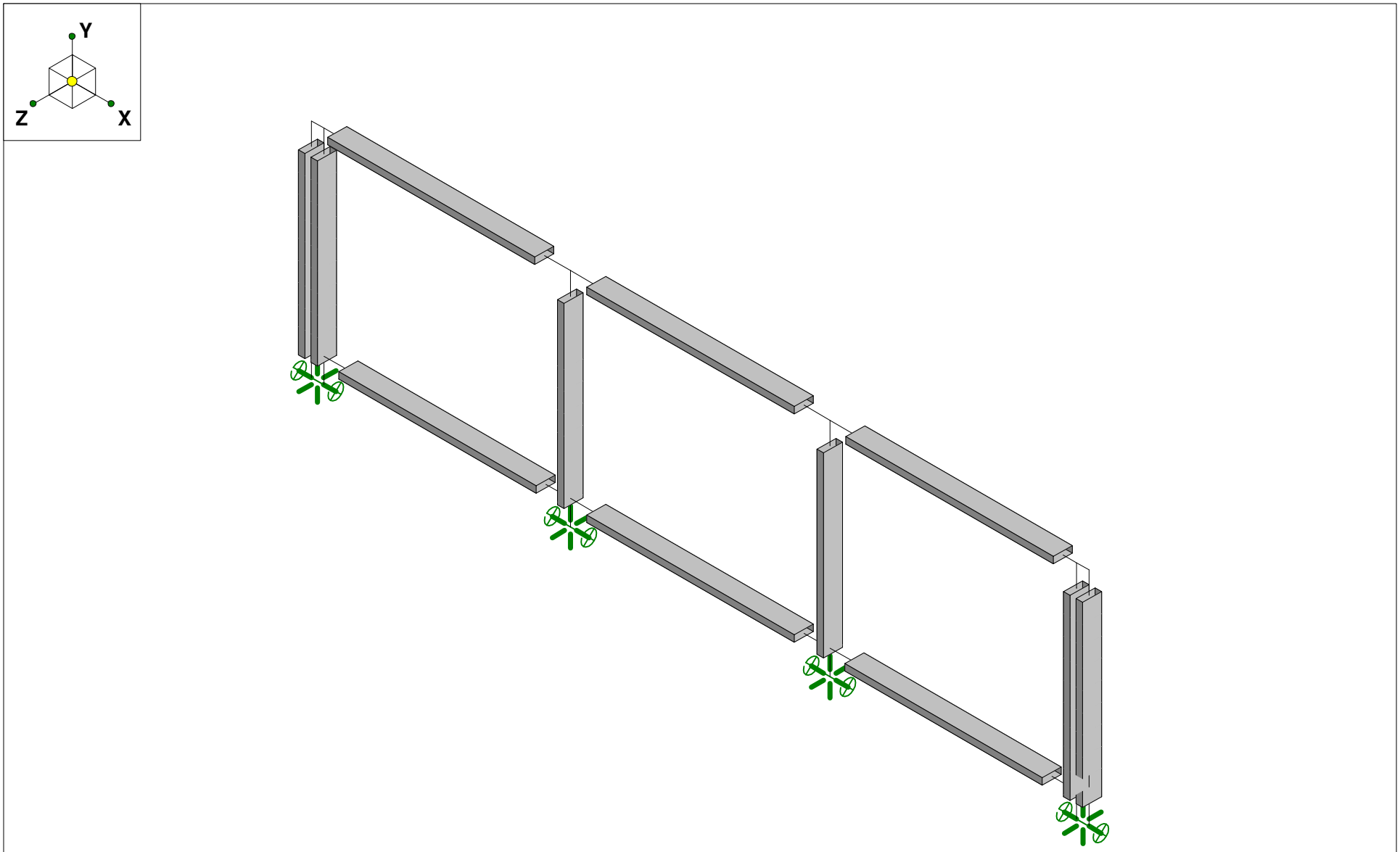
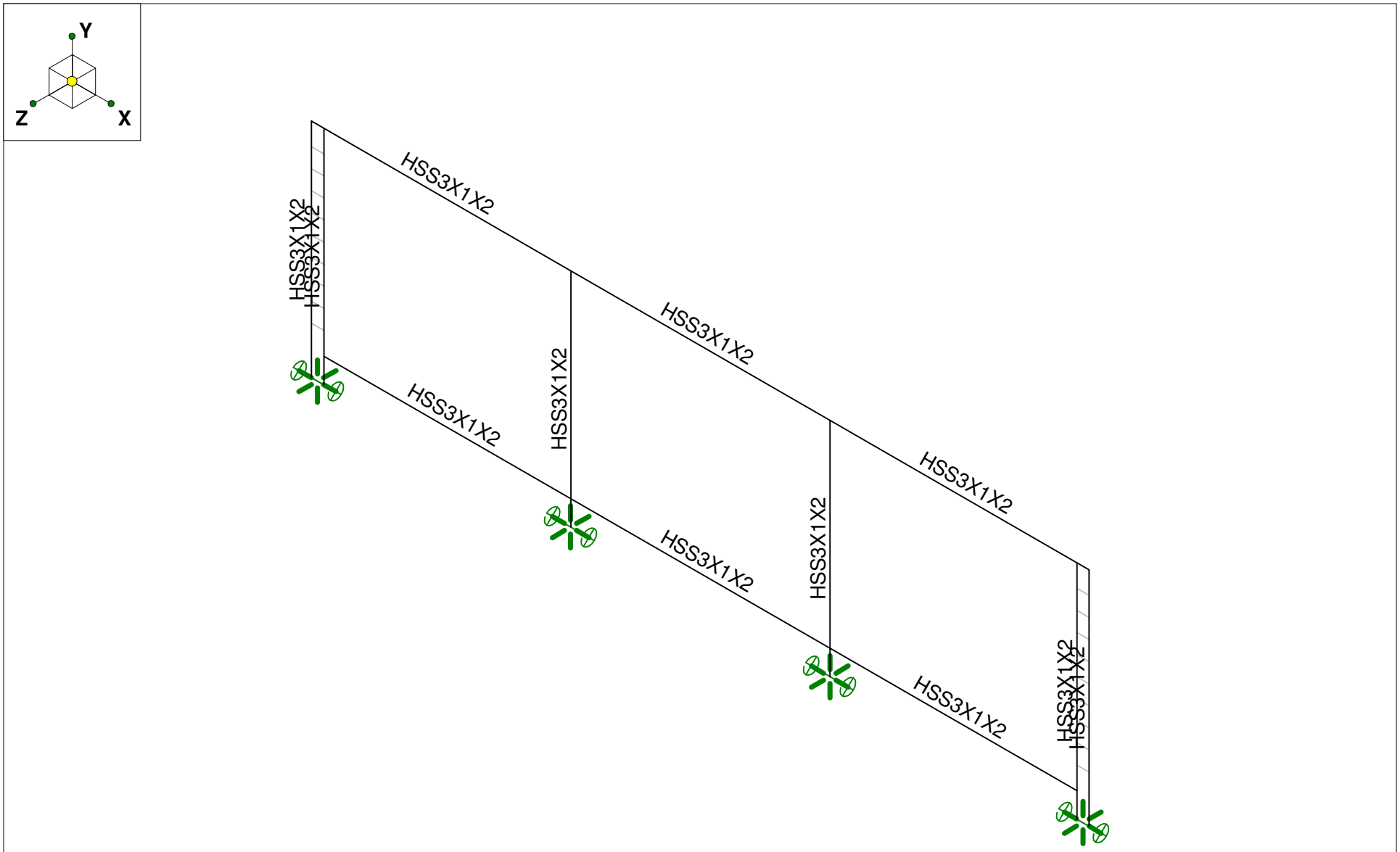
D1b—3" x 1" RECT. TUBE x 36-1/2" HIGH RAIL WITH BOTTOM RAIL

Building Code:	**2006 *International Building Code*** **2007 *California Building Code*** **AISC *Steel Construction Manual*, 13th ed—ASD**
Material:	**Carbon Steel, A500, Grade B, Fy = 42 ksi** **Stainless Steel, A554, Grade MT-304 or MT-316, Fy = 30 ksi** **Stainless Steel, LDX 2101 (UNS S32101), Fy = 60 ksi (Anchor Post)**
Height:	**36.5"**
Anchor Post:	Carbon Steel: **Double HSS 3x1x1/8 Tube** Stainless Steel: **Double 3"x1"x0.120" Tube (LDX 2101)**
Intermediate Posts:	Carbon Steel: **HSS 3x1x1/8 Tube** Stainless Steel: **3"x1"x0.120" Tube**
Top Rail:	Carbon Steel: **HSS 3x1x1/8 Tube** Stainless Steel: **3"x1"x0.120" Tube**
Bottom Rail:	Carbon Steel: **HSS 3x1x1/8 Tube** Stainless Steel: **3"x1"x0.120" Tube**
Number of Cables:	**9**
Cable Spacing:	**3.10"**
Cable Prestress:	**400 lbs**

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.



