Made By: SSM Date: 05/13/09 Job No: HAM-50-0576L

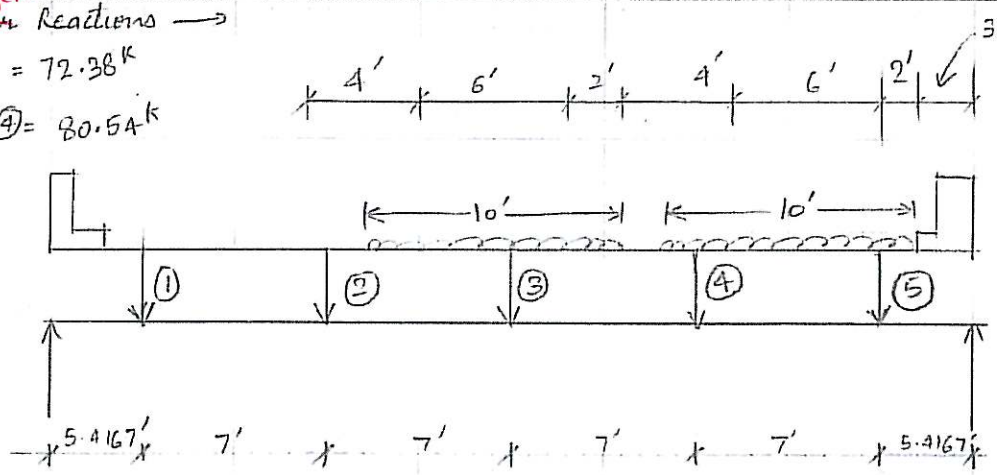
Checked By: HSL Date: 5/30/09 Sheet No: 1

FLOOR BEAM SHEAR RATING (SPAN 1 Floor Beam 2) FOR HS-20 LL

Stringer ~~Girder~~ Reactions →

① = ⑤ = 72.38 K

② = ③ = ④ = 80.54 K



(LL+I) Reaction (Int. ~~girder~~ Stringer) = 80.54 K / Stringer

D.F. = 1.2727

$$(LL+I)\ \text{Reaction for lane} = \left(\frac{80.54^{K}}{\text{~~beam~~ Stringer}}\right)\left(\frac{\text{~~beam~~ Stringer}}{1.2727\ \text{wheels}}\right)\left(\frac{2\ \text{wheels}}{\text{lane}}\right)$$

$$= 126.57^{K}/\text{lane}$$

$$= 12.66^{K}/ft \text{ on } 10' \text{ lane}$$

Reaction on ~~girder~~ Stringer ⑤ due to this lane load →

$$\text{Reaction ⑤} = (12.66^{K/ft})\,9' \times \left(\frac{9'}{2}\right)\left(\frac{1}{7'}\right) = 73.25^{K}$$

$$\text{Reaction ④} = \left[(12.66^{K/ft})(9') - 73.25^{K}\right] + (12.66^{K/ft})(1')\left(\frac{6.5'}{7'}\right) +$$

$$(12.66^{K/ft})(4')\left(\frac{2'}{7'}\right) = \boxed{66.91^{K}}$$

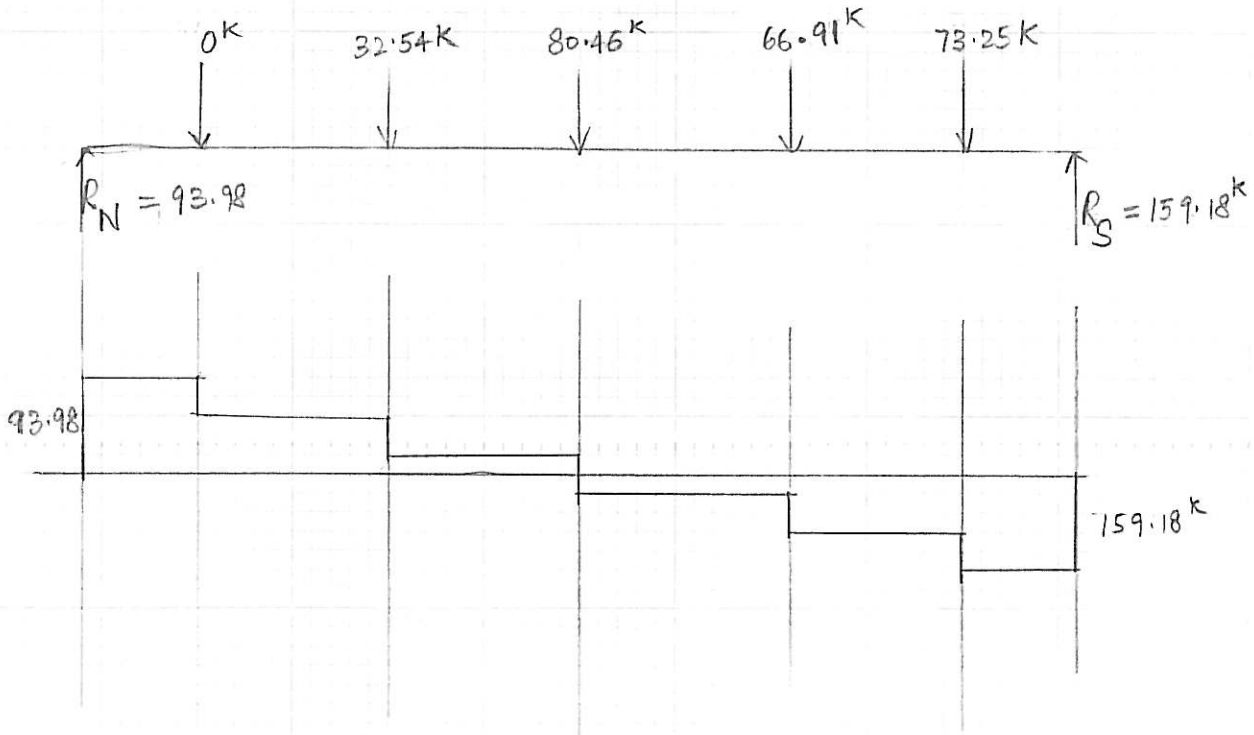
$$\text{Reaction ⑤} = (12.66^{K/ft})(1')\left(\frac{0.5'}{7'}\right) + (12.66^{K/ft})(4')\left(\frac{5'}{7'}\right)$$

$$+ (12.66^{K/ft})(6')\left(\frac{4'}{7'}\right) = \boxed{80.46^{K}}$$

$$\text{Reaction ②} = (12.66^{K/ft})(6')\left(\frac{3'}{7'}\right) = \boxed{32.54^{K}}$$

Reaction ① = 0

FB02



Max. Truck Load shear = 159.18^K (with Impact)

Shear Capacity ⟶ (AASHTO 10.48.7)

LFD

$V_p = 0.58 F_y D t_w$

$= 0.58 (33^{ksi})(33.36'')(0.885'')$

$= 565.08^K$

$k = 5$

$\frac{D}{t_w} (= 37.69) < \frac{6000\sqrt{k}}{\sqrt{F_y}} \quad (= 73.85)$

$\Rightarrow C = 1$

$V_u = C V_p = 565.08^K$

ASD

(AASHTO MCE5)

Inv. Capacity = 11 ksi (Shear in girder web)

Opr. Capacity = 15 ksi.

