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating Factor top fiber |       | Rating Factor bottom fiber |       | Rating Value | Load Capacity (tons) |
|-------------|-------------------------|-------|----------------------------|-------|--------------|----------------------|
|             | +bend                   | -bend | +bend                      | -bend |              |                      |
| HS20        | 2.83                    | 33.46 | 2.83                       | 33.46 | HS 56.59     | 101.9                |
| 5C1T        | 5.82                    | 59.26 | 5.82                       | 59.26 | 0.00         | 698.8                |

## SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 11.000

| RATIO/Inv.    | Allowable stress (fs) (psi) |           |         |         |
|---------------|-----------------------------|-----------|---------|---------|
|               | Inventory                   | Operating | Posting | Special |
| Fy (yield)    | 18150.                      | 24750.    | 0.      | 0.      |
| Fy (ultimate) | 33000.                      |           |         |         |

## Non-Composite Structural Steel Section Properties:

| Section Height | Web Depth | Thk.  |      | Dc   | b max | b min | t    | ry   |
|----------------|-----------|-------|------|------|-------|-------|------|------|
| H              | D         | tw    | top  | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |
| 21.2           | 19.76     | 0.460 | bott | 9.86 | 8.30  | 8.30  | 0.74 | 1.81 |

## Hybrid Section Properties:

| Hybrid Reduction Factor |                  | Hybrid Yield Strength |        |        |
|-------------------------|------------------|-----------------------|--------|--------|
| Positive Bending        | Negative Bending | Top                   | Web    | Bottom |
| 1.0000                  | 1.0000           | 33000.                | 33000. | 33000. |

| Section Gross | Area Net | Neutral Axis |       | Moment of Inertia |                  |
|---------------|----------|--------------|-------|-------------------|------------------|
|               |          | Top          | Bott. | Positive Bending  | Negative Bending |
| 21.50         | 21.50    | 10.60        | 10.60 | 1600.0            | 1600.0           |

| Section Modulus      |                        |                      |                        | Plastic Section Modulus - Z |
|----------------------|------------------------|----------------------|------------------------|-----------------------------|
| Positive Bending Top | Positive Bending Bott. | Negative Bending Top | Negative Bending Bott. | (Fy * Z)                    |
| 151.0                | 151.0                  | 151.0                | 151.0                  | 467.60                      |

## ADDITIONAL SECTION DATA ( ASD/LFD )

Structure I. D. HAM500

Member I. D. S03  
Check Point I. D. 11.000

|      | b'   | t    | b/t    | Lb (in.) | Lb/ry | D/tw  | Dc/tw |
|------|------|------|--------|----------|-------|-------|-------|
| top  | 3.92 | 0.74 | 11.210 | 0.01     | 0.01  | 43.43 | 21.66 |
| bott | 3.92 | 0.74 | 11.210 | 150.00   | 82.81 |       | 21.66 |

## ASD - Moment Values

| Cb   | Iy    | J     | fb         |
|------|-------|-------|------------|
| top  | bott  | top   | bott       |
| 1.75 | 35.20 | 35.20 | 2.861      |
|      |       |       | 999999.000 |
|      |       |       | 94.285     |

## LFD - Moment Values

## Compact Values (C)

|      | 4110/<br>sqrt Fy | 19230/<br>sqrt Fy | M1   | Mu     | 3.6-2.2(M1/Mu)E6/<br>Fy |
|------|------------------|-------------------|------|--------|-------------------------|
| top  | 22.62            | 105.86            | 0.00 | 467.60 | 109.1                   |
| bott | 22.62            |                   | 0.00 |        | 109.1                   |

## Braced Non Compact Values (B)

|      | 24 /  | 36500/<br>sqrt Fy | 20,000,000 Af/<br>Fy d |
|------|-------|-------------------|------------------------|
| top  | 24.00 | 200.93            | 0.00                   |
| bott | 24.00 |                   | 0.00                   |

## Non Compact Values (N)

|      | Cb   | lambda | Rb    | Mr   | Lp  | Lr   |
|------|------|--------|-------|------|-----|------|
| top  | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |
| bott | 0.00 | 0.     | 0.000 | 0.00 | 0.0 | 0.00 |

## ASD/LFD Shear Values

| k    | d0<br>(ft) | C    | Fyweb  | 6000 sqrt(k)/<br>sqrt Fy | 7500 sqrt(k)/<br>sqrt Fy | ASD<br>Fv | LFD<br>Vp |
|------|------------|------|--------|--------------------------|--------------------------|-----------|-----------|
| 5.00 | 12.50      | 1.00 | 33000. | 73.86                    | 0.00                     | 11.0      | 172.1     |

## MOMENT RATING REPORT

Rating Types and Vehicles  
 INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
 Check Point I. D. 11.000

Dead Load Moment 0.0  
 Superimposed Dead Load Moment 0.0

| Rating Veh. | Moment Capacity |                    |                 |                    | Available Capacity for LL+I |                    |                 |                    |
|-------------|-----------------|--------------------|-----------------|--------------------|-----------------------------|--------------------|-----------------|--------------------|
|             | top fiber +bend | bottom fiber -bend | top fiber +bend | bottom fiber -bend | top fiber +bend             | bottom fiber -bend | top fiber +bend | bottom fiber -bend |
| INV.        | 215.8C          | -191.7             | 191.7           | -215.8C            | 215.8                       | -191.7             | 191.7           | -215.8             |
| OPER        | 359.7C          | -319.4             | 319.4           | -359.7C            | 359.7                       | -319.4             | 319.4           | -359.7             |

