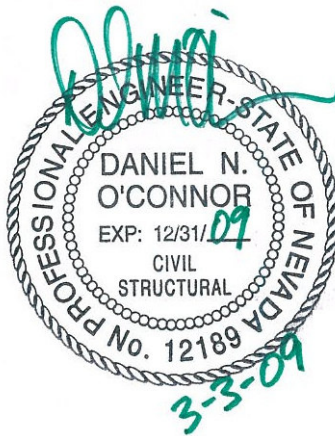
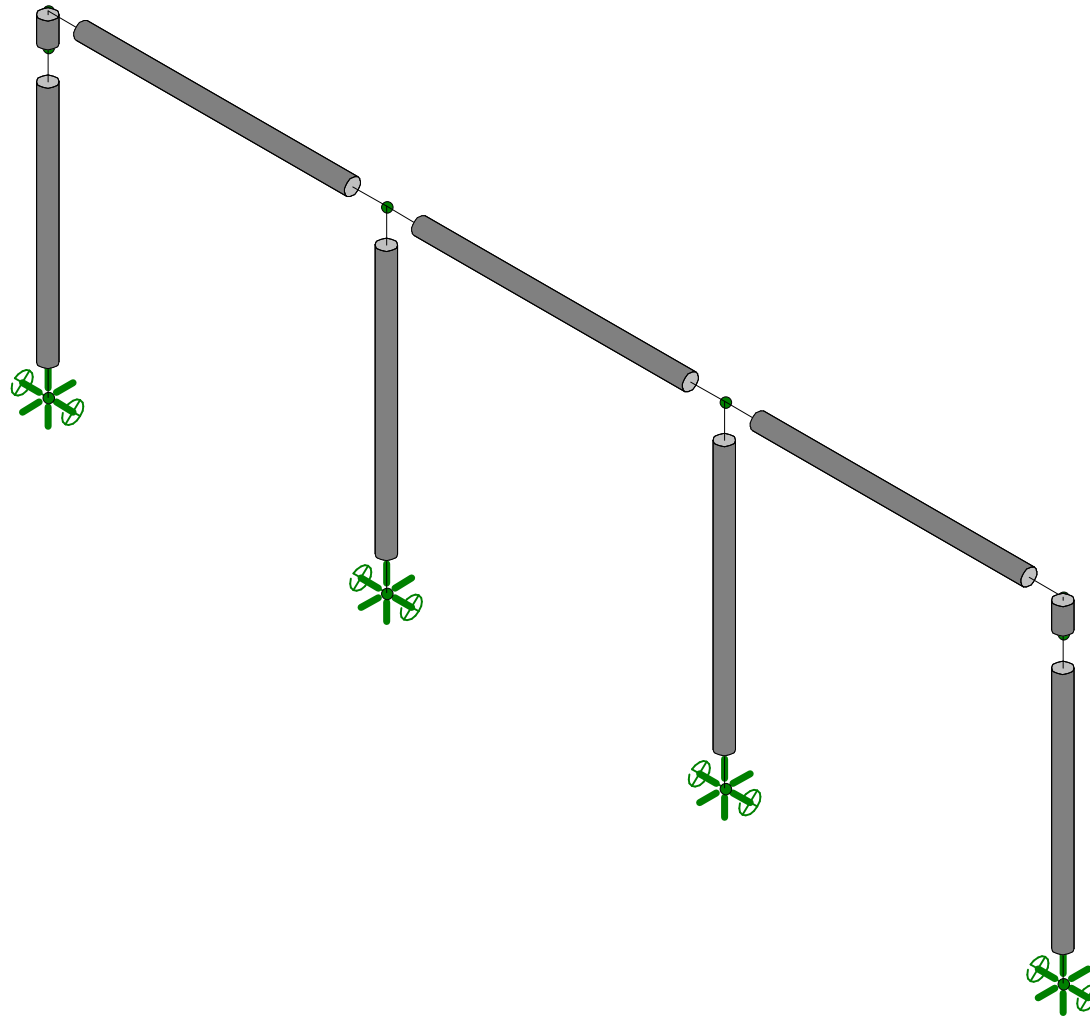
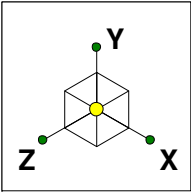


**D24—1-1/2" PIPE x 42-1/2" HIGH RAIL WITHOUT BOTTOM RAIL**

Building Code:	<b>2006 <i>International Building Code</i> 2007 <i>California Building Code</i> AISC <i>Steel Construction Manual</i>, 13th ed—ASD</b>
Material:	<b>Carbon Steel, A53, Grade B, Fy = 35 ksi or Carbon Steel, A501, Grade B, Fy = 36 ksi Stainless Steel, LDX 2101 (UNS S32101), Fy = 60 ksi</b>
Height:	<b>42.5"</b>
Anchor Post:	<b>Carbon Steel: 1-1/2" <i>SPECIAL—NO SCHD</i> (1.9" OD x 0.650") Pipe Stainless Steel: 1-1/2" <i>XXS</i> (1.90" OD x 0.400") Pipe</b>
Intermediate Posts:	<b>Carbon Steel: 1-1/2" <i>SCHD 40</i> (1.90" OD x 0.145") Pipe Stainless Steel: 1-1/2" <i>SCHD 40</i> (1.90" OD x 0.145") Pipe</b>
Top Rail Adjacent to Anchor Post:	<b>Carbon Steel: 1-1/2" <i>SPECIAL—NO SCHD</i> (1.9" OD x 0.650") Pipe Stainless Steel: 1-1/2" <i>XXS</i> (1.90" OD x 0.400") Pipe</b>
Top Rail Elsewhere:	<b>Carbon Steel: 1-1/2" <i>SCHD 40</i> (1.90" OD x 0.145") Pipe Stainless Steel: 1-1/2" <i>SCHD 40</i> (1.90" OD x 0.145") Pipe</b>
Number of Cables:	<b>12</b>
Cable Spacing:	<b>3.12"</b>
Cable Prestress:	<b>400 lbs</b>



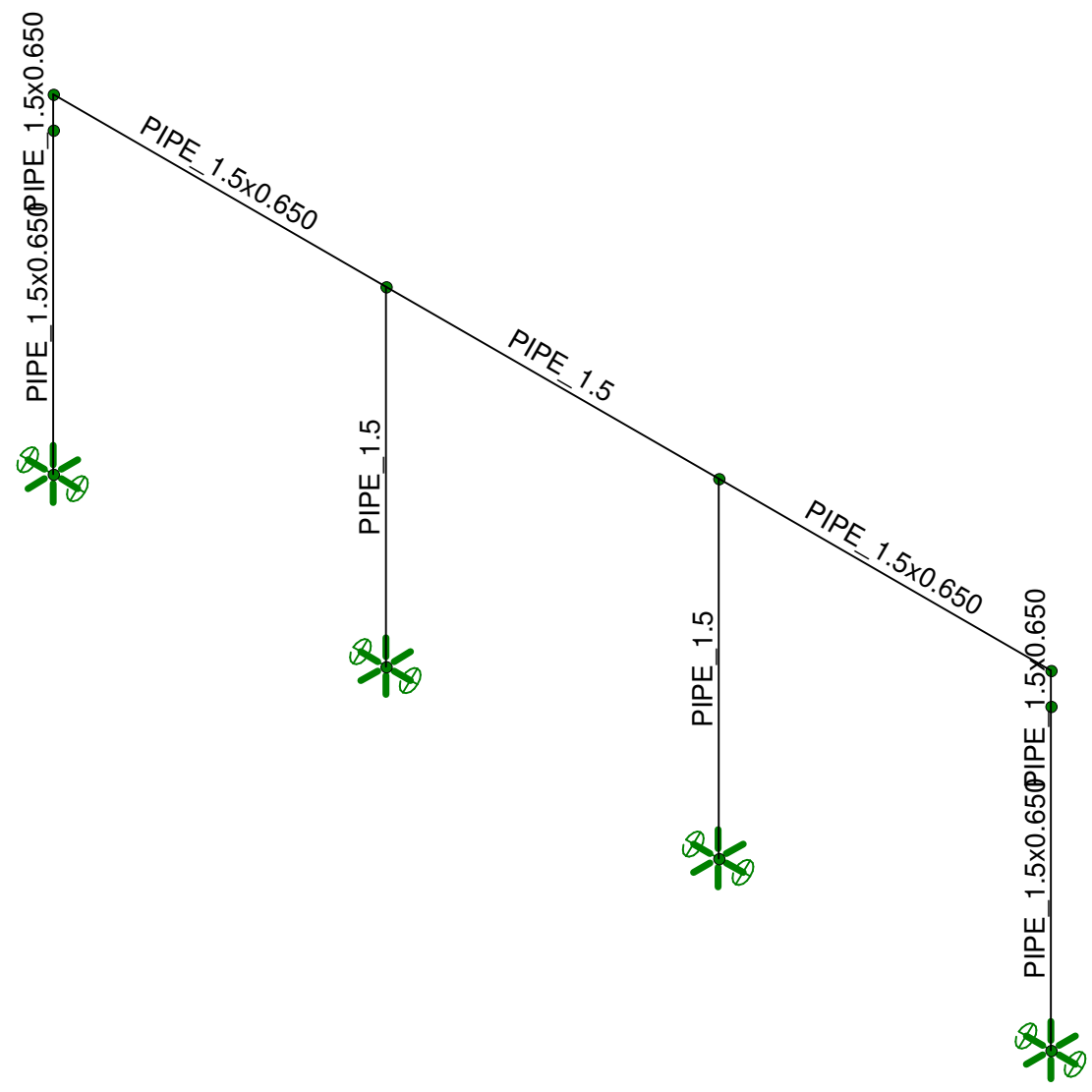
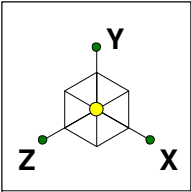
**Disclaimer:** Analysis and Structural Certification DOES NOT include base plates or anchorage to supporting structure. Where required by the Local Building Official, these shall be reviewed and designed by the project Structural Engineer of Record.



