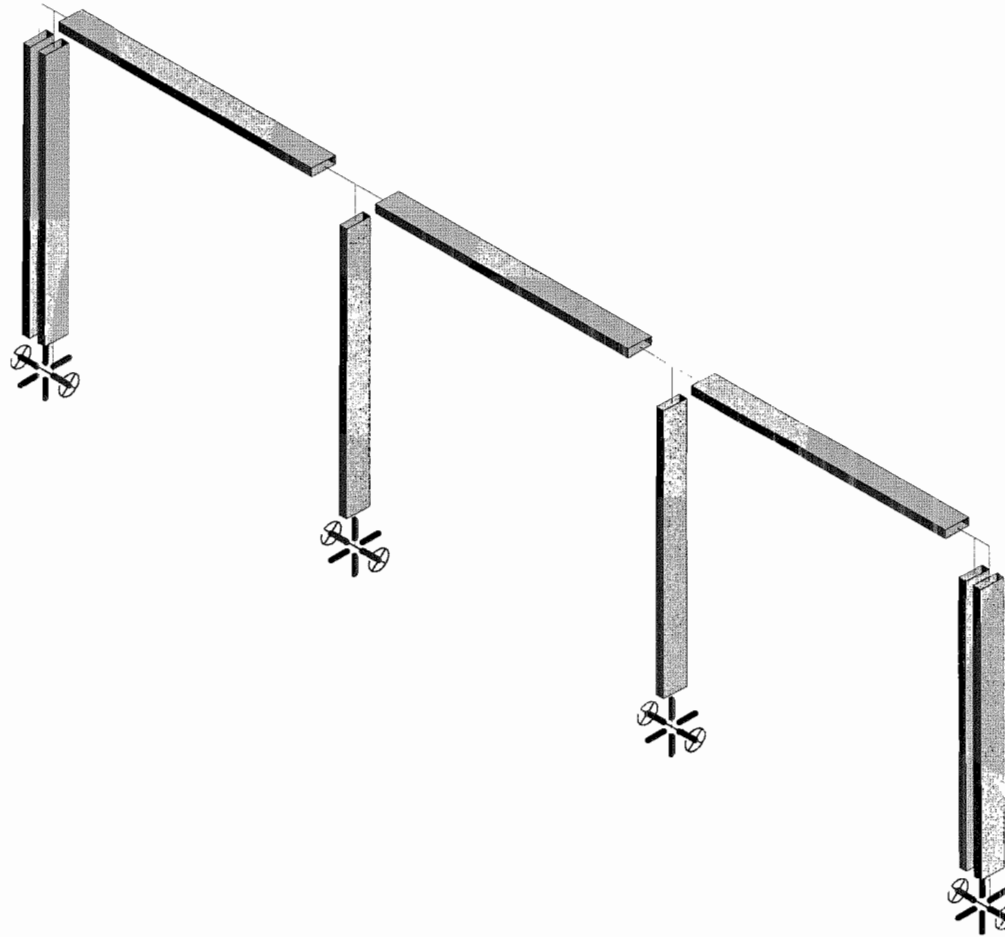
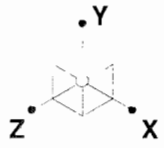


**D4b—3" x 1" RECT. TUBE x 42-1/2" HIGH RAIL WITHOUT BOTTOM RAIL**

Building Code:	<b>2006 International Building Code 2007 California Building Code AISC Steel Construction Manual, 13th ed—ASD</b>
Material:	<b>Carbon Steel, A500, Grade B, Fy = 42 ksi Stainless Steel, A554, Grade MT-304 or MT-316, Fy = 30 ksi</b>
Height:	<b>42.5"</b>
Anchor Post:	<b>Carbon Steel: Double HSS 3x1x3/16 Tube Stainless Steel: Double 3"x1" Flat Bar</b>
Intermediate Posts:	<b>Carbon Steel: HSS 3x1x1/8 Tube Stainless Steel: 3"x1"x0.120" Tube</b>
Top Rail:	<b>Carbon Steel: HSS 3x1x1/8 Tube Stainless Steel: 3"x1"x0.120" Tube</b>
Bottom Rail:	<b>None</b>
Number of Cables:	<b>12</b>
Cable Spacing:	<b>3.19"</b>



**Disclaimer:** Analysis and Structural Certification DOES NOT include base plates or anchorage to supporting structure. Where required by the Local Building Official, these shall be reviewed and designed by the project Structural Engineer of Record.



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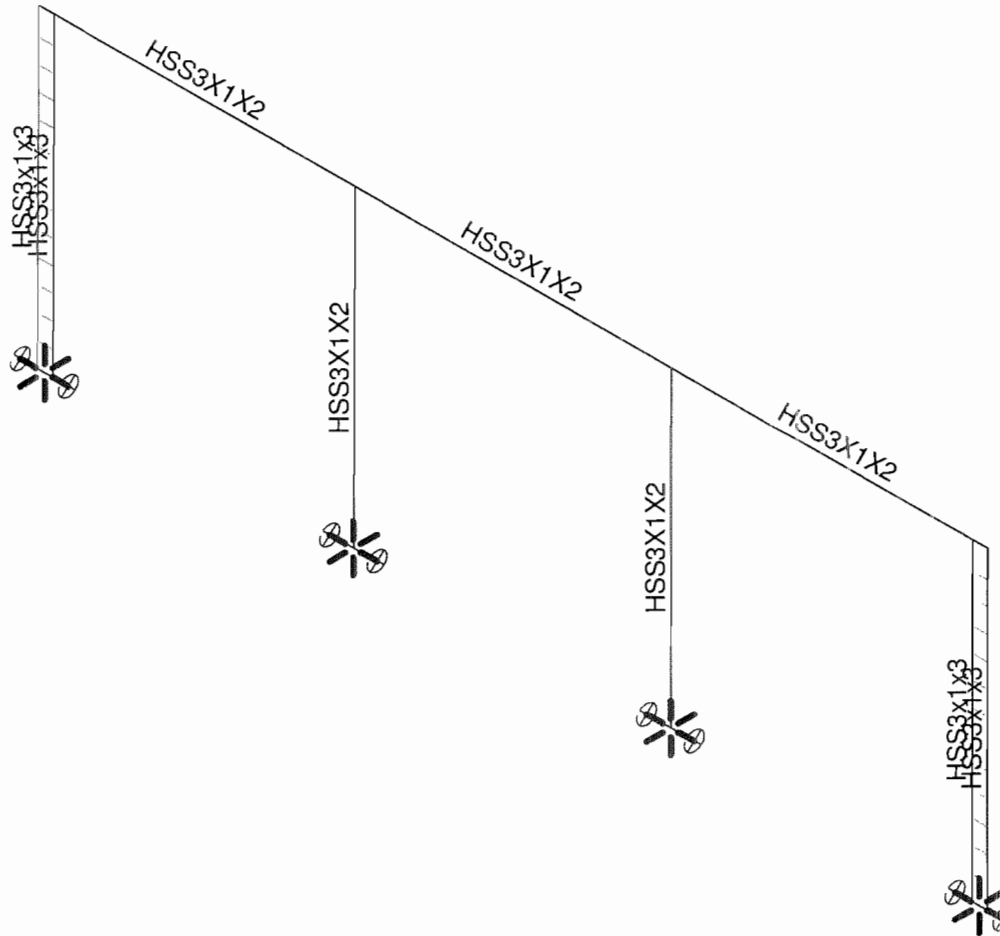
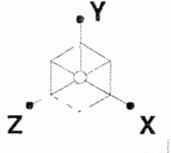
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D4b - 3" x 1" RECT TUBE x 42-1/2" HIGH RAIL W/O BOTTOM RAIL

Nov 4, 2008 at 9:37 AM

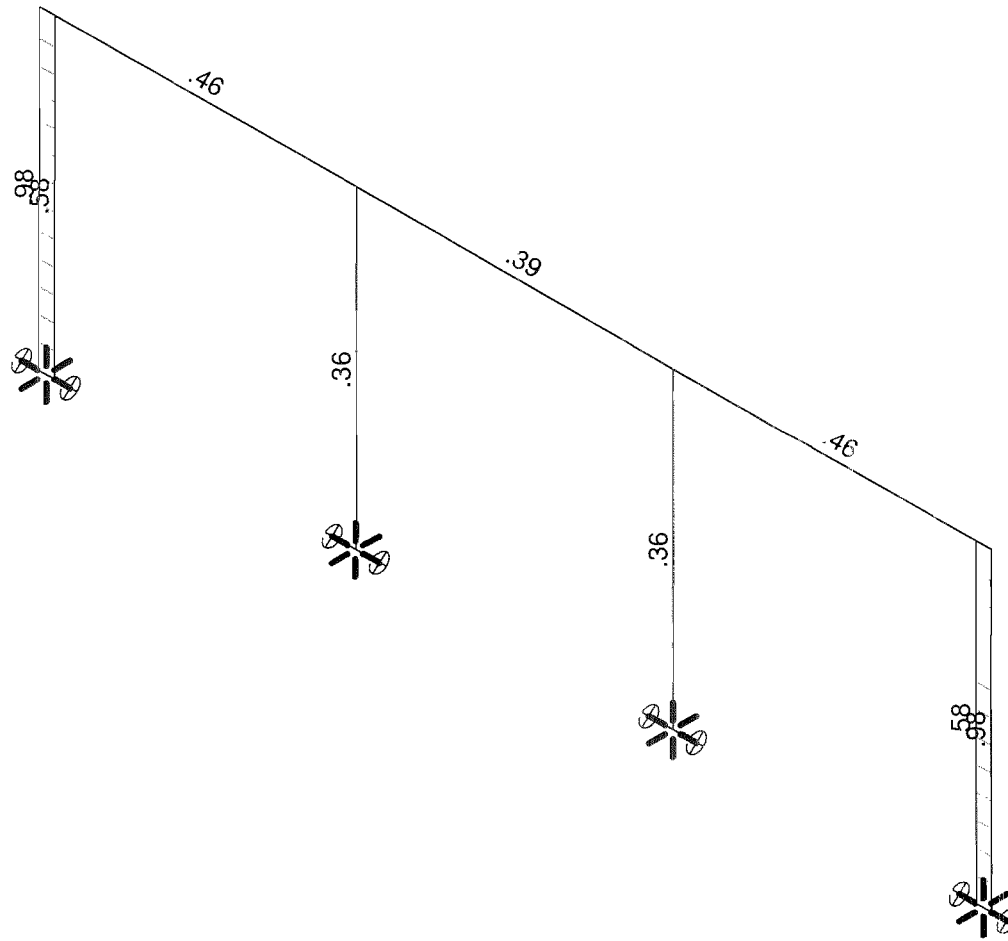
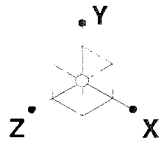
D4b-3x1.R3D