Ferrari Shields & Associates	D1b - 3"x1" RECT TUBE x 36.5" HIGH RAIL W/ BOTTOM RAIL	
o'c		Oct 29, 2008 at 8:49 AM
08196		D1b-3x1.R3D



Ferrari Shields & Associates	D1b - 3"x1" RECT TUBE x 36.5" HIGH RAIL W/ BOTTOM RAIL	
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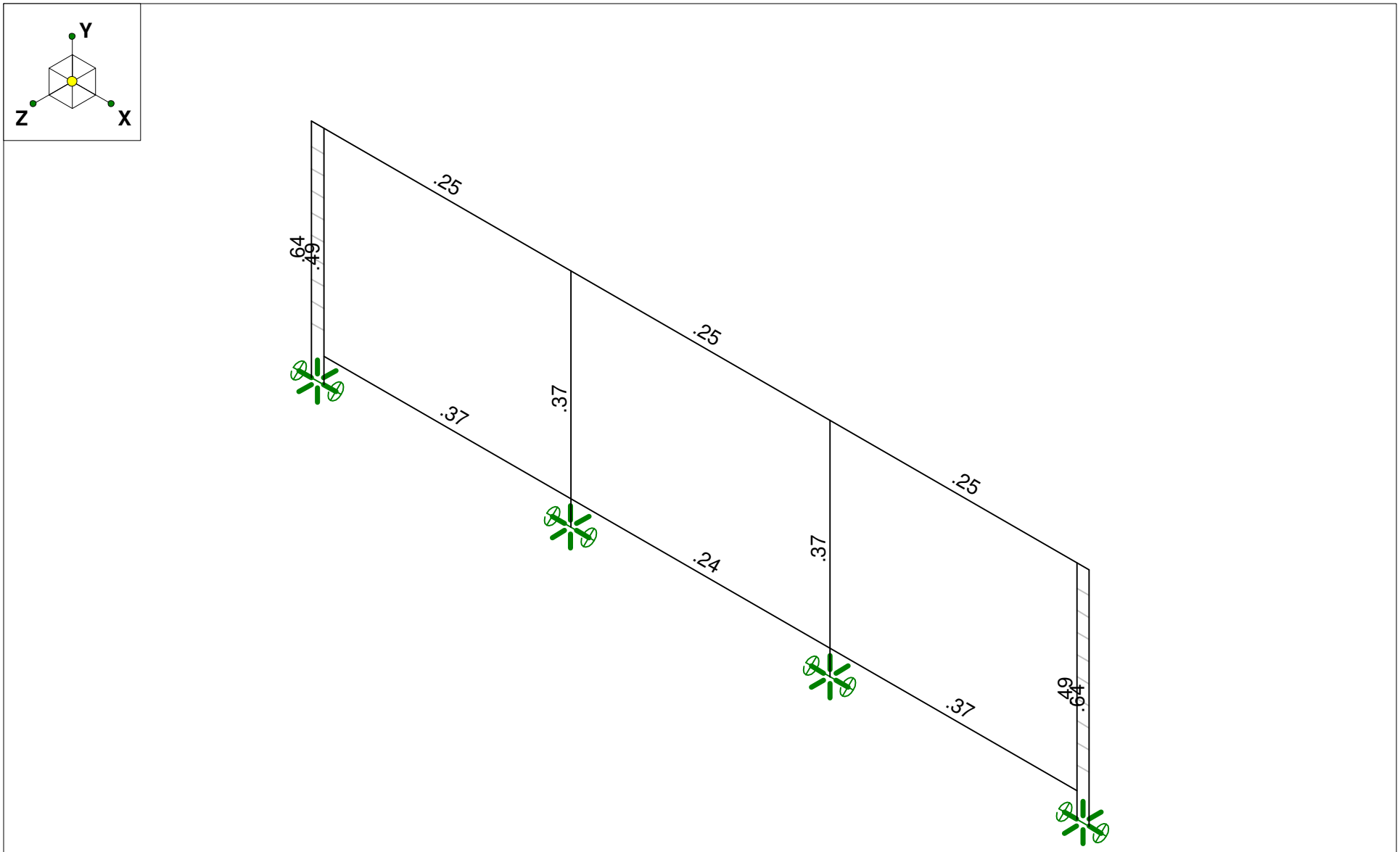
08196		D1b-3x1.R3D



Member Code Checks Displayed
Solution: Envelope

Ferrari Shields & Associates	D1b - 3"x1" RECT TUBE x 36.5" HIGH RAIL W/ BOTTOM RAIL	
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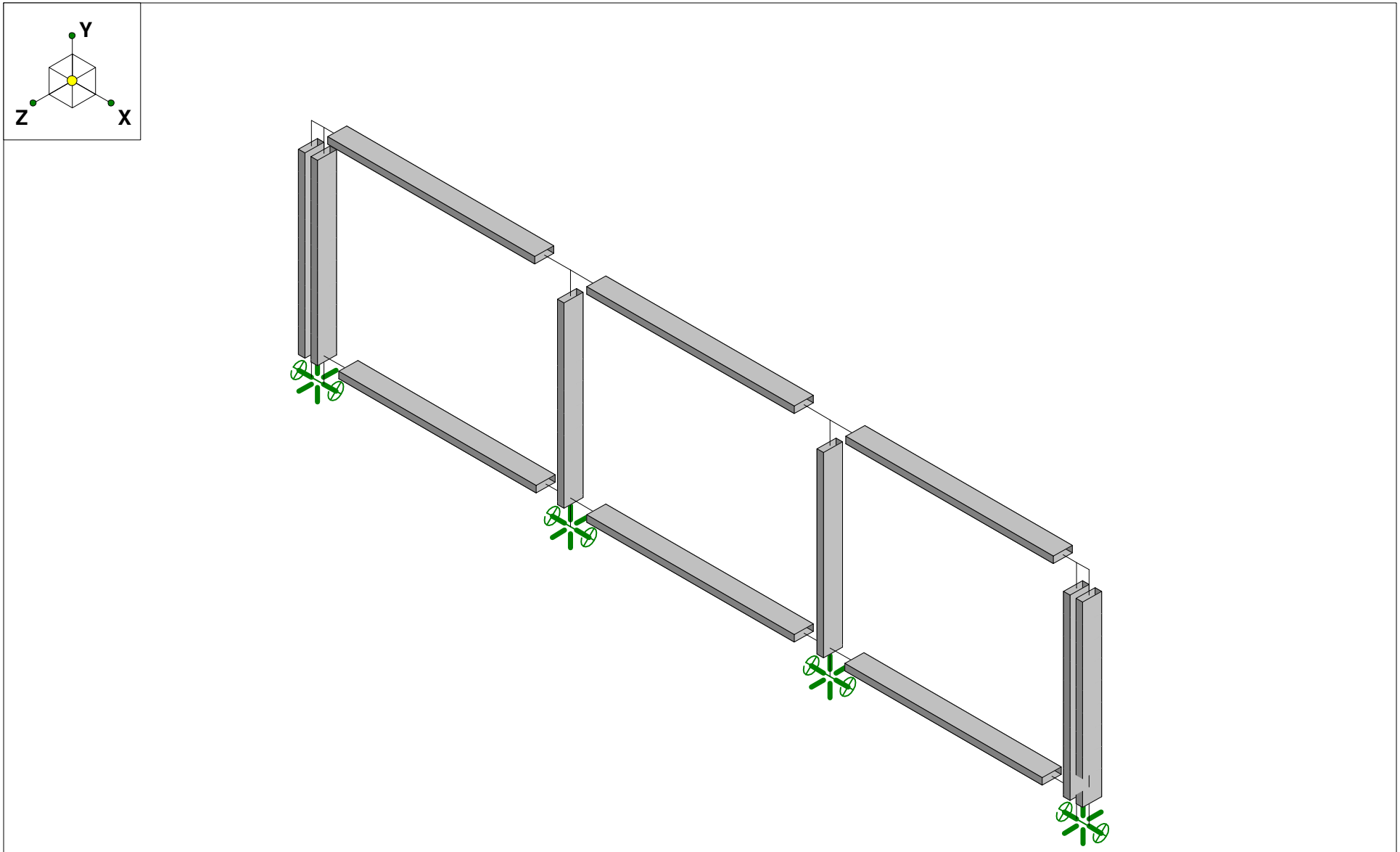
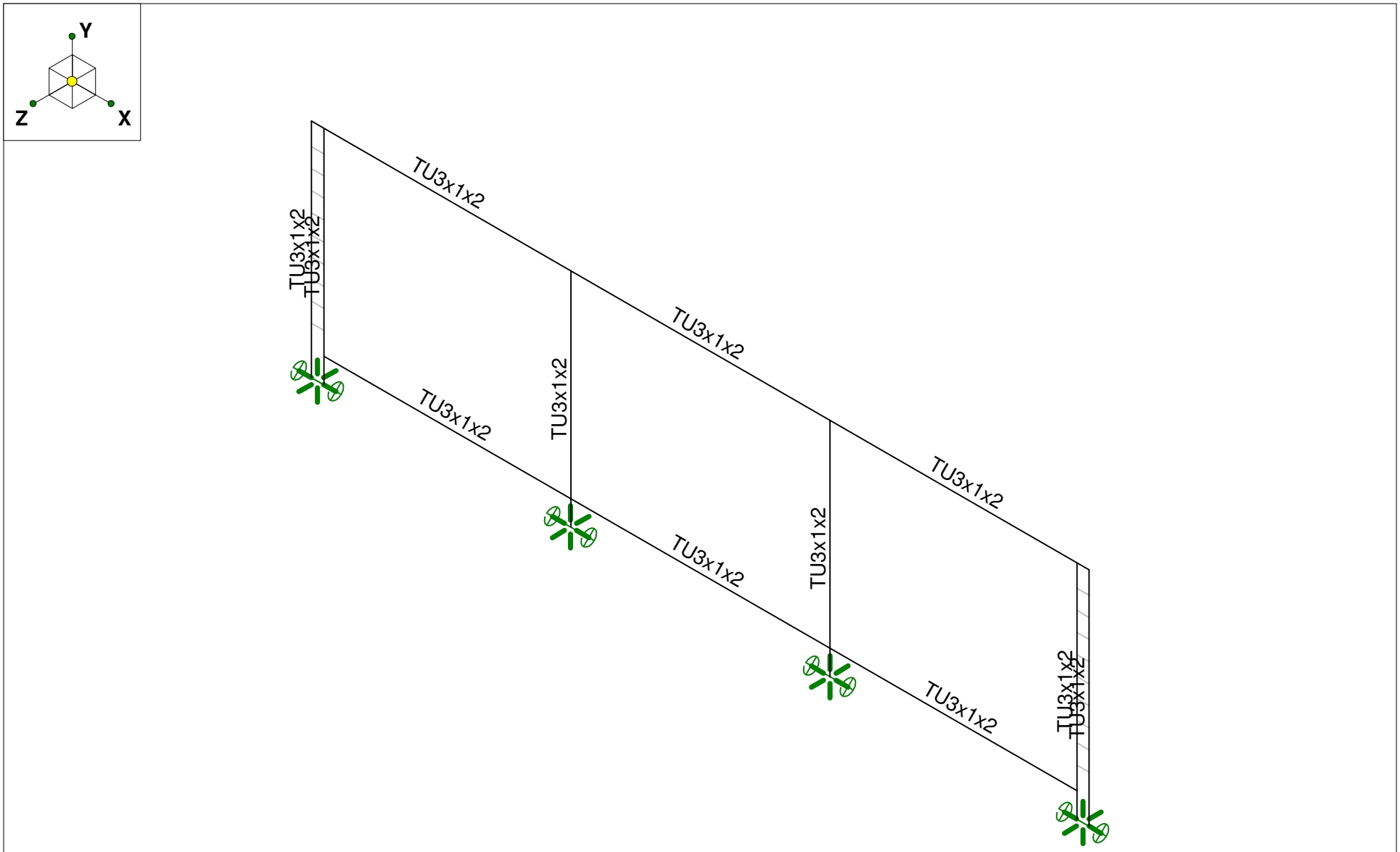
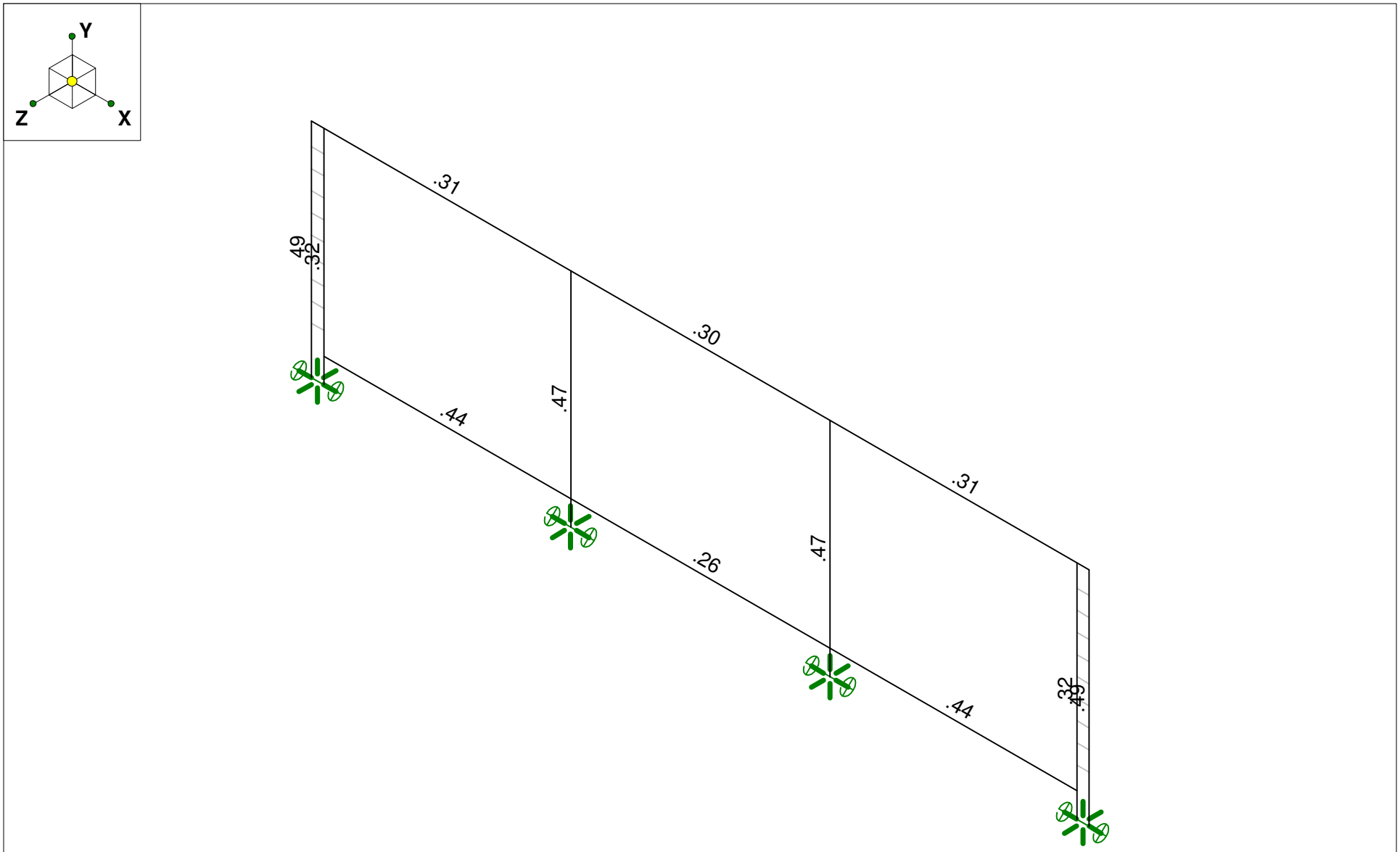
08196		D1b-3x1.R3D