Ferrari Shields & Associates  
Dan O'Connor  
08196

D24 - 1.5" PIPE x 42.5" HIGH RAIL W/O BTM RAIL

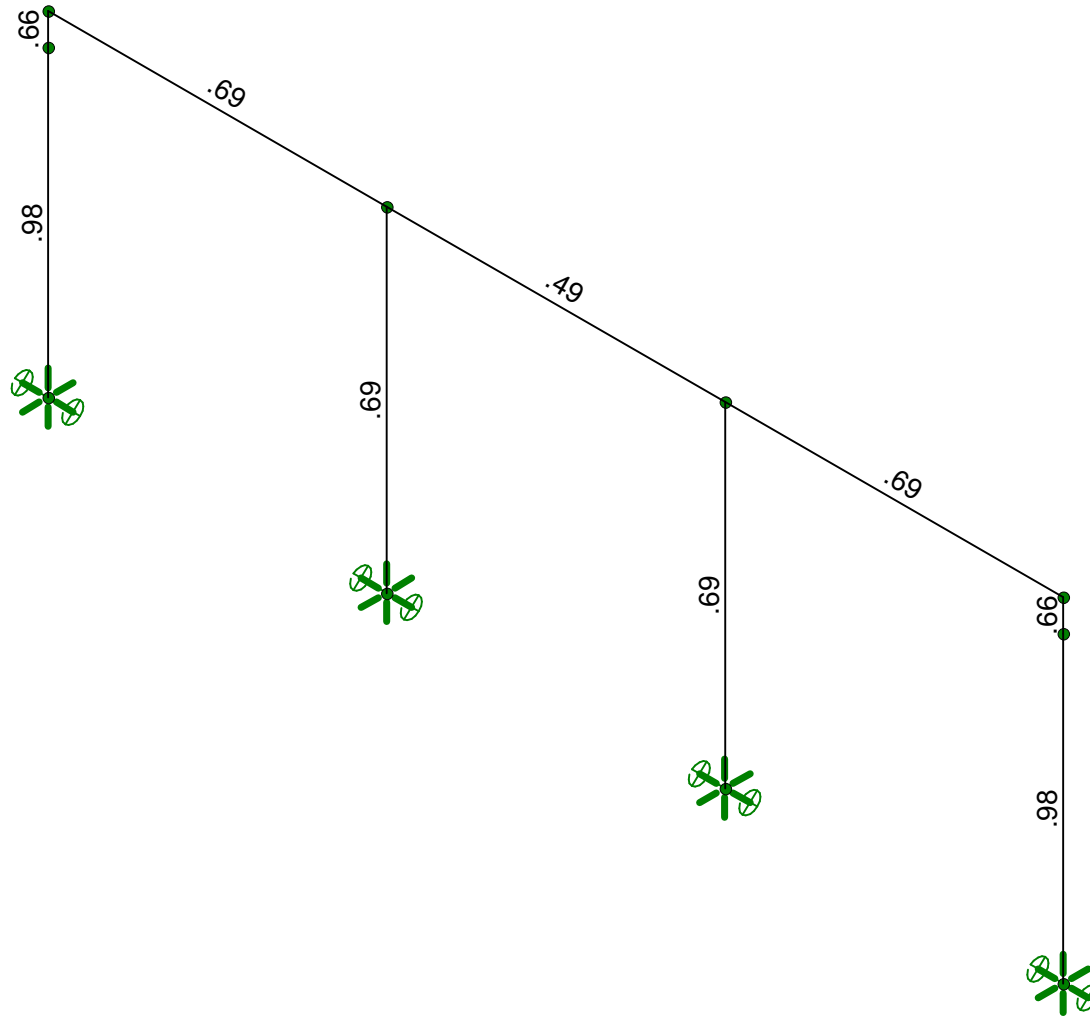
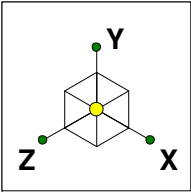
Dec 9, 2008 at 4:47 PM  
D24.R3D



Ferrari Shields & Associates  
Dan O'Connor  
08196

D24 - 1.5" PIPE x 42.5" HIGH RAIL W/O BTM RAIL

Dec 9, 2008 at 4:46 PM  
D24.R3D



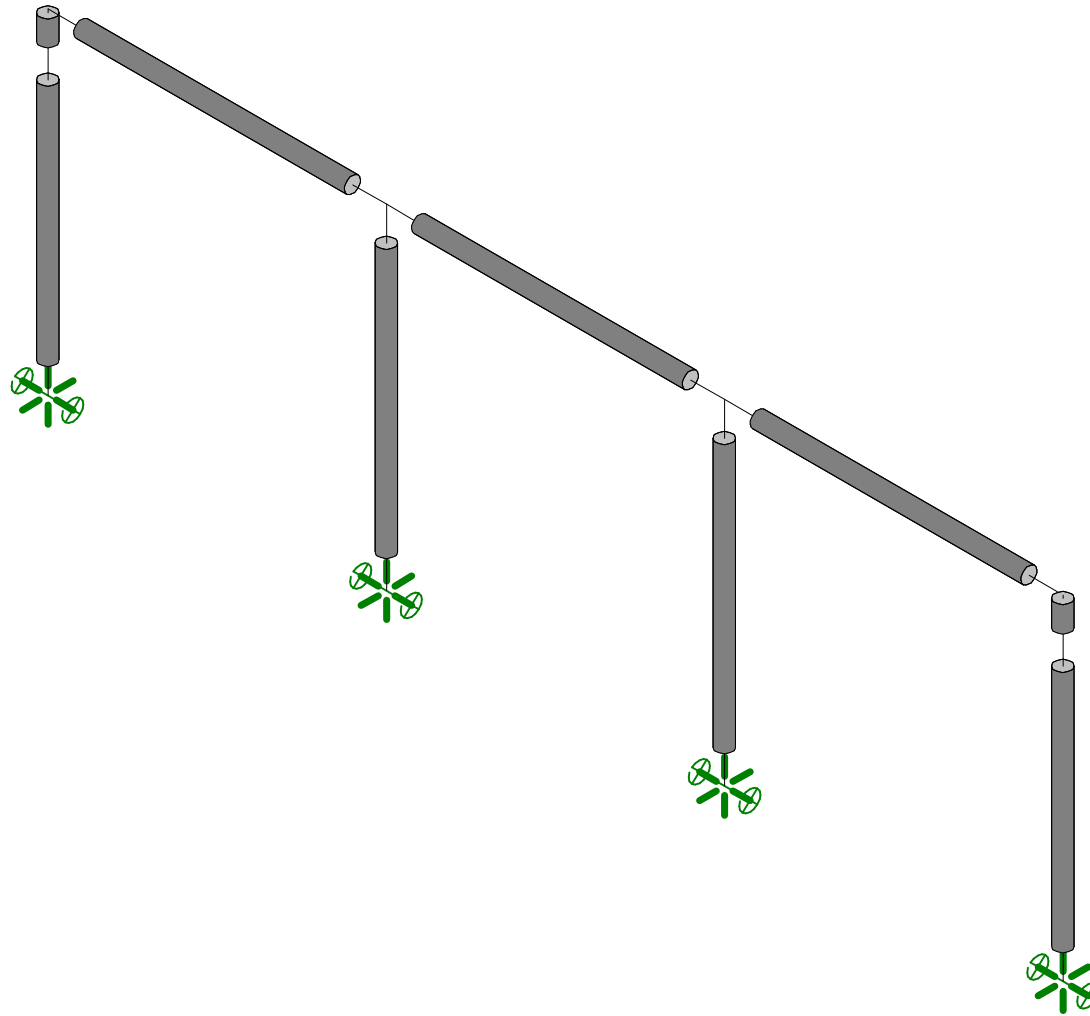
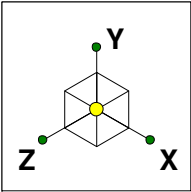
Member Code Checks Displayed  
Solution: Envelope

