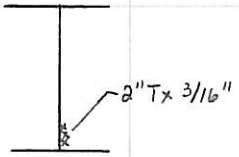
Floorbeams with loss

Floorbeam Section Loss

Span 5-6

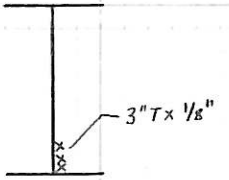
End FB @ P5 – North + South



(3' from Center Truss)

Span 9-10

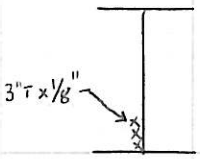
End FB @ P10 – North + South



(Full length)

Span 11-12

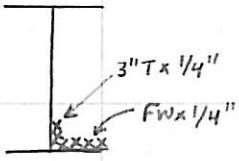
End FB @ P12 – North + South



(Full length)

Span 7-8 * from B&N Report

End FB @ P7 – North – No dimensions given → assume 3" on web (typical) + FW of 1/2 Flange



Calculations for 1/8 US Grid

Made By	CTY	Date	5/19/2009	Job No.	P410-07-0010
Checked By	BKC	Date	5/20/2009	Sheet No.	

HAM-471-0025
SECTION WITH LOSS
NORTH FB @ PIER 5 (30WF124 NORTH END FLOORBEAM)

CALCULATION OF "AS-BUILT" SECTION MODULUS

	Component Dimensions		A	y	Ay	Io	d	Ad^2
	b (in)	h (in)	(in^2)	(in)	(in^3)	(in^4)	(in)	(in^4)
30WF124	-	-	36.45	15.08	549.67	5347.10	0.00	0.00
		TOTALS:	36.45		549.67	5347.10		0.00

Neutral Axis (from bottom):

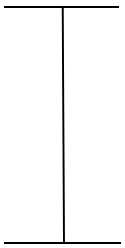
$$y_{(N.A.)} = Ay/A = \frac{549.67}{36.45} = 15.08 \text{ in.}$$

Section Modulus:

$$I = Io + Ad^2 = 5347.10 \text{ in}^4$$

$$S_{(top)} = I/(D-y_{(N.A.)}) = \frac{5347.10}{15.08} = \mathbf{354.58} \text{ in}^3$$

$$S_{(bot)} = I/y_{(N.A.)} = \frac{5347.10}{15.08} = \mathbf{354.58} \text{ in}^3$$



"As-Built" Section

Made By	CTY	Date	5/19/2009	Job No.	P410-07-0010
Checked By	BKC	Date	5/20/2009	Sheet No.	

HAM-471-0025

SECTION WITH LOSS

2008 - SECTION MODIFIED SHEAR RATING

NORTH FB @ PIER 5 (30WF124 NORTH END FLOORBEAM)

"AS-BUILT" SECTION PROPERTIES					
I_o=	5347.1	in^4	$y_{(bot)}$ =	15.1	in
A=	36.5	in^2	$S_{(top)}$=	354.6	in^3
d =	30.2	in	$S_{(bot)}$=	354.6	in^3
t_w=	0.585	in	t_f=	0.930	in
A_{web} =	16.5555	in^2			

Shear Capacity	AB - Shear Capacity	AI - Shear Capacity
	Kips	Kips
*Vu	316.87	309.69

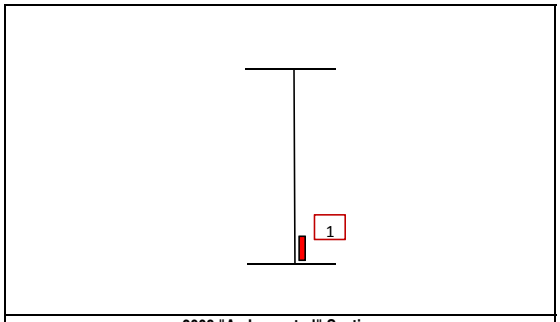
Yield Stress 33 ksi

$*V_u=0.58(F_y)(D)(t_w)$

ASTM A-36-62Tl. 6.6.2.1-1 MCEB

"AS-BUILT" SHEARS & STRESSES	DL	HS20	2F1	3F1	4F1	5C1
M	21.5 k	39.5 k	27.6 k	31.5 k	30.9 k	31.5 k
F	1.299 ksi	2.386 ksi	1.667 ksi	1.903 ksi	1.866 ksi	1.903 ksi

CALCULATION OF "AS-INSPECTED" SECTION	Deteriorated Area		A
	b (in)	h (in)	(in^2)
1	-0.1875	2.0000	-0.38
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
		TOTALS:	-0.38



2008 "As Inspected" Section

RATING FACTOR CALCULATIONS		
	Inventory	Operating
LFD	[Capacity - 1.3*DL]/[1.3*5/3*LL]	[Capacity - 1.3*DL]/[1.3*LL]

"AS-BUILT" RATING FACTORS	Inventory					Operating				
	HS-20	Type 2F1	Type 3F1	Type 4F1	Type 5C1	HS-20	Type 2f1	Type 3F1	Type 4F1	Type 5C1
LFD	3.38	NA	NA	NA	NA	5.63	8.05	7.06	7.19	7.06

"AS-INSPECTED" RATING FACTORS	Inventory					Operating				
	HS-20	Type 2F1	Type 3F1	Type 4F1	Type 5C1	HS-20	Type 2f1	Type 3F1	Type 4F1	Type 5C1
LFD	3.29	NA	NA	NA	NA	5.49	7.85	6.88	7.01	6.88