Ferrari Shields & Associates	D1 (SS) - 3"x1" RECT TUBE x 36.5" HIGH RAIL W/ BOTTOM RAIL	
o'c		Dec 10, 2008 at 9:11 AM
08196		D1b-3x1-ss.R3D

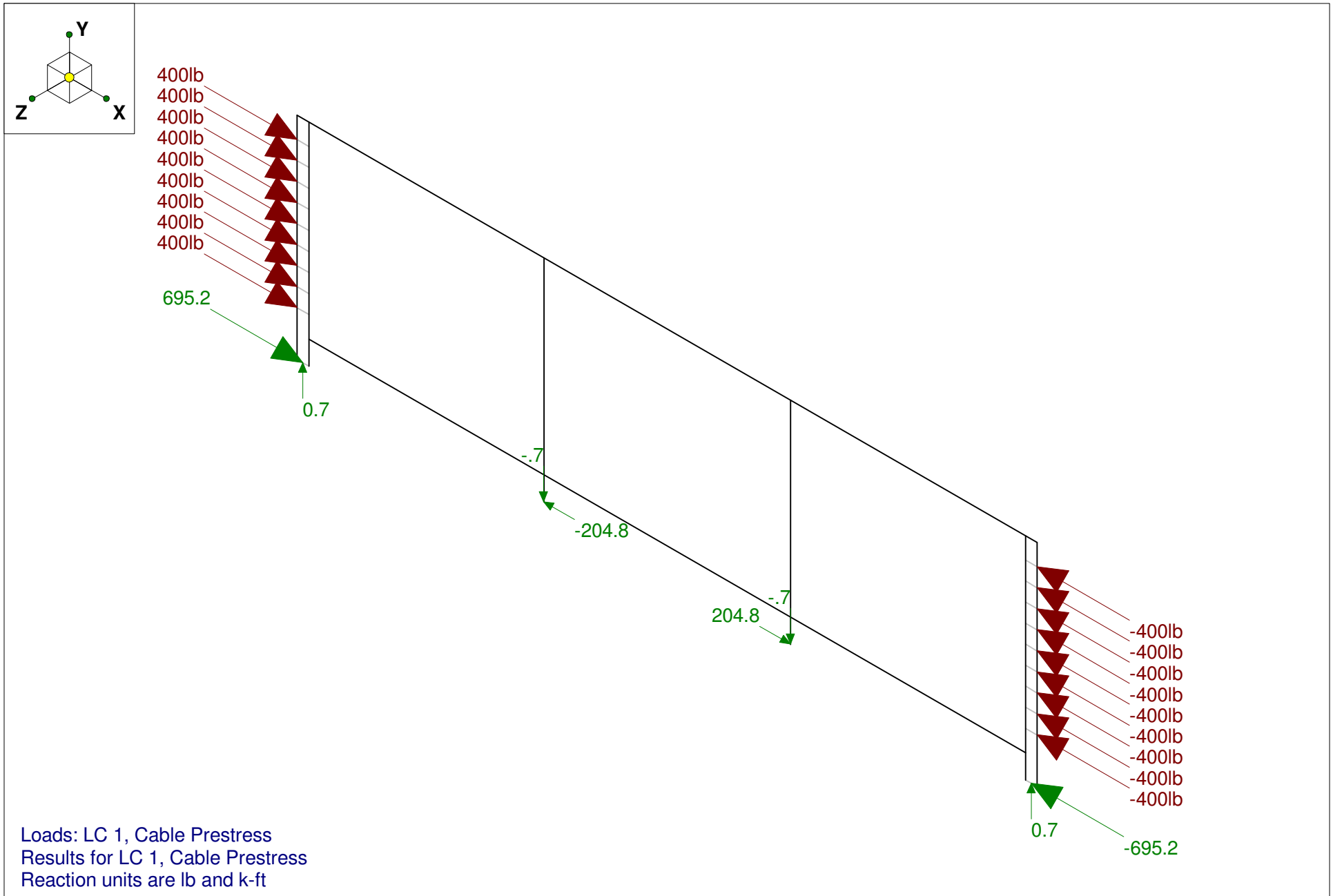


Ferrari Shields & Associates	D1 (SS) - 3"x1" RECT TUBE x 36.5" HIGH RAIL W/ BOTTOM RAIL	
o'c		Dec 10, 2008 at 9:12 AM
08196		D1b-3x1-ss.R3D



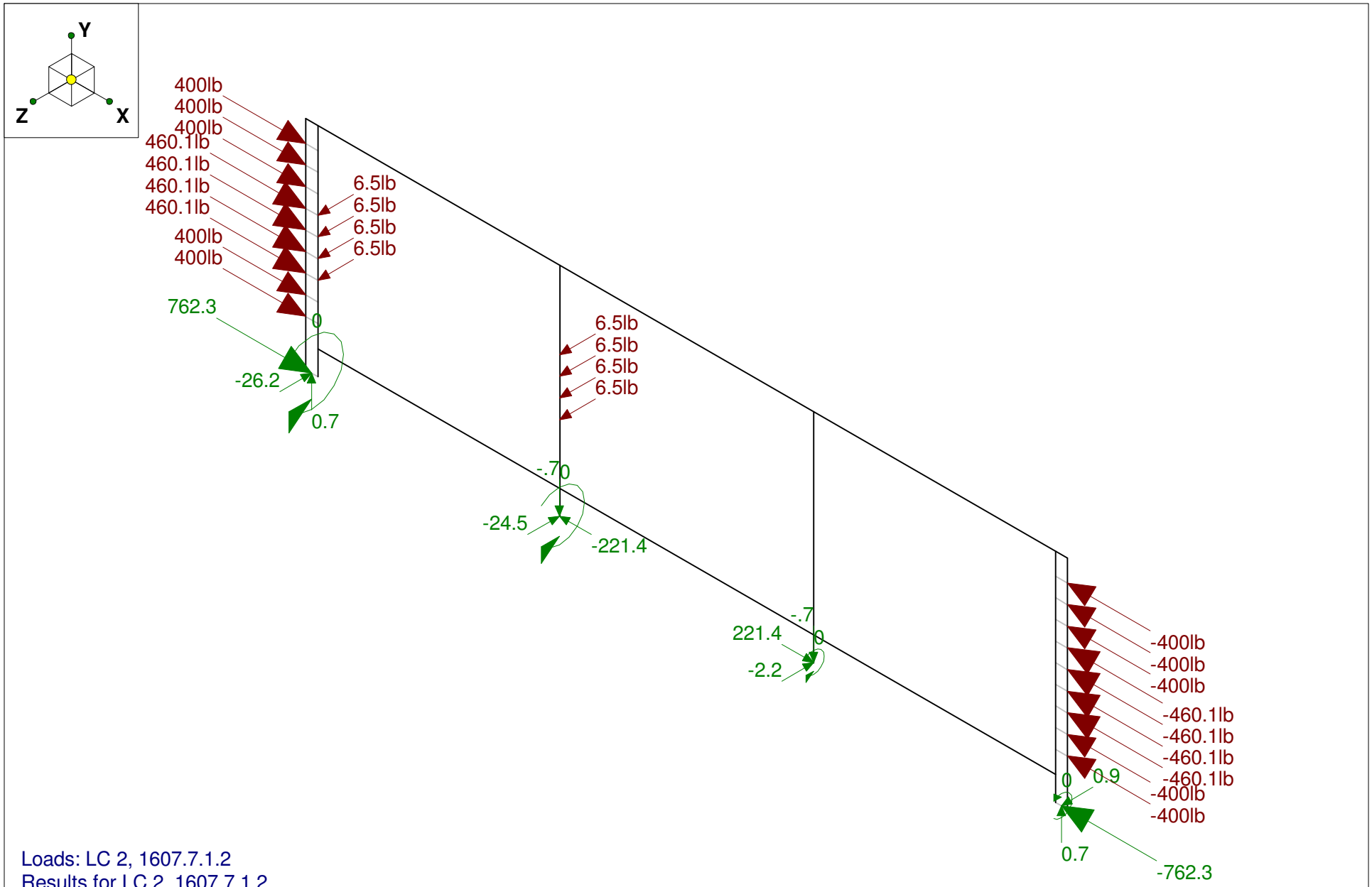
Member Code Checks Displayed
Solution: Envelope