Ferrari Shields & Associates  
Dan O'Connor  
08196

D24 - 1.5" PIPE x 42.5" HIGH RAIL W/O BTM RAIL

Dec 9, 2008 at 4:47 PM

D24.R3D

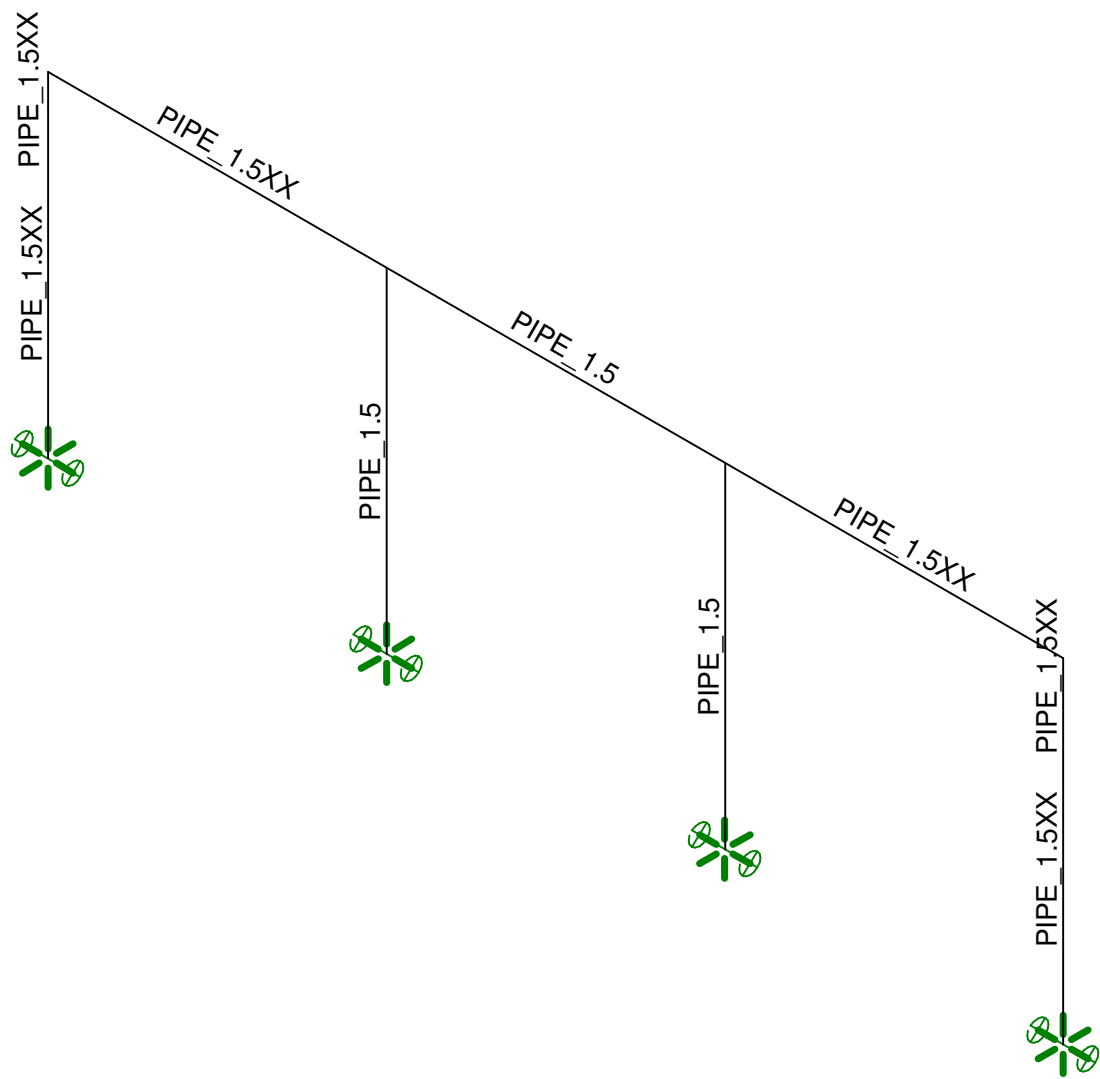
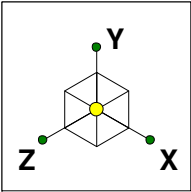


Ferrari Shields & Associates  
Dan O'Connor  
08196

D24 (SS) - 1.5" PIPE x 42.5" HIGH RAIL W/O BTM RAIL

Dec 9, 2008 at 4:51 PM

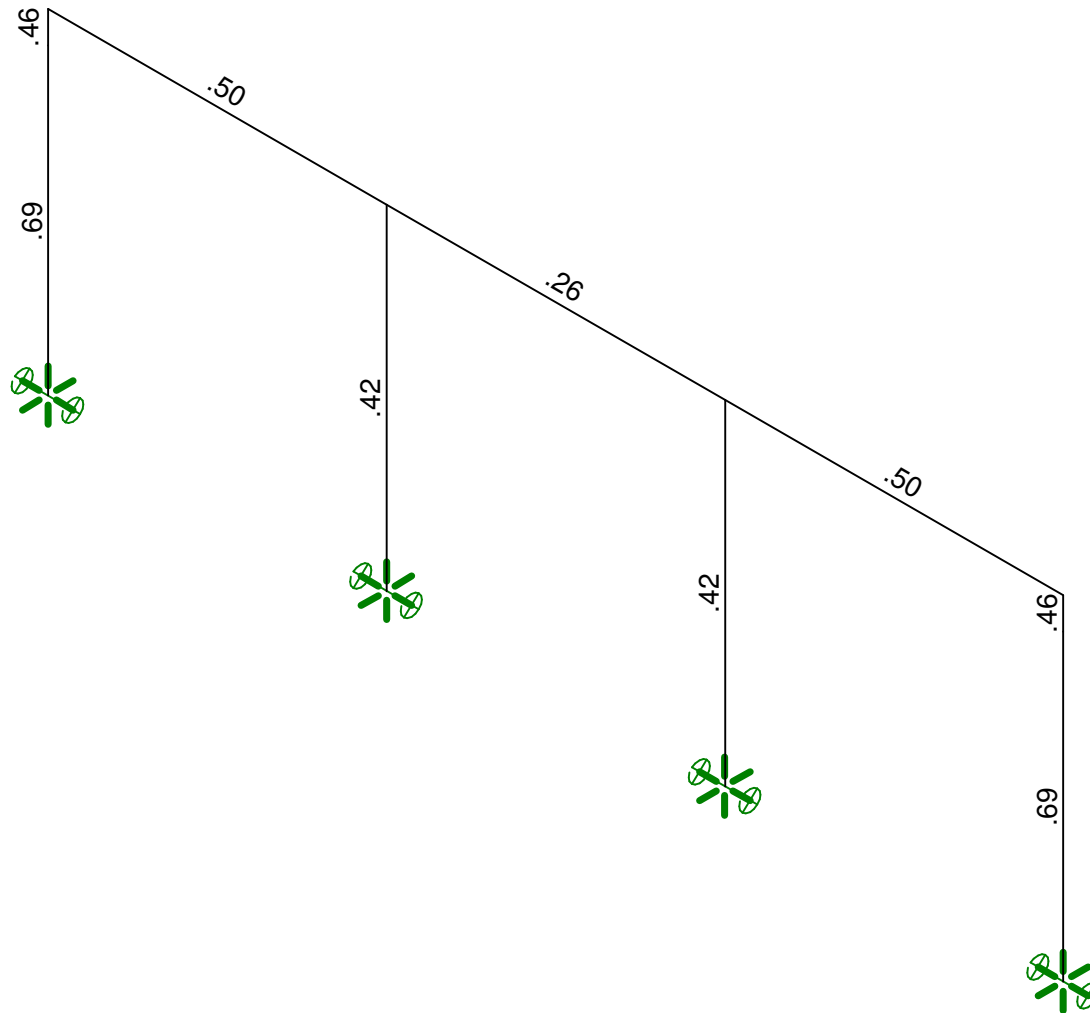
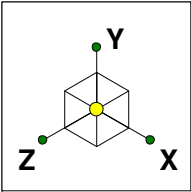
D24ss.R3D



Ferrari Shields & Associates  
Dan O'Connor  
08196

D24 (SS) - 1.5" PIPE x 42.5" HIGH RAIL W/O BTM RAIL

Dec 9, 2008 at 4:51 PM  
D24ss.R3D



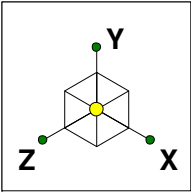
Member Code Checks Displayed  
Solution: Envelope  
Reaction units are lb and k-ft

Ferrari Shields & Associates  
Dan O'Connor  
08196

D24 (SS) - 1.5" PIPE x 42.5" HIGH RAIL W/O BTM RAIL

Dec 9, 2008 at 4:52 PM

D24ss.R3D



400lb  
400lb  
400lb  
400lb  
400lb  
400lb  
400lb  
400lb  
400lb  
400lb  
400lb



411.7

-2114.6

-411.7  
43.9

-411.7

-43.9

2114.6

411.7

-400lb  
-400lb  
-400lb  
-400lb  
-400lb  
-400lb  
-400lb  
-400lb  
-400lb  
-400lb  
-400lb



