

Mount Analysis Report

Site Address	138 Main St Coventry, CT 06238
Site Name	CTHA620A
Site ID	CTHA620A
Project Name	Coverage Strategy
Design Codes	2015 International Building Code ASCE 7-10 TIA-222-G Standards 2018 CT State Building Code

	Stress Ratio	Overall Result
Proposed Mount	50%	PASS

Client:

T - Mobile
NORTHEAST, LLC
35 Griffin Rd S
Bloomfield, CT 06002

Date: 9/23/2021

Scope of Work:

Centerline Communications was authorized by T-Mobile Northeast LLC to perform an analysis of the proposed antenna mount to determine its capacity to support the proposed T-Mobile equipment listed in this report. These mounts were analyzed using RISA 3D v17.0.4.

Final Appurtenances Configuration:

Elevation (ft)	Position ¹	Azimuth (degrees)	Quantity	Appurtenance	Sector
80	MP4	40	1	APX16DWV-16DWV-S-E-A20 Antenna	Sector 1
80	MP3	40	1	APXVAALL24_43-U-NA20 Antenna	
80	MP1	40	1	AIR6449 B41 Antenna	
80	MP4	40	1	4460 B25+B66 RRH	
80	MP3	40	1	4480 B71+B85 RRH	
80	MP12	160	1	APX16DWV-16DWV-S-E-A20 Antenna	Sector 2
80	MP11	160	1	APXVAALL24_43-U-NA20 Antenna	
80	MP9	160	1	AIR6449 B41 Antenna	
80	MP12	160	1	4460 B25+B66 RRH	
80	MP11	160	1	4480 B71+B85 RRH	
80	MP8	280	1	APX16DWV-16DWV-S-E-A20 Antenna	Sector 3
80	MP7	280	1	APXVAALL24_43-U-NA20 Antenna	
80	MP5	280	1	AIR6449 B41 Antenna	
80	MP8	280	1	4460 B25+B66 RRH	
80	MP7	280	1	4480 B71+B85 RRH	

Notes:

1. MP represent Mount Pipe.
2. Existing Appurtenance
3. **Proposed Appurtenance**

Design Criteria:

Design Codes:

2015 International Building Code
 ASCE 7-10
 TIA-222-G Standards
 2018 CT State Building Code

Ultimate Wind Speed	130 mph
Nominal Wind Speed	101 mph
Wind Speed with Ice	50 mph
Ice Thickness	1.00 in.
Exposure Category	C
Topographic Category	1
Structure Class	II
Site Soil Class (Assumed)	D-Stiff Soil
Seismic Design Category	B
Spectral Response Acceleration Parameter at a Short Periods, S_s	0.176 g
Spectral Response Acceleration Parameter at a Period of 1 Second, S_1	0.063 g
Short Period Site Coefficient, F_a	1.6
Long Period Site Coefficient, F_v	2.4

*Refer to calculations for additional design criteria.

Conclusion:

Based on the results of the analysis, we have determined that the proposed T-Mobile mount is adequate to support the proposed T-Mobile equipment loading.

- Install (1) Site Pro 1 RMQP-4096-HK platform mount.

	Stress Ratio	Overall Result
Proposed Mount	50%	PASS

Reference Documents:

- T-Mobile RFDS CTHA620A_Coverage Strategy_1_draft, dated 05/17/2021
- Construction Drawings by Centerline Communications, LLC, dated 08/25/2021
- Structural Analysis by Centerline Communications, LLC, dated 08/27/2021

Assumptions and Limitations:

- The calculations performed by Centerline Communications are limited to the structural members in these calculations only.
- Structural calculations in this report do not check the adequacy of the supporting structure, other mounts, or coax mounting attachments.
- The calculation assumes all structural members to be in good condition i.e. no damage, rust, or other defects.

Site Photos:



Overall Tower

Design Calculations



Site Details		
Site Name	CTHA620A	
Carrier	T-Mobile	
City, State	Coventry, CT	
Project	Coverage Strategy	

Mount Details		
Mount Type	3-Sided Platform	
Mount Height, z	80	ft
Number of Sectors	3	
Tower Type	Monopole	
Tower Height, h	100	ft

Topographic Factors		
Topographic Category	1	
Feature	Flat	
Crest Height, H	N/A	ft
Distance from Crest, x	N/A	ft
Slope (H/L)	N/A	
Topographic Factor, K_{zt}	1.00	

Seismic Factors		
Importance Factor, I_E	1	
Short Period Spectral Acceleration, S_s	0.176	g
1 Second Period Spectral Acceleration, S_1	0.063	g
Long-Period Transition Period, T_L	6	
Design Category	B	
Short Period Site Coefficient, F_a	1.60	
Long-Period Site Coefficient, F_v	2.4	

Site Parameters		
Ultimate Wind Speed, V_{ULT}	130	mph
Nominal Wind Speed, V	101	mph
Wind Speed with Ice, V_i	50	mph
Design Ice Thickness, t_i	1	in
Structural Class	II	
Exposure Category	C	
Site Soil Class	D-Stiff Soil (Assumed)	

Code	
Building Code	2015 IBC
TIA Code	TIA-222-G
ASCE Code	7-10

Site Constants		
Importance Factor, I (Wind no Ice)	1.00	
Importance Factor, I (Ice Thickness)	1.00	
Importance Factor, I (wind with Ice)	1.00	
Wind Direction Prob. Factor, K_d	0.95	
Velocity Pressure Coefficient, K_z	1.21	
Gust Effect Factor, G_h	1.00	
Design Ice Thickness, t_{iz}	2.19	in
Velocity Pressure, q_z	29.78	psf
Velocity Pressure with Ice, q_{zi}	7.34	psf
Shielding Factor, K_a	1.00	
Flat Velocity Pressure ($Ca = 2.0$)	59.56	psf
Round Velocity Pressure ($Ca = 1.2$)	35.73	psf
Round Velocity Pressure with Ice ($Ca = 1.2$)	8.81	psf
Engineer Initials	AP	

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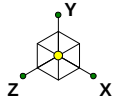
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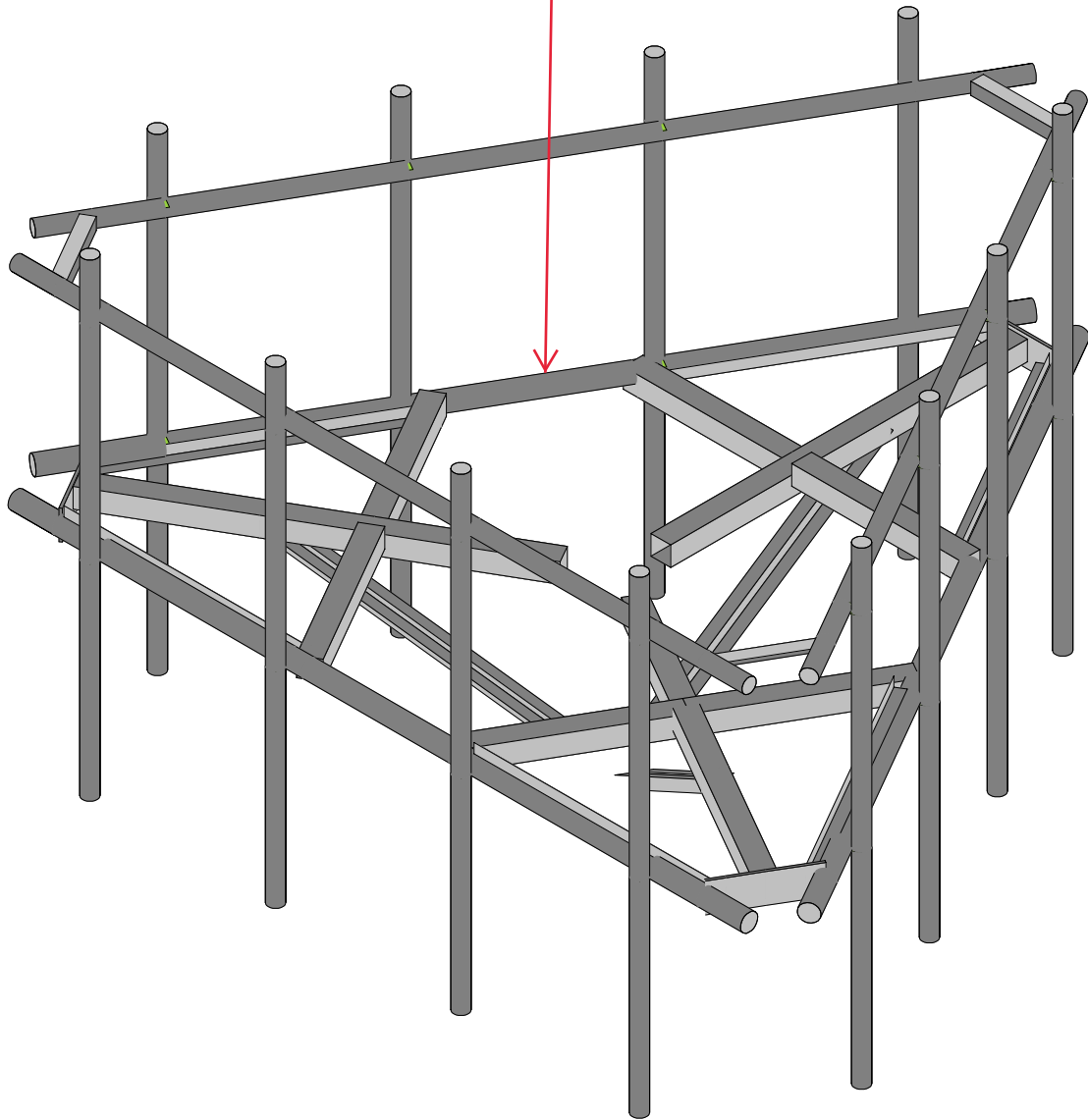
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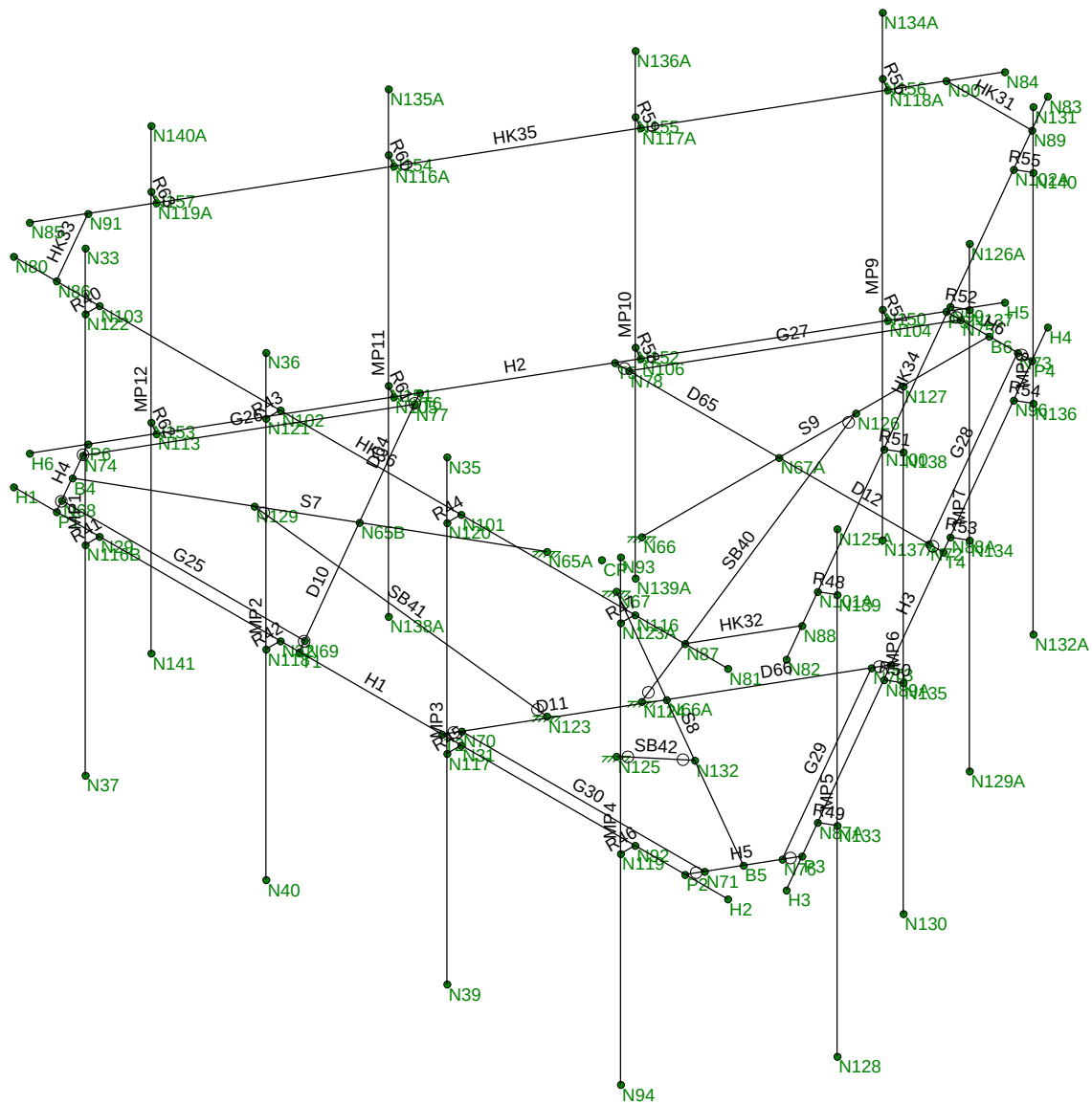
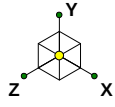
Proposed Mount Results