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Dan O'Connor  
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D4b - 3" x 1" RECT TUBE x 42-1/2" HIGH RAIL W/O BOTTOM RAIL

Nov 4, 2008 at 9:38 AM  
D4b-3x1.R3D



Member Code Checks Displayed  
Solution: Envelope

Ferrari Shields & Associates

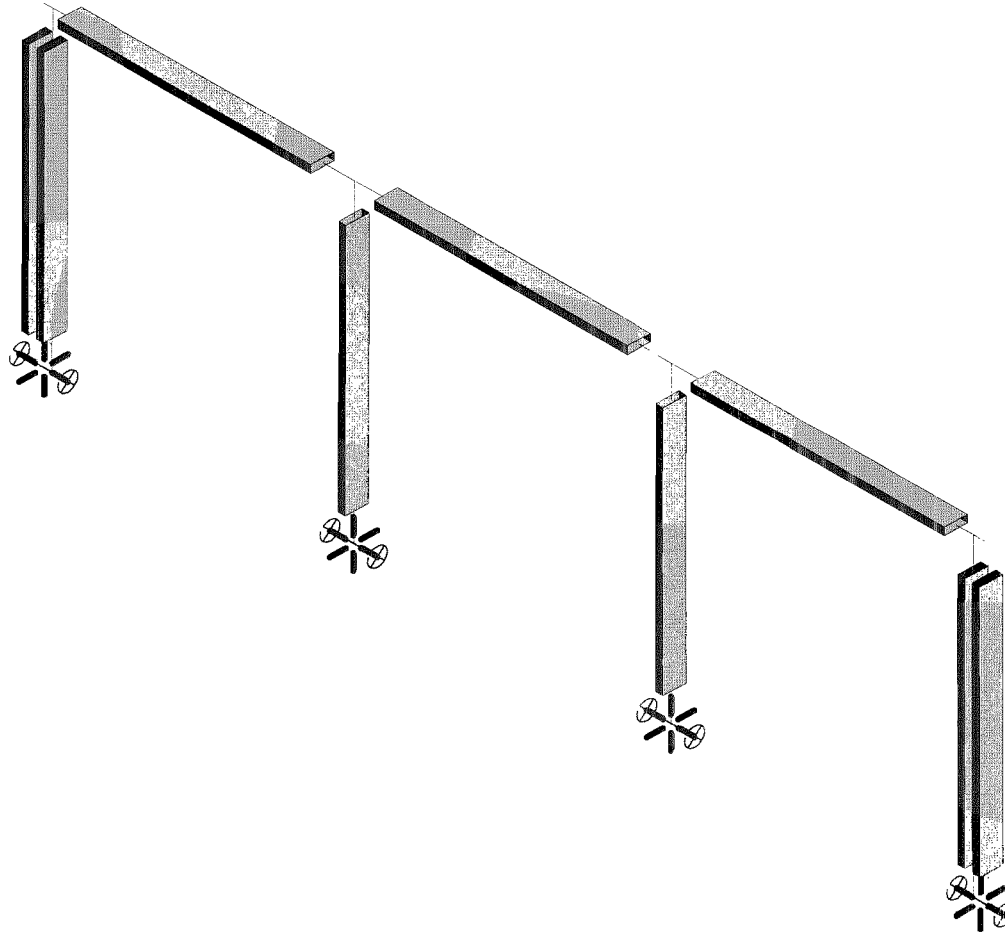
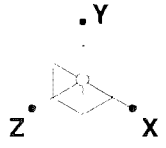
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D4b - 3" x 1" RECT TUBE x 42-1/2" HIGH RAIL W/O BOTTOM RAIL

Nov 4, 2008 at 9:38 AM

D4b-3x1.R3D

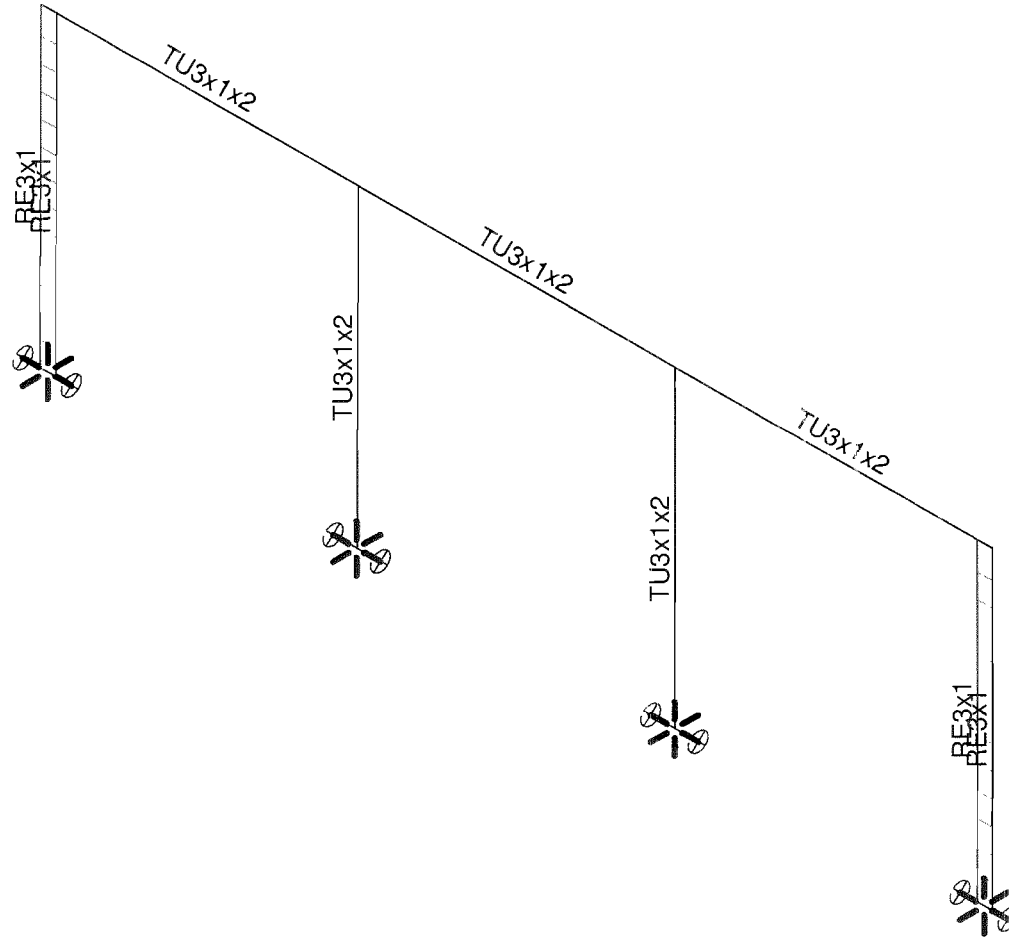
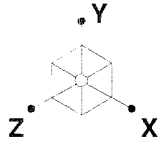


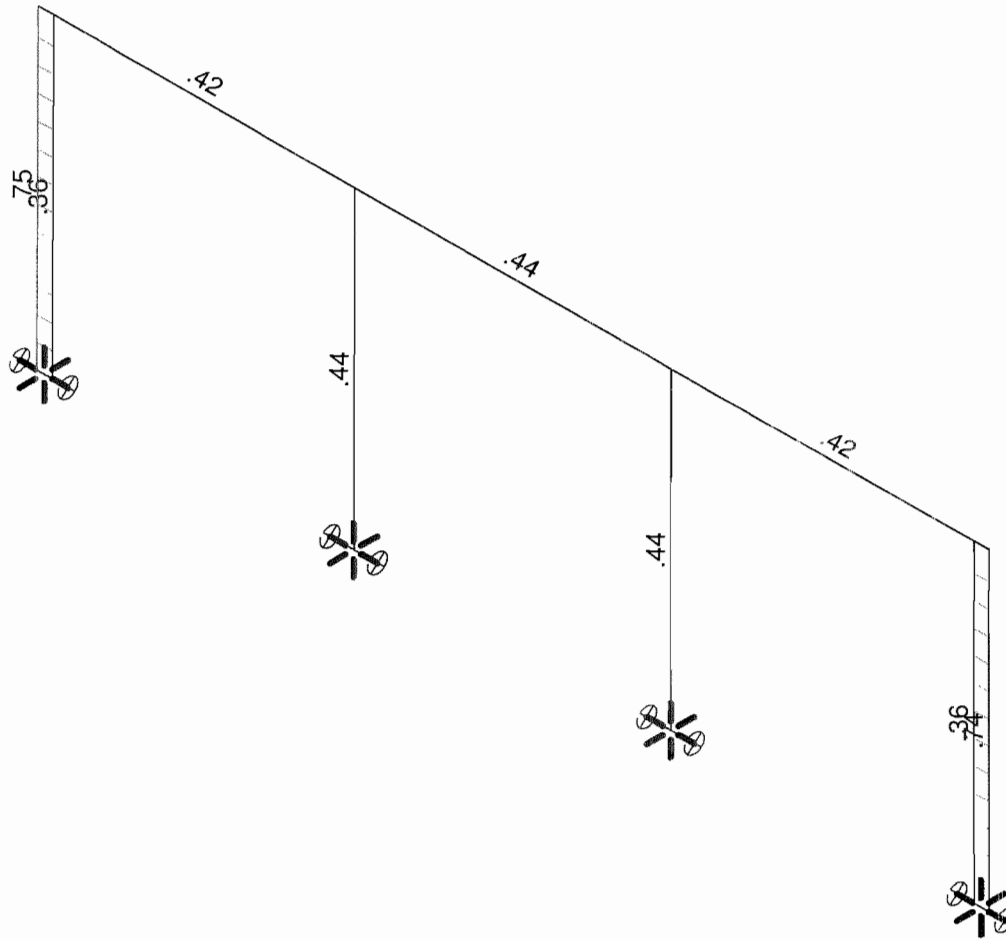
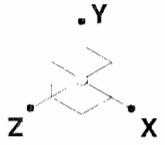
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D4b (SS) - 3" x 1" RECT TUBE x 42-1/2" HIGH RAIL W/O BOTTOM RAIL