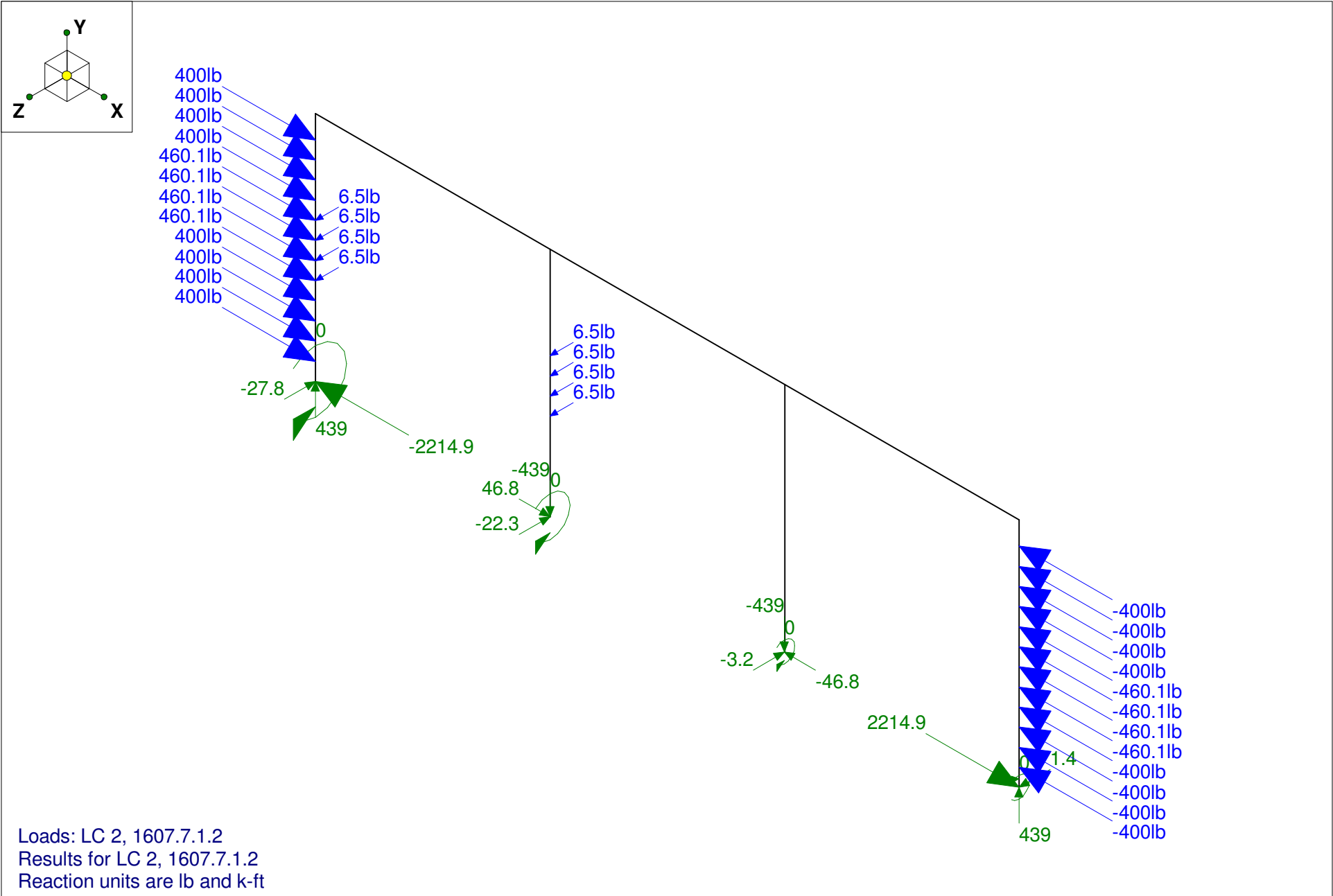
Loads: LC 1, Cable Prestress  
Results for LC 1, Cable Prestress  
Reaction units are lb and k-ft

Ferrari Shields & Associates  
Dan O'Connor  
08196

D24 - 1.5" PIPE x 42.5" HIGH RAIL W/O BTM RAIL

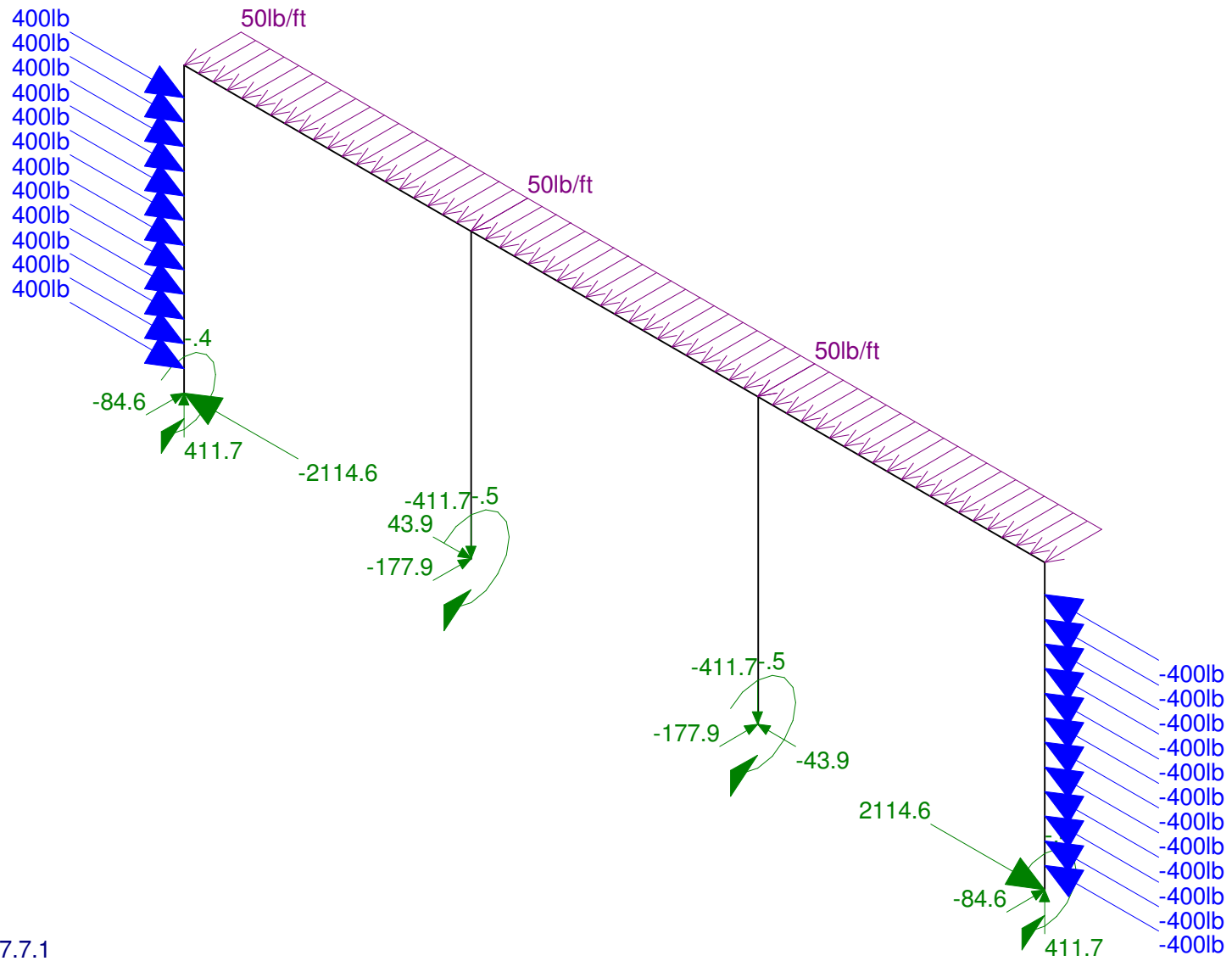
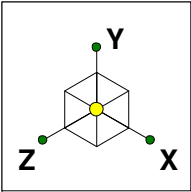
Dec 9, 2008 at 4:48 PM