Install (1) Site Pro 1 RMQP-4096-HK
platform mount



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AP		Sept 23, 2021 at 10:33 AM
		CTHA620A_MA.r3d



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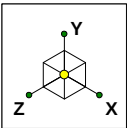
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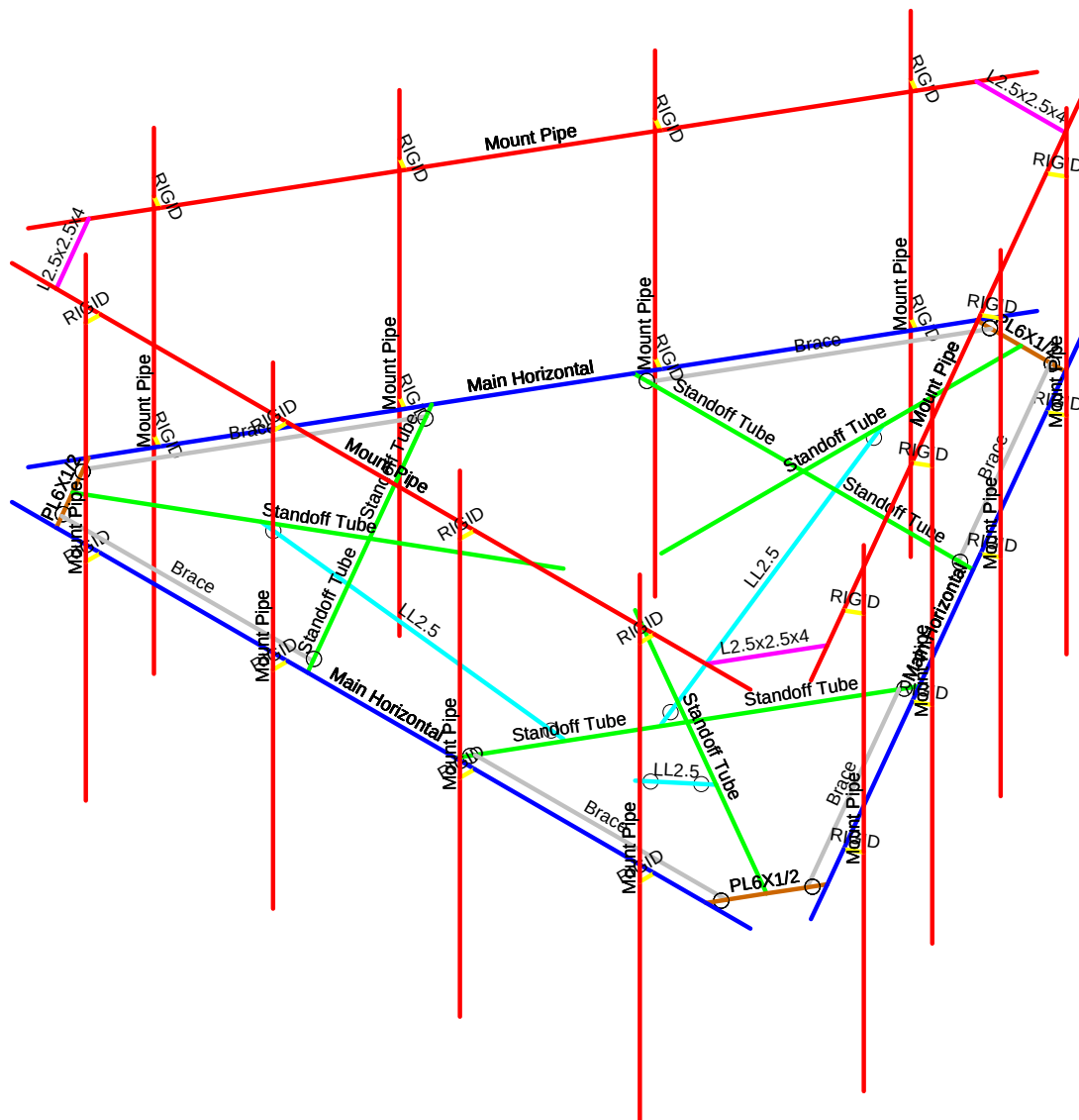
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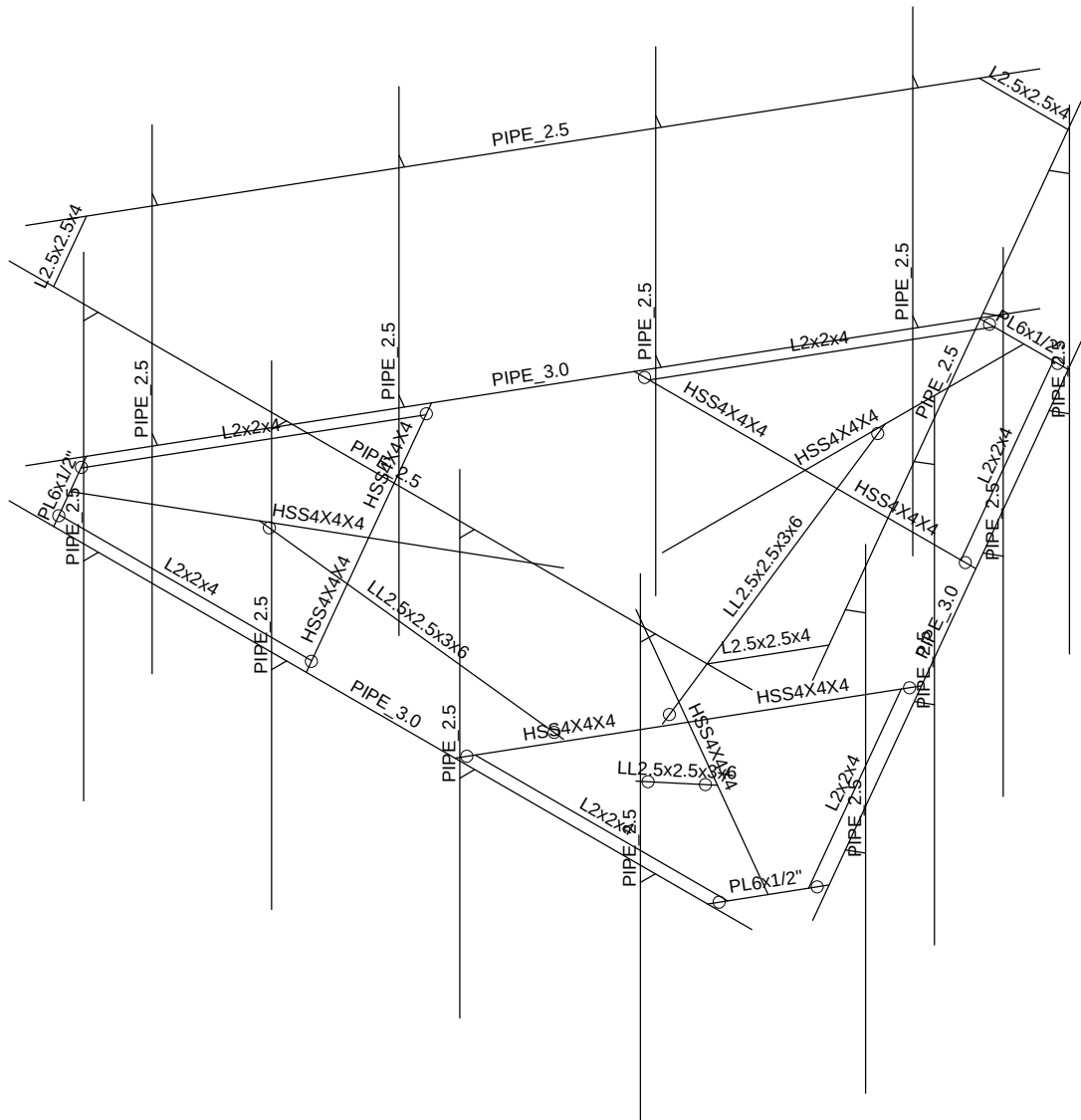
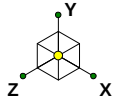
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Section Sets	
■	Main Horizontal
■	Standoff Tube
■	Mount Pipe
■	Brace
■	L2.5x2.5x4
■	LL2.5
■	PL6X1/2
■	RIGID



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		CTHA620A_MA.r3d



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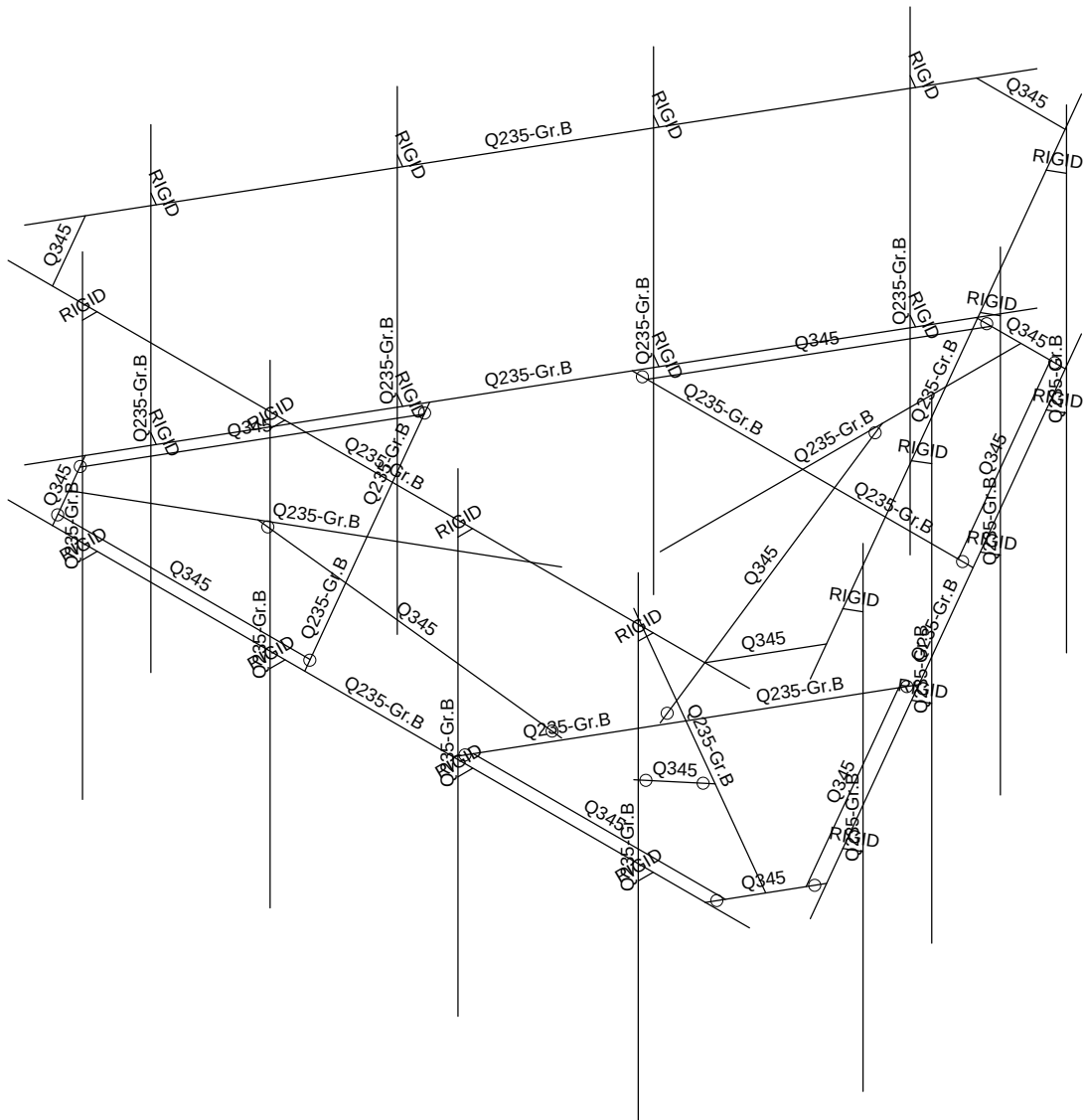
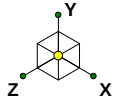
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Member Shape