Ferrari Shields & Associates	D1 (SS) - 3"x1" RECT TUBE x 36.5" HIGH RAIL W/ BOTTOM RAIL	
o'c		Dec 10, 2008 at 9:12 AM
08196		D1b-3x1-ss.R3D



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

Ferrari Shields & Associates	D1b - 3"x1" RECT TUBE x 36.5" HIGH RAIL W/ BOTTOM RAIL	
o'c		Oct 29, 2008 at 8:56 AM
08196		D1b-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	D1b - 3"x1" RECT TUBE x 36.5" HIGH RAIL W/ BOTTOM RAIL	
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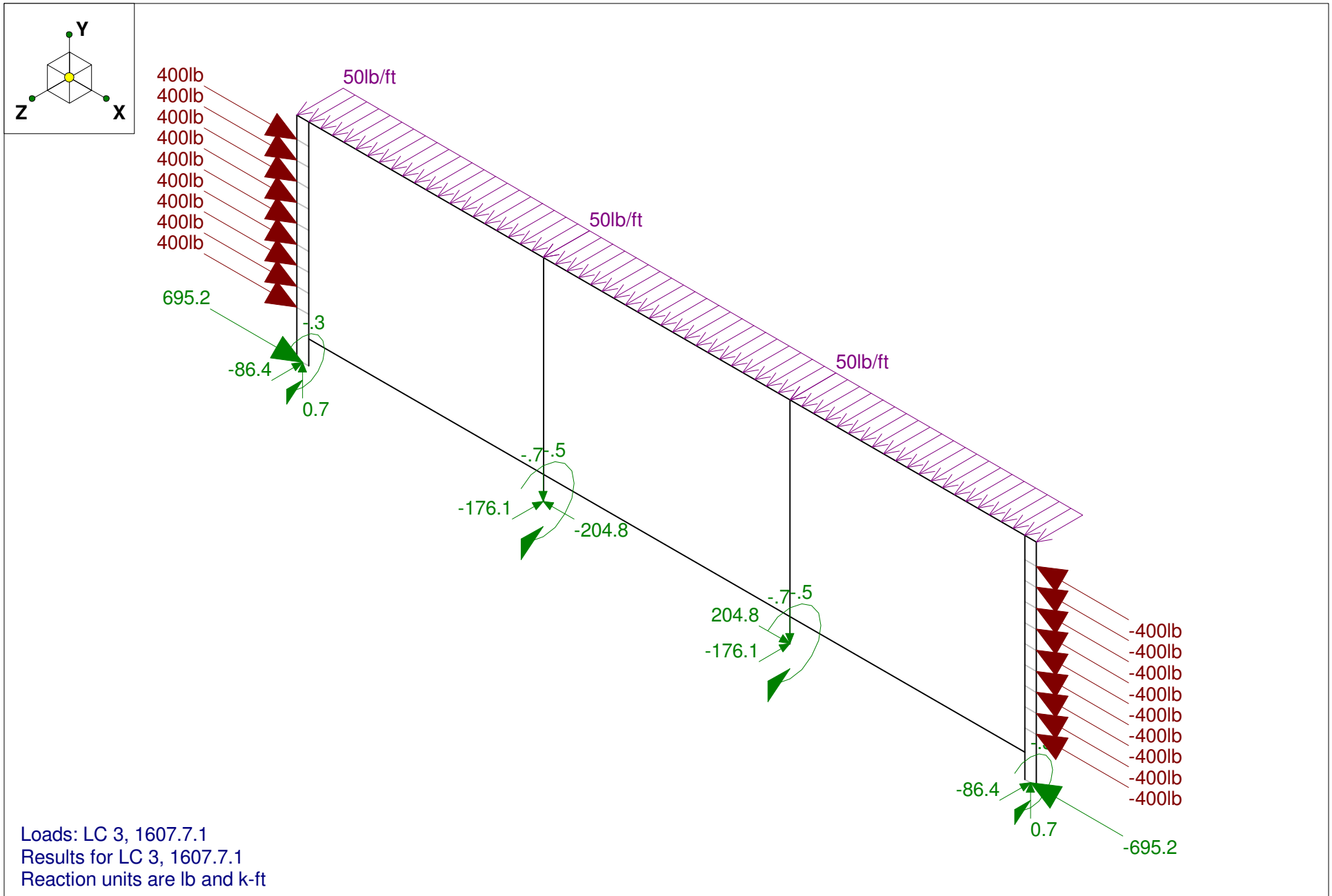
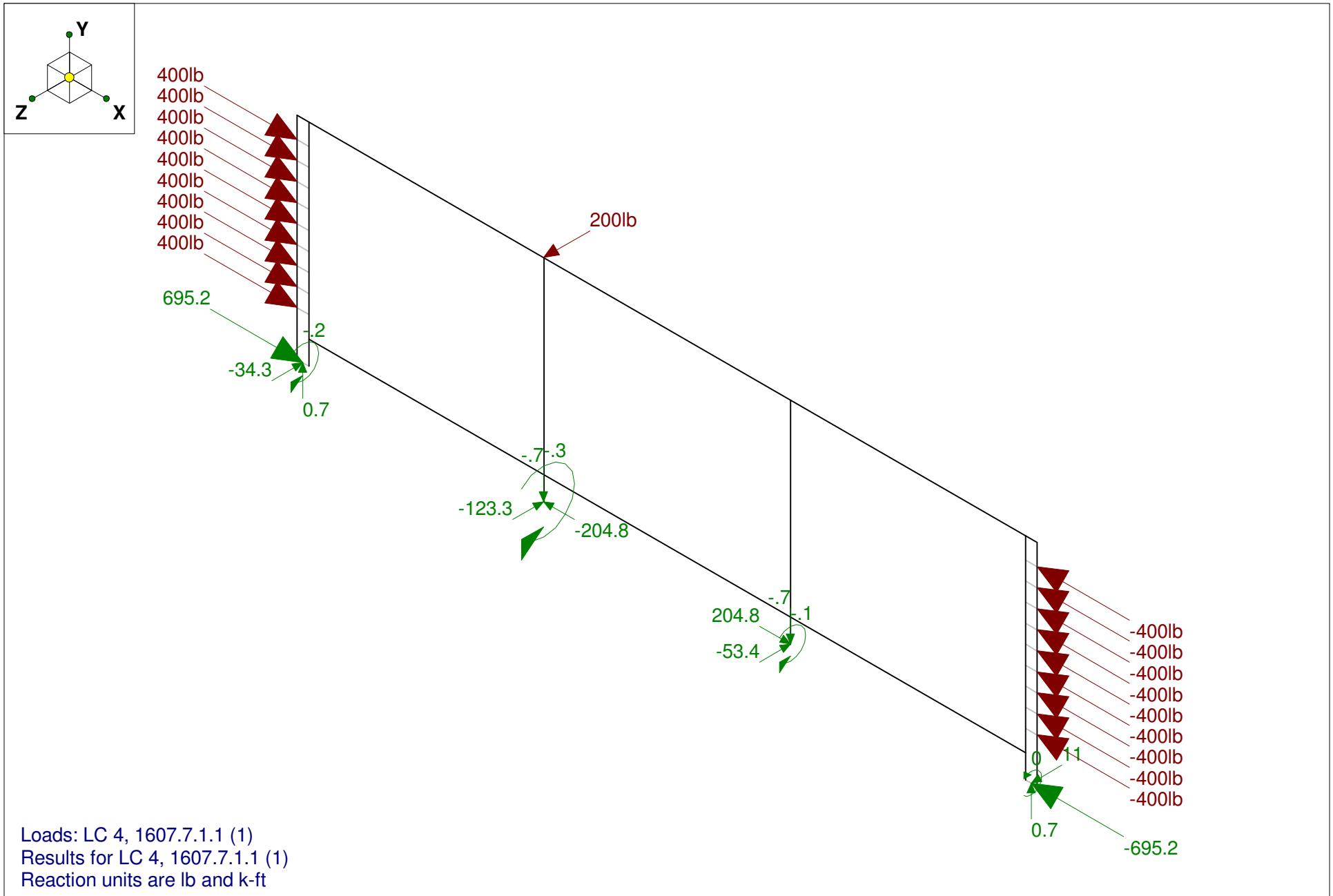
08196		D1b-3x1.R3D