D24.R3D



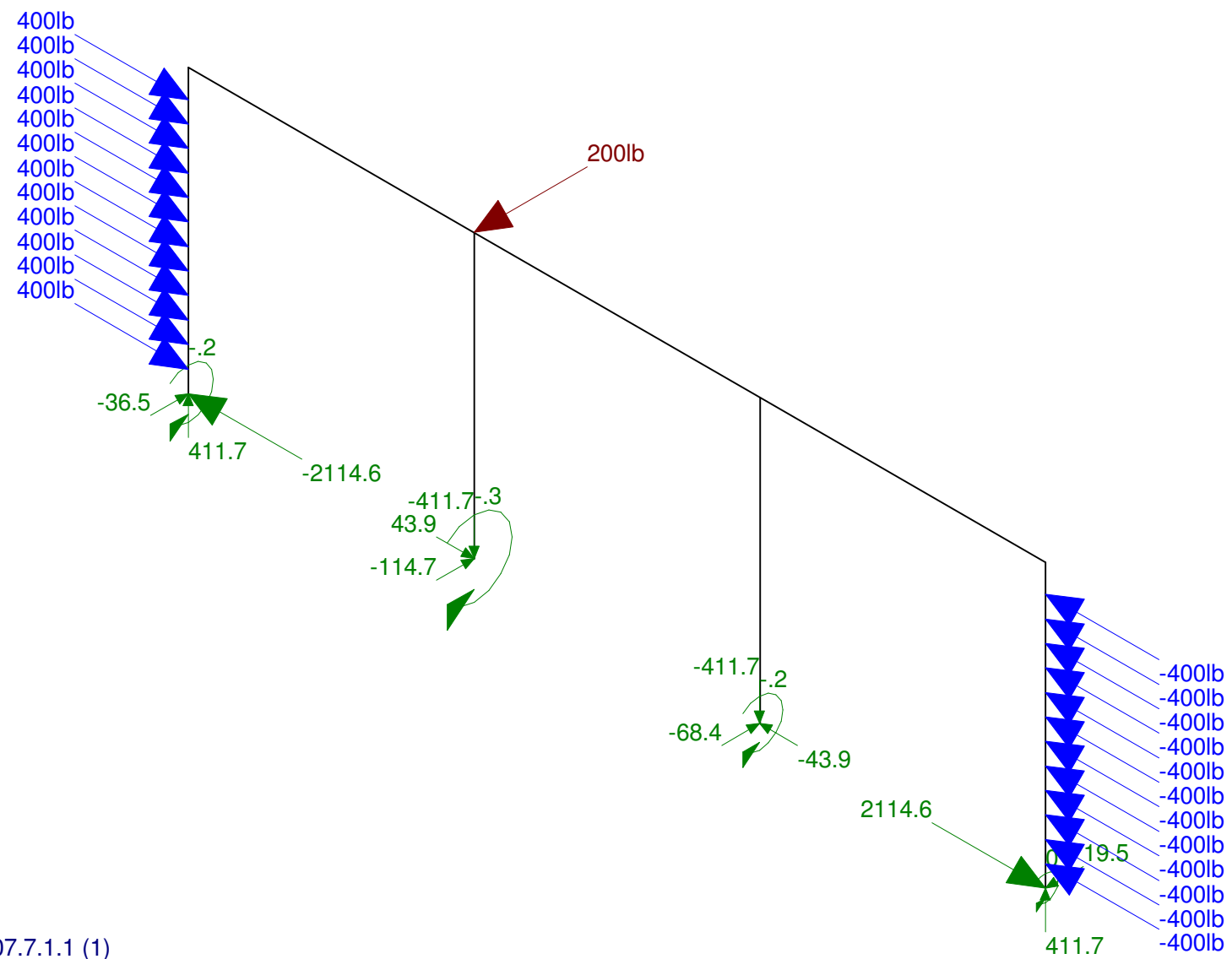
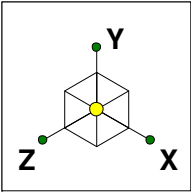
Loads: LC 2, 1607.7.1.2  
 Results for LC 2, 1607.7.1.2  
 Reaction units are lb and k-ft

Ferrari Shields & Associates	D24 - 1.5" PIPE x 42.5" HIGH RAIL W/O BTM RAIL	
Dan O'Connor		Dec 9, 2008 at 4:48 PM
08196		D24.R3D



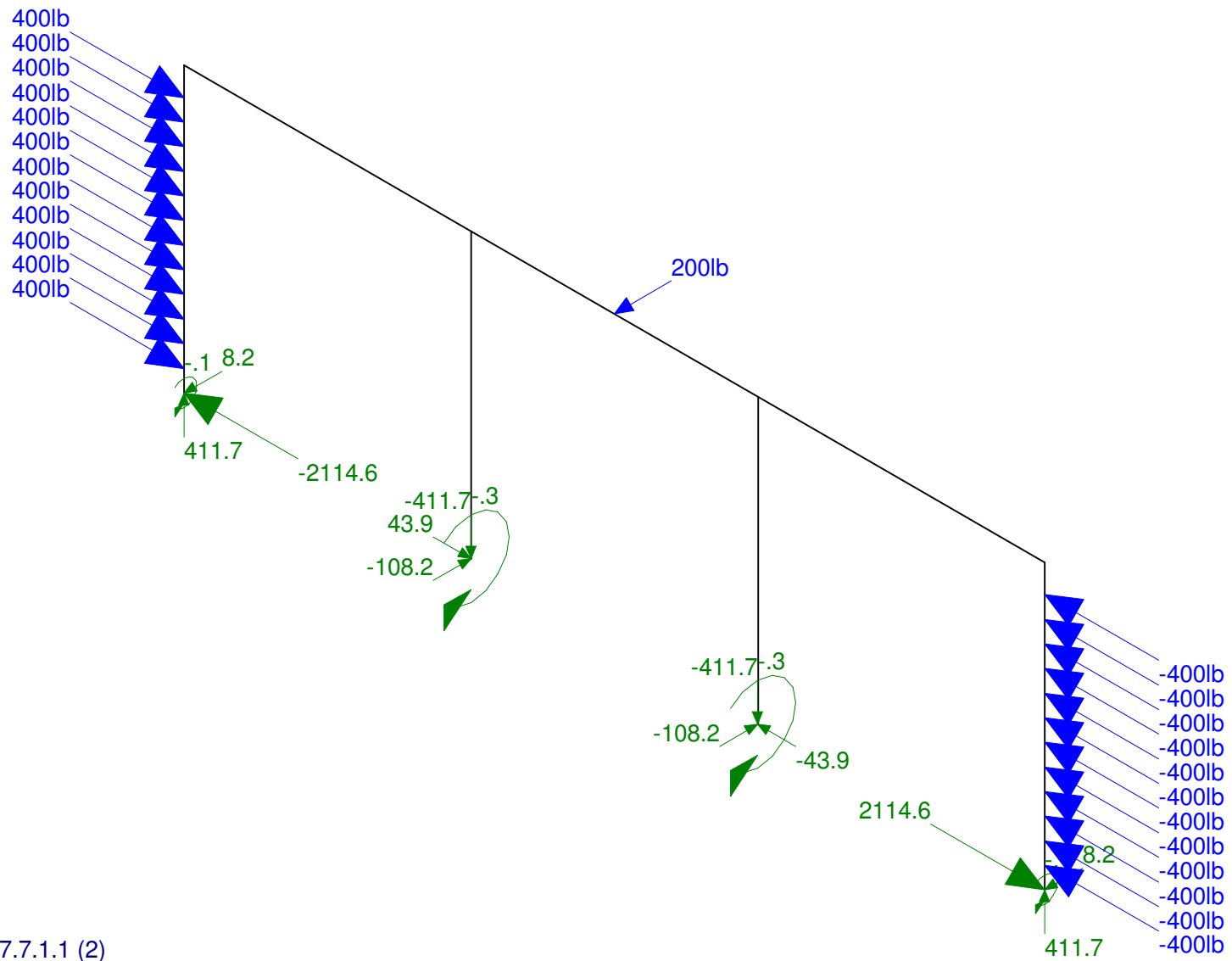
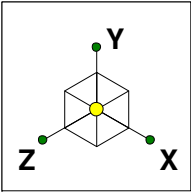
Loads: LC 3, 1607.7.1  
 Results for LC 3, 1607.7.1  
 Reaction units are lb and k-ft

Ferrari Shields & Associates	D24 - 1.5" PIPE x 42.5" HIGH RAIL W/O BTM RAIL	
Dan O'Connor		Dec 9, 2008 at 4:48 PM
08196		D24.R3D