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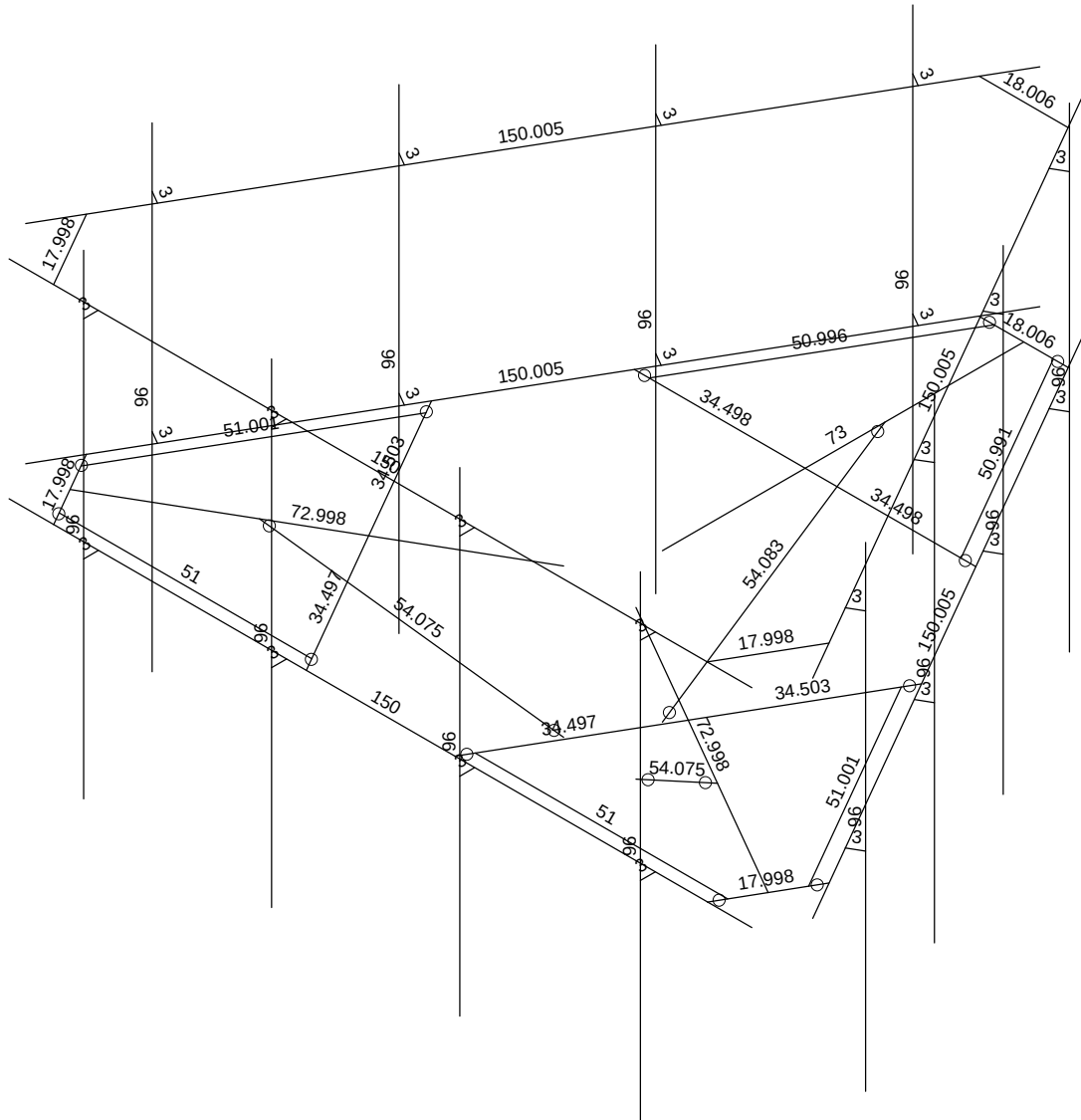
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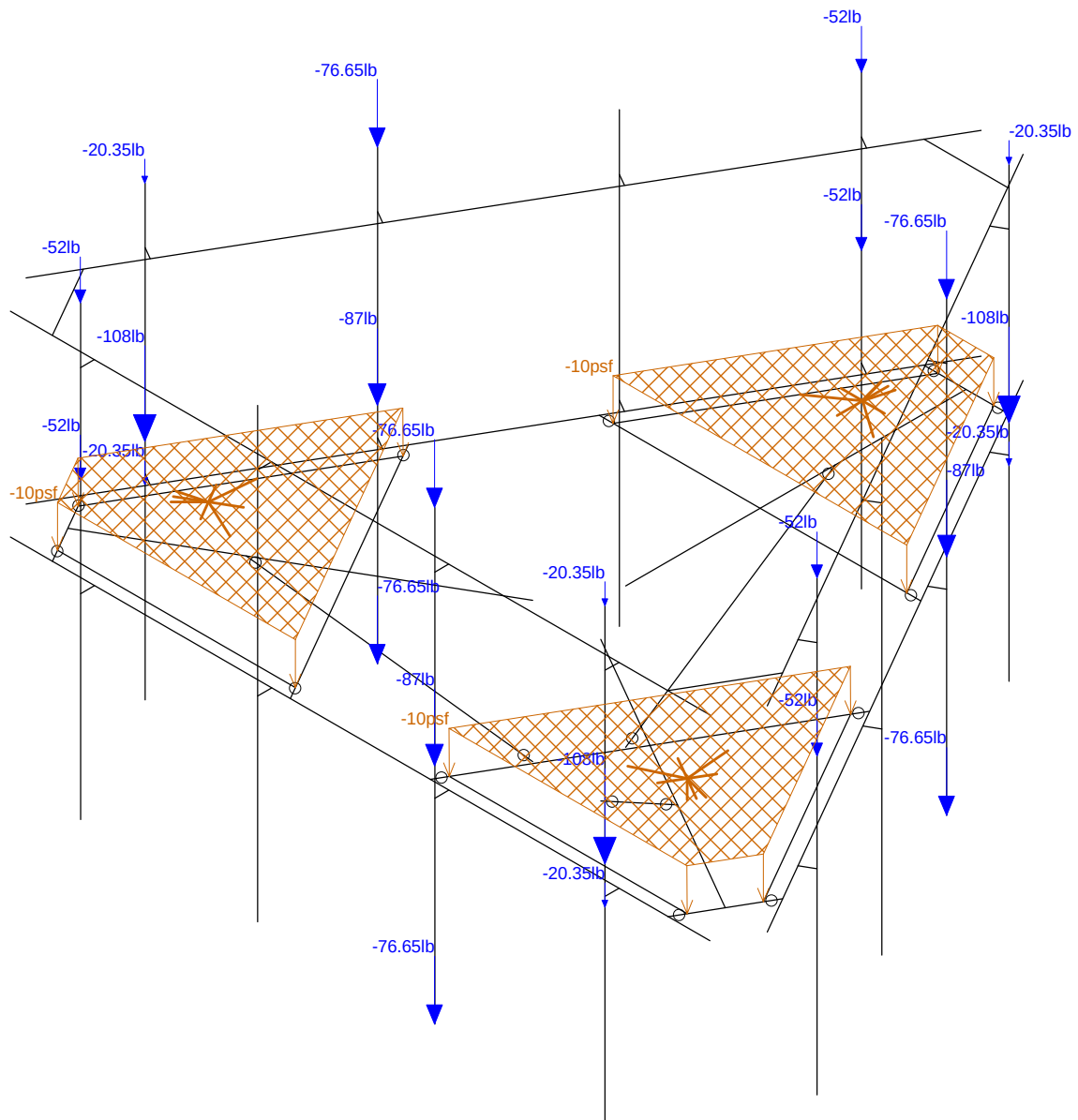
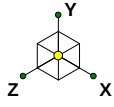
Material Sets

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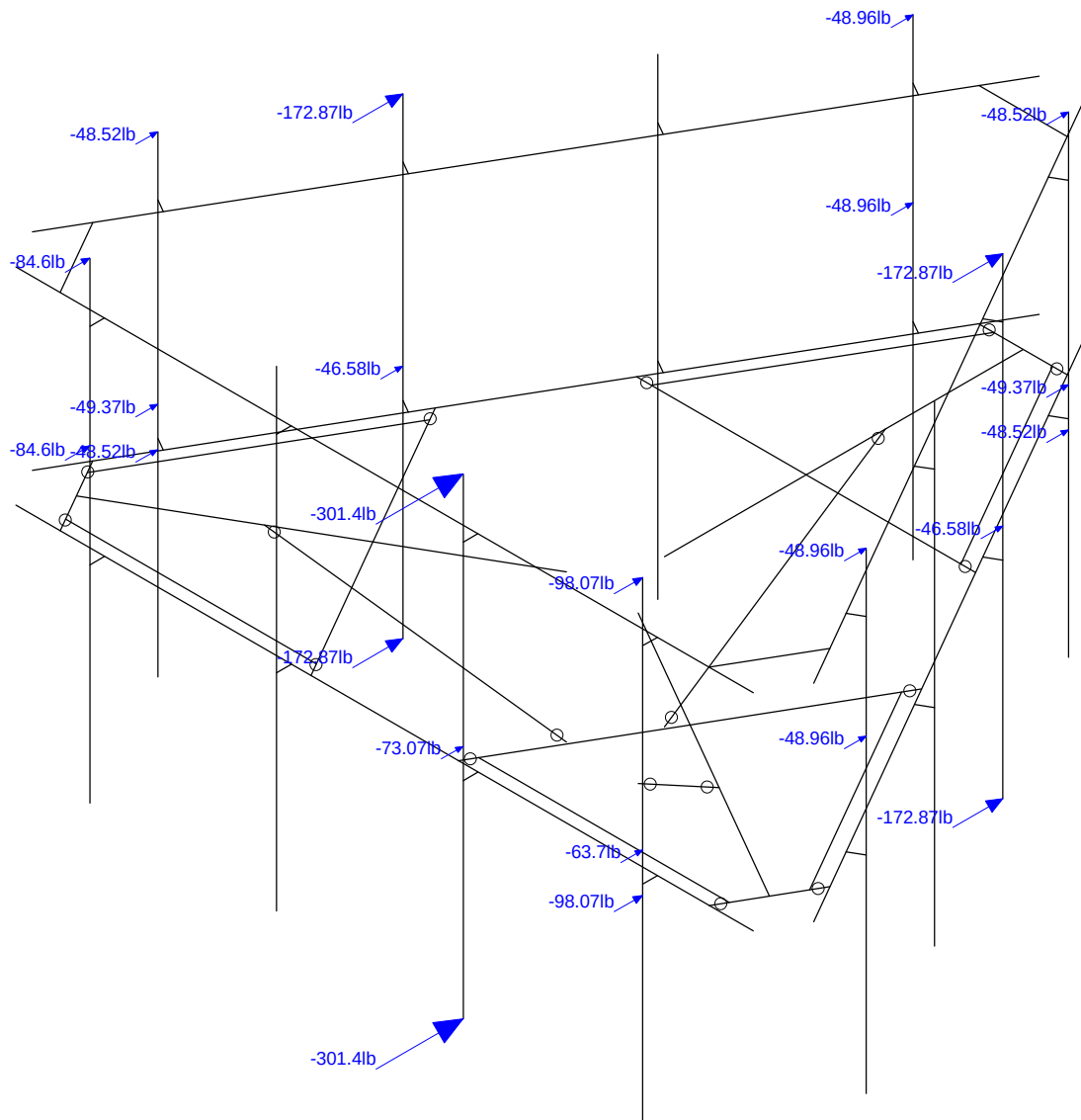
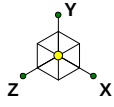