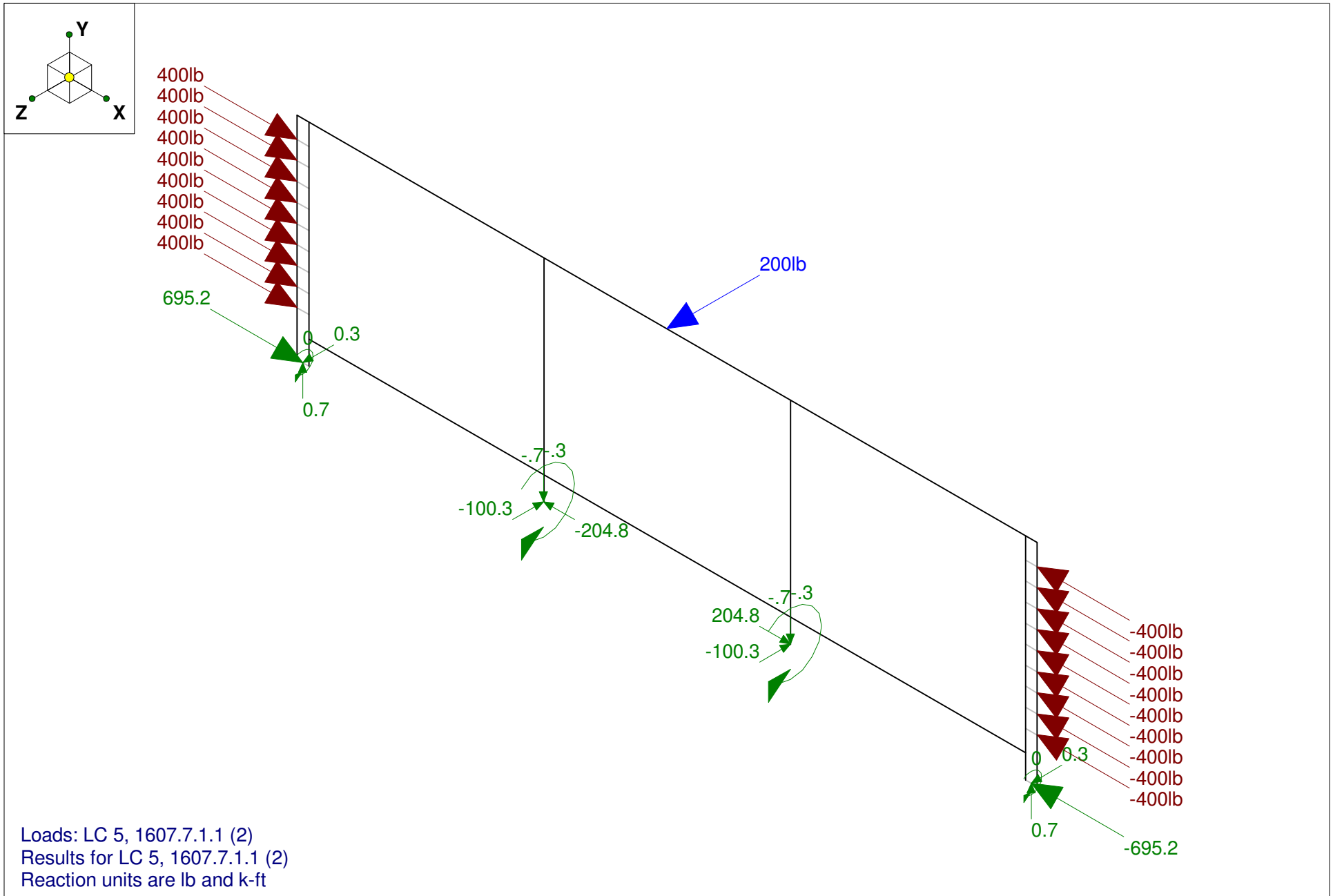
Loads: LC 3, 1607.7.1
Results for LC 3, 1607.7.1
Reaction units are lb and k-ft

Ferrari Shields & Associates	D1b - 3"x1" RECT TUBE x 36.5" HIGH RAIL W/ BOTTOM RAIL	
o'c		Oct 29, 2008 at 8:56 AM
08196		D1b-3x1.R3D



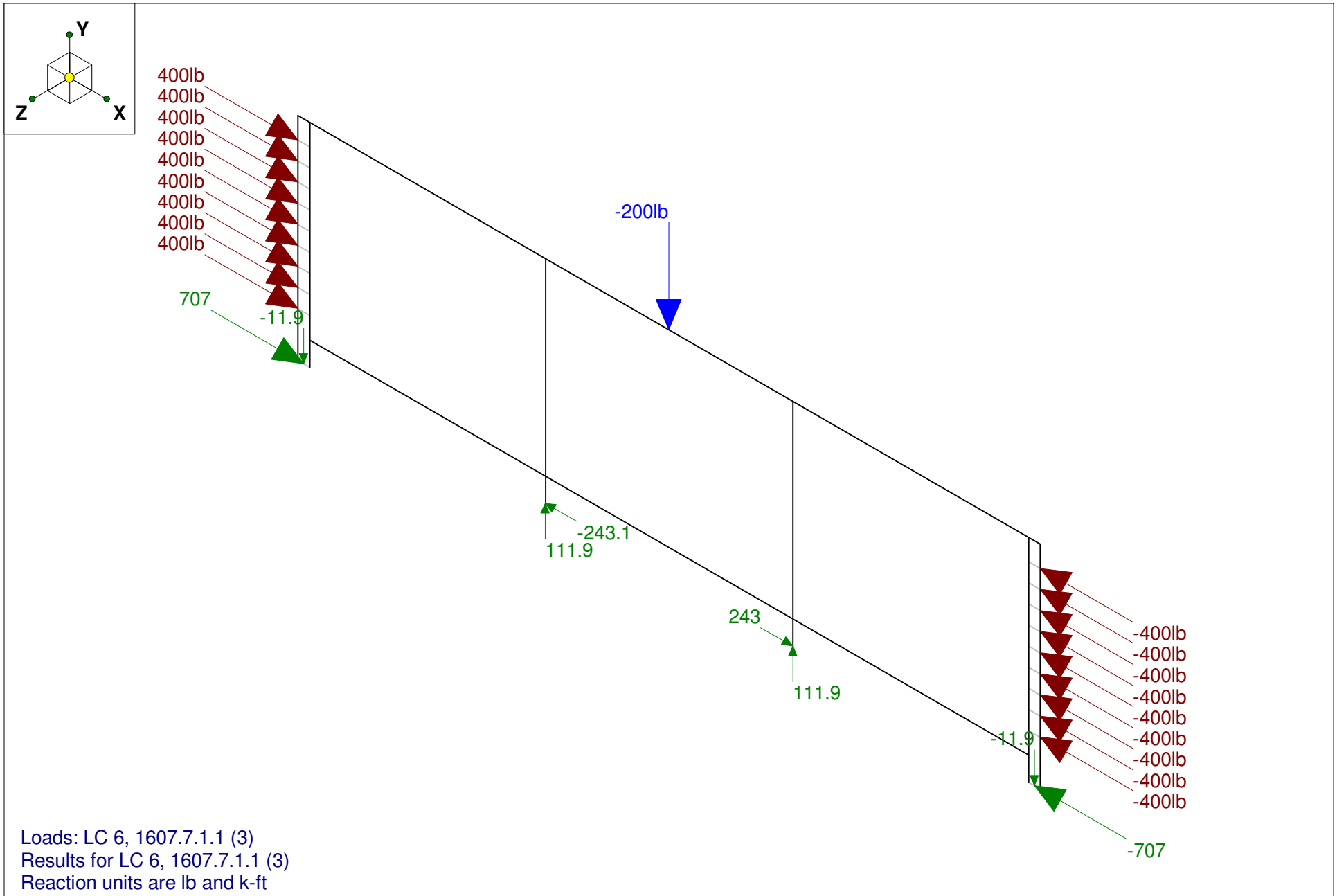
Loads: LC 4, 1607.7.1.1 (1)
Results for LC 4, 1607.7.1.1 (1)
Reaction units are lb and k-ft

Ferrari Shields & Associates	D1b - 3"x1" RECT TUBE x 36.5" HIGH RAIL W/ BOTTOM RAIL	
o'c		Oct 29, 2008 at 8:56 AM
08196		D1b-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	D1b - 3"x1" RECT TUBE x 36.5" HIGH RAIL W/ BOTTOM RAIL	
o'c		Oct 29, 2008 at 8:57 AM
08196		D1b-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	D1b - 3"x1" RECT TUBE x 36.5" HIGH RAIL W/ BOTTOM RAIL	
o'c		Oct 29, 2008 at 8:57 AM
08196		D1b-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 99: ASD
Wood Code	NDS 91/97: 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	POST	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				18				
2	1607.7.1.2	None				16				

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area (Mem...	Surface (Pl...
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	POST	Column	Tube	A500Gr42	Typical
2	M2	N3	N4		90	POST	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	POST	Column	Tube	A500Gr42	Typical
6	M6	N7	N8		90	POST	Column	Tube	A500Gr42	Typical
7	M7	N8	N6		90	RAIL	Beam	Tube	A500Gr42	Typical
8	M8	N29	N30		90	POST	Column	Tube	A500Gr42	Typical
9	M9	N41	N42		90	POST	Column	Tube	A500Gr42	Typical
10	M10	N1	N53			LINK	Beam	None	GEN_RIGID	Default
11	M11	N41	N54			LINK	Beam	None	GEN_RIGID	Default
12	M12	N53	N29			LINK	Beam	None	GEN_RIGID	Default
13	M13	N54	N5			LINK	Beam	None	GEN_RIGID	Default
14	M15	N11	N32			LINK	Beam	None	GEN_RIGID	Default
15	M16	N13	N33			LINK	Beam	None	GEN_RIGID	Default
16	M17	N15	N34			LINK	Beam	None	GEN_RIGID	Default
17	M18	N17	N35			LINK	Beam	None	GEN_RIGID	Default
18	M19	N19	N36			LINK	Beam	None	GEN_RIGID	Default
19	M20	N21	N37			LINK	Beam	None	GEN_RIGID	Default
20	M21	N23	N38			LINK	Beam	None	GEN_RIGID	Default
21	M22	N25	N39			LINK	Beam	None	GEN_RIGID	Default
22	M23	N27	N40			LINK	Beam	None	GEN_RIGID	Default
23	M25	N44	N12			LINK	Beam	None	GEN_RIGID	Default
24	M26	N45	N14			LINK	Beam	None	GEN_RIGID	Default
25	M27	N46	N16			LINK	Beam	None	GEN_RIGID	Default
26	M28	N47	N18			LINK	Beam	None	GEN_RIGID	Default
27	M29	N48	N20			LINK	Beam	None	GEN_RIGID	Default
28	M30	N49	N22			LINK	Beam	None	GEN_RIGID	Default
29	M31	N50	N24			LINK	Beam	None	GEN_RIGID	Default
30	M32	N51	N26			LINK	Beam	None	GEN_RIGID	Default
31	M33	N52	N28			LINK	Beam	None	GEN_RIGID	Default
32	M34	N31	N59		90	RAIL	Beam	Tube	A500Gr42	Typical
33	M35	N59	N60		90	RAIL	Beam	Tube	A500Gr42	Typical
34	M36	N60	N43		90	RAIL	Beam	Tube	A500Gr42	Typical