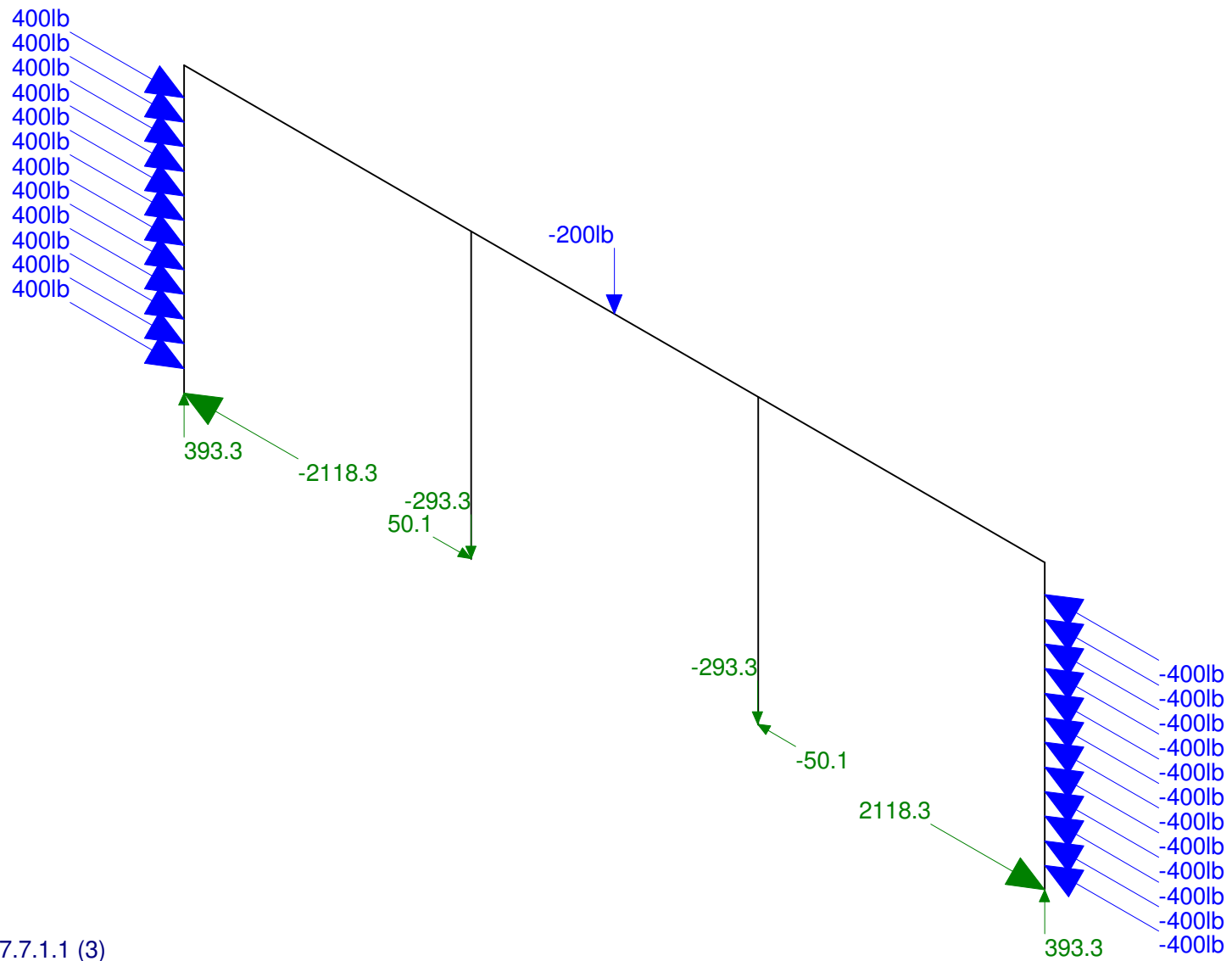
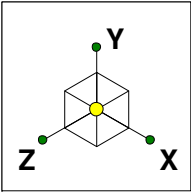
Loads: LC 4, 1607.7.1.1 (1)  
 Results for LC 4, 1607.7.1.1 (1)  
 Reaction units are lb and k-ft

Ferrari Shields & Associates	D24 - 1.5" PIPE x 42.5" HIGH RAIL W/O BTM RAIL	
Dan O'Connor		Dec 9, 2008 at 4:49 PM
08196		D24.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	D24 - 1.5" PIPE x 42.5" HIGH RAIL W/O BTM RAIL	
Dan O'Connor		Dec 9, 2008 at 4:49 PM
08196		D24.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	D24 - 1.5" PIPE x 42.5" HIGH RAIL W/O BTM RAIL	
Dan O'Connor		Dec 9, 2008 at 4:49 PM
08196		D24.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
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	A53 Gr B/A501	29000	11154	.3	.65	.49	35
2	A572Gr55	29000	11154	.3	.65	.49	55
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	PIPE 1.5	Beam	Pipe	A53 Gr B/A501	Typical	.75	.293	.293	.586
2	ERAIL	PIPE 1.5x0.650	Beam	Pipe	A53 Gr B/A501	Typical	2.553	.633	.633	1.267
3	EPOST	PIPE 1.5x0.650	Column	Pipe	A53 Gr B/A501	Typical	2.553	.633	.633	1.267
4	IPOST	PIPE 1.5	Column	Pipe	A53 Gr B/A501	Typical	.75	.293	.293	.586

### 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	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	N9			EPOST	Column	Pipe	A53 Gr B/...	Typical
2	M2	N3	N4			IPOST	Column	Pipe	A53 Gr B/...	Typical
3	M3	N2	N4			ERAIL	Beam	Pipe	A53 Gr B/...	Typical
4	M4	N4	N8			RAIL	Beam	Pipe	A53 Gr B/...	Typical
5	M5	N5	N10			EPOST	Column	Pipe	A53 Gr B/...	Typical
6	M6	N7	N8			IPOST	Column	Pipe	A53 Gr B/...	Typical
7	M7	N8	N6			ERAIL	Beam	Pipe	A53 Gr B/...	Typical
8	M8	N9	N2			ERAIL	Beam	Pipe	A53 Gr B/...	Typical
9	M9	N10	N6			ERAIL	Beam	Pipe	A53 Gr B/...	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	N1	max	-2114.617	4	439.04	2	8.204	5	0	1	0	1	0	1
2		min	-2214.942	2	393.309	6	-84.625	3	-.418	3	0	1	0	1
3	N3	max	50.103	6	-293.309	6	0	1	0	1	0	1	0	1
4		min	43.877	1	-439.04	2	-177.875	3	-.501	3	0	1	0	1
5	N5	max	2214.942	2	439.04	2	19.532	4	0	2	0	1	0	1
6		min	2114.617	4	393.309	6	-84.625	3	-.418	3	0	1	0	1
7	N7	max	-43.877	1	-293.309	6	0	1	0	1	0	1	0	1
8		min	-50.103	6	-439.04	2	-177.875	3	-.501	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	439.04	2	2215.877	2	7.592	5	0	1	.418	3	0	1
2			min	393.309	6	2115.44	1	-87.275	3	0	1	0	1	0	1
3		2	max	439.04	2	1015.877	2	7.592	5	0	1	.349	3	-1.342	1
4			min	393.309	6	915.44	1	-87.275	3	0	1	0	1	-1.421	2
5		3	max	439.04	2	-280.953	6	7.592	5	0	1	.281	3	-1.738	1
6			min	393.309	6	-304.323	2	-87.275	3	0	1	0	1	-1.878	2
7		4	max	439.04	2	-1480.953	6	7.592	5	0	1	.212	3	-1.187	1
8			min	393.309	6	-1624.523	2	-87.275	3	0	1	0	1	-1.264	2
9		5	max	439.04	2	-2680.953	6	7.592	5	0	1	.144	3	.344	2
10			min	393.309	6	-2824.523	2	-87.275	3	0	1	0	2	.299	6
11	M2	1	max	-293.309	6	-43.877	1	0	1	0	1	.501	3	0	1
12			min	-439.04	2	-50.103	6	-177.875	3	0	1	0	1	0	1
13		2	max	-293.309	6	-43.877	1	0	1	0	1	.347	3	.043	6