## Live Load Effect

Impact Factors: +bend - .000 -bend - .000

| Rat. Typ. | Rat. Veh. | Truck w/imp. | Live Load w/o imp. | Moment | Loc. of Front Wheel | Ax. Dis. | Lane w/imp. | Live Load w/o imp. | Moment | Loc. of Load 1 | Conc. Load 2 |
|-----------|-----------|--------------|--------------------|--------|---------------------|----------|-------------|--------------------|--------|----------------|--------------|
| INV.      | HS20      | 0.00 R       | 0.00               | 0.00   | 0.00                | 0.0      | 0.00        | 0.00               | 0.00   | 0.00           |              |
|           |           | 0.00 R       | 0.00               | 0.00   | 0.00                | 0.0      | 0.00        | 0.00               | 0.00   | 0.00           | 0.00         |
| OPER      | 5C1T      | 0.00 R       | 0.00               | 0.00   | 0.00                | 0.0      | 0.00        | 0.00               | 0.00   | 0.00           |              |
|           |           | 0.00 R       | 0.00               | 0.00   | 0.00                | 0.0      | 0.00        | 0.00               | 0.00   | 0.00           | 0.00         |

## Moment

| Rating Veh. | top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber +bend | bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|-----------------|---------------------------|---------------------------|--------------------|--------------|----------------------|
| HS20        | 999.00          | 999.00                    | 999.00                    | 999.00             | HS 999.00    | 999.0                |
| 5C1T        | 999.00          | 999.00                    | 999.00                    | 999.00             | 0.00         | 999.0                |

## SHEAR RATING REPORT

## Rating Types and Vehicles

INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 11.000

|           |              |           |
|-----------|--------------|-----------|
| Dead Load | Superimposed | Dead Load |
| Shear     | (-) Shear    | (+) Shear |
| -0.7      | -6.9         | 0.0       |

| Rat. Veh. | Shear Capacity VU | Available Capacity (-) | Capacity for LL+I (+) |
|-----------|-------------------|------------------------|-----------------------|
| INV.      | 103.3             | -74.9                  | 79.9                  |
| OPER      | 172.1             | -124.8                 | 133.1                 |

## Live Load Effect

Impact Factors: +bend - .300 -bend - .300

| Rat. Typ. | Rat. Veh. | Truck Live Load Shear |      |          |      | Lane Live Load Shear |      |          |      |
|-----------|-----------|-----------------------|------|----------|------|----------------------|------|----------|------|
|           |           | w/imp.                |      | w/o imp. |      | w/imp.               |      | w/o imp. |      |
|           |           | (-)                   | (+)  | (-)      | (+)  | (-)                  | (+)  | (-)      | (+)  |
| INV.      | HS20      | -32.02                | 0.00 | -24.63   | 0.00 | -24.72               | 2.36 | -19.01   | 1.82 |
| OPER      | 5C1T      | -25.40                | 0.00 | -19.54   | 0.00 | 0.00                 | 0.00 | 0.00     | 0.00 |

| Rating |            | Shear      |              |                      |
|--------|------------|------------|--------------|----------------------|
| Veh.   | Rating (-) | Factor (+) | Rating Value | Load Capacity (tons) |
| HS20   | 2.34       | 33.80      | HS 46.75     | 84.2                 |
| 5C1T   | 4.91       | 999.00     | 0.00         | 589.3                |

## SERVICEABILITY RATING REPORT

Rating Types and Vehicles  
INV. OPER POST SPEC

Structure I. D. HAM500

HS20 5C1T

Member I. D. S03  
Check Point I. D. 11.000Dead Load Moment 0.0  
Superimposed Dead Load Moment 0.0

| Rating Veh. ber | Moment Capacity top fiber |        | Moment Capacity bottom fiber |        | Available Capacity for LL+I |        |       |           |
|-----------------|---------------------------|--------|------------------------------|--------|-----------------------------|--------|-------|-----------|
|                 | +bend                     | -bend  | +bend                        | -bend  | top fiber                   | -bend  | +bend | bottom fi |
| INV. 199.3      | 199.3                     | -199.3 | 199.3                        | -199.3 | 199.3                       | -199.3 | 199.3 | -         |
| OPER 332.2      | 332.2                     | -332.2 | 332.2                        | -332.2 | 332.2                       | -332.2 | 332.2 | -         |

## Live Load Effect

Impact Factors: +bend - .000 -bend - .000

| Rat. Typ. | Truck Veh. | Live Load Moment w/imp. | Loc. of Ax. Front Wheel | Lane Live Load Moment w/imp. | Loc. of Conc. Load 1 | Load 2 |
|-----------|------------|-------------------------|-------------------------|------------------------------|----------------------|--------|
| INV.      | HS20       | 0.00 R                  | 0.00                    | 0.00                         | 0.00                 | 0.00   |
|           |            | 0.00 R                  | 0.00                    | 0.00                         | 0.00                 | 0.00   |
| OPER      | 5C1T       | 0.00 R                  | 0.00                    | 0.00                         | 0.00                 | 0.00   |
|           |            | 0.00 R                  | 0.00                    | 0.00                         | 0.00                 | 0.00   |

## Serviceability

| Rating Veh. | Rating top fiber +bend | Rating bottom fiber -bend | Factor bottom fiber -bend | Rating Value | Load Capacity (tons) |
|-------------|------------------------|---------------------------|---------------------------|--------------|----------------------|
| HS20        | 999.00                 | 999.00                    | 999.00                    | HS 999.00    | 999.0                |
| 5C1T        | 999.00                 | 999.00                    | 999.00                    | 0.00         | 999.0                |