Nov 4, 2008 at 9:56 AM

D4b-3x1-ss.R3D





Member Code Checks Displayed  
Solution: Envelope

Ferrari Shields & Associates

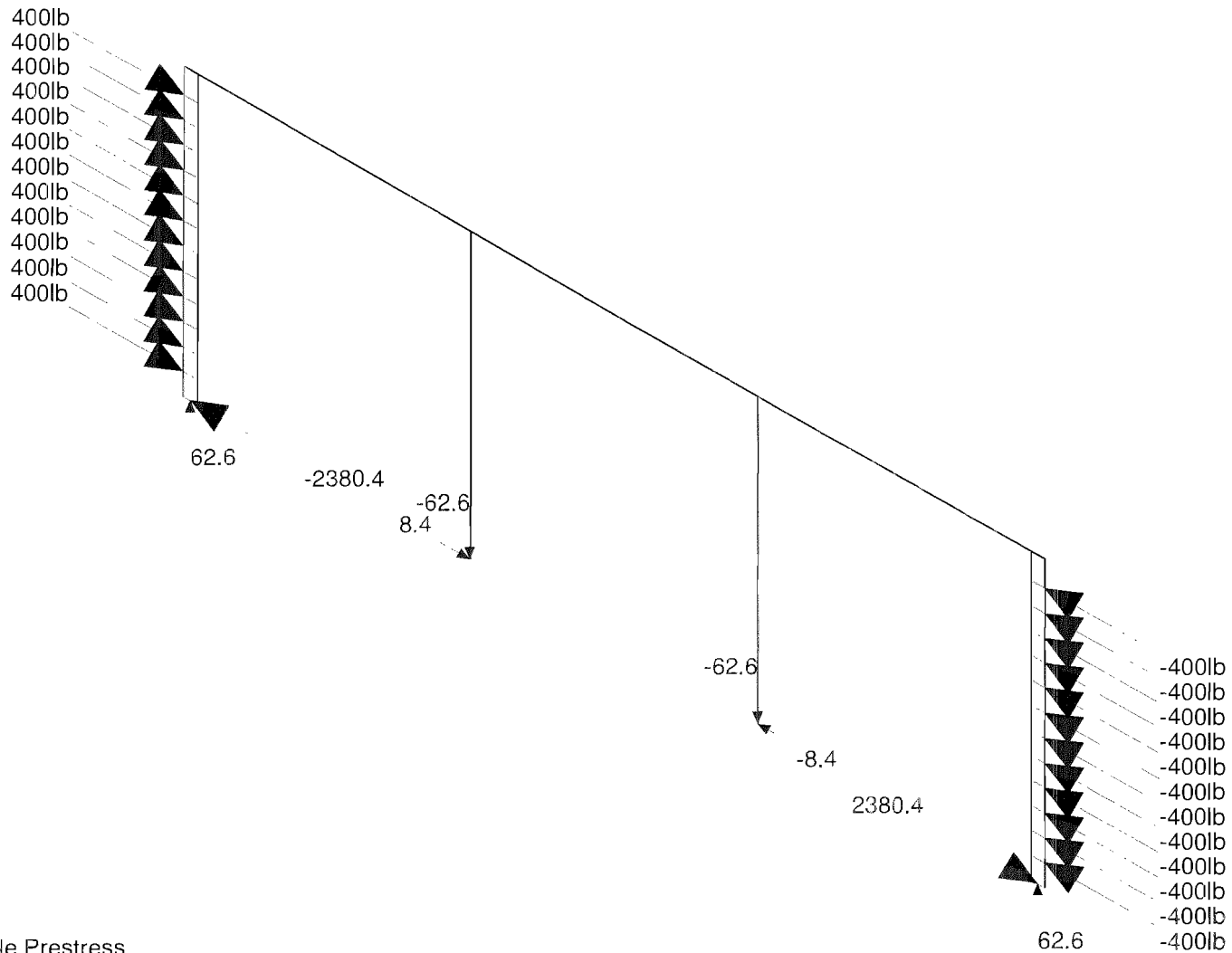
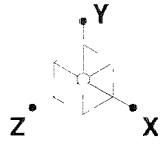
D4b (SS) - 3" x 1" RECT TUBE x 42-1/2" HIGH RAIL W/O BOTTOM RAIL

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Nov 4, 2008 at 9:57 AM

D4b-3x1-ss.R3D



Loads: LC 1, Cable Prestress  
 Results for LC 1, Cable Prestress  
 Reaction units are lb and k-ft

Ferrari Shields & Associates

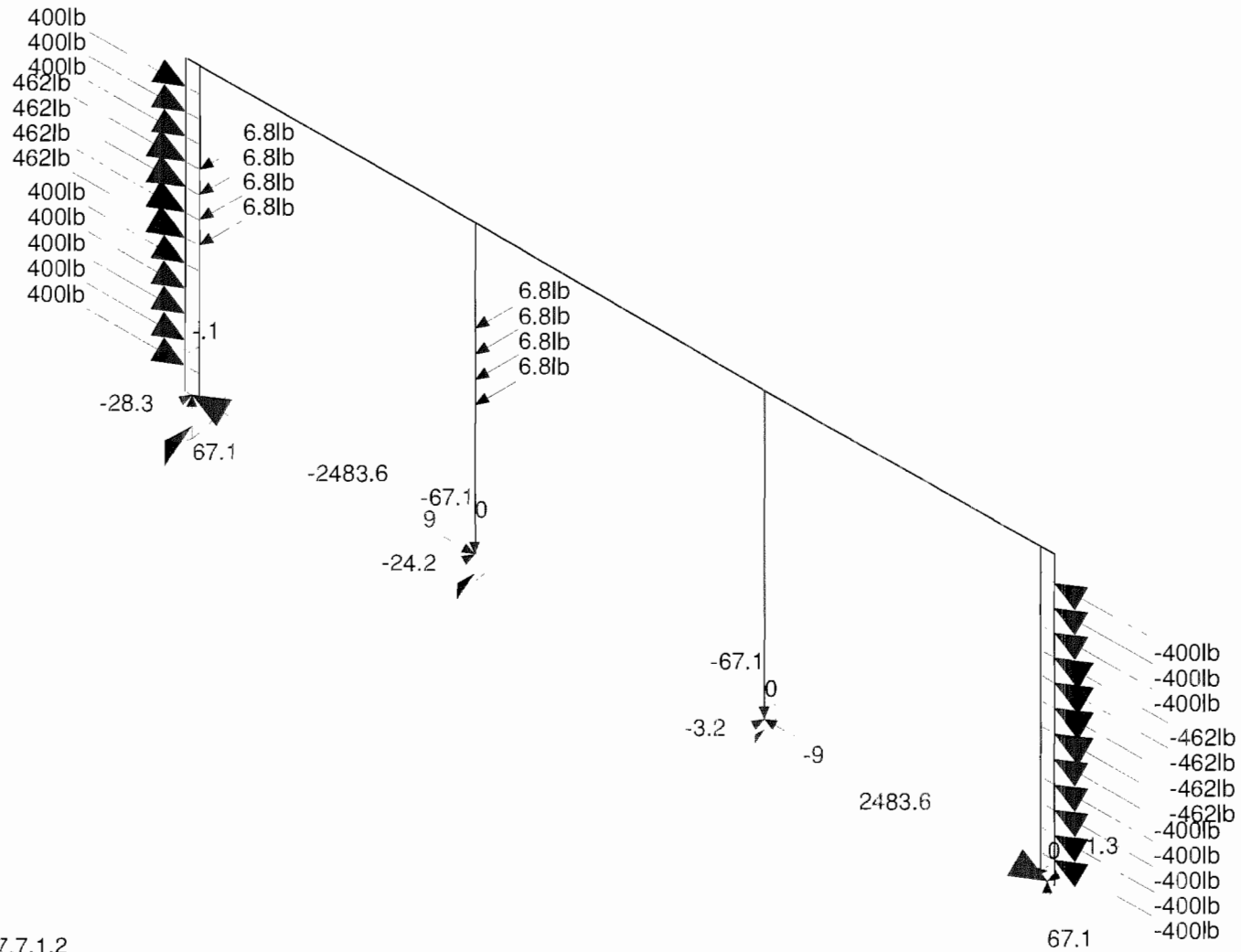
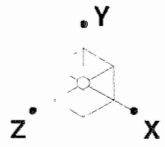
D4b - 3" x 1" RECT TUBE x 42-1/2" HIGH RAIL W/O BOTTOM RAIL

Dan O'Connor

Nov 4, 2008 at 9:39 AM

08196

D4b-3x1.R3D



Loads: LC 2, 1607.7.1.2  
 Results for LC 2, 1607.7.1.2  
 Reaction units are lb and k-ft