FLOOR BEAM 2 RATING

RATING $\longrightarrow$ $R.F = \dfrac{C - A_1 D}{A_2 L(1+I)}$

LFD $\longrightarrow$ $R.F = \dfrac{C - 1.3D}{A_2 L(I+1)}$

Inv. $\longrightarrow$ $R.F = \dfrac{565.08 - 1.3\,(10.48^{K} + 51.56^{K})}{2.17\,(159.18\,K)} = 1.4$

Opr $\longrightarrow$ $R.F = \dfrac{565.08 - 1.3(10.48^{K} + 51.56^{K})}{1.3\,(159.18^{K})} = 2.34$

ASD $\longrightarrow$ $R.F = \dfrac{C - D}{L(I+1)}$

Inv. $\longrightarrow$ $R.F = \dfrac{(11\,ksi)(33.36")(0.885") - (10.48^{K} + 51.56^{K})}{159.18^{K}}$

$= 1.65$

OPR $\longrightarrow$ $R.F = \dfrac{(15^{ksi})(33.36")(0.885") - (10.48^{t} + 51.56^{t})}{159.18^{K}}$

$= 2.39$

ASD not needed

TranSystems

Made By SSM Date 9/29/2008 Job No. P402080073

Checked By MSL Date 8/11/2009 Sheet No. 1

Calculations For: ***HAM-50-0376L, Floor Beam Loads - 191'***

*updated 8/11/2009 with STAAD output from "FLOOR BEAM REACTIONS 02(Spans 1 and 4) MSL2009-08-11.std/anl". Note that DL is due to stringer selfweight.

**using STAAD output (from "FLOOR BEAM REACTIONS 02(Spans 1 and 4) MSL2009-08-11.std/anl"). Note that SDL is due to slab,haunch, diaphragm, and railing loads.

Note that sum of DL and SDL in tables below is same as DL reaction obtained from original STAAD run for Spans 1 and 4 ("Span 1 Stringer DL.std/anl").

Losses (in.^{2})

Span 1	Span 4
P = 0.5	O =2.0313
N =0.125	M = 0.625
L = 0.25	K = 2.75
F = 0.25	

HS20 INV/OPR TRUCK/LANE SHEAR

Panel	FLOOR	S01				S02				S03				S04				S05			
Point	BEAM	DL*	SDL**	LL+I	LANE+I	DL*	SDL**	LL+I	LANE+I	DL*	SDL**	LL+I	LANE+I	DL*	SDL**	LL+I	LANE+I	DL*	SDL**	LL+I	LANE+I
L0	**B01**	0.65	7.26	31.19	24.4	0.65	5.86	34.71	27.16	0.65	6.55	34.71	27.16	0.65	6.55	34.71	27.16	0.65	7.26	31.19	24.4
L1	**B02**	1.85	20.77	72.38	52.72	1.85	16.79	80.54	58.68	1.85	18.77	80.54	58.68	1.85	18.77	80.54	58.68	1.85	20.77	72.38	52.72
L2	**B03**	1.58	17.74	67.94	51.72	1.58	14.34	75.6	57.56	1.58	16.02	75.6	57.56	1.58	16.02	75.6	57.56	1.58	17.74	67.94	51.72
L3	**B04**	1.65	18.53	67.62	52.18	1.65	14.98	75.24	58.06	1.65	16.74	75.24	58.06	1.65	16.74	75.24	58.06	1.65	18.53	67.62	52.18
L4	**B05**	1.63	18.28	67.6	52.06	1.63	14.77	75.22	57.94	1.63	16.51	75.22	57.94	1.63	16.51	75.22	57.94	1.63	18.28	67.6	52.06
L5	**B06**	1.65	18.52	67.62	52.18	1.65	14.97	75.24	58.06	1.65	16.73	75.24	58.06	1.65	16.73	75.24	58.06	1.65	18.52	67.62	52.18
L6	**B07**	1.58	17.75	67.94	51.72	1.58	14.34	75.6	57.56	1.58	16.03	75.6	57.56	1.58	16.03	75.6	57.56	1.58	17.75	67.94	51.72
L7	**B08**	1.85	20.77	72.38	52.72	1.85	16.79	80.54	58.68	1.85	18.77	80.54	58.68	1.85	18.77	80.54	58.68	1.85	20.77	72.38	52.72
L8	**B09**	0.65	7.26	31.19	24.4	0.65	5.86	34.71	27.16	0.65	6.55	34.71	27.16	0.65	6.55	34.71	27.16	0.65	7.26	31.19	24.4

2F1 TRUCK/LANE SHEAR

Panel	FLOOR	S01				S02				S03				S04				S05			
Point	BEAM	DL*	SDL**	LL+I	LANE+I	DL*	SDL**	LL+I	LANE+I	DL*	SDL**	LL+I	LANE+I	DL*	SDL**	LL+I	LANE+I	DL*	SDL**	LL+I	LANE+I
L0	**B01**	0.65	7.26	18.5		0.65	5.86	20.59		0.65	6.55	20.59		0.65	6.55	20.59		0.65	7.26	18.5	
L1	**B02**	1.85	20.77	39.88		1.85	16.79	44.38		1.85	18.77	44.38		1.85	18.77	44.38		1.85	20.77	39.88	
L2	**B03**	1.58	17.74	38.68		1.58	14.34	43.04		1.58	16.02	43.04		1.58	16.02	43.04		1.58	17.74	38.68	
L3	**B04**	1.65	18.53	38.58		1.65	14.98	42.94		1.65	16.74	42.94		1.65	16.74	42.94		1.65	18.53	38.58	
L4	**B05**	1.63	18.28	38.58		1.63	14.77	42.94		1.63	16.51	42.94		1.63	16.51	42.94		1.63	18.28	38.58	
L5	**B06**	1.65	18.52	38.58		1.65	14.97	42.94		1.65	16.73	42.94		1.65	16.73	42.94		1.65	18.52	38.58	
L6	**B07**	1.58	17.75	38.68		1.58	14.34	43.04		1.58	16.03	43.04		1.58	16.03	43.04		1.58	17.75	38.68	
L7	**B08**	1.85	20.77	39.88		1.85	16.79	44.38		1.85	18.77	44.38		1.85	18.77	44.38		1.85	20.77	39.88	
L8	**B09**	0.65	7.26	18.5		0.65	5.86	20.59		0.65	6.55	20.59		0.65	6.55	20.59		0.65	7.26	18.5	

3F1 TRUCK/LANE SHEAR

Panel	FLOOR	S01				S02				S03				S04				S05			
Point	BEAM	DL*	SDL**	LL+I	LANE+I	DL*	SDL**	LL+I	LANE+I	DL*	SDL**	LL+I	LANE+I	DL*	SDL**	LL+I	LANE+I	DL*	SDL**	LL+I	LANE+I
L0	**B01**	0.65	7.26	25.38		0.65	5.86	28.25		0.65	6.55	28.25		0.65	6.55	28.25		0.65	7.26	25.38	
L1	**B02**	1.85	20.77	57.02		1.85	16.79	63.44		1.85	18.77	63.44		1.85	18.77	63.44		1.85	20.77	57.02	
L2	**B03**	1.58	17.74	54.44		1.58	14.34	60.58		1.58	16.02	60.58		1.58	16.02	60.58		1.58	17.74	54.44	
L3	**B04**	1.65	18.53	54.26		1.65	14.98	60.38		1.65	16.74	60.38		1.65	16.74	60.38		1.65	18.53	54.26	
L4	**B05**	1.63	18.28	54.24		1.63	14.77	60.36		1.63	16.51	60.36		1.63	16.51	60.36		1.63	18.28	54.24	
L5	**B06**	1.65	18.52	54.26		1.65	14.97	60.38		1.65	16.73	60.38		1.65	16.73	60.38		1.65	18.52	54.26	
L6	**B07**	1.58	17.75	54.44		1.58	14.34	60.58		1.58	16.03	60.58		1.58	16.03	60.58		1.58	17.75	54.44	
L7	**B08**	1.85	20.77	57.02		1.85	16.79	63.44		1.85	18.77	63.44		1.85	18.77	63.44		1.85	20.77	57.02	
L8	**B09**	0.65	7.26	25.38		0.65	5.86	28.25		0.65	6.55	28.25		0.65	6.55	28.25		0.65	7.26	25.38	