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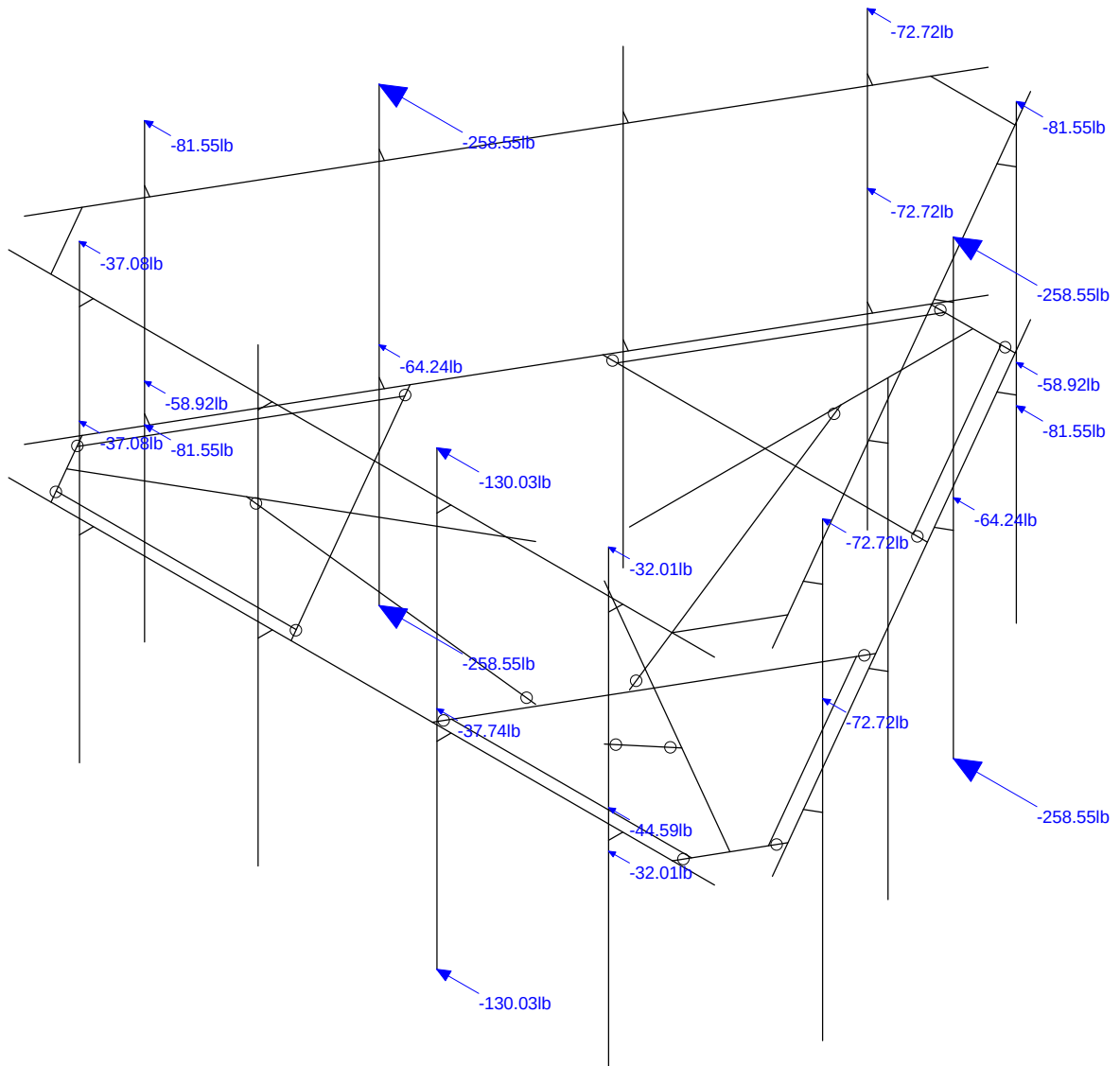
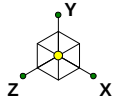
Loads: BLC 1, Dead Load

Centerline Communication...	CTHA620A_MA	Dead Load
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		CTHA620A_MA.r3d



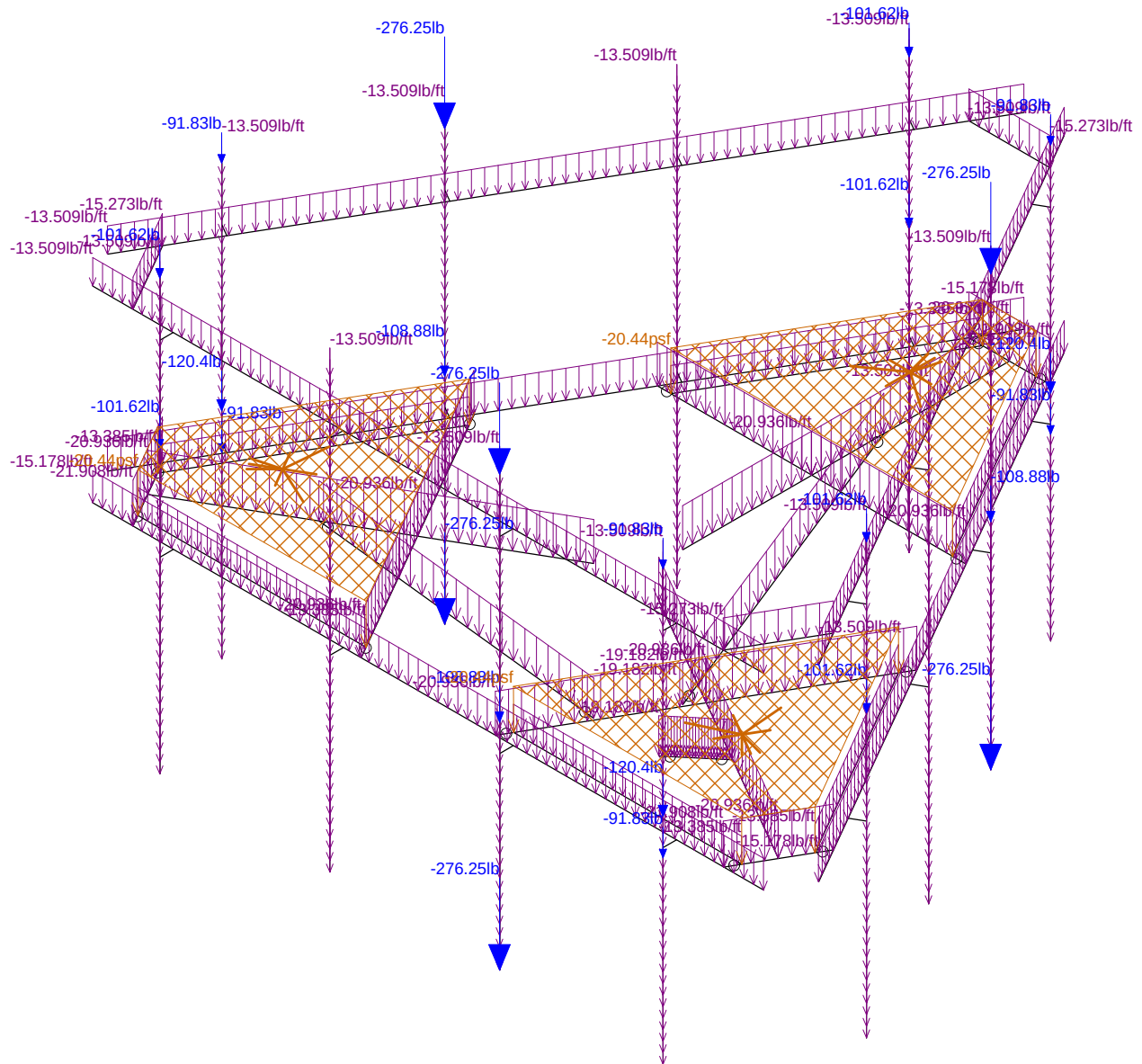
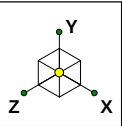
Loads: BLC 2, Wind 0

Centerline Communication...	CTHA620A_MA	Wind 0
AP		Sept 23, 2021 at 10:39 AM
		CTHA620A_MA.r3d



Loads: BLC 5, Wind 90

Centerline Communication...	CTHA620A_MA	Wind 90
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		CTHA620A_MA.r3d



Loads: BLC 9, Ice Weight

Centerline Communication...

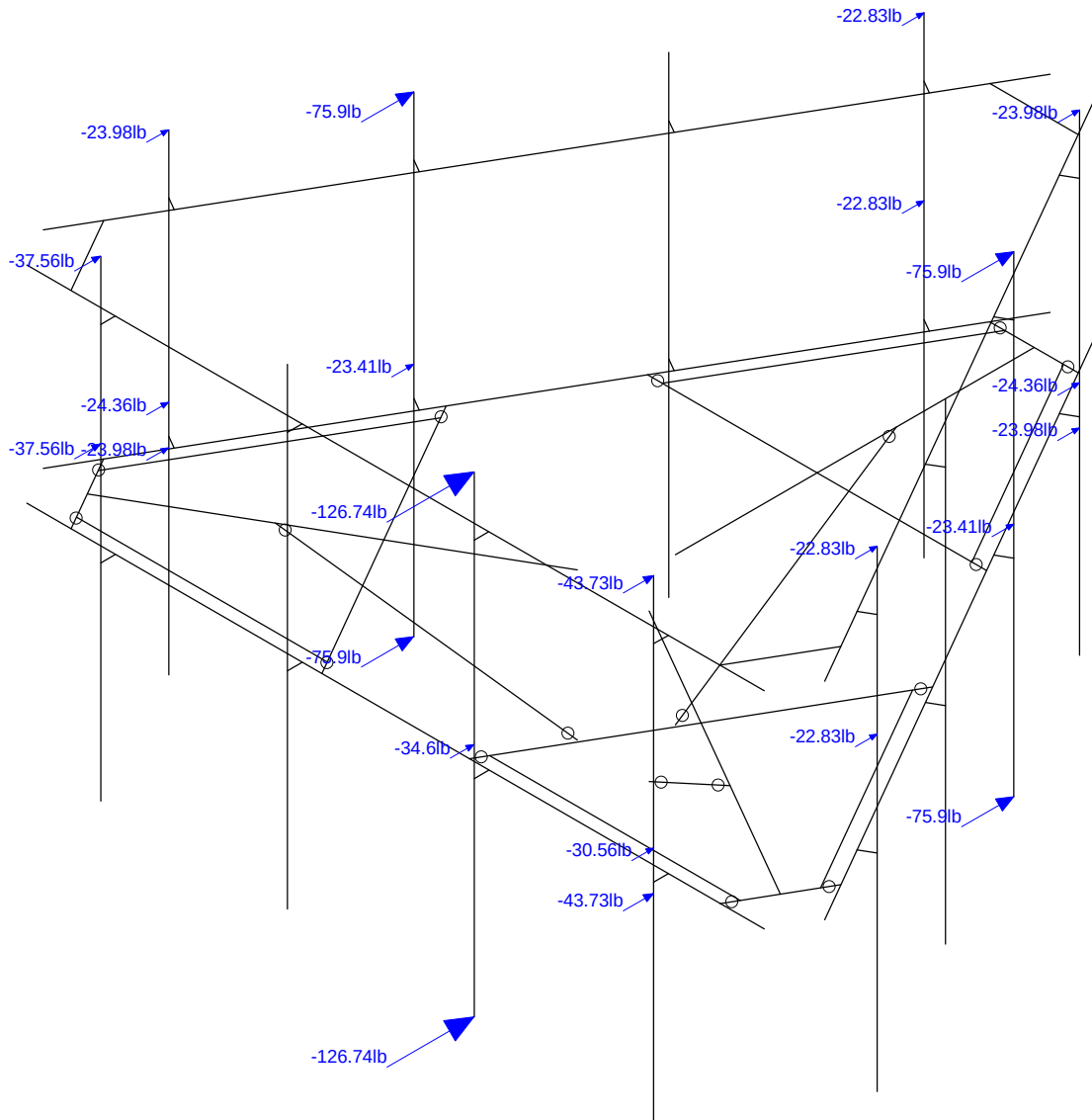
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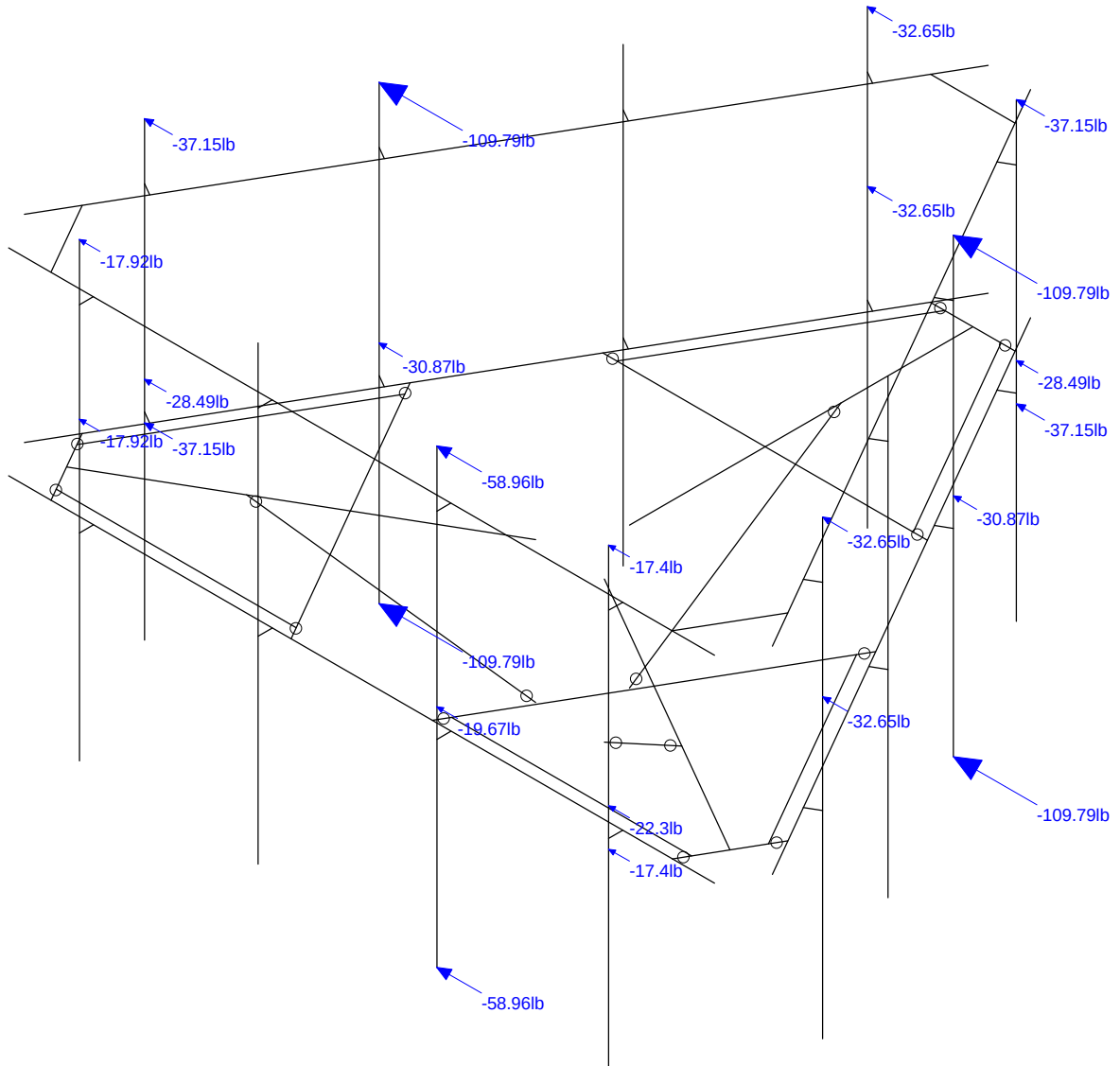
Ice Weight