Ferrari Shields & Associates

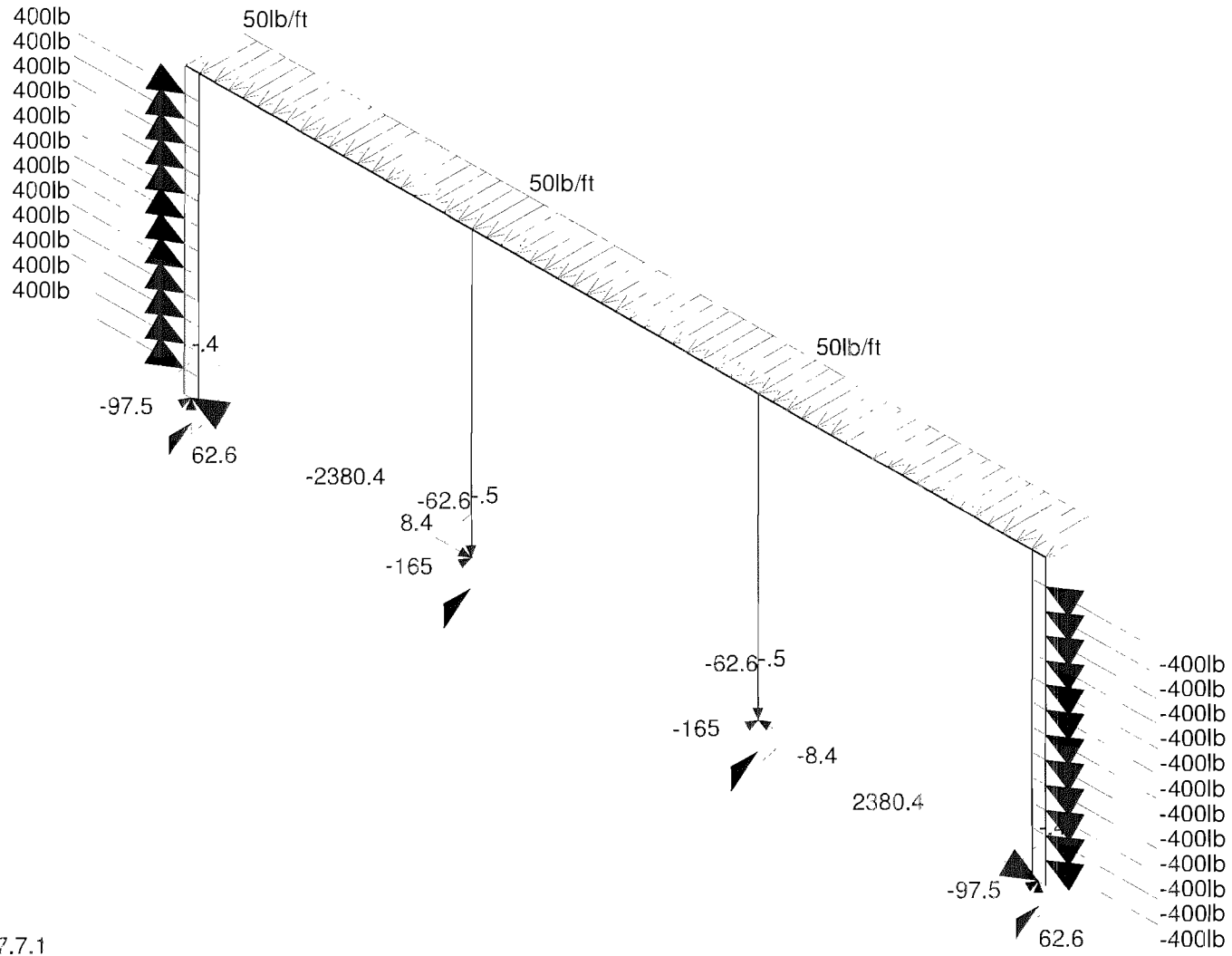
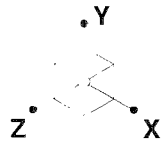
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D4b - 3" x 1" RECT TUBE x 42-1/2" HIGH RAIL W/O BOTTOM RAIL

Nov 4, 2008 at 9:39 AM

D4b-3x1.R3D



Loads: LC 3, 1607.7.1  
 Results for LC 3, 1607.7.1  
 Reaction units are lb and k-ft

Ferrari Shields & Associates

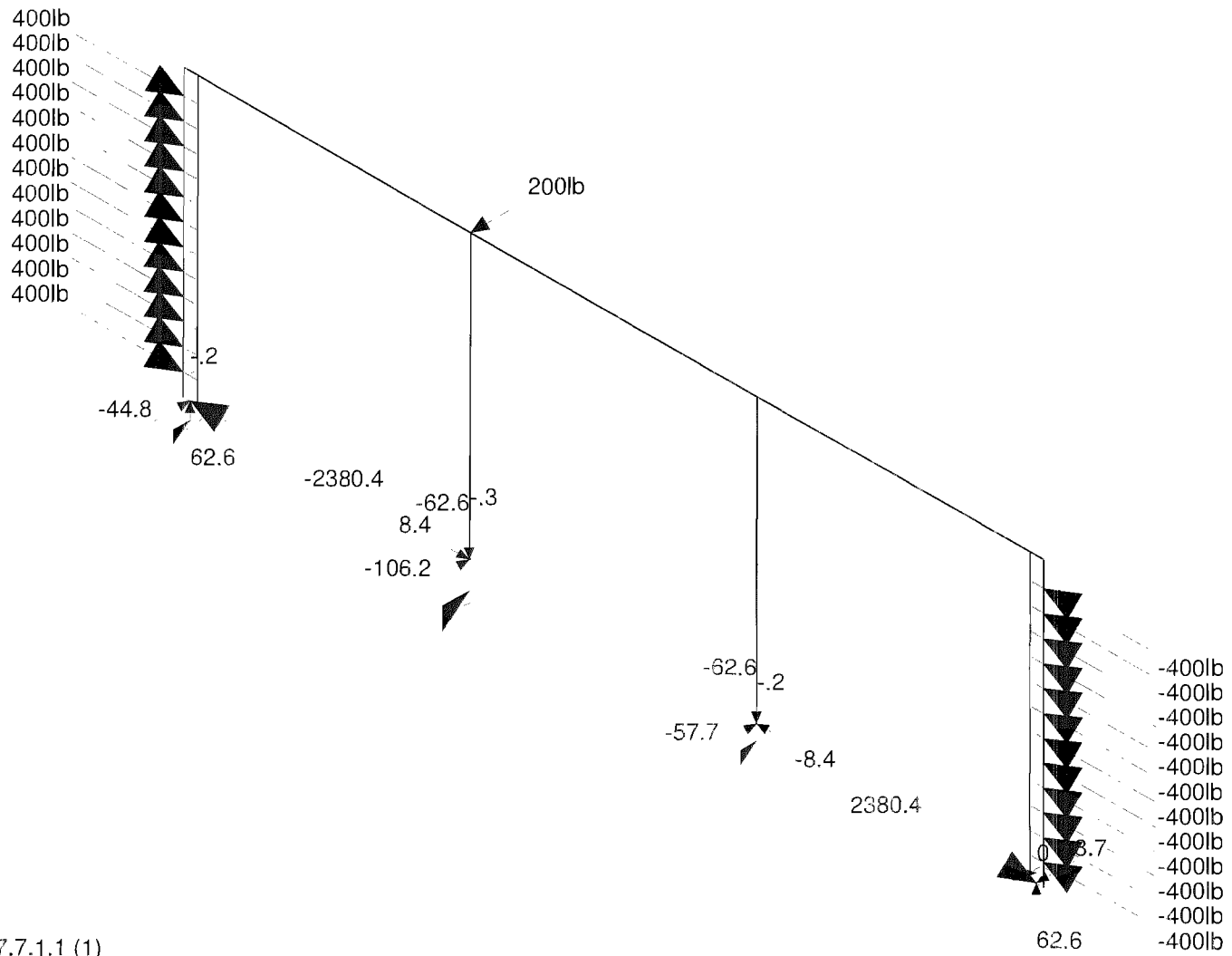
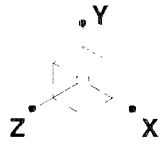
Dan O'Connor

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D4b - 3" x 1" RECT TUBE x 42-1/2" HIGH RAIL W/O BOTTOM RAIL

Nov 4, 2008 at 9:40 AM

D4b-3x1.R3D



Loads: LC 4, 1607.7.1.1 (1)  
Results for LC 4, 1607.7.1.1 (1)  
Reaction units are lb and k-ft

Ferrari Shields & Associates

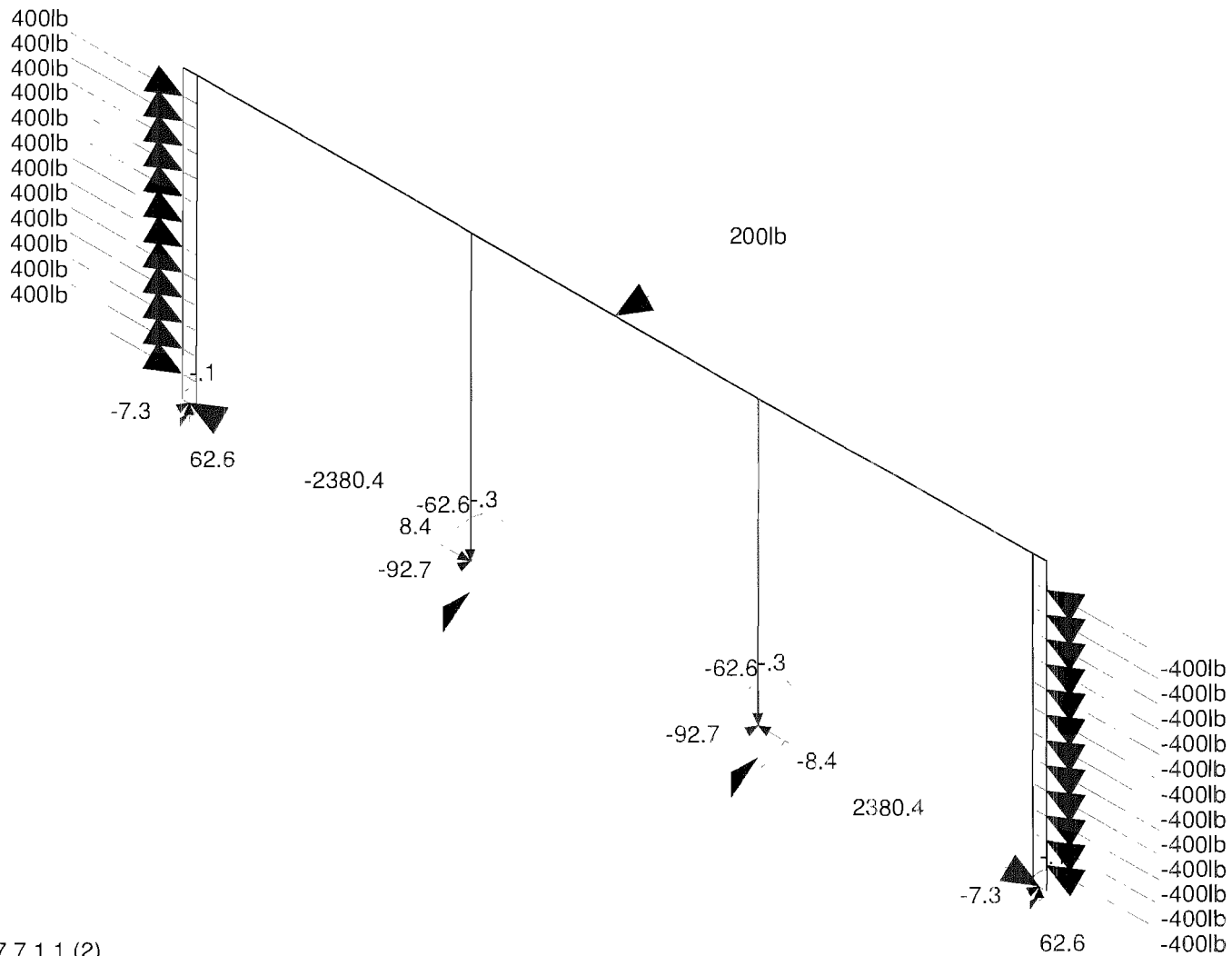
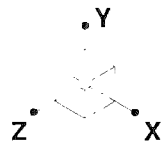
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D4b - 3" x 1" RECT TUBE x 42-1/2" HIGH RAIL W/O BOTTOM RAIL