TRUCK WEIGHTS (tons)				
HS-20	Type 2F1	Type 3F1	Type 4F1	Type 5C1
36	15	23	27	40

"AS-BUILT" RATINGS (tons)										
	Inventory					Operating				
	HS-20	Type 2F1	Type 3F1	Type 4F1	Type 5C1	HS-20	Type 2f1	Type 3F1	Type 4F1	Type 5C1
LFD	121.53	NA	NA	NA	NA	202.56	120.79	162.28	194.20	282.22

"AS-INSPECTED" RATINGS (tons)										
	Inventory					Operating				
	HS-20	Type 2F1	Type 3F1	Type 4F1	Type 5C1	HS-20	Type 2f1	Type 3F1	Type 4F1	Type 5C1
LFD	118.51	NA	NA	NA	NA	197.52	117.79	158.24	189.37	275.21

Made By	CTY	Date	5/19/2009	Job No.	P410-07-0010
Checked By	BKC	Date	5/26/2009	Sheet No.	

HAM-471-0025
SECTION WITH LOSS
NORTH FB @ PIER 7 SPAN 7-8 (30WF124 NORTH END FLOORBEAM)

CALCULATION OF "AS-BUILT" SECTION MODULUS

	Component Dimensions		A	y	Ay	Io	d	Ad^2
	b (in)	h (in)	(in^2)	(in)	(in^3)	(in^4)	(in)	(in^4)
30WF124	-	-	36.45	15.08	549.67	5347.10	0.00	0.00
		TOTALS:	36.45		549.67	5347.10		0.00

Neutral Axis (from bottom):

$$y_{(N.A.)} = Ay/A = \frac{549.67}{36.45} = 15.08 \text{ in.}$$

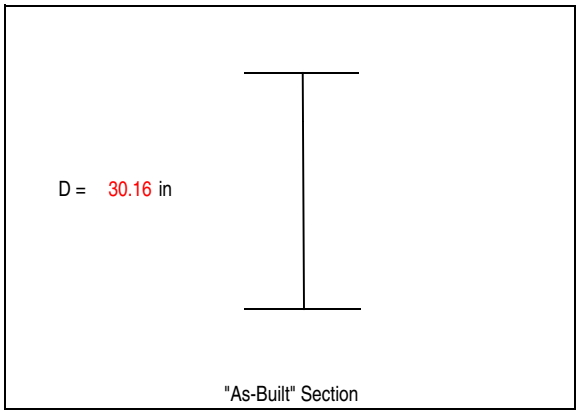
Section Modulus:

$$I = Io + Ad^2 = 5347.10 \text{ in}^4$$

$$S_{(top)} = I/(D-y_{(N.A.)}) = \frac{5347.10}{15.08} = \mathbf{354.58} \text{ in}^3$$

$$S_{(bot)} = I/y_{(N.A.)} = \frac{5347.10}{15.08} = \mathbf{354.58} \text{ in}^3$$

$$Z_{AS\ BUILT} = \mathbf{408.0} \text{ in}^3$$



"As-Built" Section

Made By	CTY	Date	5/19/2009	Job No.	P410-07-0010
Checked By	BKC	Date	5/26/2009	Sheet No.	

HAM-471-0025

SECTION WITH LOSS
2008 - SECTION MODIFIED BENDING RATING
NORTH FB @ PIER 7 SPAN 7-8 (30WF124 NORTH END FLOORBEAM)

"AS-BUILT" SECTION PROPERTIES					
I_o=	5347.1	in^4	$y_{(bot)}$ =	15.1	in
A=	36.5	in^2	$S_{(top)}$=	354.6	in^3
d =	30.2	in	$S_{(bot)}$=	354.6	in^3
t_w=	0.585	in	t_f=	0.930	in

Moment Capacity	AB - Moment Capacity	AI - Moment Capacity
	k-ft	k-ft
*M_u	1122.00	1029.88

Yield Stress 33 ksi

*M_u=Z(F_y)

ASTM A-36-62Tl. 6.6.2.1-1 MCEB

"AS-BUILT" MOMENTS & STRESSES	DL	HS20	2F1	3F1	4F1	5C1
M	211.1 k-ft	326.1 k-ft	198.4 k-ft	263.4 k-ft	244.4 k-ft	259.8 k-ft
F	7.144 ksi	11.036 ksi	6.714 ksi	8.914 ksi	8.271 ksi	8.792 ksi

CALCULATION OF "AS-INSPECTED" SECTION MODULUS

	Deteriorated Area b (in)	h (in)	A (in^2)	y (in)	Ay (in^3)	Io (in^4)	d (in)	Ad^2 (in^4)
BEAM			36.45	15.08	549.67	5347.10	0.79	22.74
1	0.2500	3.0000	-0.75	2.4300	-1.82	-0.563	13.44	-135.47
2	4.9680	0.2500	-1.24	0.8050	-1.00	-0.01	15.06	-281.87
			0.00		0.00	0.00	15.87	0.00
			0.00		0.00	0.00	15.87	0.00
			0.00		0.00	0.00	15.87	0.00
			0.00		0.00	0.00	15.87	0.00
			0.00		0.00	0.00	15.87	0.00
			0.00		0.00	0.00	15.87	0.00
			0.00		0.00	0.00	15.87	0.00
		TOTALS:	34.46		546.84	5346.53		-394.60

Neutral Axis (from bottom):

$y_{(n.a.)} = Ay/A = \frac{546.84}{34.46} = 15.87$ in.