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	-204.752	1	111.908	6	0	1	0	1	0	1	0	1
2		min	-243.06	6	-.68	4	-176.056	3	-.474	3	0	1	0	1
3	N7	max	243.028	6	111.913	6	0	1	0	1	0	1	0	1
4		min	204.752	1	-.68	4	-176.056	3	-.474	3	0	1	0	1
5	N53	max	762.337	2	.68	4	.281	5	0	1	0	1	0	1
6		min	695.215	1	-11.91	6	-86.444	3	-.339	3	0	1	0	1
7	N54	max	-695.215	1	.68	4	11.008	4	.001	2	0	1	0	1
8		min	-762.337	2	-11.912	6	-86.444	3	-.339	3	0	1	0	1
9	Totals:	max	0	2	200	6	0	1						
10		min	0	4	0	2	-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	-297.536	1	0	1	-173.641	6	.008	3	.058	2	0	1
2			min	-338.519	2	-41.048	3	-183.1	2	0	1	.055	6	-.166	3
3		2	max	2288.312	2	24.592	5	-839.715	1	.011	3	-.014	6	0	1
4			min	2127.289	6	-12.302	2	-918.129	2	0	1	-.014	2	-.131	3
5		3	max	6135.628	2	19.263	5	-142.053	1	.013	3	-.094	1	0	1
6			min	5592.918	1	-22.602	3	-152.239	2	0	2	-.103	2	-.091	3
7		4	max	4628.828	2	18.605	5	521.22	2	.013	3	-.108	1	0	1
8			min	4320.617	1	-22.785	3	466.137	6	0	2	-.117	2	-.047	3
9		5	max	596.226	6	12.4	5	842.348	2	.013	3	.084	2	0	2
10			min	558.253	4	-19.337	3	796.842	4	0	2	.078	6	-.012	3
11	M2	1	max	111.908	6	0	1	-204.752	1	0	1	0	1	0	1
12			min	-.68	4	-176.056	3	-243.149	6	0	1	0	1	-.474	3
13		2	max	71.104	6	0	1	38.322	6	.012	5	-.01	1	0	1
14			min	-45.921	2	-162.709	3	17.173	1	0	2	-.018	6	-.348	3
15		3	max	71.104	6	0	1	38.337	6	.012	5	.01	6	0	1
16			min	-45.921	2	-162.709	3	17.173	1	0	2	.002	1	-.226	3
17		4	max	71.104	6	2.023	2	38.218	6	.012	5	.039	6	.002	2
18			min	-45.921	2	-162.709	3	17.173	1	0	2	.015	1	-.104	3
19		5	max	71.104	6	2.023	2	38.218	6	.012	5	.068	6	.025	4
20			min	-45.921	2	-162.709	3	17.173	1	0	2	.028	1	0	1
21	M3	1	max	838.235	2	11.44	5	-554.351	4	0	2	.084	2	0	2
22			min	793.201	4	-19.186	3	-592.259	6	-.012	3	.078	6	-.013	3
23		2	max	1820.728	2	0	1	-29.119	6	0	2	.08	2	.029	3
24			min	1713.482	6	-58.944	3	-46.163	2	-.018	3	.07	6	-.013	5
25		3	max	1820.728	2	0	1	-29.119	6	0	2	.045	6	.062	3
26			min	1713.482	6	-47.045	4	-46.163	2	-.018	3	.037	1	-.002	5
27		4	max	1820.728	2	28.556	3	-29.119	6	0	2	.019	6	.092	4
28			min	1713.482	6	-47.045	4	-46.163	2	-.018	3	0	2	0	1
29		5	max	1820.728	2	72.306	3	-29.119	6	0	2	-.006	6	.134	4
30			min	1713.482	6	-47.045	4	-46.163	2	-.018	3	-.041	2	0	1
31	M4	1	max	1839.29	2	47.372	4	0	1	.011	4	.062	6	.132	4
32			min	1737.344	4	-100	5	-99.995	6	0	1	-.011	2	0	1
33		2	max	1839.29	2	47.372	4	0	1	.011	4	-.01	1	.096	5
34			min	1737.344	4	-100	5	-99.995	6	0	1	-.026	6	0	1
35		3	max	1839.29	2	100	5	100.005	6	.011	4	-.01	1	.184	5
36			min	1737.344	4	0	1	0	1	0	1	-.113	6	0	1
37		4	max	1839.29	2	100	5	100.005	6	.011	4	-.01	1	.096	5

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
38			min	1737.344	4	0	1	0	1	0	1	-.026	6	-.001	2
39		5	max	1839.29	2	100	5	100.005	6	.011	4	.062	6	.009	5
40			min	1737.344	4	0	1	0	1	0	1	-.011	2	-.034	4
41	M5	1	max	-297.536	1	4.725	4	183.1	2	0	1	-.055	6	.002	4
42			min	-338.519	2	-41.048	3	173.643	6	-.008	3	-.058	2	-.166	3
43		2	max	2288.312	2	24.592	5	918.129	2	0	1	.014	2	0	2
44			min	2127.299	6	-8.791	3	839.715	1	-.011	3	.014	6	-.131	3
45		3	max	6135.628	2	19.263	5	152.239	2	0	1	.103	2	0	2
46			min	5592.918	1	-22.602	3	142.053	1	-.013	3	.094	1	-.091	3
47		4	max	4628.828	2	18.605	5	-466.138	6	0	1	.117	2	0	1
48			min	4320.617	1	-22.785	3	-521.22	2	-.013	3	.108	1	-.047	3
49		5	max	596.223	6	12.4	5	-796.842	4	0	1	-.078	6	0	1
50			min	558.253	4	-19.337	3	-842.348	2	-.013	3	-.084	2	-.012	3
51	M6	1	max	111.913	6	0	1	243.117	6	0	1	0	1	0	1
52			min	-.68	4	-176.056	3	204.752	1	0	1	0	1	-.474	3
53		2	max	71.11	6	0	1	-17.173	1	0	1	.018	6	0	1
54			min	-45.921	2	-162.709	3	-38.281	6	-.012	5	.01	1	-.348	3
55		3	max	71.11	6	0	1	-17.173	1	0	1	-.002	1	0	1
56			min	-45.921	2	-162.709	3	-38.281	6	-.012	5	-.01	6	-.226	3
57		4	max	71.11	6	0	1	-17.173	1	0	1	-.015	1	0	1
58			min	-45.921	2	-162.709	3	-38.281	6	-.012	5	-.039	6	-.104	3
59		5	max	71.11	6	0	1	-17.173	1	0	1	-.028	1	.018	3
60			min	-45.921	2	-162.709	3	-38.281	6	-.012	5	-.068	6	0	2
61	M7	1	max	1820.728	2	12.85	5	46.163	2	.018	3	-.006	6	.021	5
62			min	1713.484	6	-72.306	3	29.122	6	0	1	-.041	2	-.022	4
63		2	max	1820.728	2	12.85	5	46.163	2	.018	3	.019	6	.056	3
64			min	1713.484	6	-28.556	3	29.122	6	0	1	0	2	-.02	4
65		3	max	1820.728	2	15.194	3	46.163	2	.018	3	.045	6	.062	3
66			min	1713.484	6	-2.387	4	29.122	6	0	1	.037	1	-.018	4
67		4	max	1820.728	2	58.944	3	46.163	2	.018	3	.08	2	.029	3
68			min	1713.484	6	-2.387	4	29.122	6	0	1	.07	6	-.016	4
69		5	max	838.235	2	19.186	3	592.257	6	.012	3	.084	2	0	1
70			min	793.201	4	-11.44	5	554.351	4	0	1	.078	6	-.013	3
71	M8	1	max	339.185	2	.568	5	944.522	2	0	1	-.105	1	0	1
72			min	298.215	1	-45.737	3	869.116	1	-.008	3	-.115	2	-.174	3
73		2	max	-2091.354	1	0	1	-650.717	1	.015	3	-.048	1	0	1
74			min	-2242.392	2	-95.109	3	-713.935	2	0	1	-.051	2	-.137	3
75		3	max	-5550.364	1	0	1	-142.042	1	.013	3	-.094	1	0	1
76			min	-6089.708	2	-92.647	3	-152.227	2	0	2	-.103	2	-.094	3
77		4	max	-4278.063	1	.888	2	521.172	2	.013	3	-.108	1	0	1
78			min	-4582.907	2	-91.149	3	466.076	6	0	2	-.117	2	-.052	3
79		5	max	-515.7	4	1.038	2	982.492	2	.014	3	.125	2	0	1
80			min	-567.335	6	-82.368	3	916.24	6	0	2	.111	6	-.007	5
81	M9	1	max	339.185	2	6.281	4	-869.116	1	.008	3	.115	2	0	2
82			min	298.215	1	-45.737	3	-944.522	2	0	1	.105	1	-.174	3
83		2	max	-2091.354	1	0	1	713.935	2	0	1	.051	2	0	2
84			min	-2242.392	2	-95.109	3	650.717	1	-.015	3	.048	1	-.137	3
85		3	max	-5550.364	1	0	1	152.227	2	0	1	.103	2	0	2
86			min	-6089.708	2	-92.647	3	142.042	1	-.013	3	.094	1	-.094	3
87		4	max	-4278.063	1	0	1	-466.077	6	0	1	.117	2	0	1
88			min	-4582.907	2	-91.149	3	-521.172	2	-.013	3	.108	1	-.052	3
89		5	max	-515.7	4	0	1	-916.242	6	0	1	-.111	6	0	1
90			min	-567.329	6	-82.368	3	-982.492	2	-.014	3	-.125	2	-.007	5