4F1 TRUCK/LANE SHEAR

Panel	FLOOR	S01				S02				S03				S04				S05			
Point	BEAM	DL*	SDL**	LL+I	LANE+I	DL*	SDL**	LL+I	LANE+I	DL*	SDL**	LL+I	LANE+I	DL*	SDL**	LL+I	LANE+I	DL*	SDL**	LL+I	LANE+I
L0	**B01**	0.65	7.26	26.15		0.65	5.86	29.1		0.65	6.55	29.1		0.65	6.55	29.1		0.65	7.26	26.15	
L1	**B02**	1.85	20.77	60.92		1.85	16.79	67.8		1.85	18.77	67.8		1.85	18.77	67.8		1.85	20.77	60.92	
L2	**B03**	1.58	17.74	57.28		1.58	14.34	63.76		1.58	16.02	63.76		1.58	16.02	63.76		1.58	17.74	57.28	
L3	**B04**	1.65	18.53	57.02		1.65	14.98	63.46		1.65	16.74	63.46		1.65	16.74	63.46		1.65	18.53	57.02	
L4	**B05**	1.63	18.28	57		1.63	14.77	63.44		1.63	16.51	63.44		1.63	16.51	63.44		1.63	18.28	57	
L5	**B06**	1.65	18.52	57.02		1.65	14.97	63.46		1.65	16.73	63.46		1.65	16.73	63.46		1.65	18.52	57.02	
L6	**B07**	1.58	17.75	57.28		1.58	14.34	63.76		1.58	16.03	63.76		1.58	16.03	63.76		1.58	17.75	57.28	
L7	**B08**	1.85	20.77	60.92		1.85	16.79	67.8		1.85	18.77	67.8		1.85	18.77	67.8		1.85	20.77	60.92	
L8	**B09**	0.65	7.26	26.15		0.65	5.86	29.1		0.65	6.55	29.1		0.65	6.55	29.1		0.65	7.26	26.15	

5C1 TRUCK/LANE SHEAR

Panel	FLOOR	S01				S02				S03				S04				S05			
Point	BEAM	DL*	SDL**	LL+I	LANE+I	DL*	SDL**	LL+I	LANE+I	DL*	SDL**	LL+I	LANE+I	DL*	SDL**	LL+I	LANE+I	DL*	SDL**	LL+I	LANE+I
L0	**B01**	0.65	7.26	24.68		0.65	5.86	27.46		0.65	6.55	27.46		0.65	6.55	27.46		0.65	7.26	24.68	
L1	**B02**	1.85	20.77	54.26		1.85	16.79	60.38		1.85	18.77	60.38		1.85	18.77	60.38		1.85	20.77	54.26	
L2	**B03**	1.58	17.74	51.36		1.58	14.34	57.16		1.58	16.02	57.16		1.58	16.02	57.16		1.58	17.74	51.36	
L3	**B04**	1.65	18.53	51.16		1.65	14.98	56.94		1.65	16.74	56.94		1.65	16.74	56.94		1.65	18.53	51.16	
L4	**B05**	1.63	18.28	51.14		1.63	14.77	56.92		1.63	16.51	56.92		1.63	16.51	56.92		1.63	18.28	51.14	
L5	**B06**	1.65	18.52	51.16		1.65	14.97	56.94		1.65	16.73	56.94		1.65	16.73	56.94		1.65	18.52	51.16	
L6	**B07**	1.58	17.75	51.36		1.58	14.34	57.16		1.58	16.03	57.16		1.58	16.03	57.16		1.58	17.75	51.36	
L7	**B08**	1.85	20.77	54.26		1.85	16.79	60.38		1.85	18.77	60.38		1.85	18.77	60.38		1.85	20.77	54.26	
L8	**B09**	0.65	7.26	24.68		0.65	5.86	27.46		0.65	6.55	27.46		0.65	6.55	27.46		0.65	7.26	24.68	

Made By SSM Date 9/29/2008 Job No. P402080073
Checked By MSL Date 8/11/2009 Sheet No. 1
Calculations For: ***HAM-50-0376L, Floor Beam Loads - 250'***

*updated 8/11/2009 with STAAD output from "FLOOR BEAM REACTIONS MSL2009-08-11.std/anl". Note that DL is due to stringer selfweight
**using STAAD output (from either "FLOOR BEAM REACTIONS.std/anl" or "FLOOR BEAM REACTIONS MSL2009-08-11.std/anl"). Note that SDL is due to slab,haunch, diaphragm, and railing loads

HS20 INV/OPR TRUCK/LANE SHEAR

Panel	FLOOR	S01				S02				S03				S04				S05				Losses (in.^{2})	
Point	BEAM	DL*	SDL**	LL+I	LANE+I	DL*	SDL**	LL+I	LANE+I	DL*	SDL**	LL+I	LANE+I	DL*	SDL**	LL+I	LANE+I	DL*	SDL**	LL+I	LANE+I	Span 2	Span 3
L0	B01	0.81	7.62	32.05	24.73	0.81	6.15	35.63	27.51	0.81	6.88	35.63	27.51	0.81	6.88	35.63	27.51	0.81	7.62	32.05	24.73	0	0
L1	B02	2.12	21.63	73.4	53.36	2.12	17.48	81.72	59.38	2.12	19.54	81.72	59.38	2.12	19.54	81.72	59.38	2.12	21.63	73.4	53.36	0	0.5
L2	B03	1.63	18.6	69.06	52.56	1.63	15.03	76.84	58.5	1.63	16.8	76.84	58.5	1.63	16.8	76.84	58.5	1.63	18.6	69.06	52.56	0	1
L3	B04	1.73	19.34	69.04	52.72	1.73	15.63	76.84	58.68	1.73	17.47	76.84	58.68	1.73	17.47	76.84	58.68	1.73	19.34	69.04	52.72	0	0
L4	B05	1.7	19.15	69.06	52.66	1.7	15.47	76.84	58.6	1.7	17.29	76.84	58.6	1.7	17.29	76.84	58.6	1.7	19.15	69.06	52.66	0.25	0.5
L5	B06	1.71	19.21	69.06	52.66	1.71	15.52	76.84	58.6	1.71	17.35	76.84	58.6	1.71	17.35	76.84	58.6	1.71	19.21	69.06	52.66	0.5	0.875
L6	B07	1.7	19.15	69.06	52.66	1.7	15.47	76.84	58.6	1.7	17.29	76.84	58.6	1.7	17.29	76.84	58.6	1.7	19.15	69.06	52.66	2.085	1.125
L7	B08	1.73	19.34	69.04	52.72	1.73	15.63	76.84	58.68	1.73	17.47	76.84	58.68	1.73	17.47	76.84	58.68	1.73	19.34	69.04	52.72	0.5	1.125
L8	B09	1.63	18.6	69.06	52.56	1.63	15.03	76.84	58.5	1.63	16.8	76.84	58.5	1.63	16.8	76.84	58.5	1.63	18.6	69.06	52.56	0.5	0.1875
L9	B10	2.12	21.63	73.4	53.36	2.12	17.48	81.72	59.38	2.12	19.54	81.72	59.38	2.12	19.54	81.72	59.38	2.12	21.63	73.4	53.36	0	0
L10	B11	0.81	7.62	32.05	24.73	0.81	6.15	35.63	27.51	0.81	6.88	35.63	27.51	0.81	6.88	35.63	27.51	0.81	7.62	32.05	24.73	0	0