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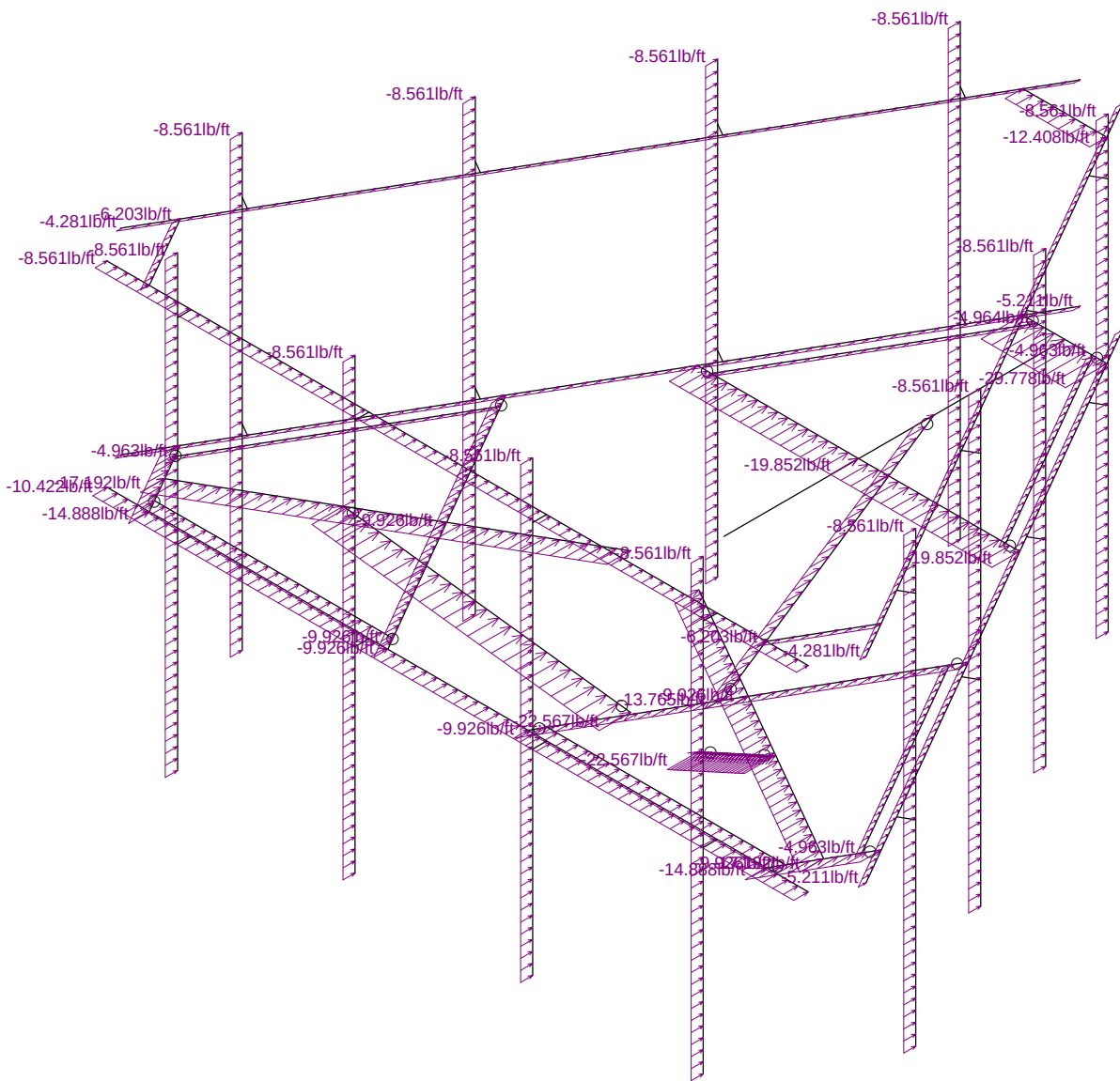
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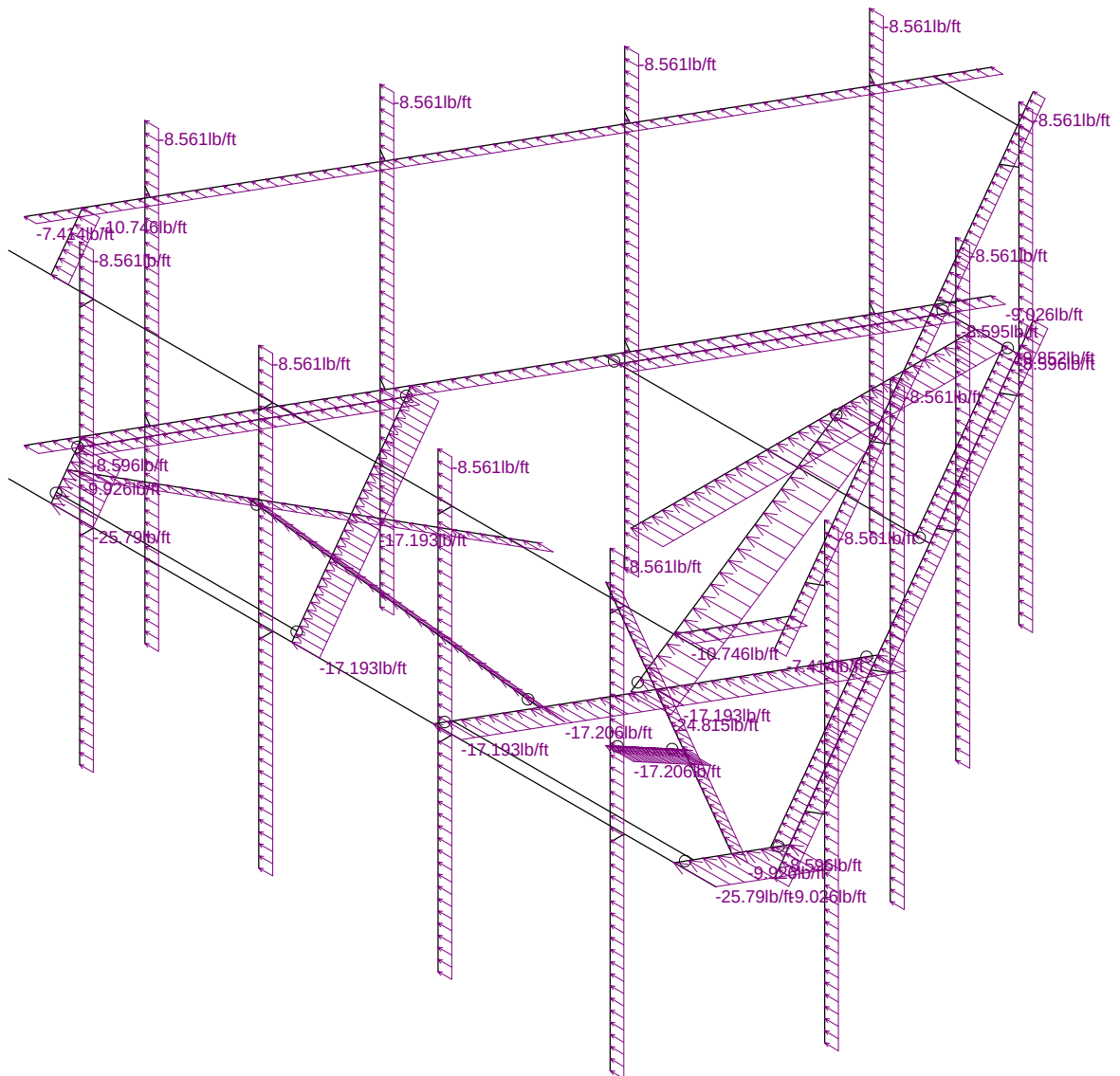
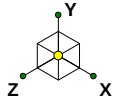
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Loads: BLC 18, Distri. Wind X