Section Modulus:

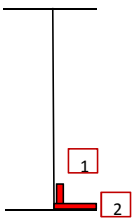
$I = Io + Ad^2 = 4951.93$ in.^4

$S_{(top)} = I/(d-y_{(N.A.)}) = \frac{4951.93}{14.29} = \mathbf{346.53}$ in^3

$S_{(bot)} = I/y_{(N.A.)} = \frac{4951.93}{15.87} = \mathbf{312.03}$ in^3

$Z_{AS\ BUILT}$ = AISC **408.0** in^3

$Z_{AS\ INSPECTED}$ = hand calc **374.5** in^3



2008 "As Inspected" Section

RATING FACTOR CALCULATIONS	Inventory	Operating
LFD	[Capacity - 1.3*DL]/[1.3*5/3*LL]	[Capacity - 1.3*DL]/[1.3*LL]

"AS-BUILT" RATING FACTORS	Inventory					Operating				
	HS-20	Type 2F1	Type 3F1	Type 4F1	Type 5C1	HS-20	Type 2F1	Type 3F1	Type 4F1	Type 5C1
LFD	1.20	NA	NA	NA	NA	2.00	3.29	2.48	2.67	2.51

"AS-INSPECTED" RATING FACTORS	Inventory					Operating				
	HS-20	Type 2F1	Type 3F1	Type 4F1	Type 5C1	HS-20	Type 2f1	Type 3F1	Type 4F1	Type 5C1
LFD	1.07	NA	NA	NA	NA	1.78	2.93	2.21	2.38	2.24

TRUCK WEIGHTS (tons)				
HS-20	Type 2F1	Type 3F1	Type 4F1	Type 5C1
36	15	23	27	40

"AS-BUILT" RATINGS (tons)										
	Inventory					Operating				
	HS-20	Type 2F1	Type 3F1	Type 4F1	Type 5C1	HS-20	Type 2f1	Type 3F1	Type 4F1	Type 5C1
LFD	43.19	NA	NA	NA	NA	71.98	49.29	56.93	72.03	100.38

"AS-INSPECTED" RATINGS (tons)										
	Inventory					Operating				
	HS-20	Type 2F1	Type 3F1	Type 4F1	Type 5C1	HS-20	Type 2f1	Type 3F1	Type 4F1	Type 5C1
LFD	38.49	NA	NA	NA	NA	64.15	43.93	50.74	64.20	89.47

Made By	CTY	Date	5/19/2009	Job No.	P410-07-0010
Checked By	BKC	Date	5/26/2009	Sheet No.	

HAM-471-0025

SECTION WITH LOSS

2008 - SECTION MODIFIED SHEAR RATING

NORTH FB @ PIER 7 SPAN 7-8 (30WF124 NORTH END FLOORBEAM)

"AS-BUILT" SECTION PROPERTIES					
I_o=	5347.1	in^4	$y_{(bot)}$ =	15.1	in
A=	36.5	in^2	$S_{(top)}$=	354.6	in^3
d =	30.2	in	$S_{(bot)}$=	354.6	in^3
t_w=	0.585	in	t_f=	0.930	in
A_{web} =	16.5555	in^2			

Shear Capacity	AB - Shear Capacity	AI - Shear Capacity
	Kips	Kips
$*V_u$	316.87	302.52

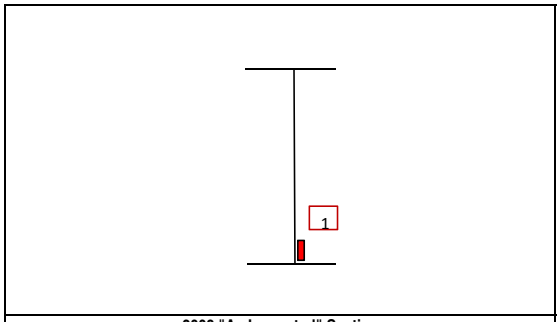
Yield Stress 33 ksi

$*V_u=0.58(F_y)(D)(t_w)$

ASTM A-36-62Tl. 6.6.2.1-1 MCEB

"AS-BUILT" SHEARS & STRESSES						
	DL	HS20	2F1	3F1	4F1	5C1
M	21.5 k	39.5 k	27.6 k	31.5 k	30.9 k	31.5 k
F	1.299 ksi	2.386 ksi	1.667 ksi	1.903 ksi	1.866 ksi	1.903 ksi

CALCULATION OF "AS-INSPECTED" SECTION			
	Deteriorated Area		A
	b (in)	h (in)	(in^2)
1	-0.2500	3.0000	-0.75
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
		TOTALS:	-0.75



2008 "As Inspected" Section

RATING FACTOR CALCULATIONS		
	Inventory	Operating
LFD	[Capacity - 1.3*DL]/[1.3*5/3*LL]	[Capacity - 1.3*DL]/[1.3*LL]

"AS-BUILT" RATING FACTORS										
	Inventory					Operating				
	HS-20	Type 2F1	Type 3F1	Type 4F1	Type 5C1	HS-20	Type 2f1	Type 3F1	Type 4F1	Type 5C1
LFD	3.38	NA	NA	NA	NA	5.63	8.05	7.06	7.19	7.06

"AS-INSPECTED" RATING FACTORS										
	Inventory					Operating				
	HS-20	Type 2F1	Type 3F1	Type 4F1	Type 5C1	HS-20	Type 2f1	Type 3F1	Type 4F1	Type 5C1
LFD	3.21	NA	NA	NA	NA	5.35	7.65	6.70	6.84	6.70