2F1 TRUCK/LANE SHEAR

Panel	FLOOR	S01				S02				S03				S04				S05			
Point	BEAM	DL*	SDL**	LL+I	LANE+I	DL*	SDL**	LL+I	LANE+I	DL*	SDL**	LL+I	LANE+I	DL*	SDL**	LL+I	LANE+I	DL*	SDL**	LL+I	LANE+I
L0	B01	0.81	7.62	18.71		0.81	6.15	20.82		0.81	6.88	20.82		0.81	6.88	20.82		0.81	7.62	18.71	
L1	B02	2.12	21.63	40.02		2.12	17.48	44.54		2.12	19.54	44.54		2.12	19.54	44.54		2.12	21.63	40.02	
L2	B03	1.63	18.6	38.9		1.63	15.03	43.28		1.63	16.8	43.28		1.63	16.8	43.28		1.63	18.6	38.9	
L3	B04	1.73	19.34	38.9		1.73	15.63	43.28		1.73	17.47	43.28		1.73	17.47	43.28		1.73	19.34	38.9	
L4	B05	1.7	19.15	38.9		1.7	15.47	43.28		1.7	17.29	43.28		1.7	17.29	43.28		1.7	19.15	38.9	
L5	B06	1.71	19.21	38.9		1.71	15.52	43.28		1.71	17.35	43.28		1.71	17.35	43.28		1.71	19.21	38.9	
L6	B07	1.7	19.15	38.9		1.7	15.47	43.28		1.7	17.29	43.28		1.7	17.29	43.28		1.7	19.15	38.9	
L7	B08	1.73	19.34	38.9		1.73	15.63	43.28		1.73	17.47	43.28		1.73	17.47	43.28		1.73	19.34	38.9	
L8	B09	1.63	18.6	38.9		1.63	15.03	43.28		1.63	16.8	43.28		1.63	16.8	43.28		1.63	18.6	38.9	
L9	B10	2.12	21.63	40.02		2.12	17.48	44.54		2.12	19.54	44.54		2.12	19.54	44.54		2.12	21.63	40.02	
L10	B11	0.81	7.62	18.71		0.81	6.15	20.82		0.81	6.88	20.82		0.81	6.88	20.82		0.81	7.62	18.71	

3F1 TRUCK/LANE SHEAR

Panel	FLOOR	S01				S02				S03				S04				S05			
Point	BEAM	DL*	SDL**	LL+I	LANE+I	DL*	SDL**	LL+I	LANE+I	DL*	SDL**	LL+I	LANE+I	DL*	SDL**	LL+I	LANE+I	DL*	SDL**	LL+I	LANE+I
L0	B01	0.81	7.62	25.87		0.81	6.15	28.77		0.81	6.88	28.77		0.81	6.88	28.77		0.81	7.62	25.87	
L1	B02	2.12	21.63	57.32		2.12	17.48	63.82		2.12	19.54	63.82		2.12	19.54	63.82		2.12	21.63	57.32	
L2	B03	1.63	18.6	54.94		1.63	15.03	61.14		1.63	16.8	61.14		1.63	16.8	61.14		1.63	18.6	54.94	
L3	B04	1.73	19.34	54.92		1.73	15.63	61.14		1.73	17.47	61.14		1.73	17.47	61.14		1.73	19.34	54.92	
L4	B05	1.7	19.15	54.94		1.7	15.47	61.14		1.7	17.29	61.14		1.7	17.29	61.14		1.7	19.15	54.94	
L5	B06	1.71	19.21	54.94		1.71	15.52	61.14		1.71	17.35	61.14		1.71	17.35	61.14		1.71	19.21	54.94	
L6	B07	1.7	19.15	54.94		1.7	15.47	61.14		1.7	17.29	61.14		1.7	17.29	61.14		1.7	19.15	54.94	
L7	B08	1.73	19.34	54.92		1.73	15.63	61.14		1.73	17.47	61.14		1.73	17.47	61.14		1.73	19.34	54.92	
L8	B09	1.63	18.6	54.94		1.63	15.03	61.14		1.63	16.8	61.14		1.63	16.8	61.14		1.63	18.6	54.94	
L9	B10	2.12	21.63	57.32		2.12	17.48	63.82		2.12	19.54	63.82		2.12	19.54	63.82		2.12	21.63	57.32	
L10	B11	0.81	7.62	25.87		0.81	6.15	28.77		0.81	6.88	28.77		0.81	6.88	28.77		0.81	7.62	25.87	

4F1 TRUCK/LANE SHEAR

Panel	FLOOR	S01				S02				S03				S04				S05			
Point	BEAM	DL*	SDL**	LL+I	LANE+I	DL*	SDL**	LL+I	LANE+I	DL*	SDL**	LL+I	LANE+I	DL*	SDL**	LL+I	LANE+I	DL*	SDL**	LL+I	LANE+I
L0	B01	0.81	7.62	26.86		0.81	6.15	29.87		0.81	6.88	29.87		0.81	6.88	29.87		0.81	7.62	26.86	
L1	B02	2.12	21.63	61.56		2.12	17.48	68.56		2.12	19.54	68.56		2.12	19.54	68.56		2.12	21.63	61.56	
L2	B03	1.63	18.6	58.1		1.63	15.03	64.66		1.63	16.8	64.66		1.63	16.8	64.66		1.63	18.6	58.1	
L3	B04	1.73	19.34	58.08		1.73	15.63	64.64		1.73	17.47	64.64		1.73	17.47	64.64		1.73	19.34	58.08	
L4	B05	1.7	19.15	58.1		1.7	15.47	64.66		1.7	17.29	64.66		1.7	17.29	64.66		1.7	19.15	58.1	
L5	B06	1.71	19.21	58.1		1.71	15.52	64.66		1.71	17.35	64.66		1.71	17.35	64.66		1.71	19.21	58.1	
L6	B07	1.7	19.15	58.1		1.7	15.47	64.66		1.7	17.29	64.66		1.7	17.29	64.66		1.7	19.15	58.1	
L7	B08	1.73	19.34	58.08		1.73	15.63	64.64		1.73	17.47	64.64		1.73	17.47	64.64		1.73	19.34	58.08	
L8	B09	1.63	18.6	58.1		1.63	15.03	64.66		1.63	16.8	64.66		1.63	16.8	64.66		1.63	18.6	58.1	
L9	B10	2.12	21.63	61.56		2.12	17.48	68.56		2.12	19.54	68.56		2.12	19.54	68.56		2.12	21.63	61.56	
L10	B11	0.81	7.62	26.86		0.81	6.15	29.87		0.81	6.88	29.87		0.81	6.88	29.87		0.81	7.62	26.86	