Nov 4, 2008 at 9:40 AM

D4b-3x1.R3D



Loads: LC 5, 1607.7.1.1 (2)  
 Results for LC 5, 1607.7.1.1 (2)  
 Reaction units are lb and k-ft

Ferrari Shields & Associates

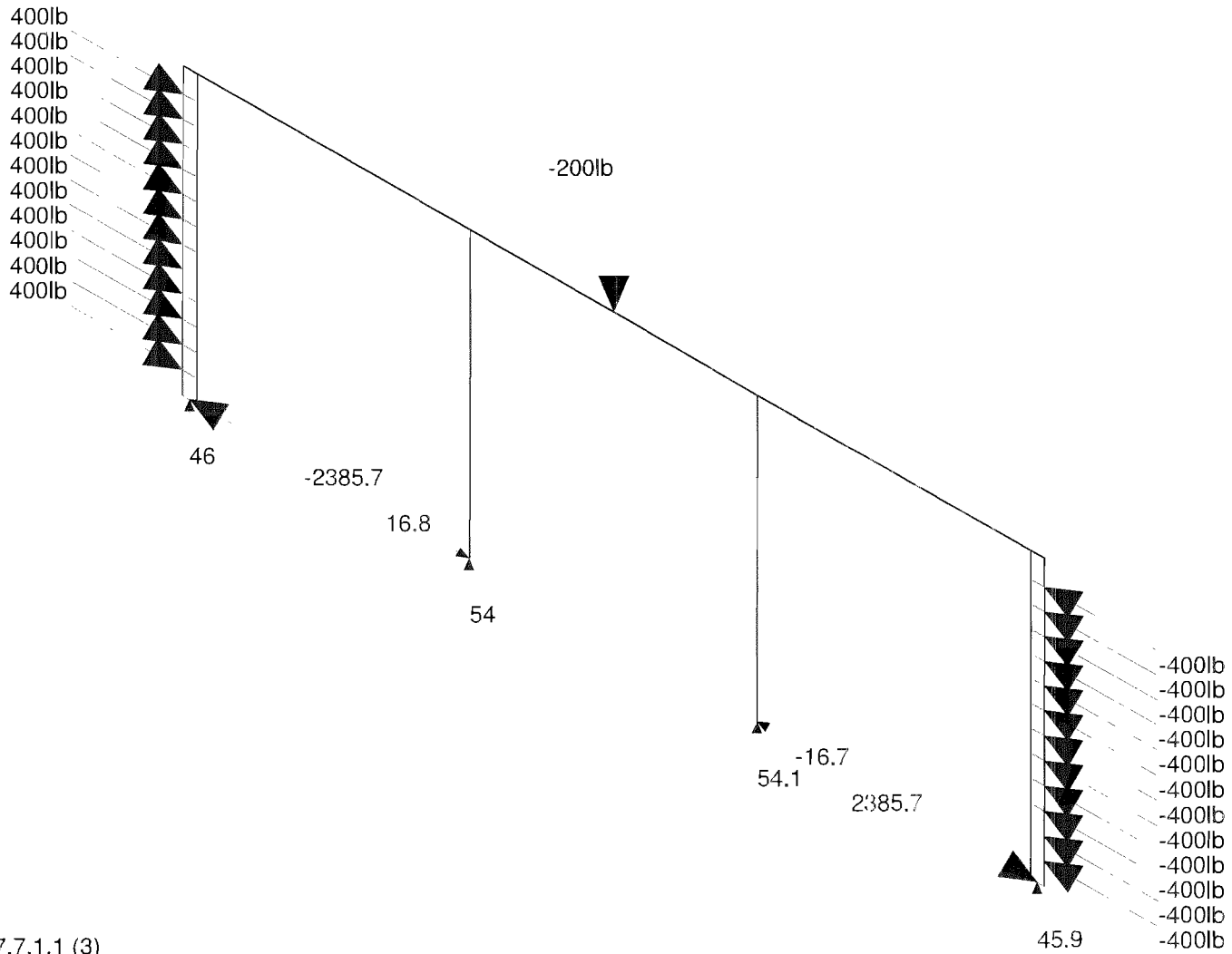
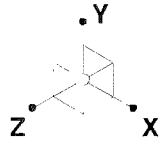
Dan O'Connor

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D4b - 3" x 1" RECT TUBE x 42-1/2" HIGH RAIL W/O BOTTOM RAIL

Nov 4, 2008 at 9:40 AM

D4b-3x1.R3D



Loads: LC 6, 1607.7.1.1 (3)  
 Results for LC 6, 1607.7.1.1 (3)  
 Reaction units are lb and k-ft

Ferrari Shields & Associates

Dan O'Connor

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D4b - 3" x 1" RECT TUBE x 42-1/2" HIGH RAIL W/O BOTTOM RAIL

Nov 4, 2008 at 9:41 AM

D4b-3x1.R3D

**Global**

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation	Yes
Include Warping	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Vertical Axis	Y

Hot Rolled Steel Code	AISC : ASD 13th
Cold Formed Steel Code	AISI 01: ASD
Wood Code	NDS 2005: ASD
Wood Temperature	< 100F
Concrete Code	ACI 2005

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	PCA Load Contour
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections	Yes
Bad Framing Warnings	No
Unused Force Warnings	Yes

**Hot Rolled Steel Properties**

	Label	E [ksi]	G [ksi]	Nu	Therm (1E5 F)	Density[k/ft^3]	Yield[ksi]
1	A500Gr42	29000	11154	.3	.65	.49	42
2	SS316	28000	11154	.3	.65	.49	30

**Hot Rolled Steel Section Sets**

	Label	Shape	Type	Design List	Material	Design Rules	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	RAIL	HSS3X1X2	Beam	Tube	A500Gr42	Typical	.841	.138	.818	.409
2	EPOST	HSS3x1x3	Column	Tube	A500Gr42	Typical	1.271	.189	1.237	.519
3	IPOST	HSS3X1X2	Column	Tube	A500Gr42	Typical	.841	.138	.818	.409

**General Material Properties**

	Label	E [ksi]	G [ksi]	Nu	Therm (1E5 F)	Density[k/ft^3]
1	GEN_RIGID	1e+6		.3	.65	0

**General Section Sets**

	Label	Shape	Type	Material	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	LiNK		Beam	GEN_RIGID	.25	.005	.005	.01

**Basic Load Cases**

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area (Mem...	Surface (Pl...
1	Cable Prestress	None				24				
2	1607.7.1.2	None				16				
3	1607.7.1	None						3		
4	1607.7.1.1 (1)	None				1				
5	1607.7.1.1 (2)	None					1			
6	1607.7.1.1 (3)	None					1			

**Load Combinations**

	Description	Solve PDelta	SR...	BLC Factor	BLC Factor	BLC Factor	BLC Factor	BLC Factor	BLC Factor	BLC Factor	BLC Factor
1	Cable Prestress	Yes	C	1	1						
2	1607.7.1.2	Yes	C	1	1	2	1				
3	1607.7.1	Yes	C	1	1	3	1				
4	1607.7.1.1 (1)	Yes	C	1	1	4	1				
5	1607.7.1.1 (2)	Yes	C	1	1	5	1				
6	1607.7.1.1 (3)	Yes	C	1	1	6	1				

**Member Primary Data**

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N1	N2		90	EPOST	Column	Tube	A500Gr42	Typical
2	M2	N3	N4		90	IPOST	Column	Tube	A500Gr42	Typical
3	M3	N2	N4		90	RAIL	Beam	Tube	A500Gr42	Typical
4	M4	N4	N8		90	RAIL	Beam	Tube	A500Gr42	Typical
5	M5	N5	N6		90	EPOST	Column	Tube	A500Gr42	Typical
6	M6	N7	N8		90	IPOST	Column	Tube	A500Gr42	Typical
7	M7	N8	N6		90	RAIL	Beam	Tube	A500Gr42	Typical
8	M8	N9	N10		90	EPOST	Column	Tube	A500Gr42	Typical
9	M9	N11	N12		90	EPOST	Column	Tube	A500Gr42	Typical
10	M10	N13	N15			LINK	Beam	None	GEN_RIGID	Default
11	M11	N16	N14			LINK	Beam	None	GEN_RIGID	Default
12	M12	N1	N17			LINK	Beam	None	GEN_RIGID	Default
13	M13	N11	N18			LINK	Beam	None	GEN_RIGID	Default
14	M14	N17	N9			LINK	Beam	None	GEN_RIGID	Default
15	M15	N18	N5			LINK	Beam	None	GEN_RIGID	Default
16	M19	N23	N25			LINK	Beam	None	GEN_RIGID	Default
17	M20	N26	N24			LINK	Beam	None	GEN_RIGID	Default
18	M21	N27	N29			LINK	Beam	None	GEN_RIGID	Default
19	M22	N30	N28			LINK	Beam	None	GEN_RIGID	Default
20	M23	N31	N33			LINK	Beam	None	GEN_RIGID	Default
21	M24	N34	N32			LINK	Beam	None	GEN_RIGID	Default
22	M25	N35	N37			LINK	Beam	None	GEN_RIGID	Default
23	M26	N38	N36			LINK	Beam	None	GEN_RIGID	Default
24	M27	N39	N41			LINK	Beam	None	GEN_RIGID	Default
25	M28	N42	N40			LINK	Beam	None	GEN_RIGID	Default
26	M29	N43	N45			LINK	Beam	None	GEN_RIGID	Default
27	M30	N46	N44			LINK	Beam	None	GEN_RIGID	Default
28	M31	N47	N49			LINK	Beam	None	GEN_RIGID	Default
29	M32	N50	N48			LINK	Beam	None	GEN_RIGID	Default
30	M33	N51	N53			LINK	Beam	None	GEN_RIGID	Default
31	M34	N54	N52			LINK	Beam	None	GEN_RIGID	Default