**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	
14		min	-439.04	2	-50.103	6	-177.875	3	0	1	0	1	.038	1	
15	3	max	-293.309	6	-43.877	1	0	1	0	1	.193	3	.087	6	
16		min	-439.04	2	-50.103	6	-177.875	3	0	1	-.003	2	.076	1	
17	4	max	-293.309	6	-43.877	1	3.656	2	0	1	.039	3	.13	6	
18		min	-439.04	2	-50.103	6	-177.875	3	0	1	-.003	2	.114	1	
19	5	max	-293.309	6	-43.877	1	3.656	2	0	1	0	2	.173	6	
20		min	-439.04	2	-50.103	6	-177.875	3	0	1	-.115	3	.152	1	
21	M3	1	max	2825.458	2	438.895	2	0	.002	2	0	1	1.265	2	
22		min	2681.744	6	393.21	6	-103.324	3	-.115	3	0	1	1.173	6	
23	2	max	2825.458	2	438.895	2	0	1	.002	2	0	1	.881	2	
24		min	2681.744	6	393.21	6	-59.574	3	-.115	3	-.071	3	.826	1	
25	3	max	2825.458	2	438.895	2	0	1	.002	2	0	1	.497	2	
26		min	2681.744	6	393.21	6	-48.75	4	-.115	3	-.104	3	.466	1	
27	4	max	2825.458	2	438.895	2	27.926	3	.002	2	0	1	.141	6	
28		min	2681.744	6	393.21	6	-48.75	4	-.115	3	-.128	4	.106	1	
29	5	max	2825.458	2	438.895	2	71.676	3	.002	2	0	1	-.203	6	
30		min	2681.744	6	393.21	6	-48.75	4	-.115	3	-.171	4	-.272	2	
31	M4	1	max	2872.257	2	100	6	56.77	.027	4	0	1	-.029	6	
32		min	2729.259	1	0	1	-100	5	0	1	-.171	4	-.109	2	
33	2	max	2872.257	2	100	6	56.77	4	.027	4	0	1	-.103	1	
34		min	2729.259	1	0	1	-100	5	0	1	-.121	4	-.117	6	
35	3	max	2872.257	2	0	1	100	5	.027	4	0	1	-.103	1	
36		min	2729.259	1	-100	6	0	1	0	1	-.199	5	-.204	6	
37	4	max	2872.257	2	0	1	100	5	.027	4	0	2	-.103	1	
38		min	2729.259	1	-100	6	0	1	0	1	-.113	3	-.117	6	
39	5	max	2872.257	2	0	1	100	5	.027	4	.028	4	-.029	6	
40		min	2729.259	1	-100	6	0	1	0	1	-.055	3	-.109	2	
41	M5	1	max	439.04	2	-2115.44	1	19.279	4	0	1	.418	3	0	1
42		min	393.309	6	-2215.877	2	-87.275	3	0	1	0	2	0	1	
43	2	max	439.04	2	-915.44	1	19.279	4	0	1	.349	3	1.421	2	
44		min	393.309	6	-1015.877	2	-87.275	3	0	1	0	1	1.342	1	
45	3	max	439.04	2	304.323	2	19.279	4	0	1	.281	3	1.878	2	
46		min	393.309	6	280.953	6	-87.275	3	0	1	0	1	1.738	1	
47	4	max	439.04	2	1624.523	2	19.279	4	0	1	.212	3	1.264	2	
48		min	393.309	6	1480.953	6	-87.275	3	0	1	0	1	1.187	1	
49	5	max	439.04	2	2824.523	2	19.279	4	0	1	.144	3	-.299	6	
50		min	393.309	6	2680.953	6	-87.275	3	0	1	0	1	-.344	2	
51	M6	1	max	-293.309	6	50.103	6	0	0	1	.501	3	0	1	
52		min	-439.04	2	43.877	1	-177.875	3	0	1	0	1	0	1	
53	2	max	-293.309	6	50.103	6	0	1	0	1	.347	3	-.038	1	
54		min	-439.04	2	43.877	1	-177.875	3	0	1	0	1	-.043	6	
55	3	max	-293.309	6	50.103	6	0	1	0	1	.193	3	-.076	1	
56		min	-439.04	2	43.877	1	-177.875	3	0	1	0	1	-.087	6	
57	4	max	-293.309	6	50.103	6	0	1	0	1	.039	3	-.114	1	
58		min	-439.04	2	43.877	1	-177.875	3	0	1	0	1	-.13	6	
59	5	max	-293.309	6	50.103	6	0	1	0	1	0	1	-.152	1	
60		min	-439.04	2	43.877	1	-177.875	3	0	1	-.115	3	-.173	6	
61	M7	1	max	2825.458	2	-393.21	6	6.975	.115	3	.028	4	-.203	6	
62		min	2681.744	6	-438.895	2	-71.676	3	0	1	-.055	3	-.272	2	
63	2	max	2825.458	2	-393.21	6	6.975	5	.115	3	.021	4	.141	6	
64		min	2681.744	6	-438.895	2	-27.926	3	0	1	-.099	3	.106	1	
65	3	max	2825.458	2	-393.21	6	15.824	3	.115	3	.014	4	.497	2	
66		min	2681.744	6	-438.895	2	-8.019	4	0	1	-.104	3	.466	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
67	4	max	2825.458	2	-393.21	6	59.574	3	.115	3	.007	4	.881	2
68		min	2681.744	6	-438.895	2	-8.019	4	0	1	-.071	3	.826	1
69	5	max	2825.458	2	-393.21	6	103.324	3	.115	3	0	1	1.265	2
70		min	2681.744	6	-438.895	2	-8.019	4	0	1	0	1	1.173	6
71	M8	1	max	439.04	2	-2688.714	6	6.841	5	0	.144	3	.344	2
72		min	393.309	6	-2833.702	2	-89.292	3	0	1	0	2	.299	6
73	2	max	439.04	2	-2688.714	6	6.841	5	0	1	.137	3	.574	2
74		min	393.309	6	-2833.702	2	-89.292	3	0	1	-.001	2	.518	6
75	3	max	439.04	2	-2688.714	6	6.841	5	0	1	.129	3	.804	2
76		min	393.309	6	-2833.702	2	-89.292	3	0	1	-.001	2	.736	6
77	4	max	439.04	2	-2688.714	6	6.841	5	0	1	.122	3	1.034	2
78		min	393.309	6	-2833.702	2	-89.292	3	0	1	-.001	2	.955	6
79	5	max	439.04	2	-2688.714	6	6.841	5	0	1	.115	3	1.265	2
80		min	393.309	6	-2833.702	2	-89.292	3	0	1	-.002	2	1.173	6
81	M9	1	max	439.04	2	2833.702	2	18.801	4	0	.144	3	-.299	6
82		min	393.309	6	2688.714	6	-89.292	3	0	1	0	1	-.344	2
83	2	max	439.04	2	2833.702	2	18.801	4	0	1	.137	3	-.518	6
84		min	393.309	6	2688.714	6	-89.292	3	0	1	0	1	-.574	2
85	3	max	439.04	2	2833.702	2	18.801	4	0	1	.129	3	-.736	6
86		min	393.309	6	2688.714	6	-89.292	3	0	1	0	1	-.804	2
87	4	max	439.04	2	2833.702	2	18.801	4	0	1	.122	3	-.955	6
88		min	393.309	6	2688.714	6	-89.292	3	0	1	0	1	-1.034	2
89	5	max	439.04	2	2833.702	2	18.801	4	0	1	.115	3	-1.173	6
90		min	393.309	6	2688.714	6	-89.292	3	0	1	0	1	-1.265	2

**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	PIPE_1.5x0.6...	.977	18.825	2	.176	37.65	2	39933.473	53496.432	1.934	1.934	1...	H1-1b
2	M2	PIPE 1.5	.695	0	3	.039	0	3	12536.729	15718.563	.735	.735	1...	H1-1b
3	M3	PIPE_1.5x0.6...	.692	0	2	.109	0	3	37179.038	53496.432	1.934	1.934	1...	H1-1b
4	M4	PIPE 1.5	.490	21	5	.054	0	4	12475.128	15718.563	.735	.735	1	H1-1a
5	M5	PIPE_1.5x0.6...	.977	18.825	2	.176	37.65	2	39933.473	53496.432	1.934	1.934	1...	H1-1b
6	M6	PIPE 1.5	.695	0	3	.039	0	3	12536.729	15718.563	.735	.735	1...	H1-1b
7	M7	PIPE_1.5x0.6...	.692	42	2	.109	42	3	37179.038	53496.432	1.934	1.934	1...	H1-1b
8	M8	PIPE_1.5x0.6...	.658	3.9	2	.177	0	2	53328.852	53496.432	1.934	1.934	1...	H1-1b
9	M9	PIPE_1.5x0.6...	.658	3.9	2	.177	0	2	53328.852	53496.432	1.934	1.934	1...	H1-1b

**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	A53 Gr B/A501	29000	11154	.3	.65	.49	35
2	A572Gr55	29000	11154	.3	.65	.49	55
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	PIPE 1.5	Beam	Pipe	LDX2101	Typical	.75	.293	.293	.586
2	ERAIL	PIPE 1.5XX	Beam	Pipe	LDX2101	Typical	1.885	.568	.568	1.136
3	EPOST	PIPE 1.5XX	Column	Pipe	LDX2101	Typical	1.885	.568	.568	1.136
4	IPOST	PIPE 1.5	Column	Pipe	LDX2101	Typical	.75	.293	.293	.586

**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	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	N9			EPOST	Column	Pipe	LDX2101	Typical
2	M2	N3	N4			IPOST	Column	Pipe	LDX2101	Typical
3	M3	N2	N4			ERAIL	Beam	Pipe	LDX2101	Typical
4	M4	N4	N8			RAIL	Beam	Pipe	LDX2101	Typical
5	M5	N5	N10			EPOST	Column	Pipe	LDX2101	Typical
6	M6	N7	N8			IPOST	Column	Pipe	LDX2101	Typical
7	M7	N8	N6			ERAIL	Beam	Pipe	LDX2101	Typical
8	M8	N9	N2			ERAIL	Beam	Pipe	LDX2101	Typical
9	M9	N10	N6			ERAIL	Beam	Pipe	LDX2101	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	N1	max	-2113.646	4	445.03	2	8.707	5	0	1	0	1	0	1
2		min	-2213.9	2	399.743	6	-82.909	3	-406	3	0	1	0	1
3	N3	max	53.334	6	-299.743	6	0	1	0	1	0	1	0	1
4		min	46.704	1	-445.03	2	-179.591	3	-514	3	0	1	0	1
5	N5	max	2213.9	2	445.03	2	20.167	4	.001	2	0	1	0	1
6		min	2113.646	4	399.743	6	-82.909	3	-406	3	0	1	0	1
7	N7	max	-46.704	1	-299.743	6	0	1	0	1	0	1	0	1
8		min	-53.334	6	-445.03	2	-179.591	3	-514	3	0	1	0	1
9	Totals:	max	0	2	200	6	0	1						
10		min	0	4	0	1	-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	445.03	2	2214.999	2	8.033	5	0	1	.406	3	0	1
2			min	399.743	6	2114.612	1	-85.915	3	0	1	0	1	0	1
3		2	max	445.03	2	1014.999	2	8.033	5	0	1	.339	3	-1.341	1
4			min	399.743	6	914.612	1	-85.915	3	0	1	0	1	-1.42	2
5		3	max	445.03	2	-281.946	6	8.033	5	0	1	.271	3	-1.736	1
6			min	399.743	6	-305.201	2	-85.915	3	0	1	0	1	-1.877	2
7		4	max	445.03	2	-1481.946	6	8.033	5	0	1	.204	3	-1.185	1
8			min	399.743	6	-1625.401	2	-85.915	3	0	1	0	1	-1.262	2
9		5	max	445.03	2	-2681.946	6	8.033	5	0	1	.136	3	.346	2
10			min	399.743	6	-2825.401	2	-85.915	3	0	1	-.001	2	.303	6
11	M2	1	max	-299.743	6	-46.704	1	0	1	0	1	.514	3	0	1
12			min	-445.03	2	-53.334	6	-179.591	3	0	1	0	1	0	1
13		2	max	-299.743	6	-46.704	1	0	1	0	1	.359	3	.046	6