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
91	M34	1	max	2782.01	2	13.468	3	45.537	2	0	2	-.09	6	.032	3
92			min	2575.044	1	0	1	41.043	6	-.003	5	-.099	2	0	1
93		2	max	2782.01	2	13.468	3	45.537	2	0	2	-.056	6	.021	3
94			min	2575.044	1	0	1	41.043	6	-.003	5	-.061	2	0	1
95		3	max	2782.01	2	13.468	3	45.537	2	0	2	-.021	1	.01	3
96			min	2575.044	1	0	1	41.043	6	-.003	5	-.023	2	0	1
97		4	max	2782.01	2	13.468	3	45.537	2	0	2	.015	2	.001	4
98			min	2575.044	1	0	1	41.043	6	-.003	5	.012	6	-.003	5
99		5	max	2782.01	2	13.468	3	45.537	2	0	2	.053	2	0	1
100			min	2575.044	1	0	1	41.043	6	-.003	5	.046	6	-.013	3
101	M35	1	max	2542.073	2	0	1	0	1	.003	4	0	6	0	5
102			min	2312.209	6	-2.814	4	-.003	6	0	1	-.002	2	-.006	4
103		2	max	2542.073	2	0	1	0	1	.003	4	0	6	0	5
104			min	2312.209	6	-2.814	4	-.003	6	0	1	-.002	2	-.005	3
105		3	max	2542.073	2	0	1	0	1	.003	4	0	6	0	5
106			min	2312.209	6	-2.814	4	-.003	6	0	1	-.002	2	-.005	3
107		4	max	2542.073	2	0	1	0	1	.003	4	0	6	.001	4
108			min	2312.209	6	-2.814	4	-.003	6	0	1	-.002	2	-.005	3
109		5	max	2542.073	2	0	1	0	1	.003	4	0	6	.004	4
110			min	2312.209	6	-2.814	4	-.003	6	0	1	-.002	2	-.005	3
111	M36	1	max	2782.01	2	0	1	-41.048	6	.003	5	.053	2	0	1
112			min	2575.044	1	-13.468	3	-45.537	2	0	1	.046	6	-.013	3
113		2	max	2782.01	2	0	1	-41.048	6	.003	5	.015	2	0	1
114			min	2575.044	1	-13.468	3	-45.537	2	0	1	.012	6	-.003	5
115		3	max	2782.01	2	0	1	-41.048	6	.003	5	-.021	1	.01	3
116			min	2575.044	1	-13.468	3	-45.537	2	0	1	-.023	2	0	1
117		4	max	2782.01	2	0	1	-41.048	6	.003	5	-.056	6	.021	3
118			min	2575.044	1	-13.468	3	-45.537	2	0	1	-.061	2	0	1
119		5	max	2782.01	2	0	1	-41.048	6	.003	5	-.09	6	.032	3
120			min	2575.044	1	-13.468	3	-45.537	2	0	1	-.099	2	0	1

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	HSS3X1X2	.638	19.875	2	.402	7.875	z	2	13014.147	21154.469	.683	1.528	2....	H1-1a
2	M2	HSS3X1X2	.368	3.75	3	.106	0	z	6	13014.147	21154.469	.683	1.528	1....	H1-1b
3	M3	HSS3X1X2	.248	2.188	2	.268	0	z	3	10920.289	21154.469	.683	1.528	1....	H1-1b
4	M4	HSS3X1X2	.246	21	6	.044	21	z	6	10920.289	21154.469	.683	1.528	1	H1-1b
5	M5	HSS3X1X2	.637	19.875	2	.402	7.875	z	2	13014.147	21154.469	.683	1.528	2....	H1-1a
6	M6	HSS3X1X2	.368	3.75	3	.106	0	z	6	13014.147	21154.469	.683	1.528	1....	H1-1b
7	M7	HSS3X1X2	.248	39.813	2	.268	40.25	z	3	10920.289	21154.469	.683	1.528	1....	H1-1b
8	M8	HSS3X1X2	.495	4.125	3	.806	4.125	z	2	13014.147	21154.469	.683	1.528	1....	H1-1b
9	M9	HSS3X1X2	.495	4.125	3	.806	4.125	z	2	13014.147	21154.469	.683	1.528	1....	H1-1b
10	M34	HSS3X1X2	.369	0	2	.025	0	z	5	11612.675	21154.469	.683	1.528	1....	H1-1a
11	M35	HSS3X1X2	.236	0	2	.005	0	z	4	10920.289	21154.469	.683	1.528	2....	H1-1a
12	M36	HSS3X1X2	.368	40	2	.025	0	z	5	11612.675	21154.469	.683	1.528	2....	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 99: ASD
Wood Code	NDS 91/97: 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
3	LDX2101	28000	11154	.3	.65	.49	60

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	TU3x1x2	Column	Tube	LDX2101	Typical	.902	.149	.918	.41
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				18				
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	LDX2101	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	LDX2101	Typical
6	M6	N7	N8		90	IPOST	Column	Tube	SS316	Typical
7	M7	N8	N6		90	RAIL	Beam	Tube	SS316	Typical
8	M8	N27	N28		90	EPOST	Column	Tube	LDX2101	Typical
9	M9	N39	N40		90	EPOST	Column	Tube	LDX2101	Typical
10	M10	N1	N51			LINK	Beam	None	GEN_RIGID	Default
11	M11	N39	N52			LINK	Beam	None	GEN_RIGID	Default
12	M12	N51	N27			LINK	Beam	None	GEN_RIGID	Default
13	M13	N52	N5			LINK	Beam	None	GEN_RIGID	Default
14	M14	N9	N30			LINK	Beam	None	GEN_RIGID	Default
15	M15	N11	N31			LINK	Beam	None	GEN_RIGID	Default
16	M16	N13	N32			LINK	Beam	None	GEN_RIGID	Default
17	M17	N15	N33			LINK	Beam	None	GEN_RIGID	Default
18	M18	N17	N34			LINK	Beam	None	GEN_RIGID	Default
19	M19	N19	N35			LINK	Beam	None	GEN_RIGID	Default
20	M20	N21	N36			LINK	Beam	None	GEN_RIGID	Default
21	M21	N23	N37			LINK	Beam	None	GEN_RIGID	Default
22	M22	N25	N38			LINK	Beam	None	GEN_RIGID	Default
23	M23	N42	N10			LINK	Beam	None	GEN_RIGID	Default
24	M24	N43	N12			LINK	Beam	None	GEN_RIGID	Default
25	M25	N44	N14			LINK	Beam	None	GEN_RIGID	Default
26	M26	N45	N16			LINK	Beam	None	GEN_RIGID	Default
27	M27	N46	N18			LINK	Beam	None	GEN_RIGID	Default
28	M28	N47	N20			LINK	Beam	None	GEN_RIGID	Default
29	M29	N48	N22			LINK	Beam	None	GEN_RIGID	Default
30	M30	N49	N24			LINK	Beam	None	GEN_RIGID	Default
31	M31	N50	N26			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	M32	N29	N57		90	RAIL	Beam	Tube	SS316	Typical
33	M33	N57	N58		90	RAIL	Beam	Tube	SS316	Typical
34	M34	N58	N41		90	RAIL	Beam	Tube	SS316	Typical