TRUCK WEIGHTS (tons)				
HS-20	Type 2F1	Type 3F1	Type 4F1	Type 5C1
36	15	23	27	40

"AS-BUILT" RATINGS (tons)										
	Inventory					Operating				
	HS-20	Type 2F1	Type 3F1	Type 4F1	Type 5C1	HS-20	Type 2f1	Type 3F1	Type 4F1	Type 5C1
LFD	121.53	NA	NA	NA	NA	202.56	120.79	162.28	194.20	282.22

"AS-INSPECTED" RATINGS (tons)										
	Inventory					Operating				
	HS-20	Type 2F1	Type 3F1	Type 4F1	Type 5C1	HS-20	Type 2f1	Type 3F1	Type 4F1	Type 5C1
LFD	115.49	NA	NA	NA	NA	192.49	114.79	154.21	184.55	268.20

Made By	CTY	Date	5/19/2009	Job No.	P410-07-0010
Checked By	BKC	Date	5/26/2009	Sheet No.	

HAM-471-0025
SECTION WITH LOSS
NORTH FB @ PIER 10 SPAN 9-10 (30WF124 NORTH END FLOORBEAM)

CALCULATION OF "AS-BUILT" SECTION MODULUS

	Component Dimensions		A	y	Ay	Io	d	Ad^2
	b (in)	h (in)	(in^2)	(in)	(in^3)	(in^4)	(in)	(in^4)
30WF124	-	-	36.45	15.08	549.67	5347.10	0.00	0.00
		TOTALS:	36.45		549.67	5347.10		0.00

Neutral Axis (from bottom):

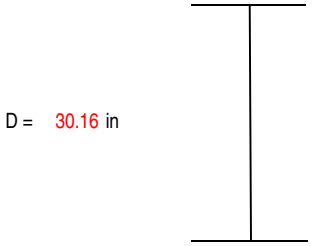
$$y_{(N.A.)} = Ay/A = \frac{549.67}{36.45} = 15.08 \text{ in.}$$

Section Modulus:

$$I = Io + Ad^2 = 5347.10 \text{ in}^4$$

$$S_{(top)} = I/(D-y_{(N.A.)}) = \frac{5347.10}{15.08} = \mathbf{354.58} \text{ in}^3$$

$$S_{(bot)} = I/y_{(N.A.)} = \frac{5347.10}{15.08} = \mathbf{354.58} \text{ in}^3$$



"As-Built" Section

Made By	CTY	Date	5/19/2009	Job No.	P410-07-0010
Checked By	BKC	Date	5/26/2009	Sheet No.	

HAM-471-0025

SECTION WITH LOSS

2008 - SECTION MODIFIED SHEAR RATING

NORTH FB @ PIER 10 SPAN 9-10 (30WF124 NORTH END FLOORBEAM)

"AS-BUILT" SECTION PROPERTIES					
I_o=	5347.1	in^4	$y_{(bot)}$ =	15.1	in
A=	36.5	in^2	$S_{(top)}$=	354.6	in^3
d =	30.2	in	$S_{(bot)}$=	354.6	in^3
t_w=	0.585	in	t_f=	0.930	in
A_{web} =	16.5555	in^2			

Shear Capacity	AB - Shear Capacity	AI - Shear Capacity
	Kips	Kips
*Vu	316.87	309.69

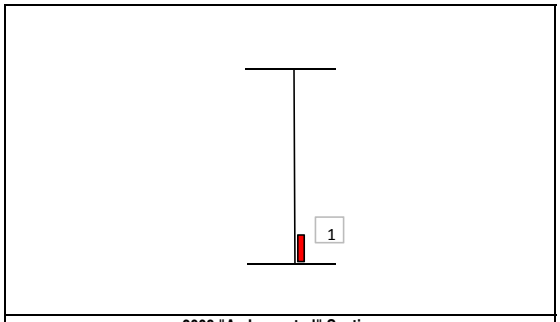
Yield Stress 33 ksi

$*V_u=0.58(F_y)(D)(t_w)$

ASTM A-36-62Tl. 6.6.2.1-1 MCEB

"AS-BUILT" SHEARS & STRESSES						
	DL	HS20	2F1	3F1	4F1	5C1
M	21.5 k	39.5 k	27.6 k	31.5 k	30.9 k	31.5 k
F	1.299 ksi	2.386 ksi	1.667 ksi	1.903 ksi	1.866 ksi	1.903 ksi

CALCULATION OF "AS-INSPECTED" SECTION			
	Deteriorated Area		A
	b (in)	h (in)	(in^2)
1	-0.1250	3.0000	-0.38
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
		TOTALS:	-0.38



2008 "As Inspected" Section

RATING FACTOR CALCULATIONS		
	Inventory	Operating
LFD	[Capacity - 1.3*DL]/[1.3*5/3*LL]	[Capacity - 1.3*DL]/[1.3*LL]

"AS-BUILT" RATING FACTORS										
	Inventory					Operating				
	HS-20	Type 2F1	Type 3F1	Type 4F1	Type 5C1	HS-20	Type 2f1	Type 3F1	Type 4F1	Type 5C1
LFD	3.38	NA	NA	NA	NA	5.63	8.05	7.06	7.19	7.06