**Member Primary Data (Continued)**

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
32	M35	N55	N57			LINK	Beam	None	GEN_RIGID	Default
33	M36	N58	N56			LINK	Beam	None	GEN_RIGID	Default
34	M34A	N59A	N61A			LINK	Beam	None	GEN_RIGID	Default
35	M35A	N62A	N60A			LINK	Beam	None	GEN_RIGID	Default
36	M36A	N63	N65			LINK	Beam	None	GEN_RIGID	Default
37	M37	N66	N64			LINK	Beam	None	GEN_RIGID	Default

**Envelope Joint Reactions**

Joint		X [lb]	lc	Y [lb]	lc	Z [lb]	lc	MX [k-ft]	lc	MY [k-ft]	lc	MZ [k-ft]	lc	
1	N3	max	16.759	6	53.984	6	0	1	0	1	0	1	0	1
		min	8.405	1	-67.079	2	-164.973	3	-.548	3	0	1	0	1
3	N7	max	-8.405	1	54.121	6	0	1	0	1	0	1	0	1
		min	-16.727	6	-67.079	2	-164.973	3	-.548	3	0	1	0	1
5	N17	max	-2380.438	4	67.079	2	0	1	0	1	0	1	0	1
		min	-2483.572	2	46.01	6	-97.527	3	-.447	3	0	1	0	1
7	N18	max	2483.572	2	67.079	2	8.736	4	.013	4	0	1	0	1
		min	2380.438	4	45.885	6	-97.527	3	-.447	3	0	1	0	1
9	Totals:	max	0	5	200	6	0	1						
		min	0	2	0	4	-525	3						

**Envelope Member Section Forces**

Member	Sec		Axial[lb]	lc	y Shear[lb]	lc	z Shear[lb]	lc	Torque[k-ft]	lc	y-y Moment[...]	lc	z-z Moment[...]	lc	
1	M1	1	max	1844.643	2	0	1	-1200.921	1	0	2	.151	2	0	1
			min	1760.292	6	-49.828	3	-1253.582	2	0	5	.144	1	-.224	3
		2	max	9467.985	2	0	1	-619.776	1	0	1	-.11	1	0	1
			min	8954.98	1	-61.64	3	-675.456	2	-.001	3	-.115	2	-.178	3
		3	max	12344.842	2	0	1	7.643	1	0	1	-.183	1	0	1
			min	11442.756	1	-70.812	3	-13.593	2	-.002	3	-.198	2	-.122	3
7	4	max	9509.207	2	0	1	712.251	2	0	1	-.078	4	0	1	
		min	8830.182	1	-69.871	3	633.189	6	-.002	3	-.082	2	-.063	3	
9	5	max	814.161	6	0	1	1153.225	2	0	5	.114	2	0	2	
		min	770.779	1	-69.173	3	1089.046	1	0	2	.107	6	-.004	3	
11	M2	1	max	53.984	6	0	1	16.84	6	0	1	0	1	0	1
			min	-67.079	2	-164.973	3	8.405	1	0	1	0	1	-.548	3
		2	max	53.984	6	0	1	16.84	6	0	1	.015	6	0	1
			min	-67.079	2	-164.973	3	8.405	1	0	1	-.007	1	-.404	3
		3	max	53.984	6	0	1	16.784	6	0	1	.029	6	0	1
			min	-67.079	2	-164.973	3	8.405	1	0	1	.015	1	-.259	3
4	max	53.984	6	3.019	2	16.632	6	0	1	.044	6	.003	2		
	min	-67.079	2	-164.973	3	8.405	1	0	1	.022	1	-.115	3		
19	5	max	53.984	6	3.019	2	16.632	6	0	1	.059	6	.032	4	
		min	-67.079	2	-164.973	3	8.405	1	0	1	.029	1	0	1	
21	M3	1	max	1144.832	2	0	1	-762.245	4	0	2	.114	2	0	2
			min	1081.624	4	-71.023	3	-805.481	6	-.004	3	.107	6	0	5
		2	max	2564.428	2	0	1	-46.498	6	0	2	.124	2	.067	3
			min	2414.266	6	-61.613	3	-67.602	2	-.029	3	.111	6	0	1
		3	max	2564.428	2	0	1	-46.498	6	0	2	.07	6	.102	3
			min	2414.266	6	-50.491	4	-67.602	2	-.029	3	.061	1	0	1
4	max	2564.428	2	25.887	3	-46.498	6	0	2	.029	6	.13	4		
	min	2414.266	6	-50.491	4	-67.602	2	-.029	3	.005	1	0	1		

**Envelope Member Section Forces (Continued)**

Member	Sec		Axial[lb]	lc	y Shear[lb]	lc	z Shear[lb]	lc	Torque[k-ft]	lc	y-y Moment[...]	lc	z-z Moment[...]	lc	
29		5	max	2564.428	2	69.637	3	-46.498	6	0	2	-.011	6	.174	4
30			min	2414.266	6	-50.491	4	-67.602	2	-.029	3	-.053	2	0	1
31	M4	1	max	2573.437	2	52.655	4	0	1	.012	4	.047	6	.174	4
32			min	2427.962	1	-100	5	-99.994	6	0	1	-.022	2	0	1
33		2	max	2573.437	2	52.655	4	0	1	.012	4	-.02	1	.138	5
34			min	2427.962	1	-100	5	-99.994	6	0	1	-.04	6	0	1
35		3	max	2573.437	2	100	5	100.006	6	.012	4	-.02	1	.226	5
36			min	2427.962	1	0	1	0	1	0	1	-.128	6	0	1
37		4	max	2573.437	2	100	5	100.006	6	.012	4	-.02	1	.138	5
38			min	2427.962	1	0	1	0	1	0	1	-.04	6	0	2
39		5	max	2573.437	2	100	5	100.006	6	.012	4	.047	6	.056	3
40			min	2427.962	1	0	1	0	1	0	1	-.022	2	-.01	4
41	M5	1	max	1844.643	2	4.2	4	1253.582	2	0	4	-.144	1	.006	4
42			min	1760.237	6	-49.828	3	1200.921	1	0	3	-.151	2	-.224	3
43		2	max	9467.985	2	4.282	4	675.456	2	.001	3	.115	2	.003	4
44			min	8954.98	1	-61.64	3	619.776	1	0	1	.11	1	-.178	3
45		3	max	12344.842	2	4.155	4	13.593	2	.002	3	.198	2	0	2
46			min	11442.756	1	-70.812	3	-7.643	1	0	1	.183	1	-.122	3
47		4	max	9509.207	2	3.416	4	-633.141	6	.002	3	.082	2	0	2
48			min	8830.182	1	-69.871	3	-712.251	2	0	1	.078	4	-.063	3
49		5	max	814.948	6	0	1	-1089.046	1	0	1	-.107	6	0	1
50			min	770.779	1	-69.173	3	-1153.225	2	0	5	-.114	2	-.004	3
51	M6	1	max	54.121	6	0	1	-8.405	1	0	1	0	1	0	1
52			min	-67.079	2	-164.973	3	-16.722	6	0	1	0	1	-.548	3
53		2	max	54.121	6	0	1	-8.405	1	0	1	-.007	1	0	1
54			min	-67.079	2	-164.973	3	-16.722	6	0	1	-.015	6	-.404	3
55		3	max	54.121	6	0	1	-8.405	1	0	1	-.015	1	0	1
56			min	-67.079	2	-164.973	3	-16.722	6	0	1	-.029	6	-.259	3
57		4	max	54.121	6	0	1	-8.405	1	0	1	-.022	1	0	1
58			min	-67.079	2	-164.973	3	-16.722	6	0	1	-.044	6	-.115	3
59		5	max	54.121	6	0	1	-8.405	1	0	1	-.029	1	.029	3
60			min	-67.079	2	-164.973	3	-16.722	6	0	1	-.059	6	0	1
61	M7	1	max	2564.428	2	14.384	5	67.602	2	.029	3	-.011	6	.056	3
62			min	2414.298	6	-69.637	3	46.373	6	0	1	-.053	2	-.01	4
63		2	max	2564.428	2	14.384	5	67.602	2	.029	3	.029	6	.098	3
64			min	2414.298	6	-25.887	3	46.373	6	0	1	.005	1	-.007	4
65		3	max	2564.428	2	17.863	3	67.602	2	.029	3	.07	6	.102	3
66			min	2414.298	6	-3.219	4	46.373	6	0	1	.061	1	-.004	4
67		4	max	2564.428	2	61.613	3	67.602	2	.029	3	.124	2	.067	3
68			min	2414.298	6	-3.219	4	46.373	6	0	1	.111	6	-.001	4
69		5	max	1144.832	2	71.023	3	806.281	6	.004	3	.114	2	0	1
70			min	1081.624	4	0	1	762.245	4	0	1	.107	6	0	5
71	M8	1	max	-1702.037	1	0	1	-1197.356	1	0	1	.15	2	0	1
72			min	-1777.564	2	-50.013	3	-1249.834	2	0	3	.144	1	-.223	3
73		2	max	-8892.346	1	0	1	-619.762	1	0	1	-.11	1	0	1
74			min	-9400.906	2	-56.65	3	-675.441	2	-.001	3	-.115	2	-.176	3
75		3	max	-11380.123	1	0	1	7.643	1	0	1	-.183	1	0	1
76			min	-12277.762	2	-62.019	3	-13.611	2	-.002	3	-.198	2	-.122	3
77		4	max	-8767.549	1	.698	2	712.127	2	0	1	-.078	4	0	1
78			min	-9442.128	2	-59.272	3	633.172	6	-.002	3	-.082	2	-.065	3
79		5	max	-708.144	4	14.296	5	1419.596	2	0	5	.192	2	0	1
80			min	-768.151	6	-31.287	3	1324.021	6	-.001	2	.172	6	-.025	3
81	M9	1	max	-1702.037	1	4.604	4	1249.834	2	0	3	-.144	1	.007	4