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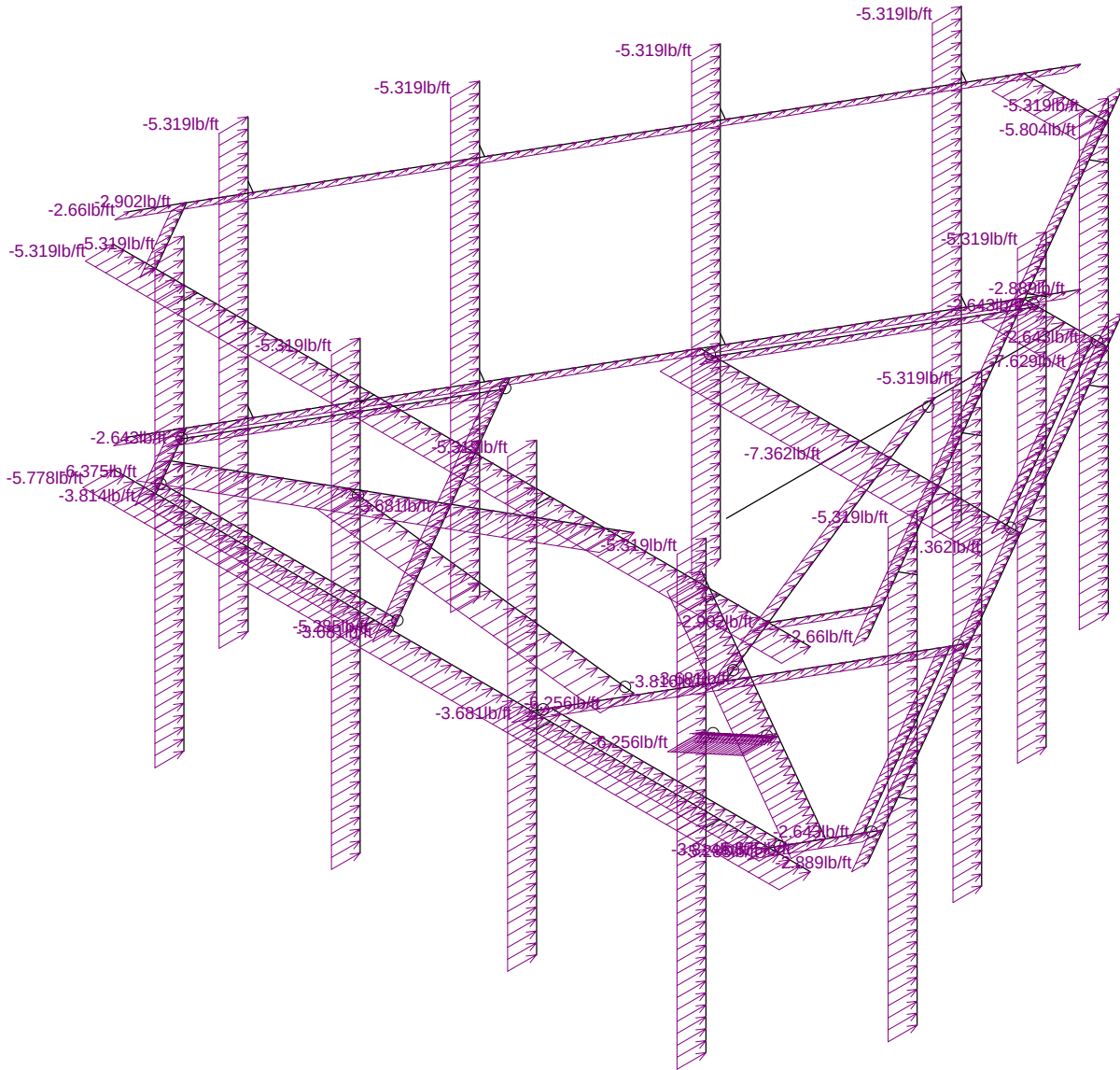
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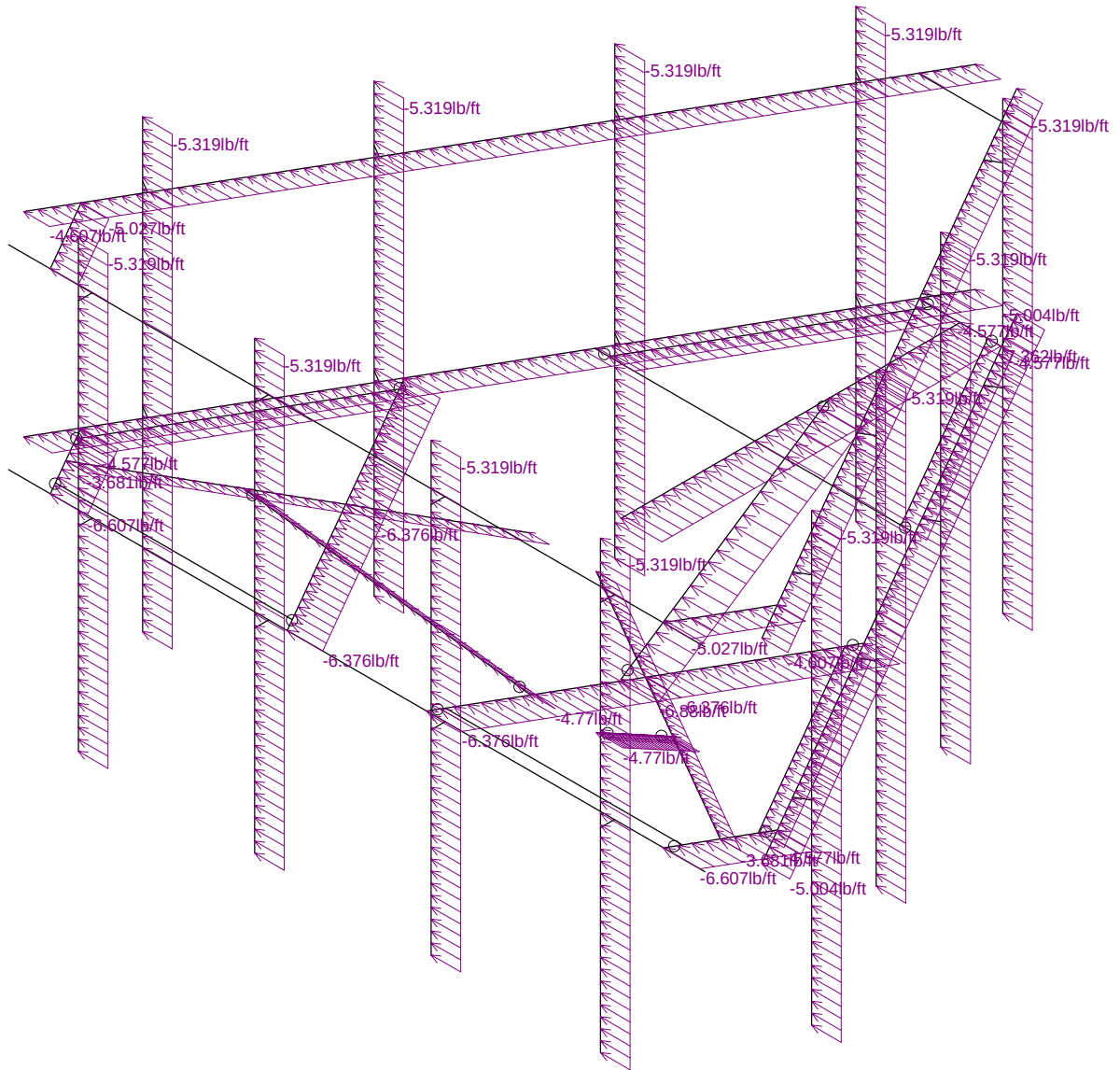
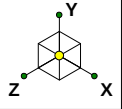
Distr. Wind 90

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CTHA620A_MA.r3d



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Loads: BLC 20, Distr. Ice + Wind X

Centerline Communication...

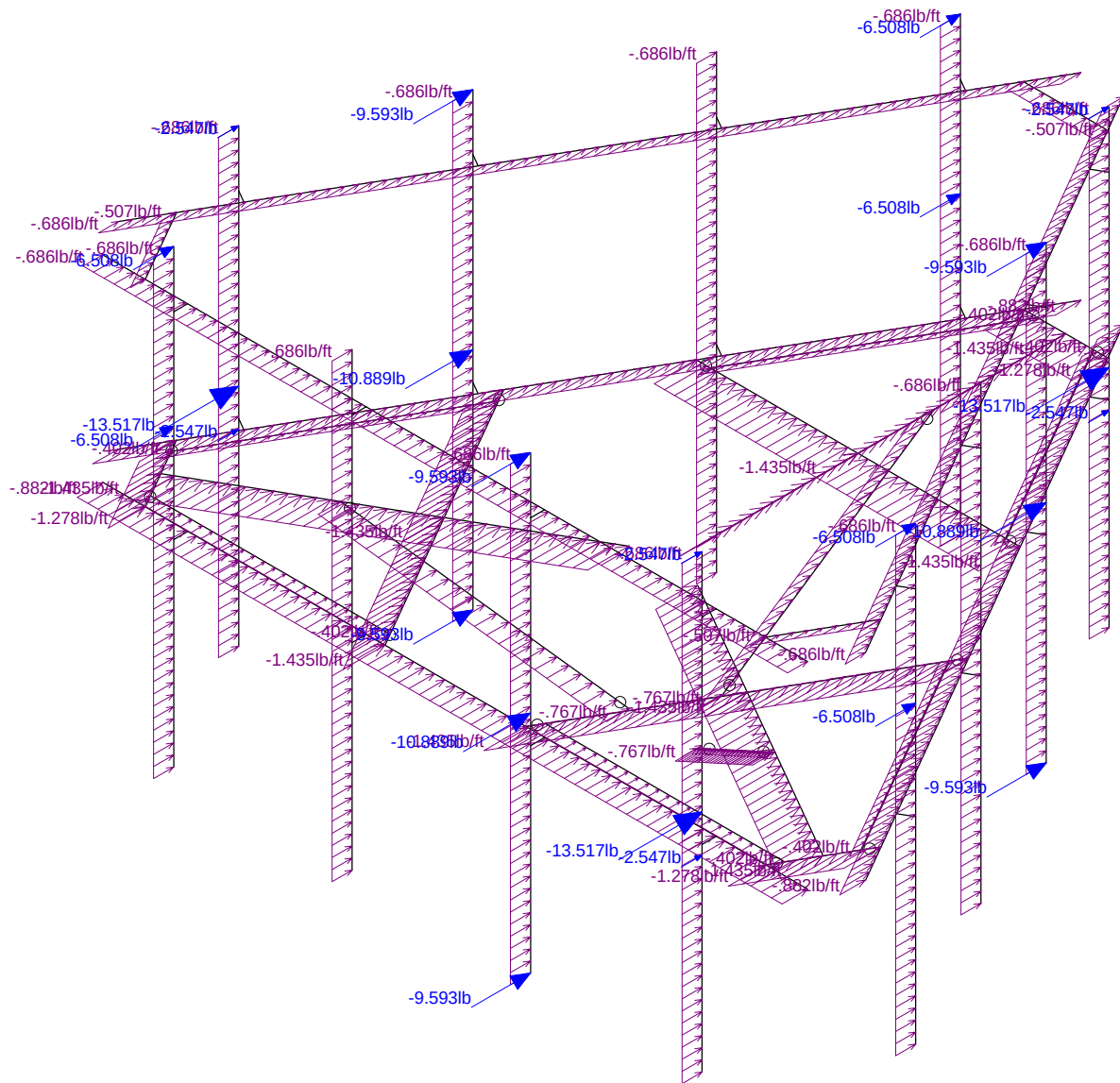
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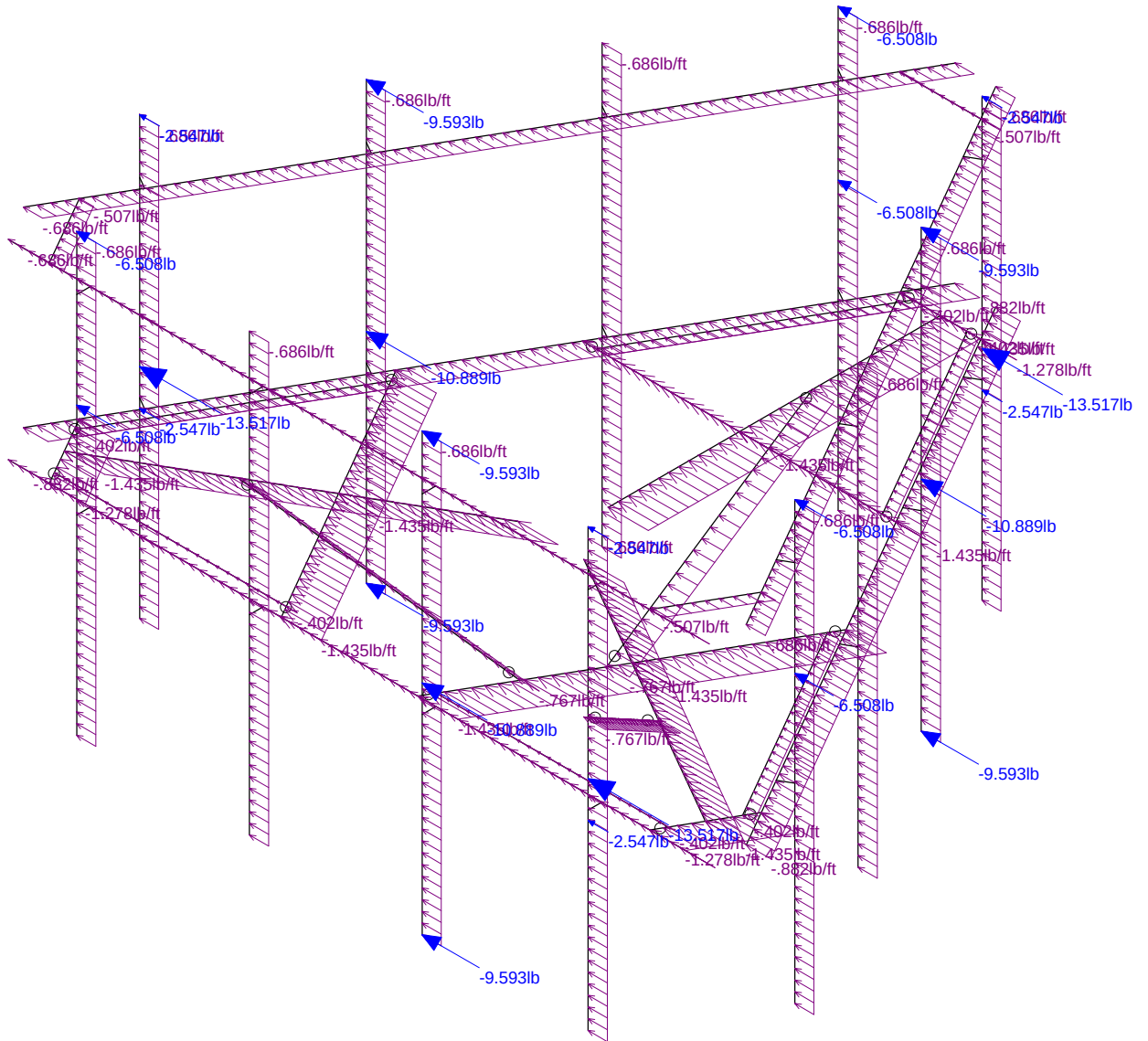
Distr. Ice + Wind 90