"AS-INSPECTED" RATING FACTORS										
	Inventory					Operating				
	HS-20	Type 2F1	Type 3F1	Type 4F1	Type 5C1	HS-20	Type 2f1	Type 3F1	Type 4F1	Type 5C1
LFD	3.29	NA	NA	NA	NA	5.49	7.85	6.88	7.01	6.88

TRUCK WEIGHTS (tons)				
HS-20	Type 2F1	Type 3F1	Type 4F1	Type 5C1
36	15	23	27	40

"AS-BUILT" RATINGS (tons)										
	Inventory					Operating				
	HS-20	Type 2F1	Type 3F1	Type 4F1	Type 5C1	HS-20	Type 2f1	Type 3F1	Type 4F1	Type 5C1
LFD	121.53	NA	NA	NA	NA	202.56	120.79	162.28	194.20	282.22

"AS-INSPECTED" RATINGS (tons)										
	Inventory					Operating				
	HS-20	Type 2F1	Type 3F1	Type 4F1	Type 5C1	HS-20	Type 2f1	Type 3F1	Type 4F1	Type 5C1
LFD	118.51	NA	NA	NA	NA	197.52	117.79	158.24	189.37	275.21

Made By	CTY	Date	5/19/2009	Job No.	P410-07-0010
Checked By	BKC	Date	5/20/2009	Sheet No.	

HAM-471-0025
SECTION WITH LOSS
NORTH FB @ PIER 12 (30WF124 NORTH END FLOORBEAM)

CALCULATION OF "AS-BUILT" SECTION MODULUS

	Component Dimensions		A	y	Ay	Io	d	Ad^2
	b (in)	h (in)	(in^2)	(in)	(in^3)	(in^4)	(in)	(in^4)
30WF124	-	-	36.45	15.08	549.67	5347.10	0.00	0.00
		TOTALS:	36.45		549.67	5347.10		0.00

Neutral Axis (from bottom):

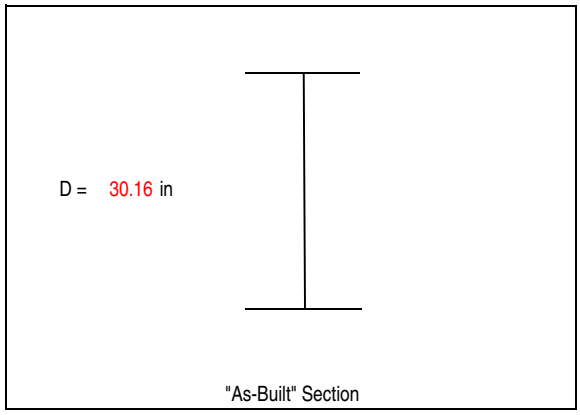
$$y_{(N.A.)} = Ay/A = \frac{549.67}{36.45} = 15.08 \text{ in.}$$

Section Modulus:

$$I = Io + Ad^2 = 5347.10 \text{ in}^4$$

$$S_{(top)} = I/(D-y_{(N.A.)}) = \frac{5347.10}{15.08} = \mathbf{354.58} \text{ in}^3$$

$$S_{(bot)} = I/y_{(N.A.)} = \frac{5347.10}{15.08} = \mathbf{354.58} \text{ in}^3$$



"As-Built" Section

Made By	CTY	Date	5/19/2009	Job No.	P410-07-0010
Checked By	BKC	Date	5/20/2009	Sheet No.	

HAM-471-0025

SECTION WITH LOSS

2008 - SECTION MODIFIED SHEAR RATING

NORTH FB @ PIER 12 (30WF124 NORTH END FLOORBEAM)

"AS-BUILT" SECTION PROPERTIES					
I_o=	5347.1	in^4	$y_{(bot)}$ =	15.1	in
A=	36.5	in^2	$S_{(top)}$=	354.6	in^3
d =	30.2	in	$S_{(bot)}$=	354.6	in^3
t_w=	0.585	in	t_f=	0.930	in
A_{web} =	16.5555	in^2			

Shear Capacity	AB - Shear Capacity	AI - Shear Capacity
	Kips	Kips
*Vu	316.87	309.69

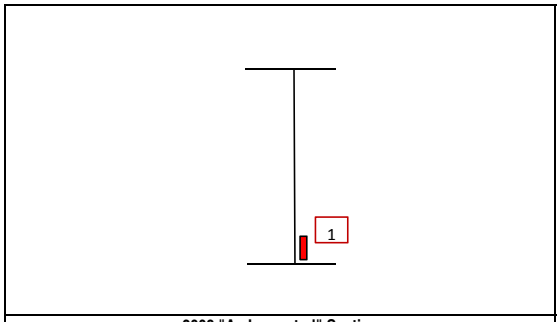
Yield Stress 33 ksi

$*V_u=0.58(F_y)(D)(t_w)$

ASTM A-36-62Tl. 6.6.2.1-1 MCEB

"AS-BUILT" SHEARS & STRESSES	DL	HS20	2F1	3F1	4F1	5C1
M	21.5 k	39.5 k	27.6 k	31.5 k	30.9 k	31.5 k
F	1.299 ksi	2.386 ksi	1.667 ksi	1.903 ksi	1.866 ksi	1.903 ksi

CALCULATION OF "AS-INSPECTED" SECTION	Deteriorated Area		A
	b (in)	h (in)	(in^2)
1	-0.1250	3.0000	-0.38
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
		TOTALS:	-0.38



2008 "As Inspected" Section

RATING FACTOR CALCULATIONS		
	Inventory	Operating
LFD	[Capacity - 1.3*DL]/[1.3*5/3*LL]	[Capacity - 1.3*DL]/[1.3*LL]