**Envelope Member Section Forces (Continued)**

Member	Sec	Axial[lb]	lc	y Shear[lb]	lc	z Shear[lb]	lc	Torque[k-ft]	lc	y-y Moment[...]	lc	z-z Moment[...]	lc	
82		min	-1777.564	2	-50.013	3	1197.356	1	0	2	-.15	2	-.223	3
83	2	max	-8892.346	1	4.987	4	675.441	2	.001	3	.115	2	.003	4
84		min	-9400.906	2	-56.65	3	619.762	1	0	1	.11	1	-.176	3
85	3	max	-11380.123	1	5.287	4	13.611	2	.002	3	.198	2	0	2
86		min	-12277.762	2	-62.019	3	-7.643	1	0	1	.183	1	-.122	3
87	4	max	-8767.549	1	5.716	4	-633.124	6	.002	3	.082	2	0	1
88		min	-9442.128	2	-59.272	3	-712.127	2	0	1	.078	4	-.065	3
89	5	max	-708.144	4	19.143	4	-1323.839	6	0	1	-.171	6	0	1
90		min	-769.063	6	-31.287	3	-1419.596	2	0	4	-.192	2	-.025	3

**Envelope AISC 13th ASD Steel Code Checks**

Member	Shape	Code Check	Loc[in]	lc	Shear ...	Loc[in]	Dir	lc	Pnc/om [lb]	Pnt/om [lb]	Mnyy/om [k-ft]	Mnzz/om ...	Cb	LRFD E...
1	M1	HSS3x1x3	.984	22.313	2	.500	0	z	2	15410.397	31962.654	.981	2.313	2... H1-1a
2	M2	HSS3X1X2	.360	0	3	.018	25.813	y	3	10920.117	21154.469	.683	1.528	1... H1-1b
3	M3	HSS3X1X2	.459	2.188	2	.353	0	z	2	10920.289	21154.469	.683	1.528	1... H1-1a
4	M4	HSS3X1X2	.389	21	6	.044	21	z	6	10920.289	21154.469	.683	1.528	1 H1-1a
5	M5	HSS3x1x3	.982	22.313	2	.499	0	z	2	15410.397	31962.654	.981	2.313	2... H1-1a
6	M6	HSS3X1X2	.360	0	3	.018	0	y	3	10920.117	21154.469	.683	1.528	1... H1-1b
7	M7	HSS3X1X2	.457	39.813	2	.353	40.25	z	6	10920.289	21154.469	.683	1.528	1... H1-1a
8	M8	HSS3x1x3	.581	18.813	3	.568	38.5	z	2	15410.397	31962.654	.981	2.313	1... H1-1a
9	M9	HSS3x1x3	.581	18.813	3	.566	38.5	z	2	15410.397	31962.654	.981	2.313	1... H1-1a

**Global**

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation	Yes
Include Warping	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Vertical Axis	Y

Hot Rolled Steel Code	AISC : ASD 13th
Cold Formed Steel Code	AISI 01: ASD
Wood Code	NDS 2005: ASD
Wood Temperature	< 100F
Concrete Code	ACI 2005

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	PCA Load Contour
Parame Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections	Yes
Bad Framing Warnings	No
Unused Force Warnings	Yes

**Hot Rolled Steel Properties**

	Label	E [ksi]	G [ksi]	Nu	Therm (1E5 F)	Density[k/ft^3]	Yield[ksi]
1	A500Gr42	29000	11154	.3	.65	.49	42
2	SS316	28000	11154	.3	.65	.49	30

**Hot Rolled Steel Section Sets**

	Label	Shape	Type	Design List	Material	Design Rules	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	RAIL	TU3x1x2	Beam	Tube	SS316	Typical	.902	.149	.918	.41
2	EPOST	RE3x1	Column	Tube	SS316	Typical	3	.25	2.25	.79
3	IPOST	TU3x1x2	Column	Tube	SS316	Typical	.902	.149	.918	.41

**General Material Properties**

	Label	E [ksi]	G [ksi]	Nu	Therm (1E5 F)	Density[k/ft^3]
1	GEN_RIGID	1e+6		.3	.65	0

**General Section Sets**

	Label	Shape	Type	Material	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	LINK		Beam	GEN_RIGID	.25	.005	.005	.01

**Basic Load Cases**

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area (Mem...	Surface (Pl...
1	Cable Prestress	None				24				
2	1607.7.1.2	None				16				
3	1607.7.1	None						3		
4	1607.7.1.1 (1)	None				1				
5	1607.7.1.1 (2)	None					1			
6	1607.7.1.1 (3)	None					1			

**Load Combinations**

	Description	Solve	PDelta	SR...	BLC Factor	BLC Factor	BLC Factor	BLC Factor	BLC Factor	BLC Factor	BLC Factor	BLC Factor
1	Cable Prestress	Yes	C		1	1						
2	1607.7.1.2	Yes	C		1	1	2	1				
3	1607.7.1	Yes	C		1	1	3	1				
4	1607.7.1.1 (1)	Yes	C		1	1	4	1				
5	1607.7.1.1 (2)	Yes	C		1	1	5	1				
6	1607.7.1.1 (3)	Yes	C		1	1	6	1				

**Member Primary Data**

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N1	N2		90	EPOST	Column	Tube	SS316	Typical
2	M2	N3	N4		90	IPOST	Column	Tube	SS316	Typical
3	M3	N2	N4		90	RAIL	Beam	Tube	SS316	Typical
4	M4	N4	N8		90	RAIL	Beam	Tube	SS316	Typical
5	M5	N5	N6		90	EPOST	Column	Tube	SS316	Typical
6	M6	N7	N8		90	IPOST	Column	Tube	SS316	Typical
7	M7	N8	N6		90	RAIL	Beam	Tube	SS316	Typical
8	M8	N9	N10		90	EPOST	Column	Tube	SS316	Typical
9	M9	N11	N12		90	EPOST	Column	Tube	SS316	Typical
10	M10	N13	N15			LINK	Beam	None	GEN_RIGID	Default
11	M11	N16	N14			LINK	Beam	None	GEN_RIGID	Default
12	M12	N1	N17			LINK	Beam	None	GEN_RIGID	Default
13	M13	N11	N18			LINK	Beam	None	GEN_RIGID	Default
14	M14	N17	N9			LINK	Beam	None	GEN_RIGID	Default
15	M15	N18	N5			LINK	Beam	None	GEN_RIGID	Default
16	M19	N23	N25			LINK	Beam	None	GEN_RIGID	Default
17	M20	N26	N24			LINK	Beam	None	GEN_RIGID	Default
18	M21	N27	N29			LINK	Beam	None	GEN_RIGID	Default
19	M22	N30	N28			LINK	Beam	None	GEN_RIGID	Default
20	M23	N31	N33			LINK	Beam	None	GEN_RIGID	Default
21	M24	N34	N32			LINK	Beam	None	GEN_RIGID	Default
22	M25	N35	N37			LINK	Beam	None	GEN_RIGID	Default
23	M26	N38	N36			LINK	Beam	None	GEN_RIGID	Default
24	M27	N39	N41			LINK	Beam	None	GEN_RIGID	Default
25	M28	N42	N40			LINK	Beam	None	GEN_RIGID	Default
26	M29	N43	N45			LINK	Beam	None	GEN_RIGID	Default
27	M30	N46	N44			LINK	Beam	None	GEN_RIGID	Default
28	M31	N47	N49			LINK	Beam	None	GEN_RIGID	Default
29	M32	N50	N48			LINK	Beam	None	GEN_RIGID	Default
30	M33	N51	N53			LINK	Beam	None	GEN_RIGID	Default
31	M34	N54	N52			LINK	Beam	None	GEN_RIGID	Default

**Member Primary Data (Continued)**

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
32	M35	N55	N57			LINK	Beam	None	GEN_RIGID	Default
33	M36	N58	N56			LINK	Beam	None	GEN_RIGID	Default
34	M34A	N59A	N61A			LINK	Beam	None	GEN_RIGID	Default
35	M35A	N62A	N60A			LINK	Beam	None	GEN_RIGID	Default
36	M36A	N63	N65			LINK	Beam	None	GEN_RIGID	Default
37	M37	N66	N64			LINK	Beam	None	GEN_RIGID	Default

**Envelope Joint Reactions**

Joint		X [lb]	lc	Y [lb]	lc	Z [lb]	lc	MX [k-ft]	lc	MY [k-ft]	lc	MZ [k-ft]	lc	
1	N3	max	12.893	6	81.993	6	0	1	0	1	0	1	0	1
2		min	4.577	1	-37.344	2	-160.9	3	-0.532	3	0	1	0	1
3	N7	max	-4.577	1	82.161	6	0	1	0	1	0	1	0	1
4		min	-12.854	6	-37.344	2	-160.9	3	-0.532	3	0	1	0	1
5	N17	max	-2402.231	4	37.344	2	0	1	0	1	0	1	0	1
6		min	-2506.913	2	18	6	-101.6	3	-0.447	3	0	1	0	1
7	N18	max	2506.913	2	37.344	2	7.559	4	.01	4	0	1	0	1
8		min	2402.231	4	17.846	6	-101.6	3	-0.447	3	0	1	0	1
9	Totals:	max	0	3	200	6	0	1						
10		min	0	2	0	4	-525	3						