5C1 TRUCK/LANE SHEAR

Panel	FLOOR	S01				S02				S03				S04				S05			
Point	BEAM	DL*	SDL**	LL+I	LANE+I	DL*	SDL**	LL+I	LANE+I	DL*	SDL**	LL+I	LANE+I	DL*	SDL**	LL+I	LANE+I	DL*	SDL**	LL+I	LANE+I
L0	B01	0.81	7.62	25.17		0.81	6.15	27.99		0.81	6.88	27.99		0.81	6.88	27.99		0.81	7.62	25.17	
L1	B02	2.12	21.63	54.6		2.12	17.48	60.82		2.12	19.54	60.82		2.12	19.54	60.82		2.12	21.63	54.6	
L2	B03	1.63	18.6	51.84		1.63	15.03	57.68		1.63	16.8	57.68		1.63	16.8	57.68		1.63	18.6	51.84	
L3	B04	1.73	19.34	51.92		1.73	15.63	57.78		1.73	17.47	57.78		1.73	17.47	57.78		1.73	19.34	51.92	
L4	B05	1.7	19.15	51.92		1.7	15.47	57.78		1.7	17.29	57.78		1.7	17.29	57.78		1.7	19.15	51.92	
L5	B06	1.71	19.21	51.92		1.71	15.52	57.78		1.71	17.35	57.78		1.71	17.35	57.78		1.71	19.21	51.92	
L6	B07	1.7	19.15	51.92		1.7	15.47	57.78		1.7	17.29	57.78		1.7	17.29	57.78		1.7	19.15	51.92	
L7	B08	1.73	19.34	51.92		1.73	15.63	57.78		1.73	17.47	57.78		1.73	17.47	57.78		1.73	19.34	51.92	
L8	B09	1.63	18.6	51.84		1.63	15.03	57.68		1.63	16.8	57.68		1.63	16.8	57.68		1.63	18.6	51.84	
L9	B10	2.12	21.63	54.6		2.12	17.48	60.82		2.12	19.54	60.82		2.12	19.54	60.82		2.12	21.63	54.6	
L10	B11	0.81	7.62	25.17		0.81	6.15	27.99		0.81	6.88	27.99		0.81	6.88	27.99		0.81	7.62	25.17	

TranSystems

Made By SSM Date ####### Job No. P402080073
Checked By MSL Date 8/11/2009 Sheet No. 4

Calculations For: ***HAM-50-0376L Span 2, Floor Beam 7 (B07) Shear Rating (at Panel Point L6)***

Stringer Reactions:

	DL (Kips)	SDL (Kips)	HS20 (Kips	2F1 (Kips)	3F1 (Kips)	4F1 (Kips)	5C1 (Kips)
S01 =	1.7	19.15	69.06	38.9	54.94	58.1	51.92
S02 =	1.7	15.47	76.84	43.28	61.14	64.66	57.78
S03 =	1.7	17.29	76.84	43.28	61.14	64.66	57.78
S04 =	1.7	17.29	76.84	43.28	61.14	64.66	57.78
S05 =	1.7	19.15	69.06	38.9	54.94	58.1	51.92

Distribution Factors:

Int. Stringers =	1.2727
Ext. Stringers =	1.143

	HS20	2F1	3F1	4F1	5C1		
LL+I per lane =	12.08	6.80	9.61	10.16	9.08	K/ft	(10' lane)

Position these lanes on the bridge such as to maximize reaction on Ext. Stringer S05

Stringer Reactions (LL+I):

	HS20 (Kips)	2F1 (Kips)	3F1 (Kips)	4F1 (Kips)	5C1 (Kips)
S01 =	0	0	0	0	0
S02 =	31.05	17.49	24.71	26.13	23.35
S03 =	76.76	43.24	61.08	64.60	57.72
S04 =	63.83	35.95	50.78	53.71	47.99
S05 =	69.86	39.35	55.59	58.79	52.53

Maximum shear on the Floor Beam ends:

	DL (Kips)	SDL (Kips)	HS20 (Kips	2F1 (Kips)	3F1 (Kips)	4F1 (Kips)	5C1 (Kips)
North End =	10.23	43.85	89.66	50.50	71.34	75.45	67.42
South End =	10.23	44.50	151.85	85.53	120.82	127.78	114.18

Shear Capacity:

LFD

Web Depth (D) =	33.36	in.	Web thick.(t_w) =	0.885	in.
Losses =	0	$in.^2$			
Dt_w - Losses =	29.52	$in.^2$			
V_p =	565.08	Kips			
K =	5				
D/t_w =	37.69	<	73.85	OK	
C =	1				
V_u =	**565.08**	Kips			

ASD

Inv. Capacity =	**11**	Ksi
Oper. Capacity =	**15**	Ksi

Shear Ratings

	HS20 TRUCK		2F1		3F1		4F1		5C1	
	Inventory	Operating	Inventory	Operating	Inventory	Operating	Inventory	Operating	Inventory	Operating
LFD =	**1.50**	**2.50**		**4.44**		**3.14**		**2.97**		**3.33**
ASD =	**1.78**	**2.56**		**4.54**		**3.21**		**3.04**		**3.40**

TranSystems

Made By SSM Date ####### Job No. P402080073

Checked By MSL Date 8/11/2009 Sheet No. 4

Calculations For: ***HAM-50-0376L Span 2, Floor Beam 7 (B07) Shear Rating (at Panel Point L6)***

Stringer Reactions:

	DL (Kips)	SDL (Kips)	HS20 (Kips	2F1 (Kips)	3F1 (Kips)	4F1 (Kips)	5C1 (Kips)
S01 =	1.7	19.15	69.06	38.9	54.94	58.1	51.92
S02 =	1.7	15.47	76.84	43.28	61.14	64.66	57.78
S03 =	1.7	17.29	76.84	43.28	61.14	64.66	57.78
S04 =	1.7	17.29	76.84	43.28	61.14	64.66	57.78
S05 =	1.7	19.15	69.06	38.9	54.94	58.1	51.92

Distribution Factors:

Int. Stringers =	1.2727
Ext. Stringers =	1.143

	HS20	2F1	3F1	4F1	5C1		
LL+I per lane =	12.08	6.80	9.61	10.16	9.08	K/ft	(10' lane)

Position these lanes on the bridge such as to maximize reaction on Ext. Stringer S05

Stringer Reactions (LL+I):

	HS20 (Kips)	2F1 (Kips)	3F1 (Kips)	4F1 (Kips)	5C1 (Kips)
S01 =	0	0	0	0	0
S02 =	31.05	17.49	24.71	26.13	23.35
S03 =	76.76	43.24	61.08	64.60	57.72
S04 =	63.83	35.95	50.78	53.71	47.99
S05 =	69.86	39.35	55.59	58.79	52.53

Maximum shear on the Floor Beam ends:

	DL (Kips)	SDL (Kips)	HS20 (Kips	2F1 (Kips)	3F1 (Kips)	4F1 (Kips)	5C1 (Kips)
North End =	10.23	43.85	89.66	50.50	71.34	75.45	67.42
South End =	10.23	44.50	151.85	85.53	120.82	127.78	114.18

Shear Capacity:

LFD

Web Depth (D) =	33.36	in.	**Web thick.(t_w) =**	0.885	in.
Losses =	2.085	$in.^2$			
Dt_w - Losses =	27.44	$in.^2$			
V_p =	525.17	Kips			
K =	5				
D/t_w =	37.69	<	73.85	OK	
C =	1				
V_u =	**525.17**	Kips			

ASD

Inv. Capacity =	**11**	Ksi
Oper. Capacity =	**15**	Ksi

Shear Ratings

	HS20 TRUCK		2F1		3F1		4F1		5C1	
	Inventory	Operating	Inventory	Operating	Inventory	Operating	Inventory	Operating	Inventory	Operating
LFD =	**1.38**	**2.30**		**4.08**		**2.89**		**2.73**		**3.06**
ASD =	**1.63**	**2.35**		**4.17**		**2.95**		**2.79**		**3.13**

TranSystems

Made By SSM Date 8/19/2009 Job No. P402080073

Checked By MSL Date 8/11/2009 Sheet No. 5

Calculations For: ***HAM-50-0376L Span 3, Floor Beam 2 (B02) Shear Rating (at Panel Point L1)***

Stringer Reactions:

	DL (Kips)	SDL (Kips)	HS20 (Kips)	2F1 (Kips)	3F1 (Kips)	4F1 (Kips)	5C1 (Kips)
S01 =	2.12	21.63	73.4	40.02	57.32	61.56	54.6
S02 =	2.12	17.48	81.72	44.54	63.82	68.56	60.82
S03 =	2.12	19.54	81.72	44.54	63.82	68.56	60.82
S04 =	2.12	19.54	81.72	44.54	63.82	68.56	60.82
S05 =	2.12	21.63	73.4	40.02	57.32	61.56	54.6

Distribution Factors:

Int. Stringers =	1.2727
Ext. Stringers =	1.143

	HS20	2F1	3F1	4F1	5C1		
LL+I per lane =	12.84	7.00	10.03	10.77	9.56	K/ft	(10' lane)

Position these lanes on the bridge such as to maximize reaction on Ext. Stringer S05

Stringer Reactions (LL+I):

	HS20 (Kips)	2F1 (Kips)	3F1 (Kips)	4F1 (Kips)	5C1 (Kips)
S01 =	0	0	0	0	0
S02 =	33.02	18.00	25.79	27.70	24.58
S03 =	81.64	44.50	63.76	68.49	60.76
S04 =	67.88	37.00	53.01	56.95	50.52
S05 =	74.30	40.50	58.03	62.33	55.30

Maximum shear on the Floor Beam ends:

	DL (Kips)	SDL (Kips)	HS20 (Kips)	2F1 (Kips)	3F1 (Kips)	4F1 (Kips)	5C1 (Kips)
North End =	11.71	49.54	95.35	51.97	74.47	80.00	70.97
South End =	11.71	50.28	161.49	88.02	126.12	135.48	120.19

Shear Capacity:

LFD

Web Depth (D) =	33.34	in.	Web thick.(t_w) =	0.945	in.
Losses =	0	$in.^2$			
Dt_w - Losses =	31.51	$in.^2$			
V_p =	603.03	Kips			
K =	5				
D/t_w =	35.28	<	73.85	OK	
C =	1				
V_u =	**603.03**	Kips			

ASD

Inv. Capacity =	**11**	Ksi
Oper. Capacity =	**15**	Ksi

Shear Ratings

	HS20 TRUCK		2F1		3F1		4F1		5C1	
	Inventory	Operating	Inventory	Operating	Inventory	Operating	Inventory	Operating	Inventory	Operating
LFD =	**1.49**	**2.49**		**4.57**		**3.19**		**2.97**		**3.34**
ASD =	**1.76**	**2.54**		**4.66**		**3.26**		**3.03**		**3.42**

TranSystems

Made By SSM Date 8/19/2009 Job No. P402080073

Checked By MSL Date 8/11/2009 Sheet No. 5

Calculations For: ***HAM-50-0376L Span 3, Floor Beam 2 (B02) Shear Rating (at Panel Point L1)***

Stringer Reactions:

	DL (Kips)	SDL (Kips)	HS20 (Kips)	2F1 (Kips)	3F1 (Kips)	4F1 (Kips)	5C1 (Kips)
S01 =	2.12	21.63	73.4	40.02	57.32	61.56	54.6
S02 =	2.12	17.48	81.72	44.54	63.82	68.56	60.82
S03 =	2.12	19.54	81.72	44.54	63.82	68.56	60.82
S04 =	2.12	19.54	81.72	44.54	63.82	68.56	60.82
S05 =	2.12	21.63	73.4	40.02	57.32	61.56	54.6

Distribution Factors:

Int. Stringers =	1.2727
Ext. Stringers =	1.143

	HS20	2F1	3F1	4F1	5C1		
LL+I per lane =	12.84	7.00	10.03	10.77	9.56	K/ft	(10' lane)

Position these lanes on the bridge such as to maximize reaction on Ext. Stringer S05

Stringer Reactions (LL+I):

	HS20 (Kips)	2F1 (Kips)	3F1 (Kips)	4F1 (Kips)	5C1 (Kips)
S01 =	0	0	0	0	0
S02 =	33.02	18.00	25.79	27.70	24.58
S03 =	81.64	44.50	63.76	68.49	60.76
S04 =	67.88	37.00	53.01	56.95	50.52
S05 =	74.30	40.50	58.03	62.33	55.30

Maximum shear on the Floor Beam ends:

	DL (Kips)	SDL (Kips)	HS20 (Kips)	2F1 (Kips)	3F1 (Kips)	4F1 (Kips)	5C1 (Kips)
North End =	11.71	49.54	95.35	51.97	74.47	80.00	70.97
South End =	11.71	50.28	161.49	88.02	126.12	135.48	120.19

Shear Capacity:

LFD

Web Depth (D) =	33.34	in.	Web thick.(t_w) =	0.945	in.
Losses =	0.5	$in.^2$			
Dt_w - Losses =	31.01	$in.^2$			
V_p =	593.46	Kips			
K =	5				
D/t_w =	35.28	<	73.85	OK	
C =	1				
V_u =	**593.46**	Kips			

ASD

Inv. Capacity =	**11**	Ksi
Oper. Capacity =	**15**	Ksi

Shear Ratings

	HS20 TRUCK		2F1		3F1		4F1		5C1	
	Inventory	Operating	Inventory	Operating	Inventory	Operating	Inventory	Operating	Inventory	Operating
LFD =	**1.46**	**2.44**		**4.48**		**3.13**		**2.91**		**3.28**
ASD =	**1.73**	**2.50**		**4.58**		**3.20**		**2.98**		**3.35**

TranSystems

Made By SSM Date ####### Job No. P402080073

Checked By MSL Date 8/11/2009 Sheet No. 1

Calculations For: ***HAM-50-0376L Span 4, Floor Beam 1 (B01) Shear Rating (at Panel Point L0)***

Stringer Reactions: (refer to cell comment)

	DL (Kips)	SDL (Kips)	HS20 (Kips	2F1 (Kips)	3F1 (Kips)	4F1 (Kips)	5C1 (Kips)
S01 =	0.65	7.26	31.19	18.5	25.38	26.15	24.68
S02 =	0.65	5.86	34.71	20.59	28.25	29.1	27.46
S03 =	0.65	6.55	34.71	20.59	28.25	29.1	27.46
S04 =	0.65	6.55	34.71	20.59	28.25	29.1	27.46
S05 =	0.65	7.26	31.19	18.5	25.38	26.15	24.68

Distribution Factors:

Int. Stringers =	1.2727
Ext. Stringers =	1.143

	HS20	2F1	3F1	4F1	5C1		
LL+I per lane =	5.45	3.24	4.44	4.57	4.32	K/ft	(10' lane)

Position these lanes on the bridge such as to maximize reaction on Ext. Stringer S05

Stringer Reactions (LL+I):

S01 =	0	0	0	0	0
S02 =	14.03	8.32	11.42	11.76	11.10
S03 =	34.68	20.57	28.22	29.07	27.43
S04 =	28.83	17.10	23.47	24.17	22.81
S05 =	31.56	18.72	25.68	26.46	24.97

Maximum shear on the Floor Beam ends:

	DL (Kips)	SDL (Kips)	HS20 (Kips	2F1 (Kips)	3F1 (Kips)	4F1 (Kips)	5C1 (Kips)
North End =	7.18	16.62	40.50	24.02	32.96	33.95	32.04
South End =	7.18	16.86	68.59	40.69	55.83	57.51	54.27

Shear Capacity:

LFD

Web Depth (D) =	33.36	in.	Web thick.(t_w) =	0.84	in.
Losses =	0.00	$in.^2$			
Dt_w - Losses =	28.02	$in.^2$			
V_p =	536.35	Kips			
K =	5				
D/t_w =	39.71	<	73.85	OK	
C =	1				
V_u =	**536.35**	Kips			

ASD

Inv. Capacity =	**11**	Ksi
Oper. Capacity =	**15**	Ksi

Shear Ratings

	HS20 TRUCK		2F1		3F1		4F1		5C1	
	Inventory	Operating	Inventory	Operating	Inventory	Operating	Inventory	Operating	Inventory	Operating
LFD =	**3.39**	**5.66**		**9.55**		**6.96**		**6.76**		**7.16**
ASD =	**4.14**	**5.78**		**9.74**		**7.10**		**6.89**		**7.30**

TranSystems

Made By SSM Date ####### Job No. P402080073

Checked By MSL Date 8/11/2009 Sheet No. 1

Calculations For: ***HAM-50-0376L Span 4, Floor Beam 1 (B01) Shear Rating (at Panel Point L0)***

Stringer Reactions: (refer to cell comment)

	DL (Kips)	SDL (Kips)	HS20 (Kips	2F1 (Kips)	3F1 (Kips)	4F1 (Kips)	5C1 (Kips)
S01 =	0.65	7.26	31.19	18.5	25.38	26.15	24.68
S02 =	0.65	5.86	34.71	20.59	28.25	29.1	27.46
S03 =	0.65	6.55	34.71	20.59	28.25	29.1	27.46
S04 =	0.65	6.55	34.71	20.59	28.25	29.1	27.46
S05 =	0.65	7.26	31.19	18.5	25.38	26.15	24.68

Distribution Factors:

Int. Stringers =	1.2727
Ext. Stringers =	1.143

	HS20	2F1	3F1	4F1	5C1		
LL+I per lane =	5.45	3.24	4.44	4.57	4.32	K/ft	(10' lane)

Position these lanes on the bridge such as to maximize reaction on Ext. Stringer S05

Stringer Reactions (LL+I):

S01 =	0	0	0	0	0
S02 =	14.03	8.32	11.42	11.76	11.10
S03 =	34.68	20.57	28.22	29.07	27.43
S04 =	28.83	17.10	23.47	24.17	22.81
S05 =	31.56	18.72	25.68	26.46	24.97

Maximum shear on the Floor Beam ends:

	DL (Kips)	SDL (Kips)	HS20 (Kips	2F1 (Kips)	3F1 (Kips)	4F1 (Kips)	5C1 (Kips)
North End =	7.18	16.62	40.50	24.02	32.96	33.95	32.04
South End =	7.18	16.86	68.59	40.69	55.83	57.51	54.27

Shear Capacity:

LFD

Web Depth (D) =	33.36	in.	Web thick.(t_w) =	0.84	in.
Losses =	2.03	$in.^2$			
Dt_w - Losses =	25.99	$in.^2$			
V_p =	497.47	Kips			
K =	5				
D/t_w =	39.71	<	73.85	OK	
C =	1				
V_u =	**497.47**	Kips			

ASD

Inv. Capacity =	**11**	Ksi
Oper. Capacity =	**15**	Ksi

Shear Ratings

	HS20 TRUCK		2F1		3F1		4F1		5C1	
	Inventory	Operating	Inventory	Operating	Inventory	Operating	Inventory	Operating	Inventory	Operating
LFD =	**3.13**	**5.23**		**8.81**		**6.42**		**6.24**		**6.61**
ASD =	**3.82**	**5.33**		**8.99**		**6.55**		**6.36**		**6.74**

TranSystems

Made By SSM Date ####### Job No. P402080073
Checked By MSL Date 8/11/2009 Sheet No. 2

Calculations For: ***HAM-50-0376L Span 4, Floor Beam 2 (B02) Shear Rating (at Panel Point L1)***

Stringer Reactions: (refer to cell comment)

	DL (Kips)	SDL (Kips)	HS20 (Kips	2F1 (Kips)	3F1 (Kips)	4F1 (Kips)	5C1 (Kips)
S01 =	1.85	20.77	72.38	39.88	57.02	60.92	54.26
S02 =	1.85	16.79	80.54	44.38	63.44	67.8	60.38
S03 =	1.85	18.77	80.54	44.38	63.44	67.8	60.38
S04 =	1.85	18.77	80.54	44.38	63.44	67.8	60.38
S05 =	1.85	20.77	72.38	39.88	57.02	60.92	54.26

Distribution Factors:

Int. Stringers =	1.2727
Ext. Stringers =	1.143

	HS20	2F1	3F1	4F1	5C1		
LL+I per lane =	12.66	6.97	9.97	10.65	9.49	K/ft	(10' lane)

Position these lanes on the bridge such as to maximize reaction on Ext. Stringer S05

Stringer Reactions (LL+I):

	HS20 (Kips)	2F1 (Kips)	3F1 (Kips)	4F1 (Kips)	5C1 (Kips)
S01 =	0	0	0	0	0
S02 =	32.55	17.93	25.64	27.40	24.40
S03 =	80.46	44.34	63.38	67.73	60.32
S04 =	66.90	36.86	52.70	56.32	50.15
S05 =	73.23	40.35	57.68	61.64	54.90

Maximum shear on the Floor Beam ends:

	DL (Kips)	SDL (Kips)	HS20 (Kips	2F1 (Kips)	3F1 (Kips)	4F1 (Kips)	5C1 (Kips)
North End =	10.61	47.58	93.97	51.78	74.02	79.11	70.45
South End =	10.61	48.29	159.16	87.70	125.37	133.98	119.32

Shear Capacity:

LFD

Web Depth (D) =	33.36	in.	Web thick.(t_w) =	0.885	in.
Losses =	0	$in.^2$			
Dt_w - Losses =	29.52	$in.^2$			
V_p =	565.08	Kips			
K =	5				
D/t_w =	37.69	<	73.85	OK	
C =	1				
V_u =	**565.08**	Kips			

ASD

Inv. Capacity =	**11**	Ksi
Oper. Capacity =	**15**	Ksi

Shear Ratings

	HS20 TRUCK		2F1		3F1		4F1		5C1	
	Inventory	Operating	Inventory	Operating	Inventory	Operating	Inventory	Operating	Inventory	Operating
LFD =	**1.41**	**2.36**		**4.28**		**3.00**		**2.80**		**3.15**
ASD =	**1.67**	**2.41**		**4.38**		**3.06**		**2.87**		**3.22**

TranSystems

Made By SSM Date ####### Job No. P402080073
Checked By MSL Date 8/11/2009 Sheet No. 2

Calculations For: ***HAM-50-0376L Span 4, Floor Beam 2 (B02) Shear Rating (at Panel Point L1)***

Stringer Reactions: (refer to cell comment)

	DL (Kips)	SDL (Kips)	HS20 (Kips	2F1 (Kips)	3F1 (Kips)	4F1 (Kips)	5C1 (Kips)
S01 =	1.85	20.77	72.38	39.88	57.02	60.92	54.26
S02 =	1.85	16.79	80.54	44.38	63.44	67.8	60.38
S03 =	1.85	18.77	80.54	44.38	63.44	67.8	60.38
S04 =	1.85	18.77	80.54	44.38	63.44	67.8	60.38
S05 =	1.85	20.77	72.38	39.88	57.02	60.92	54.26

Distribution Factors:

Int. Stringers =	1.2727
Ext. Stringers =	1.143

	HS20	2F1	3F1	4F1	5C1		
LL+I per lane =	12.66	6.97	9.97	10.65	9.49	K/ft	(10' lane)