"AS-BUILT" RATING FACTORS	Inventory					Operating				
	HS-20	Type 2F1	Type 3F1	Type 4F1	Type 5C1	HS-20	Type 2f1	Type 3F1	Type 4F1	Type 5C1
LFD	3.38	NA	NA	NA	NA	5.63	8.05	7.06	7.19	7.06

"AS-INSPECTED" RATING FACTORS	Inventory					Operating				
	HS-20	Type 2F1	Type 3F1	Type 4F1	Type 5C1	HS-20	Type 2f1	Type 3F1	Type 4F1	Type 5C1
LFD	3.29	NA	NA	NA	NA	5.49	7.85	6.88	7.01	6.88

TRUCK WEIGHTS (tons)				
HS-20	Type 2F1	Type 3F1	Type 4F1	Type 5C1
36	15	23	27	40

"AS-BUILT" RATINGS (tons)										
	Inventory					Operating				
	HS-20	Type 2F1	Type 3F1	Type 4F1	Type 5C1	HS-20	Type 2f1	Type 3F1	Type 4F1	Type 5C1
LFD	121.53	NA	NA	NA	NA	202.56	120.79	162.28	194.20	282.22

"AS-INSPECTED" RATINGS (tons)										
	Inventory					Operating				
	HS-20	Type 2F1	Type 3F1	Type 4F1	Type 5C1	HS-20	Type 2f1	Type 3F1	Type 4F1	Type 5C1
LFD	118.51	NA	NA	NA	NA	197.52	117.79	158.24	189.37	275.21

Made By	CTY	Date	5/19/2009	Job No.	P410-07-0010
Checked By	BKC	Date	5/20/2009	Sheet No.	

HAM-471-0025
SECTION WITH LOSS
SOUTH FB @ PIER 5 (30WF124 SOUTH-WEST END FLOORBEAM)

CALCULATION OF "AS-BUILT" SECTION MODULUS

	Component Dimensions		A	y	Ay	Io	d	Ad^2
	b (in)	h (in)	(in^2)	(in)	(in^3)	(in^4)	(in)	(in^4)
30WF124	-	-	36.45	15.08	549.67	5347.10	0.00	0.00
		TOTALS:	36.45		549.67	5347.10		0.00

Neutral Axis (from bottom):

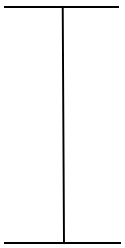
$$y_{(N.A.)} = Ay/A = \frac{549.67}{36.45} = 15.08 \text{ in.}$$

Section Modulus:

$$I = Io + Ad^2 = 5347.10 \text{ in}^4$$

$$S_{(top)} = I/(D-y_{(N.A.)}) = \frac{5347.10}{15.08} = \mathbf{354.58} \text{ in}^3$$

$$S_{(bot)} = I/y_{(N.A.)} = \frac{5347.10}{15.08} = \mathbf{354.58} \text{ in}^3$$



"As-Built" Section

Made By	CTY	Date	5/19/2009	Job No.	P410-07-0010
Checked By	BKC	Date	5/20/2009	Sheet No.	

HAM-471-0025

SECTION WITH LOSS

2008 - SECTION MODIFIED SHEAR RATING

SOUTH FB @ PIER 5 (30WF124 SOUTH-WEST END FLOORBEAM)

"AS-BUILT" SECTION PROPERTIES					
I_o=	5347.1	in^4	$y_{(bot)}$ =	15.1	in
A=	36.5	in^2	$S_{(top)}$=	354.6	in^3
d =	30.2	in	$S_{(bot)}$=	354.6	in^3
t_w=	0.585	in	t_f=	0.930	in
A_{web} =	16.5555	in^2			

Shear Capacity	AB - Shear Capacity	AI - Shear Capacity
	Kips	Kips
*Vu	316.87	309.69

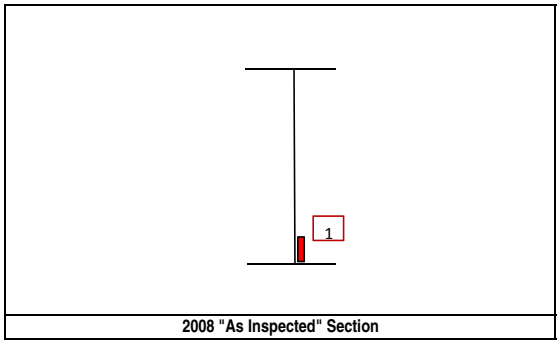
Yield Stress 33 ksi

$*V_u=0.58(F_y)(D)(t_w)$

ASTM A-36-62Tl. 6.6.2.1-1 MCEB

"AS-BUILT" SHEARS & STRESSES	DL	HS20	2F1	3F1	4F1	5C1
M	21.9 k	39.3 k	24.8 k	31.4 k	30.8 k	30.4 k
F	1.323 ksi	2.374 ksi	1.498 ksi	1.897 ksi	1.860 ksi	1.836 ksi

CALCULATION OF "AS-INSPECTED" SECTION	Deteriorated Area		A
	b (in)	h (in)	(in^2)
1	-0.1875	2.0000	-0.38
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
		TOTALS:	-0.38



2008 "As Inspected" Section

RATING FACTOR CALCULATIONS		
	Inventory	Operating
LFD	[Capacity - 1.3*DL]/[1.3*5/3*LL]	[Capacity - 1.3*DL]/[1.3*LL]