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	-206.817	1	111.983	6	0	1	0	1	0	1	0	1
2		min	-245.261	6	-.611	4	-175.862	3	-.477	3	0	1	0	1
3	N7	max	245.23	6	111.988	6	0	1	0	1	0	1	0	1
4		min	206.817	1	-.611	4	-175.862	3	-.477	3	0	1	0	1
5	N51	max	769.658	2	.611	4	0	1	0	1	0	1	0	1
6		min	701.974	1	-11.984	6	-86.638	3	-.335	3	0	1	0	1
7	N52	max	-701.974	1	.611	4	10.813	4	.002	4	0	1	0	1
8		min	-769.658	2	-11.986	6	-86.638	3	-.335	3	0	1	0	1
9	Totals:	max	0	4	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	-302.416	1	0	1	-170.157	6	.007	3	.057	2	0	1
2			min	-343.774	2	-41.366	3	-179.364	2	0	1	.054	6	-.163	3
3		2	max	2270.178	2	23.753	5	-844.777	1	.011	3	-.013	6	0	1
4			min	2110.284	6	-12.265	2	-923.574	2	0	1	-.014	2	-.129	3
5		3	max	6113.035	2	18.471	5	-142.371	1	.012	3	-.094	1	0	1
6			min	5572.544	1	-23.426	3	-152.574	2	0	2	-.104	2	-.09	3
7		4	max	4613.79	2	17.802	5	520.306	2	.012	3	-.109	1	0	1
8			min	4306.652	1	-23.645	3	465.313	6	0	2	-.117	2	-.046	3
9		5	max	604.049	6	12.06	5	840.521	2	.013	3	.085	2	0	2
10			min	565.688	4	-20.217	3	795.15	4	0	2	.079	6	-.012	3
11	M2	1	max	111.983	6	0	1	-206.817	1	0	1	0	1	0	1
12			min	-.611	4	-175.862	3	-245.347	6	0	1	0	1	-.477	3
13		2	max	70.938	6	0	1	38.496	6	.011	5	-.011	1	0	1
14			min	-46.103	2	-163.219	3	17.334	1	0	2	-.019	6	-.35	3
15		3	max	70.938	6	0	1	38.51	6	.011	5	.01	6	0	1
16			min	-46.103	2	-163.219	3	17.334	1	0	2	.002	1	-.228	3
17		4	max	70.938	6	1.965	2	38.396	6	.011	5	.039	6	.002	2
18			min	-46.103	2	-163.219	3	17.334	1	0	2	.015	1	-.106	3
19		5	max	70.938	6	1.965	2	38.396	6	.011	5	.068	6	.023	4
20			min	-46.103	2	-163.219	3	17.334	1	0	2	.028	1	0	1
21	M3	1	max	836.532	2	11.149	5	-561.94	4	0	2	.085	2	0	2
22			min	791.619	4	-20.054	3	-600.239	6	-.012	3	.079	6	-.013	3
23		2	max	1819.845	2	0	1	-29.277	6	0	2	.08	2	.03	3
24			min	1712.648	6	-58.208	3	-46.336	2	-.017	3	.07	6	-.012	5
25		3	max	1819.845	2	0	1	-29.277	6	0	2	.045	6	.062	3
26			min	1712.648	6	-46.732	4	-46.336	2	-.017	3	.037	1	-.001	5
27		4	max	1819.845	2	29.292	3	-29.277	6	0	2	.019	6	.093	4
28			min	1712.648	6	-46.732	4	-46.336	2	-.017	3	0	2	0	1
29		5	max	1819.845	2	73.042	3	-29.277	6	0	2	-.006	6	.134	4
30			min	1712.648	6	-46.732	4	-46.336	2	-.017	3	-.041	2	0	1
31	M4	1	max	1838.582	2	47.381	4	0	1	.01	4	.062	6	.133	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
32			min	1736.687	4	-100	5	-99.996	6	0	1	-.011	2	0	1
33		2	max	1838.582	2	47.381	4	0	1	.01	4	-.01	1	.097	5
34			min	1736.687	4	-100	5	-99.996	6	0	1	-.026	6	0	1
35		3	max	1838.582	2	100	5	100.004	6	.01	4	-.01	1	.185	5
36			min	1736.687	4	0	1	0	1	0	1	-.113	6	0	1
37		4	max	1838.582	2	100	5	100.004	6	.01	4	-.01	1	.097	5
38			min	1736.687	4	0	1	0	1	0	1	-.026	6	-.001	2
39		5	max	1838.582	2	100	5	100.004	6	.01	4	.062	6	.01	5
40			min	1736.687	4	0	1	0	1	0	1	-.011	2	-.033	4
41	M5	1	max	-302.416	1	4.6	4	179.364	2	0	1	-.054	6	.003	4
42			min	-343.774	2	-41.366	3	170.159	6	-.007	3	-.057	2	-.163	3
43		2	max	2270.178	2	23.753	5	923.574	2	0	1	.014	2	0	4
44			min	2110.294	6	-10.083	3	844.777	1	-.011	3	.013	6	-.129	3
45		3	max	6113.035	2	18.471	5	152.574	2	0	1	.104	2	0	2
46			min	5572.544	1	-23.426	3	142.371	1	-.012	3	.094	1	-.09	3
47		4	max	4613.79	2	17.802	5	-465.314	6	0	1	.117	2	0	2
48			min	4306.652	1	-23.645	3	-520.306	2	-.012	3	.109	1	-.046	3
49		5	max	604.046	6	12.06	5	-795.15	4	0	1	-.079	6	0	1
50			min	565.688	4	-20.217	3	-840.521	2	-.013	3	-.085	2	-.012	3
51	M6	1	max	111.988	6	0	1	245.317	6	0	1	0	1	0	1
52			min	-.611	4	-175.862	3	206.817	1	0	1	0	1	-.477	3
53		2	max	70.944	6	0	1	-17.334	1	0	1	.019	6	0	1
54			min	-46.103	2	-163.219	3	-38.457	6	-.011	5	.011	1	-.35	3
55		3	max	70.944	6	0	1	-17.334	1	0	1	-.002	1	0	1
56			min	-46.103	2	-163.219	3	-38.457	6	-.011	5	-.01	6	-.228	3
57		4	max	70.944	6	0	1	-17.334	1	0	1	-.015	1	0	1
58			min	-46.103	2	-163.219	3	-38.457	6	-.011	5	-.039	6	-.106	3
59		5	max	70.944	6	0	1	-17.334	1	0	1	-.028	1	.017	3
60			min	-46.103	2	-163.219	3	-38.457	6	-.011	5	-.068	6	0	2
61	M7	1	max	1819.845	2	12.547	5	46.336	2	.017	3	-.006	6	.021	5
62			min	1712.65	6	-73.042	3	29.28	6	0	1	-.041	2	-.022	4
63		2	max	1819.845	2	12.547	5	46.336	2	.017	3	.019	6	.056	3
64			min	1712.65	6	-29.292	3	29.28	6	0	1	0	2	-.02	4
65		3	max	1819.845	2	14.458	3	46.336	2	.017	3	.045	6	.062	3
66			min	1712.65	6	-2.655	4	29.28	6	0	1	.037	1	-.018	4
67		4	max	1819.845	2	58.208	3	46.336	2	.017	3	.08	2	.03	3
68			min	1712.65	6	-2.655	4	29.28	6	0	1	.07	6	-.015	4
69		5	max	836.532	2	20.054	3	600.236	6	.012	3	.085	2	0	1
70			min	791.619	4	-11.149	5	561.94	4	0	1	.079	6	-.013	3
71	M8	1	max	344.368	2	.432	5	948.121	2	0	1	-.105	1	0	1
72			min	303.027	1	-45.608	3	872.436	1	-.008	3	-.114	2	-.171	3
73		2	max	-2074.336	1	0	1	-645.952	1	.014	3	-.049	1	0	1
74			min	-2224.075	2	-93.043	3	-708.761	2	0	1	-.052	2	-.135	3
75		3	max	-5529.823	1	0	1	-142.361	1	.012	3	-.094	1	0	1
76			min	-6066.932	2	-90.215	3	-152.563	2	0	2	-.104	2	-.092	3
77		4	max	-4263.931	1	1	2	520.242	2	.012	3	-.109	1	0	1
78			min	-4567.687	2	-88.723	3	465.238	6	0	2	-.117	2	-.051	3
79		5	max	-522.967	4	1.126	2	983.313	2	.013	3	.126	2	0	1
80			min	-574.991	6	-80.862	3	916.869	6	0	2	.112	6	-.007	5
81	M9	1	max	344.368	2	6.212	4	-872.436	1	.008	3	.114	2	0	2
82			min	303.027	1	-45.608	3	-948.121	2	0	1	.105	1	-.171	3
83		2	max	-2074.336	1	0	1	708.761	2	0	1	.052	2	0	2
84			min	-2224.075	2	-93.043	3	645.952	1	-.014	3	.049	1	-.135	3

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
85		3	max	-5529.823	1	0	1	152.563	2	0	1	.104	2	0	2
86			min	-6066.932	2	-90.215	3	142.361	1	-.012	3	.094	1	-.092	3
87		4	max	-4263.931	1	0	1	-465.238	6	0	1	.117	2	0	1
88			min	-4567.687	2	-88.723	3	-520.242	2	-.012	3	.109	1	-.051	3
89		5	max	-522.967	4	0	1	-916.871	6	0	1	-.112	6	0	1
90			min	-574.985	6	-80.862	3	-983.313	2	-.013	3	-.126	2	-.007	5
91	M32	1	max	2790.213	2	12.765	3	45.782	2	0	2	-.091	6	.031	3
92			min	2582.621	1	0	1	41.274	6	-.003	5	-.099	2	0	1
93		2	max	2790.213	2	12.765	3	45.782	2	0	2	-.056	6	.02	3
94			min	2582.621	1	0	1	41.274	6	-.003	5	-.061	2	0	1
95		3	max	2790.213	2	12.765	3	45.782	2	0	2	-.021	1	.009	3
96			min	2582.621	1	0	1	41.274	6	-.003	5	-.023	2	0	1
97		4	max	2790.213	2	12.765	3	45.782	2	0	2	.015	2	0	4
98			min	2582.621	1	0	1	41.274	6	-.003	5	.012	6	-.002	5
99		5	max	2790.213	2	12.765	3	45.782	2	0	2	.053	2	0	1
100			min	2582.621	1	0	1	41.274	6	-.003	5	.047	6	-.012	3
101	M33	1	max	2547.87	2	0	1	0	1	.002	4	0	6	0	5
102			min	2317.528	6	-2.675	4	-.003	6	0	1	-.002	2	-.006	4
103		2	max	2547.87	2	0	1	0	1	.002	4	0	6	0	5
104			min	2317.528	6	-2.675	4	-.003	6	0	1	-.002	2	-.005	3
105		3	max	2547.87	2	0	1	0	1	.002	4	0	6	0	5
106			min	2317.528	6	-2.675	4	-.003	6	0	1	-.002	2	-.005	3
107		4	max	2547.87	2	0	1	0	1	.002	4	0	6	.001	4
108			min	2317.528	6	-2.675	4	-.003	6	0	1	-.002	2	-.005	3
109		5	max	2547.87	2	0	1	0	1	.002	4	0	6	.003	4
110			min	2317.528	6	-2.675	4	-.003	6	0	1	-.002	2	-.005	3
111	M34	1	max	2790.213	2	0	1	-41.279	6	.003	5	.053	2	0	1
112			min	2582.621	1	-12.765	3	-45.782	2	0	3	.047	6	-.012	3
113		2	max	2790.213	2	0	1	-41.279	6	.003	5	.015	2	0	1
114			min	2582.621	1	-12.765	3	-45.782	2	0	3	.012	6	-.002	5
115		3	max	2790.213	2	0	1	-41.279	6	.003	5	-.021	1	.009	3
116			min	2582.621	1	-12.765	3	-45.782	2	0	3	-.023	2	0	1
117		4	max	2790.213	2	0	1	-41.279	6	.003	5	-.056	6	.02	3
118			min	2582.621	1	-12.765	3	-45.782	2	0	3	-.061	2	0	1
119		5	max	2790.213	2	0	1	-41.279	6	.003	5	-.091	6	.031	3
120			min	2582.621	1	-12.765	3	-45.782	2	0	3	-.099	2	0	1

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	TU3x1x2	.493	19.875	2	.279	7.875	z	2	15890.123	32421.557	1.052	2.403	2....	H1-1a
2	M2	TU3x1x2	.474	3.75	3	.148	0	z	6	11348.816	16210.778	.526	1.202	1....	H1-1b
3	M3	TU3x1x2	.306	2.188	2	.373	0	z	3	9977.855	16210.778	.526	1.202	1....	H1-1b
4	M4	TU3x1x2	.303	21	6	.060	21	z	6	9977.855	16210.778	.526	1.202	1	H1-1b
5	M5	TU3x1x2	.493	19.875	2	.279	7.875	z	2	15890.123	32421.557	1.052	2.403	2....	H1-1a
6	M6	TU3x1x2	.474	3.75	3	.148	0	z	6	11348.816	16210.778	.526	1.202	1....	H1-1b
7	M7	TU3x1x2	.305	39.813	2	.373	40.25	z	3	9977.855	16210.778	.526	1.202	1....	H1-1b
8	M8	TU3x1x2	.323	4.125	3	.558	4.125	z	2	15890.123	32421.557	1.052	2.403	1....	H1-1b
9	M9	TU3x1x2	.323	4.125	3	.558	4.125	z	2	15890.123	32421.557	1.052	2.403	1....	H1-1b
10	M32	TU3x1x2	.435	0	2	.034	0	z	5	10438.36	16210.778	.526	1.202	1....	H1-1a
11	M33	TU3x1x2	.259	0	2	.007	0	z	4	9977.855	16210.778	.526	1.202	2....	H1-1a
12	M34	TU3x1x2	.435	40	2	.034	0	z	5	10438.36	16210.778	.526	1.202	2....	H1-1a

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