Position these lanes on the bridge such as to maximize reaction on Ext. Stringer S05

Stringer Reactions (LL+I):

	HS20 (Kips)	2F1 (Kips)	3F1 (Kips)	4F1 (Kips)	5C1 (Kips)
S01 =	0	0	0	0	0
S02 =	32.55	17.93	25.64	27.40	24.40
S03 =	80.46	44.34	63.38	67.73	60.32
S04 =	66.90	36.86	52.70	56.32	50.15
S05 =	73.23	40.35	57.68	61.64	54.90

Maximum shear on the Floor Beam ends:

	DL (Kips)	SDL (Kips)	HS20 (Kips	2F1 (Kips)	3F1 (Kips)	4F1 (Kips)	5C1 (Kips)
North End =	10.61	47.58	93.97	51.78	74.02	79.11	70.45
South End =	10.61	48.29	159.16	87.70	125.37	133.98	119.32

Shear Capacity:

LFD

Web Depth (D) =	33.36	in.	Web thick.(t_w) =	0.885	in.
Losses =	0.625	$in.^2$			
Dt_w - Losses =	28.90	$in.^2$			
V_p =	553.12	Kips			
K =	5				
D/t_w =	37.69	<	73.85	OK	
C =	1				
V_u =	**553.12**	Kips			

ASD

Inv. Capacity =	**11**	Ksi
Oper. Capacity =	**15**	Ksi

Shear Ratings

	HS20 TRUCK		2F1		3F1		4F1		5C1	
	Inventory	Operating	Inventory	Operating	Inventory	Operating	Inventory	Operating	Inventory	Operating
LFD =	**1.38**	**2.30**		**4.18**		**2.92**		**2.74**		**3.07**
ASD =	**1.63**	**2.35**		**4.27**		**2.99**		**2.80**		**3.14**

TranSystems

Made By SSM Date ####### Job No. P402080073
Checked By MSL Date 8/11/2009 Sheet No. 3

Calculations For: ***HAM-50-0376L Span 4, Floor Beam 3 (B03) Shear Rating (at Panel Point L2)***

Stringer Reactions: (refer to cell comment)

	DL (Kips)	SDL (Kips)	HS20 (Kips	2F1 (Kips)	3F1 (Kips)	4F1 (Kips)	5C1 (Kips)
S01 =	1.58	17.74	67.94	38.68	54.44	57.28	51.36
S02 =	1.58	14.34	75.6	43.04	60.58	63.76	57.16
S03 =	1.58	16.02	75.6	43.04	60.58	63.76	57.16
S04 =	1.58	16.02	75.6	43.04	60.58	63.76	57.16
S05 =	1.58	17.74	67.94	38.68	54.44	57.28	51.36

Distribution Factors:

Int. Stringers =	1.2727
Ext. Stringers =	1.143

	HS20	2F1	3F1	4F1	5C1		
LL+I per lane =	11.88	6.76	9.52	10.02	8.98	K/ft	(10' lane)

Position these lanes on the bridge such as to maximize reaction on Ext. Stringer S05

Stringer Reactions (LL+I):

	HS20 (Kips)	2F1 (Kips)	3F1 (Kips)	4F1 (Kips)	5C1 (Kips)
S01 =	0	0	0	0	0
S02 =	30.55	17.39	24.48	25.76	23.10
S03 =	75.52	43.00	60.52	63.70	57.10
S04 =	62.80	35.75	50.32	52.96	47.48
S05 =	68.74	39.13	55.08	57.97	51.97

Maximum shear on the Floor Beam ends:

	DL (Kips)	SDL (Kips)	HS20 (Kips	2F1 (Kips)	3F1 (Kips)	4F1 (Kips)	5C1 (Kips)
North End =	9.51	40.63	88.21	50.22	70.69	74.40	66.69
South End =	9.51	41.23	149.40	85.05	119.72	126.00	112.96

Shear Capacity:

LFD

Web Depth (D) =	33.36	in.	Web thick.(t_w) =	0.84	in.
Losses =	0	$in.^2$			
Dt_w - Losses =	28.02	$in.^2$			
V_p =	536.35	Kips			
K =	5				
D/t_w =	39.71	<	73.85	OK	
C =	1				
V_u =	**536.35**	Kips			

ASD

Inv. Capacity =	**11**	Ksi
Oper. Capacity =	**15**	Ksi

Shear Ratings

	HS20 TRUCK		2F1		3F1		4F1		5C1	
	Inventory	Operating	Inventory	Operating	Inventory	Operating	Inventory	Operating	Inventory	Operating
LFD =	**1.45**	**2.42**		**4.25**		**3.02**		**2.87**		**3.20**
ASD =	**1.72**	**2.47**		**4.35**		**3.09**		**2.93**		**3.27**

TranSystems

Made By SSM Date ####### Job No. P402080073
Checked By MSL Date 8/11/2009 Sheet No. 3

Calculations For: ***HAM-50-0376L Span 4, Floor Beam 3 (B03) Shear Rating (at Panel Point L2)***

Stringer Reactions: (refer to cell comment)

	DL (Kips)	SDL (Kips)	HS20 (Kips	2F1 (Kips)	3F1 (Kips)	4F1 (Kips)	5C1 (Kips)
S01 =	1.58	17.74	67.94	38.68	54.44	57.28	51.36
S02 =	1.58	14.34	75.6	43.04	60.58	63.76	57.16
S03 =	1.58	16.02	75.6	43.04	60.58	63.76	57.16
S04 =	1.58	16.02	75.6	43.04	60.58	63.76	57.16
S05 =	1.58	17.74	67.94	38.68	54.44	57.28	51.36

Distribution Factors:

Int. Stringers =	1.2727
Ext. Stringers =	1.143

	HS20	2F1	3F1	4F1	5C1		
LL+I per lane =	11.88	6.76	9.52	10.02	8.98	K/ft	(10' lane)

Position these lanes on the bridge such as to maximize reaction on Ext. Stringer S05

Stringer Reactions (LL+I):

	HS20 (Kips)	2F1 (Kips)	3F1 (Kips)	4F1 (Kips)	5C1 (Kips)
S01 =	0	0	0	0	0
S02 =	30.55	17.39	24.48	25.76	23.10
S03 =	75.52	43.00	60.52	63.70	57.10
S04 =	62.80	35.75	50.32	52.96	47.48
S05 =	68.74	39.13	55.08	57.97	51.97

Maximum shear on the Floor Beam ends:

	DL (Kips)	SDL (Kips)	HS20 (Kips	2F1 (Kips)	3F1 (Kips)	4F1 (Kips)	5C1 (Kips)
North End =	9.51	40.63	88.21	50.22	70.69	74.40	66.69
South End =	9.51	41.23	149.40	85.05	119.72	126.00	112.96

Shear Capacity:

LFD

Web Depth (D) =	33.36	in.	Web thick.(t_w) =	0.84	in.
Losses =	2.75	$in.^2$			
Dt_w - Losses =	25.27	$in.^2$			
V_p =	483.71	Kips			
K =	5				
D/t_w =	39.71	<	73.85	OK	
C =	1				
V_u =	**483.71**	Kips			

ASD

Inv. Capacity =	**11**	Ksi
Oper. Capacity =	**15**	Ksi

Shear Ratings

	HS20 TRUCK		2F1		3F1		4F1		5C1	
	Inventory	Operating	Inventory	Operating	Inventory	Operating	Inventory	Operating	Inventory	Operating
LFD =	**1.29**	**2.15**		**3.78**		**2.68**		**2.55**		**2.84**
ASD =	**1.52**	**2.20**		**3.86**		**2.74**		**2.61**		**2.91**