"AS-BUILT" RATING FACTORS	Inventory					Operating				
	HS-20	Type 2F1	Type 3F1	Type 4F1	Type 5C1	HS-20	Type 2f1	Type 3F1	Type 4F1	Type 5C1
LFD	3.39	NA	NA	NA	NA	5.64	8.95	7.07	7.20	7.30

"AS-INSPECTED" RATING FACTORS	Inventory					Operating				
	HS-20	Type 2F1	Type 3F1	Type 4F1	Type 5C1	HS-20	Type 2f1	Type 3F1	Type 4F1	Type 5C1
LFD	3.30	NA	NA	NA	NA	5.50	8.72	6.89	7.02	7.12

TRUCK WEIGHTS (tons)				
HS-20	Type 2F1	Type 3F1	Type 4F1	Type 5C1
36	15	23	27	40

"AS-BUILT" RATINGS (tons)										
	Inventory					Operating				
	HS-20	Type 2F1	Type 3F1	Type 4F1	Type 5C1	HS-20	Type 2f1	Type 3F1	Type 4F1	Type 5C1
LFD	121.93	NA	NA	NA	NA	203.22	134.18	162.50	194.48	291.91

"AS-INSPECTED" RATINGS (tons)										
	Inventory					Operating				
	HS-20	Type 2F1	Type 3F1	Type 4F1	Type 5C1	HS-20	Type 2f1	Type 3F1	Type 4F1	Type 5C1
LFD	118.90	NA	NA	NA	NA	198.16	130.84	158.46	189.64	284.64

Made By	CTY	Date	5/19/2009	Job No.	P410-07-0010
Checked By	BKC	Date	5/20/2009	Sheet No.	

HAM-471-0025

SECTION WITH LOSS

2008 - SECTION MODIFIED SHEAR RATING

SOUTH END FB @ PIER 10 SPAN 9-10 (30WF124 SOUTH-EAST END FLOORBEAM)

"AS-BUILT" SECTION PROPERTIES					
I_o=	5347.1	in^4	$y_{(bot)}$ =	15.1	in
A=	36.5	in^2	$S_{(top)}$=	354.6	in^3
d =	30.2	in	$S_{(bot)}$=	354.6	in^3
t_w=	0.585	in	t_f=	0.930	in
A_{web} =	16.5555	in^2			

Shear Capacity	AB - Shear Capacity	AI - Shear Capacity
	Kips	Kips
$*V_u$	316.87	309.69

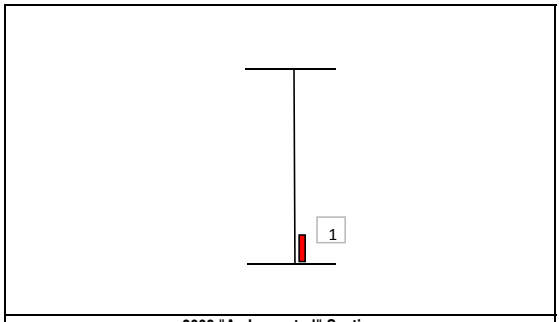
Yield Stress 33 ksi

$*V_u=0.58(F_y)(D)(t_w)$

ASTM A-36-62Tl. 6.6.2.1-1 MCEB

"AS-BUILT" SHEARS & STRESSES	DL	HS20	2F1	3F1	4F1	5C1
M	21.9 k	35.0 k	27.6 k	31.5 k	27.7 k	31.5 k
F	1.323 ksi	2.114 ksi	1.667 ksi	1.903 ksi	1.673 ksi	1.903 ksi

CALCULATION OF "AS-INSPECTED" SECTION	Deteriorated Area		A
	b (in)	h (in)	(in^2)
1	-0.1250	3.0000	-0.38
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
		TOTALS:	-0.38



2008 "As Inspected" Section

RATING FACTOR CALCULATIONS		
	Inventory	Operating
LFD	[Capacity - 1.3*DL]/[1.3*5/3*LL]	[Capacity - 1.3*DL]/[1.3*LL]

"AS-BUILT" RATING FACTORS	Inventory					Operating				
	HS-20	Type 2F1	Type 3F1	Type 4F1	Type 5C1	HS-20	Type 2f1	Type 3F1	Type 4F1	Type 5C1
LFD	3.80	NA	NA	NA	NA	6.34	8.04	7.04	8.01	7.04

"AS-INSPECTED" RATING FACTORS	Inventory					Operating				
	HS-20	Type 2F1	Type 3F1	Type 4F1	Type 5C1	HS-20	Type 2f1	Type 3F1	Type 4F1	Type 5C1
LFD	3.71	NA	NA	NA	NA	6.18	7.84	6.87	7.81	6.87

TRUCK WEIGHTS (tons)				
HS-20	Type 2F1	Type 3F1	Type 4F1	Type 5C1
36	15	23	27	40

"AS-BUILT" RATINGS (tons)										
	Inventory					Operating				
	HS-20	Type 2F1	Type 3F1	Type 4F1	Type 5C1	HS-20	Type 2f1	Type 3F1	Type 4F1	Type 5C1
LFD	136.91	NA	NA	NA	NA	228.19	120.57	161.98	216.24	281.71

"AS-INSPECTED" RATINGS (tons)										
	Inventory					Operating				
	HS-20	Type 2F1	Type 3F1	Type 4F1	Type 5C1	HS-20	Type 2f1	Type 3F1	Type 4F1	Type 5C1
LFD	133.50	NA	NA	NA	NA	222.51	117.57	157.95	210.86	274.70

Made By	CTY	Date	5/19/2009	Job No.	P410-07-0010
Checked By	BKC	Date	5/20/2009	Sheet No.	