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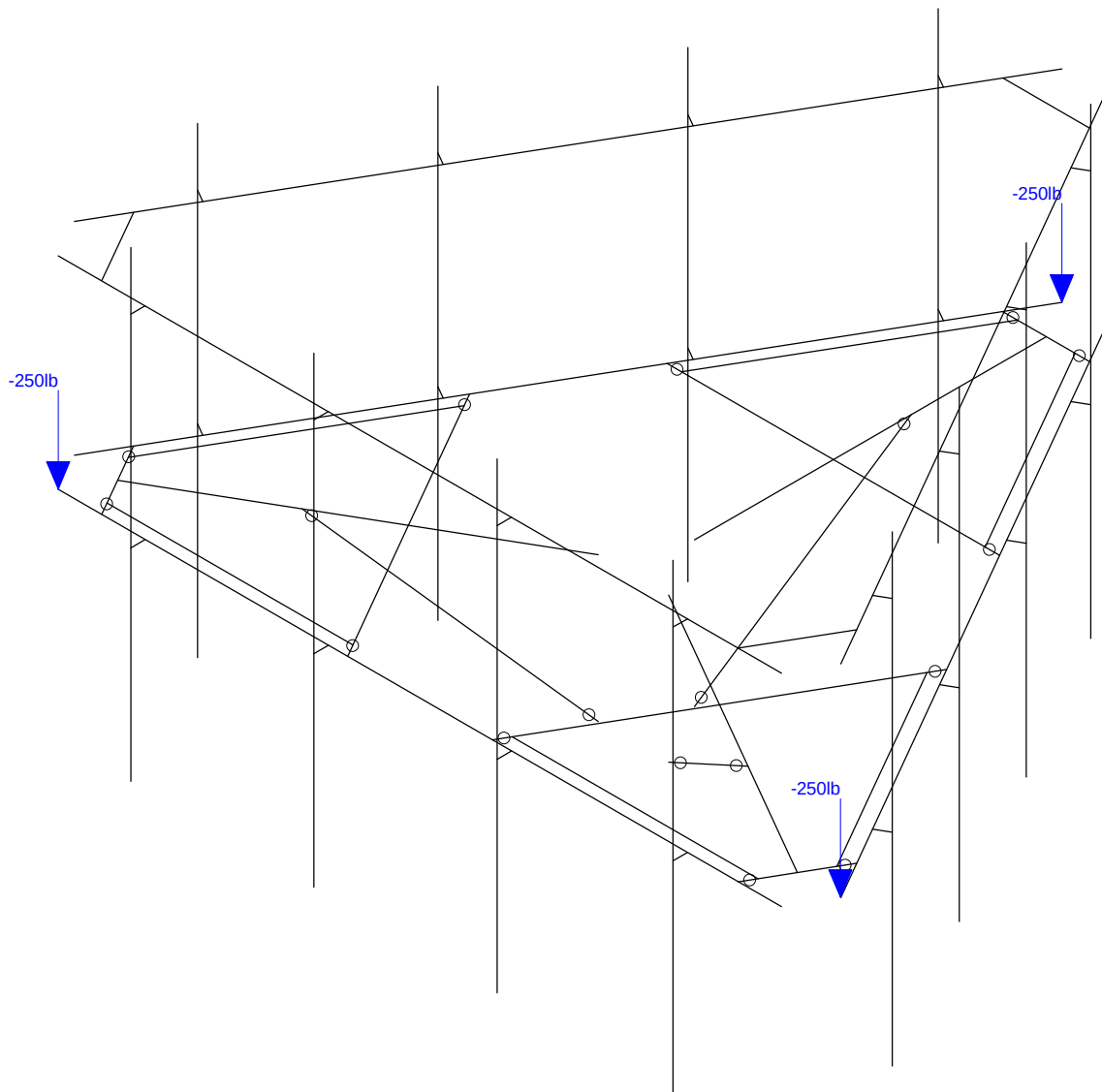
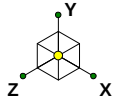
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Loads: BLC 23, Live Load 1

Centerline Communication...	CTHA620A_MA	Live Load
AP		Sept 23, 2021 at 10:42 AM
		CTHA620A_MA.r3d

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/...	Density[lb/ft^3]	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A36 Gr.36	29000	11154	.3	.65	490	36	1.5	58	1.2
2	Q345	29000	11154	.3	.65	490	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	.3	.65	490	50	1.1	65	1.1
4	A992	29000	11154	.3	.65	490	50	1.1	65	1.1
5	A500 Gr.42	29000	11154	.3	.65	490	42	1.4	58	1.3
6	A500 Gr.46	29000	11154	.3	.65	490	46	1.4	58	1.3
7	A53 Gr. B	29000	11154	.3	.65	490	35	1.5	58	1.2
8	Q235-Gr.B	29000	11154	.3	.65	490	35	1.5	58	1.2

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Main Horizontal	PIPE 3.0	None	None	Q235-Gr.B	Typical	2.07	2.85	2.85	5.69
2	Standoff Tube	HSS4X4X4	None	None	Q235-Gr.B	Typical	3.37	7.8	7.8	12.8
3	Mount Pipe	PIPE 2.5	None	None	Q235-Gr.B	Typical	1.61	1.45	1.45	2.89
4	Brace	L2x2x4	None	None	Q345	Typical	.944	.346	.346	.021
5	L2.5x2.5x4	L2.5x2.5x4	None	None	Q345	Typical	1.19	.692	.692	.026
6	LL2.5	LL2.5x2.5x3x6	None	None	Q345	Typical	1.8	3.09	1.07	.023
7	PL6X3/8	PL6x3/8	None	None	Q345	Typical	2.25	.026	6.75	.101
8	PL6X1/2	PL6x1/2"	None	None	Q345	Typical	3	.063	9	.237

Joint Coordinates and Temperatures

	Label	X [in]	Y [in]	Z [in]	Temp [F]	Detach From Diap...
1	CP	75	0	-48.5	0	
2	H1	0	0	0	0	
3	H2	150	0	0	0	
4	H3	154.5	0	-7.79	0	
5	H4	79.5	0	-137.7	0	
6	H5	70.5	0	-137.7	0	
7	H6	-4.5	0	-7.79	0	
8	P1	9	0	0	0	
9	P2	141	0	0	0	
10	P3	149.998441	0	-15.5873	0	
11	P4	84.003118	0	-129.9	0	
12	P5	65.996882	0	-129.9	0	
13	P6	0.001559	0	-15.5873	0	
14	T1	60	0	0	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [in]	Y [in]	Z [in]	Temp [F]	Detach From Diap...
15	T2	90	0	0	0	
16	T3	124.498268	0	-59.757	0	
17	T4	109.497691	0	-85.74	0	
18	T5	40.502309	0	-85.74	0	
19	T6	25.501732	0	-59.757	0	
20	B4	4.502165	0	-7.79125	0	
21	B5	145.497835	0	-7.79125	0	
22	B6	75	0	-129.9	0	
23	N29	18	0	0	0	
24	N31	94	0	0	0	
25	N32	56	0	0	0	
26	N33	18	54	3	0	
27	N35	94	54	3	0	
28	N36	56	54	3	0	
29	N37	18	-42	3	0	
30	N39	94	-42	3	0	
31	N40	56	-42	3	0	
32	N65A	67.719391	0	-44.290803	0	
33	N66	75	0	-56.9	0	
34	N67	82.280609	0	-44.290803	0	
35	N65B	42.75247	0	-29.875722	0	
36	N66A	107.24753	0	-29.875722	0	
37	N67A	75	0	-85.74	0	
38	N68	7.500111	0	-2.59814	0	
39	N69	58.50008	0	-2.598122	0	
40	N70	91.49992	0	-2.598122	0	
41	N71	142.499889	0	-2.59814	0	
42	N72	106.497691	0	-85.74	0	
43	N73	81.003118	0	-129.9	0	
44	N74	1.500557	0	-12.990702	0	
45	N75	69.003118	0	-129.9	0	
46	N76	148.499443	0	-12.990702	0	
47	N77	27.001759	0	-57.158692	0	
48	N78	43.497691	0	-85.74	0	
49	N79	122.998241	0	-57.158692	0	
50	N80	0	42	0	0	
51	N81	150	42	0	0	
52	N82	154.5	42	-7.79	0	
53	N83	79.5	42	-137.7	0	
54	N84	70.5	42	-137.7	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [in]	Y [in]	Z [in]	Temp [F]	Detach From Diap...
55	N85	-4.5	42	-7.79	0	
56	N86	9	42	0	0	
57	N87	141	42	0	0	
58	N88	149.998441	42	-15.5873	0	
59	N89	84.003118	42	-129.9	0	
60	N90	65.996882	42	-129.9	0	
61	N91	0.001559	42	-15.5873	0	
62	N92	130.5	0	0	0	
63	N93	130.5	54	3	0	
64	N94	130.5	-42	3	0	
65	N101	94	42	0	0	
66	N102	56	42	0	0	
67	N103	18	42	0	0	
68	N116	130.5	42	0	0	
69	N123	67.719391	-30	-44.290803	0	
70	N124	75	-30	-56.9	0	
71	N125	82.280609	-30	-44.290803	0	
72	N126	75	0	-101.9	0	
73	N129	28.754243	0	-21.8	0	
74	N132	121.245757	0	-21.8	0	
75	N87A	145.502232	0	-23.386552	0	
76	N88A	107.502232	0	-89.204483	0	
77	N89A	126.502232	0	-56.295517	0	
78	N96	89.252232	0	-120.81441	0	
79	N99	107.502232	42	-89.204483	0	
80	N100	126.502232	42	-56.295517	0	
81	N101A	145.502232	42	-23.386552	0	
82	N102A	89.252232	42	-120.81441	0	
83	N104	61.497768	0	-122.113448	0	
84	N105	23.497768	0	-56.295517	0	
85	N106	42.497768	0	-89.204483	0	
86	N113	5.247768	0	-24.68559	0	
87	N116A	23.497768	42	-56.295517	0	
88	N117A	42.497768	42	-89.204483	0	
89	N118A	61.497768	42	-122.113448	0	
90	N119A	5.247768	42	-24.68559	0	
91	N116B	18	0	3	0	
92	N117	94	0	3	0	
93	N118	56	0	3	0	
94	N119	130.5	0	3	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [in]	Y [in]	Z [in]	Temp [F]	Detach From Diap...
95	N120	94	42	3	0	
96	N121	56	42	3	0	
97	N122	18	42	3	0	
98	N123A	130.5	42	3	0	
99	N133	148.100308	0	-24.886552	0	
100	N134	110.100308	0	-90.704483	0	
101	N135	129.100308	0	-57.795517	0	
102	N136	91.850308	0	-122.31441	0	
103	N137	110.100308	42	-90.704483	0	
104	N138	129.100308	42	-57.795517	0	
105	N139	148.100308	42	-24.886552	0	
106	N140	91.850308	42	-122.31441	0	
107	N150	58.899692	0	-123.613448	0	
108	N151	20.899692	0	-57.795517	0	
109	N152	39.899692	0	-90.704483	0	
110	N153	2.649692	0	-26.18559	0	
111	N154	20.899692	42	-57.795517	0	
112	N155	39.899692	42	-90.704483	0	
113	N156	58.899692	42	-123.613448	0	
114	N157	2.649692	42	-26.18559	0	
115	N125A	148.100308	54	-24.886552	0	
116	N126A	110.100308	54	-90.704483	0	
117	N127	129.100308	54	-57.795517	0	
118	N128	148.100308	-42	-24.886552	0	
119	N129A	110.100308	-42	-90.704483	0	
120	N130	129.100308	-42	-57.795517	0	
121	N131	91.850308	54	-122.31441	0	
122	N132A	91.850308	-42	-122.31441	0	
123	N134A	58.899692	54	-123.613448	0	
124	N135A	20.899692	54	-57.795517	0	
125	N136A	39.899692	54	-90.704483	0	
126	N137A	58.899692	-42	-123.613448	0	
127	N138A	20.899692	-42	-57.795517	0	
128	N139A	39.899692	-42	-90.704483	0	
129	N140A	2.649692	54	-26.18559	0	
130	N141	2.649692	-42	-26.18559	0	

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N65A	max	5860.435	20	323.439	16	1380.022	9	215.933	11	1702.677	10	18.341	15
2		min	51.115	9	-151.513	13	-3404.267	7	-184.607	22	-1692.63	15	-599.641	16
3	N67	max	2302.465	11	353.12	19	2764.143	10	104.042	9	2592.004	8	472.694	17
4		min	-5049.324	22	-82.32	57	-3849.586	8	-460.809	21	-2591.551	9	-96.389	15
5	N66	max	2248.35	5	362.892	22	6724.326	16	600.507	22	184.409	9	165.348	16
6		min	-204.743	9	-171.216	9	-3142.066	15	-14.931	9	-3532.703	12	-225.077	13
7	N123	max	-621.388	9	4100.015	20	3024.158	20	.307	4	.067	43	.05	43
8		min	-5242.896	20	490.637	9	439.483	9	-.087	43	-.236	4	-.177	4
9	N124	max	87.115	12	4112.525	16	19.87	15	0	78	.071	43	.181	52
10		min	-.105	2	-33.917	15	-6075.645	16	0	1	-.121	52	-.107	43
11	N125	max	5067.901	22	3959.212	22	2913.155	22	.101	9	.078	9	.059	9
12		min	10.608	11	-20.76	11	15.842	11	-.214	6	-.164	6	-.123	6
13	Totals:	max	7316.841	5	12241.788	22	7476.632	2						
14		min	-.002	9	3109.974	10	-7476.631	15						