**Envelope Member Section Forces**

Member	Sec		Axial[lb]	lc	y Shear[lb]	lc	z Shear[lb]	lc	Torque[k-ft]	lc	y-y Moment[...]	lc	z-z Moment[...]	lc	
1	M1	1	max	2008.412	2	0	1	-1208.167	1	0	3	.166	2	0	1
2			min	1917.508	6	-51.584	3	-1261.135	2	0	5	.159	1	-.224	3
3		2	max	10124.706	2	0	1	-616.831	1	0	1	-.057	4	0	1
4			min	9580.537	1	-61.118	3	-671.311	2	-.001	3	-.059	2	-.176	3
5		3	max	13229.708	2	0	1	-3.179	1	0	1	-.115	1	0	1
6			min	12276.13	1	-67.402	3	-24.957	2	-.002	3	-.125	2	-.121	3
7		4	max	10363.919	2	0	1	686.003	2	0	1	-.03	2	0	1
8			min	9630.849	1	-67.204	3	609.479	6	-.002	3	-.031	6	-.064	3
9		5	max	1023.292	2	0	1	1130.858	2	0	5	.101	2	0	2
10			min	966.198	1	-72.502	3	1067.975	1	0	2	.095	1	-.003	3
11	M2	1	max	81.993	6	0	1	12.982	6	0	1	0	1	0	1
12			min	-37.344	2	-160.9	3	4.577	1	0	1	0	1	-.532	3
13		2	max	81.993	6	0	1	12.982	6	0	1	.011	6	0	1
14			min	-37.344	2	-160.9	3	4.577	1	0	1	.004	1	-.391	3
15		3	max	81.993	6	0	1	12.92	6	0	1	.023	6	0	1
16			min	-37.344	2	-160.9	3	4.577	1	0	1	.008	1	-.251	3
17		4	max	81.993	6	3.473	2	12.75	6	0	1	.034	6	.004	2
18			min	-37.344	2	-160.9	3	4.577	1	0	1	.012	1	-.11	3
19		5	max	81.993	6	3.473	2	12.75	6	0	1	.045	6	.031	3
20			min	-37.344	2	-160.9	3	4.577	1	0	1	.016	1	0	1
21	M3	1	max	1125.692	2	0	1	-962.33	1	0	2	.101	2	0	2
22			min	1063.417	4	-74.781	3	-1018.898	2	-.003	3	.095	1	0	5
23		2	max	2541.087	2	0	1	-18.236	6	0	2	.069	2	.07	3
24			min	2392.297	6	-65.932	3	-37.583	2	-.031	3	.059	6	0	1
25		3	max	2541.087	2	0	1	-18.236	6	0	2	.043	6	.109	3
26			min	2392.297	6	-51.925	4	-37.583	2	-.031	3	.034	1	0	1
27		4	max	2541.087	2	21.568	3	-18.236	6	0	2	.027	6	.134	4
28			min	2392.297	6	-51.925	4	-37.583	2	-.031	3	.003	1	0	1

**Envelope Member Section Forces (Continued)**

Member	Sec		Axial[lb]	lc	y Shear[lb]	lc	z Shear[lb]	lc	Torque[k-ft]	lc	y-y Moment[...]	lc	z-z Moment[...]	lc	
29		5	max	2541.087	2	65.318	3	-18.236	6	0	2	.011	6	.179	4
30			min	2392.297	6	-51.925	4	-37.583	2	-.031	3	-.029	2	0	1
31	M4	1	max	2545.987	2	53.416	4	0	1	.01	4	.057	6	.179	4
32			min	2402.345	1	-100	5	-99.993	6	0	1	-.012	2	0	1
33		2	max	2545.987	2	53.416	4	0	1	.01	4	-.012	1	.141	5
34			min	2402.345	1	-100	5	-99.993	6	0	1	-.031	6	0	1
35		3	max	2545.987	2	100	5	100.007	6	.01	4	-.012	1	.228	5
36			min	2402.345	1	0	1	0	1	0	1	-.118	6	0	1
37		4	max	2545.987	2	100	5	100.007	6	.01	4	-.012	1	.141	5
38			min	2402.345	1	0	1	0	1	0	1	-.031	6	0	2
39		5	max	2545.987	2	100	5	100.007	6	.01	4	.057	6	.071	3
40			min	2402.345	1	0	1	0	1	0	1	-.012	2	-.008	4
41	M5	1	max	2008.412	2	3.688	4	1261.135	2	0	4	-.159	1	.005	4
42			min	1917.441	6	-51.584	3	1208.167	1	0	3	-.166	2	-.224	3
43		2	max	10124.706	2	3.7	4	671.311	2	.001	3	.059	2	.001	4
44			min	9580.537	1	-61.118	3	616.831	1	0	1	.057	4	-.176	3
45		3	max	13229.708	2	3.588	4	24.957	2	.002	3	.125	2	0	2
46			min	12276.13	1	-67.402	3	3.179	1	0	1	.115	1	-.121	3
47		4	max	10363.919	2	2.865	4	-609.415	6	.002	3	.031	6	0	1
48			min	9630.849	1	-67.204	3	-686.003	2	0	1	.03	2	-.064	3
49		5	max	1023.292	2	0	1	-1067.975	1	0	1	-.095	1	0	1
50			min	966.198	1	-72.502	3	-1130.858	2	0	5	-.101	2	-.003	3
51	M6	1	max	82.161	6	0	1	-4.577	1	0	1	0	1	0	1
52			min	-37.344	2	-160.9	3	-12.847	6	0	1	0	1	-.532	3
53		2	max	82.161	6	0	1	-4.577	1	0	1	-.004	1	0	1
54			min	-37.344	2	-160.9	3	-12.847	6	0	1	-.011	6	-.391	3
55		3	max	82.161	6	0	1	-4.577	1	0	1	-.008	1	0	1
56			min	-37.344	2	-160.9	3	-12.847	6	0	1	-.022	6	-.251	3
57		4	max	82.161	6	0	1	-4.577	1	0	1	-.012	1	0	1
58			min	-37.344	2	-160.9	3	-12.847	6	0	1	-.034	6	-.11	3
59		5	max	82.161	6	0	1	-4.577	1	0	1	-.016	1	.031	3
60			min	-37.344	2	-160.9	3	-12.847	6	0	1	-.045	6	0	1
61	M7	1	max	2541.087	2	15.1	5	37.583	2	.031	3	.012	6	.071	3
62			min	2392.337	6	-65.318	3	18.08	6	0	1	-.029	2	-.008	4
63		2	max	2541.087	2	15.1	5	37.583	2	.031	3	.027	6	.109	3
64			min	2392.337	6	-21.568	3	18.08	6	0	1	.003	1	-.005	4
65		3	max	2541.087	2	22.182	3	37.583	2	.031	3	.043	6	.109	3
66			min	2392.337	6	-2.55	4	18.08	6	0	1	.034	1	-.003	4
67		4	max	2541.087	2	65.932	3	37.583	2	.031	3	.069	2	.07	3
68			min	2392.337	6	-2.55	4	18.08	6	0	1	.059	6	0	4
69		5	max	1125.692	2	74.781	3	1018.898	2	.003	3	.101	2	0	1
70			min	1063.417	4	0	1	962.33	1	0	1	.095	1	0	5
71	M8	1	max	-1886.621	1	0	1	-1203.453	1	0	1	.165	2	0	1
72			min	-1971.068	2	-52.37	3	-1256.213	2	0	3	.158	1	-.223	3
73		2	max	-9545.623	1	0	1	-616.841	1	0	1	-.057	4	0	1
74			min	-10087.362	2	-57.678	3	-671.306	2	-.001	3	-.059	2	-.175	3
75		3	max	-12241.216	1	0	1	-3.175	1	0	1	-.115	1	0	1
76			min	-13192.364	2	-61.54	3	-25.045	2	-.002	3	-.125	2	-.121	3
77		4	max	-9595.935	1	.65	2	684.409	2	0	1	-.03	2	0	1
78			min	-10326.575	2	-58.565	3	608.376	6	-.002	3	-.031	6	-.066	3
79		5	max	-931.284	1	14.22	5	1415.395	2	0	5	.164	2	0	1
80			min	-992.078	6	-31.648	3	1310.799	6	-.001	2	.144	6	-.028	3
81	M9	1	max	-1886.621	1	3.922	4	1256.213	2	0	3	-.158	1	.005	4

**Envelope Member Section Forces (Continued)**

Member	Sec	Axial[lb]	lc	y Shear[lb]	lc	z Shear[lb]	lc	Torque[k-ft]	lc	y-y Moment[...]	lc	z-z Moment[...]	lc
82		min -1971.068	2	-52.37	3	1203.453	1	0	2	-.165	2	-.223	3
83	2	max -9545.623	1	4.193	4	671.306	2	.001	3	.059	2	.002	4
84		min -10087.362	2	-57.678	3	616.841	1	0	1	.057	4	-.175	3
85	3	max -12241.216	1	4.387	4	25.045	2	.002	3	.125	2	0	2
86		min -13192.364	2	-61.54	3	3.175	1	0	1	.115	1	-.121	3
87	4	max -9595.935	1	4.923	4	-608.315	6	.002	3	.031	6	0	1
88		min -10326.575	2	-58.565	3	-684.409	2	0	1	.03	2	-.066	3
89	5	max -931.284	1	18.674	4	-1310.39	6	0	1	-.144	6	0	1
90		min -993.171	6	-31.648	3	-1415.395	2	0	4	-.164	2	-.028	3

**Envelope AISC 13th ASD Steel Code Checks**

Member	Shape	Code Check	Loc[in]	lc	Shear ...	Loc[in]	Dir	lc	Pnc/om [lb]	Pnt/om [lb]	Mnyy/om [k-ft]	Mnzz/om ...	Cb LRFD E...	
1	M1	RE3x1	.746	22.313	2	.039	0	z	2	20567.049	53892.216	1.123	3.368	2... H1-1a
2	M2	TU3x1x2	.444	0	3	.024	19.25	y	3	9977.739	16210.778	.526	1.202	1... H1-1b
3	M3	TU3x1x2	.419	42	4	.617	0	z	2	9977.855	16210.778	.526	1.202	1... H1-1a
4	M4	TU3x1x2	.441	21	6	.060	21	z	6	9977.855	16210.778	.526	1.202	1 H1-1a
5	M5	RE3x1	.744	22.313	2	.039	0	z	2	20567.049	53892.216	1.123	3.368	2... H1-1a
6	M6	TU3x1x2	.444	0	3	.024	0	y	3	9977.739	16210.778	.526	1.202	1... H1-1b
7	M7	TU3x1x2	.416	39.813	2	.616	40.25	z	2	9977.855	16210.778	.526	1.202	1... H1-1a
8	M8	RE3x1	.365	15.75	3	.045	38.5	z	2	20567.049	53892.216	1.123	3.368	1... H1-1a
9	M9	RE3x1	.365	15.75	3	.044	38.5	z	2	20567.049	53892.216	1.123	3.368	1... H1-1a

\*\*\* End of Calculations \*\*\*