HAM-471-0025
SECTION WITH LOSS
SOUTH END FB @ PIER 12 (30WF124 SOUTH-EAST END FLOORBEAM)

CALCULATION OF "AS-BUILT" SECTION MODULUS

	Component Dimensions		A	y	Ay	Io	d	Ad^2
	b (in)	h (in)	(in^2)	(in)	(in^3)	(in^4)	(in)	(in^4)
30WF124	-	-	36.45	15.08	549.67	5347.10	0.00	0.00
		TOTALS:	36.45		549.67	5347.10		0.00

Neutral Axis (from bottom):

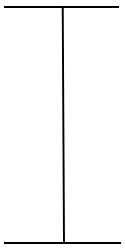
$$y_{(N.A.)} = Ay/A = \frac{549.67}{36.45} = 15.08 \text{ in.}$$

Section Modulus:

$$I = Io + Ad^2 = 5347.10 \text{ in}^4$$

$$S_{(top)} = I/(D-y_{(N.A.)}) = \frac{5347.10}{15.08} = \mathbf{354.58} \text{ in}^3$$

$$S_{(bot)} = I/y_{(N.A.)} = \frac{5347.10}{15.08} = \mathbf{354.58} \text{ in}^3$$



"As-Built" Section

Made By	CTY	Date	5/19/2009	Job No.	P410-07-0010
Checked By	BKC	Date	5/20/2009	Sheet No.	

HAM-471-0025

SECTION WITH LOSS

2008 - SECTION MODIFIED SHEAR RATING

SOUTH END FB @ PIER 12 (30WF124 SOUTH-EAST END FLOORBEAM)

"AS-BUILT" SECTION PROPERTIES					
I_o=	5347.1	in^4	$y_{(bot)}$ =	15.1	in
A=	36.5	in^2	$S_{(top)}$=	354.6	in^3
d =	30.2	in	$S_{(bot)}$=	354.6	in^3
t_w=	0.585	in	t_f=	0.930	in
A_{web} =	16.5555	in^2			

Shear Capacity	AB - Shear Capacity	AI - Shear Capacity
	Kips	Kips
$*V_u$	316.87	309.69

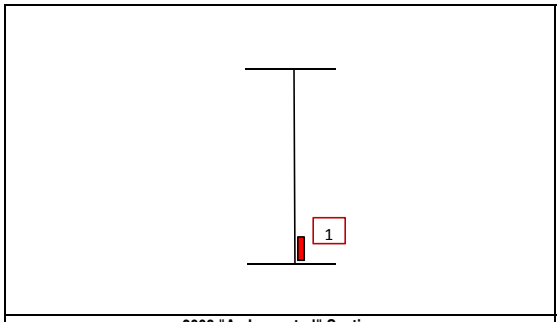
Yield Stress 33 ksi

$*V_u=0.58(F_y)(D)(t_w)$

ASTM A-36-62Tl. 6.6.2.1-1 MCEB

"AS-BUILT" SHEARS & STRESSES						
	DL	HS20	2F1	3F1	4F1	5C1
M	21.9 k	35.0 k	27.6 k	31.5 k	27.7 k	31.5 k
F	1.323 ksi	2.114 ksi	1.667 ksi	1.903 ksi	1.673 ksi	1.903 ksi

CALCULATION OF "AS-INSPECTED" SECTION			
	Deteriorated Area		A
	b (in)	h (in)	(in^2)
1	-0.1250	3.0000	-0.38
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
		TOTALS:	-0.38



2008 "As Inspected" Section

RATING FACTOR CALCULATIONS		
	Inventory	Operating
LFD	[Capacity - 1.3*DL]/[1.3*5/3*LL]	[Capacity - 1.3*DL]/[1.3*LL]

"AS-BUILT" RATING FACTORS										
	Inventory					Operating				
	HS-20	Type 2F1	Type 3F1	Type 4F1	Type 5C1	HS-20	Type 2f1	Type 3F1	Type 4F1	Type 5C1
LFD	3.80	NA	NA	NA	NA	6.34	8.04	7.04	8.01	7.04

"AS-INSPECTED" RATING FACTORS										
	Inventory					Operating				
	HS-20	Type 2F1	Type 3F1	Type 4F1	Type 5C1	HS-20	Type 2f1	Type 3F1	Type 4F1	Type 5C1
LFD	3.71	NA	NA	NA	NA	6.18	7.84	6.87	7.81	6.87

TRUCK WEIGHTS (tons)				
HS-20	Type 2F1	Type 3F1	Type 4F1	Type 5C1
36	15	23	27	40

"AS-BUILT" RATINGS (tons)										
	Inventory					Operating				
	HS-20	Type 2F1	Type 3F1	Type 4F1	Type 5C1	HS-20	Type 2f1	Type 3F1	Type 4F1	Type 5C1
LFD	136.91	NA	NA	NA	NA	228.19	120.57	161.98	216.24	281.71

"AS-INSPECTED" RATINGS (tons)										
	Inventory					Operating				
	HS-20	Type 2F1	Type 3F1	Type 4F1	Type 5C1	HS-20	Type 2f1	Type 3F1	Type 4F1	Type 5C1
LFD	133.50	NA	NA	NA	NA	222.51	117.57	157.95	210.86	274.70