**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	
14		min	-445.03	2	-53.334	6	-179.591	3	0	1	0	1	.04	1	
15	3	max	-299.743	6	-46.704	1	0	1	0	1	.203	3	.092	6	
16		min	-445.03	2	-53.334	6	-179.591	3	0	1	-.003	2	.081	1	
17	4	max	-299.743	6	-46.704	1	3.459	2	0	1	.048	3	.139	6	
18		min	-445.03	2	-53.334	6	-179.591	3	0	1	-.003	2	.121	1	
19	5	max	-299.743	6	-46.704	1	3.459	2	0	1	0	2	.185	6	
20		min	-445.03	2	-53.334	6	-179.591	3	0	1	-.108	3	.162	1	
21	M3	1	max	2826.5	2	444.865	2	0	.002	2	0	1	1.268	2	
22		min	2682.878	6	399.628	6	-102.18	3	-.108	3	0	1	1.177	6	
23	2	max	2826.5	2	444.865	2	0	1	.002	2	0	1	.879	2	
24		min	2682.878	6	399.628	6	-58.43	3	-.108	3	-.07	3	.824	1	
25	3	max	2826.5	2	444.865	2	0	1	.002	2	0	1	.49	2	
26		min	2682.878	6	399.628	6	-48.337	4	-.108	3	-.102	3	.459	1	
27	4	max	2826.5	2	444.865	2	29.07	3	.002	2	0	1	.128	6	
28		min	2682.878	6	399.628	6	-48.337	4	-.108	3	-.127	4	.094	1	
29	5	max	2826.5	2	444.865	2	72.82	3	.002	2	0	1	-.221	6	
30		min	2682.878	6	399.628	6	-48.337	4	-.108	3	-.169	4	-.289	2	
31	M4	1	max	2876.314	2	100	6	56.223	4	.03	4	0	1	-.037	6
32		min	2733.057	1	0	1	-100	5	0	1	-.169	4	-.116	2	
33	2	max	2876.314	2	100	6	56.223	4	.03	4	0	1	-.109	1	
34		min	2733.057	1	0	1	-100	5	0	1	-.12	4	-.124	6	
35	3	max	2876.314	2	0	1	100	5	.03	4	0	1	-.109	1	
36		min	2733.057	1	-100	6	0	1	0	1	-.201	5	-.212	6	
37	4	max	2876.314	2	0	1	100	5	.03	4	0	2	-.109	1	
38		min	2733.057	1	-100	6	0	1	0	1	-.113	5	-.124	6	
39	5	max	2876.314	2	0	1	100	5	.03	4	.028	4	-.037	6	
40		min	2733.057	1	-100	6	0	1	0	1	-.051	3	-.116	2	
41	M5	1	max	445.03	2	-2114.612	1	19.903	4	0	1	.406	3	0	1
42		min	399.743	6	-2214.999	2	-85.915	3	0	1	-.001	2	0	1	
43	2	max	445.03	2	-914.612	1	19.903	4	0	1	.339	3	1.42	2	
44		min	399.743	6	-1014.999	2	-85.915	3	0	1	0	1	1.341	1	
45	3	max	445.03	2	305.201	2	19.903	4	0	1	.271	3	1.877	2	
46		min	399.743	6	281.946	6	-85.915	3	0	1	0	1	1.736	1	
47	4	max	445.03	2	1625.401	2	19.903	4	0	1	.204	3	1.262	2	
48		min	399.743	6	1481.946	6	-85.915	3	0	1	0	1	1.185	1	
49	5	max	445.03	2	2825.401	2	19.903	4	0	1	.136	3	-.303	6	
50		min	399.743	6	2681.946	6	-85.915	3	0	1	0	1	-.346	2	
51	M6	1	max	-299.743	6	53.334	6	0	0	1	.514	3	0	1	
52		min	-445.03	2	46.704	1	-179.591	3	0	1	0	1	0	1	
53	2	max	-299.743	6	53.334	6	0	1	0	1	.359	3	-.04	1	
54		min	-445.03	2	46.704	1	-179.591	3	0	1	0	1	-.046	6	
55	3	max	-299.743	6	53.334	6	0	1	0	1	.203	3	-.081	1	
56		min	-445.03	2	46.704	1	-179.591	3	0	1	0	1	-.092	6	
57	4	max	-299.743	6	53.334	6	0	1	0	1	.048	3	-.121	1	
58		min	-445.03	2	46.704	1	-179.591	3	0	1	0	1	-.139	6	
59	5	max	-299.743	6	53.334	6	0	1	0	1	0	1	-.162	1	
60		min	-445.03	2	46.704	1	-179.591	3	0	1	-.108	3	-.185	6	
61	M7	1	max	2826.5	2	-399.628	6	7.363	5	.108	3	.028	4	-.221	6
62		min	2682.878	6	-444.865	2	-72.82	3	0	1	-.051	3	-.289	2	
63	2	max	2826.5	2	-399.628	6	7.363	5	.108	3	.021	4	.128	6	
64		min	2682.878	6	-444.865	2	-29.07	3	0	1	-.096	3	.094	1	
65	3	max	2826.5	2	-399.628	6	14.68	3	.108	3	.014	4	.49	2	
66		min	2682.878	6	-444.865	2	-7.885	4	0	1	-.102	3	.459	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
67	4	max	2826.5	2	-399.628	6	58.43	3	.108	3	.007	4	.879	2
68		min	2682.878	6	-444.865	2	-7.885	4	0	1	-.07	3	.824	1
69	5	max	2826.5	2	-399.628	6	102.18	3	.108	3	0	1	1.268	2
70		min	2682.878	6	-444.865	2	-7.885	4	0	1	0	1	1.177	6
71	M8	1	max	445.03	2	-2691.072	6	7.194	5	0	.136	3	.346	2
72		min	399.743	6	-2836.174	2	-88.186	3	0	1	-.001	2	.303	6
73	2	max	445.03	2	-2691.072	6	7.194	5	0	1	.129	3	.577	2
74		min	399.743	6	-2836.174	2	-88.186	3	0	1	-.001	2	.521	6
75	3	max	445.03	2	-2691.072	6	7.194	5	0	1	.122	3	.807	2
76		min	399.743	6	-2836.174	2	-88.186	3	0	1	-.002	2	.74	6
77	4	max	445.03	2	-2691.072	6	7.194	5	0	1	.115	3	1.038	2
78		min	399.743	6	-2836.174	2	-88.186	3	0	1	-.002	2	.959	6
79	5	max	445.03	2	-2691.072	6	7.194	5	0	1	.108	3	1.268	2
80		min	399.743	6	-2836.174	2	-88.186	3	0	1	-.002	2	1.177	6
81	M9	1	max	445.03	2	2836.174	2	19.371	4	0	.136	3	-.303	6
82		min	399.743	6	2691.072	6	-88.186	3	0	1	0	1	-.346	2
83	2	max	445.03	2	2836.174	2	19.371	4	0	1	.129	3	-.521	6
84		min	399.743	6	2691.072	6	-88.186	3	0	1	0	1	-.577	2
85	3	max	445.03	2	2836.174	2	19.371	4	0	1	.122	3	-.74	6
86		min	399.743	6	2691.072	6	-88.186	3	0	1	0	1	-.807	2
87	4	max	445.03	2	2836.174	2	19.371	4	0	1	.115	3	-.959	6
88		min	399.743	6	2691.072	6	-88.186	3	0	1	0	1	-1.038	2
89	5	max	445.03	2	2836.174	2	19.371	4	0	1	.108	3	-1.177	6
90		min	399.743	6	2691.072	6	-88.186	3	0	1	0	1	-1.268	2

**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	PIPE 1.5XX	.686	18.825	2	.139	37.65	2	44165.798	67724.551	2.757	2.757	1...	H1-1b
2	M2	PIPE 1.5	.416	0	3	.023	0	3	18033.92	26946.108	1.26	1.26	1...	H1-1b
3	M3	PIPE 1.5XX	.495	0	2	.071	0	3	39783.792	67724.551	2.757	2.757	1...	H1-1b
4	M4	PIPE 1.5	.258	21	5	.034	0	4	17876.889	26946.108	1.26	1.26	1	H1-1b
5	M5	PIPE 1.5XX	.686	18.825	2	.139	37.65	2	44165.798	67724.551	2.757	2.757	1...	H1-1b
6	M6	PIPE 1.5	.416	0	3	.023	0	3	18033.92	26946.108	1.26	1.26	1...	H1-1b
7	M7	PIPE 1.5XX	.495	42	2	.071	42	3	39783.792	67724.551	2.757	2.757	1...	H1-1b
8	M8	PIPE 1.5XX	.463	3.9	2	.140	0	2	67414.606	67724.551	2.757	2.757	1...	H1-1b
9	M9	PIPE 1.5XX	.463	3.9	2	.140	0	2	67414.606	67724.551	2.757	2.757	1...	H1-1b

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