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N65A	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N67	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	N66	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
4	N123	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
5	N124	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
6	N125	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
7	N126						
8	N129						
9	N132						

Hot Rolled Steel Design Parameters

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torq...	Kyy	Kzz	Cb	Function
1	MP3	Mount Pipe	96			Lbyy						Lateral
2	MP2	Mount Pipe	96			Lbyy						Lateral
3	MP1	Mount Pipe	96			Lbyy						Lateral
4	G30	Brace	51			Lbyy						Lateral
5	G29	Brace	51.001			Lbyy						Lateral
6	G28	Brace	50.991			Lbyy						Lateral
7	G27	Brace	50.996			Lbyy						Lateral

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torg...	Kyy	Kzz	Cb	Function
8	G26	Brace	51.001			Lbyy						Lateral
9	G25	Brace	51			Lbyy						Lateral
10	D12	Standoff Tu...	34.498			Lbyy						Lateral
11	D11	Standoff Tu...	34.497			Lbyy						Lateral
12	D10	Standoff Tu...	34.497			Lbyy						Lateral
13	S9	Standoff Tu...	73			Lbyy						Lateral
14	S8	Standoff Tu...	72.998			Lbyy						Lateral
15	S7	Standoff Tu...	72.998			Lbyy						Lateral
16	H6	PL6X1/2	18.006			Lbyy						Lateral
17	H5	PL6X1/2	17.998			Lbyy						Lateral
18	H4	PL6X1/2	17.998			Lbyy						Lateral
19	H3	Main Horizo...	150.005			Lbyy						Lateral
20	H2	Main Horizo...	150.005			Lbyy						Lateral
21	H1	Main Horizo...	150			Lbyy						Lateral
22	HK31	L2.5x2.5x4	18.006			Lbyy						Lateral
23	HK32	L2.5x2.5x4	17.998			Lbyy						Lateral
24	HK33	L2.5x2.5x4	17.998			Lbyy						Lateral
25	HK34	Mount Pipe	150.005			Lbyy						Lateral
26	HK35	Mount Pipe	150.005			Lbyy						Lateral
27	HK36	Mount Pipe	150			Lbyy						Lateral
28	MP4	Mount Pipe	96			Lbyy						Lateral
29	SB40	LL2.5	54.083									Lateral
30	SB41	LL2.5	54.075									Lateral
31	SB42	LL2.5	54.075									Lateral
32	MP7	Mount Pipe	96			Lbyy						Lateral
33	MP6	Mount Pipe	96			Lbyy						Lateral
34	MP5	Mount Pipe	96			Lbyy						Lateral
35	MP8	Mount Pipe	96			Lbyy						Lateral
36	MP11	Mount Pipe	96			Lbyy						Lateral
37	MP10	Mount Pipe	96			Lbyy						Lateral
38	MP9	Mount Pipe	96			Lbyy						Lateral
39	MP12	Mount Pipe	96			Lbyy						Lateral
40	D64	Standoff Tu...	34.503			Lbyy						Lateral
41	D65	Standoff Tu...	34.498			Lbyy						Lateral
42	D66	Standoff Tu...	34.503			Lbyy						Lateral

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	MP3	N35	N39			Mount Pipe	None	None	Q235-Gr.B	Typical
2	MP2	N36	N40			Mount Pipe	None	None	Q235-Gr.B	Typical
3	MP1	N33	N37			Mount Pipe	None	None	Q235-Gr.B	Typical
4	G30	N71	N70			Brace	None	None	Q345	Typical
5	G29	N76	N79			Brace	None	None	Q345	Typical
6	G28	N73	N72			Brace	None	None	Q345	Typical
7	G27	N75	N78			Brace	None	None	Q345	Typical
8	G26	N74	N77			Brace	None	None	Q345	Typical
9	G25	N69	N68			Brace	None	None	Q345	Typical
10	D12	T4	N67A			Standoff Tube	None	None	Q235-Gr.B	Typical
11	D11	T2	N66A			Standoff Tube	None	None	Q235-Gr.B	Typical
12	D10	T1	N65B			Standoff Tube	None	None	Q235-Gr.B	Typical
13	S9	B6	N66			Standoff Tube	None	None	Q235-Gr.B	Typical
14	S8	B5	N67			Standoff Tube	None	None	Q235-Gr.B	Typical
15	S7	B4	N65A			Standoff Tube	None	None	Q235-Gr.B	Typical
16	H6	P4	P5			PL6X1/2	None	None	Q345	Typical
17	H5	P2	P3			PL6X1/2	None	None	Q345	Typical
18	H4	P1	P6			PL6X1/2	None	None	Q345	Typical
19	H3	H3	H4			Main Horizontal	None	None	Q235-Gr.B	Typical
20	H2	H5	H6			Main Horizontal	None	None	Q235-Gr.B	Typical
21	H1	H1	H2			Main Horizontal	None	None	Q235-Gr.B	Typical
22	HK31	N89	N90		90	L2.5x2.5x4	None	None	Q345	Typical
23	HK32	N87	N88		90	L2.5x2.5x4	None	None	Q345	Typical
24	HK33	N91	N86		90	L2.5x2.5x4	None	None	Q345	Typical
25	HK34	N82	N83			Mount Pipe	None	None	Q235-Gr.B	Typical
26	HK35	N85	N84			Mount Pipe	None	None	Q235-Gr.B	Typical
27	HK36	N80	N81			Mount Pipe	None	None	Q235-Gr.B	Typical
28	MP4	N93	N94			Mount Pipe	None	None	Q235-Gr.B	Typical
29	SB40	N124	N126			LL2.5	None	None	Q345	Typical
30	SB41	N123	N129			LL2.5	None	None	Q345	Typical
31	SB42	N125	N132			LL2.5	None	None	Q345	Typical
32	R40	N122	N103			RIGID	None	None	RIGID	Typical
33	R41	N116B	N29			RIGID	None	None	RIGID	Typical
34	R42	N118	N32			RIGID	None	None	RIGID	Typical
35	R43	N121	N102			RIGID	None	None	RIGID	Typical
36	R44	N120	N101			RIGID	None	None	RIGID	Typical
37	R45	N117	N31			RIGID	None	None	RIGID	Typical
38	R46	N119	N92			RIGID	None	None	RIGID	Typical
39	R47	N123A	N116			RIGID	None	None	RIGID	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
40	R48	N139	N101A			RIGID	None	None	RIGID	Typical
41	R49	N133	N87A			RIGID	None	None	RIGID	Typical
42	R50	N135	N89A			RIGID	None	None	RIGID	Typical
43	R51	N138	N100			RIGID	None	None	RIGID	Typical
44	R52	N137	N99			RIGID	None	None	RIGID	Typical
45	R53	N134	N88A			RIGID	None	None	RIGID	Typical
46	R54	N136	N96			RIGID	None	None	RIGID	Typical
47	R55	N140	N102A			RIGID	None	None	RIGID	Typical
48	R56	N156	N118A			RIGID	None	None	RIGID	Typical
49	R57	N150	N104			RIGID	None	None	RIGID	Typical
50	R58	N152	N106			RIGID	None	None	RIGID	Typical
51	R59	N155	N117A			RIGID	None	None	RIGID	Typical
52	R60	N154	N116A			RIGID	None	None	RIGID	Typical
53	R61	N151	N105			RIGID	None	None	RIGID	Typical
54	R62	N153	N113			RIGID	None	None	RIGID	Typical
55	R63	N157	N119A			RIGID	None	None	RIGID	Typical
56	MP7	N126A	N129A			Mount Pipe	None	None	Q235-Gr.B	Typical
57	MP6	N127	N130			Mount Pipe	None	None	Q235-Gr.B	Typical
58	MP5	N125A	N128			Mount Pipe	None	None	Q235-Gr.B	Typical
59	MP8	N131	N132A			Mount Pipe	None	None	Q235-Gr.B	Typical
60	MP11	N135A	N138A			Mount Pipe	None	None	Q235-Gr.B	Typical
61	MP10	N136A	N139A			Mount Pipe	None	None	Q235-Gr.B	Typical
62	MP9	N134A	N137A			Mount Pipe	None	None	Q235-Gr.B	Typical
63	MP12	N140A	N141			Mount Pipe	None	None	Q235-Gr.B	Typical
64	D64	N65B	T6			Standoff Tube	None	None	Q235-Gr.B	Typical
65	D65	N67A	T5			Standoff Tube	None	None	Q235-Gr.B	Typical
66	D66	N66A	T3			Standoff Tube	None	None	Q235-Gr.B	Typical

Member Advanced Data

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Rat...	Analysis ...	Inactive	Seismic...
1	MP3						Yes	** NA **			None
2	MP2						Yes	** NA **			None
3	MP1						Yes	** NA **			None
4	G30						Yes	** NA **			None
5	G29						Yes	** NA **			None
6	G28						Yes	** NA **			None
7	G27						Yes	** NA **			None
8	G26						Yes	** NA **			None
9	G25						Yes	** NA **			None

Member Advanced Data (Continued)

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Rat...	Analysis ...	Inactive	Seismic...
10	D12	BenPIN					Yes	** NA **			None
11	D11	BenPIN					Yes	** NA **			None
12	D10	BenPIN					Yes	** NA **			None
13	S9						Yes	** NA **			None
14	S8						Yes	** NA **			None
15	S7						Yes	** NA **			None
16	H6	BenPIN	BenPIN				Yes	** NA **			None
17	H5	BenPIN	BenPIN				Yes	** NA **			None
18	H4	BenPIN	BenPIN				Yes	** NA **			None
19	H3						Yes	** NA **			None
20	H2						Yes	** NA **			None
21	H1						Yes	** NA **			None
22	HK31						Yes	** NA **			None
23	HK32						Yes	** NA **			None
24	HK33						Yes	** NA **			None
25	HK34						Yes	** NA **			None
26	HK35						Yes	** NA **			None
27	HK36						Yes	** NA **			None
28	MP4						Yes	** NA **			None
29	SB40	BenPIN	BenPIN				Yes	** NA **			None
30	SB41	BenPIN	BenPIN				Yes	** NA **			None
31	SB42	BenPIN	BenPIN				Yes	** NA **			None
32	R40						Yes	** NA **			None
33	R41						Yes	** NA **			None
34	R42						Yes	** NA **			None
35	R43						Yes	** NA **			None
36	R44						Yes	** NA **			None
37	R45						Yes	** NA **			None
38	R46						Yes	** NA **			None
39	R47						Yes	** NA **			None
40	R48						Yes	** NA **			None
41	R49						Yes	** NA **			None
42	R50						Yes	** NA **			None
43	R51						Yes	** NA **			None
44	R52						Yes	** NA **			None
45	R53						Yes	** NA **			None
46	R54						Yes	** NA **			None
47	R55						Yes	** NA **			None
48	R56						Yes	** NA **			None
49	R57						Yes	** NA **			None

Member Advanced Data (Continued)

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Rat...	Analysis ...	Inactive	Seismic...
50	R58						Yes	** NA **			None
51	R59						Yes	** NA **			None
52	R60						Yes	** NA **			None
53	R61						Yes	** NA **			None
54	R62						Yes	** NA **			None
55	R63						Yes	** NA **			None
56	MP7						Yes	** NA **			None
57	MP6						Yes	** NA **			None
58	MP5						Yes	** NA **			None
59	MP8						Yes	** NA **			None
60	MP11						Yes	** NA **			None
61	MP10						Yes	** NA **			None
62	MP9						Yes	** NA **			None
63	MP12						Yes	** NA **			None
64	D64		BenPIN				Yes	** NA **			None
65	D65		BenPIN				Yes	** NA **			None
66	D66		BenPIN				Yes	** NA **			None

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed Area(Me...	Surface(P...
1	Dead Load	DL		-1			24		3
2	Wind 0	WLZ					48		
3	Wind 30	None					48		
4	Wind 60	None					48		
5	Wind 90	WLX					48		
6	Wind 120	None					48		
7	Wind 150	None					48		
8	Wind 180	WLZ					48		
9	Ice Weight	DL					24	66	3
10	Ice + Wind 0	WLZ					48		
11	Ice + Wind 30	None					48		
12	Ice + Wind 60	None					48		
13	Ice + Wind 90	WLX					48		
14	Ice + Wind 120	None					48		
15	Ice + Wind 150	None					48		
16	Ice + Wind 180	WLZ					48		
17	Distri. Wind Z	WLZ						66	
18	Distri. Wind X	WLX						66	
19	Distri. Ice + Wind Z	WLZ						66	

Basic Load Cases (Continued)

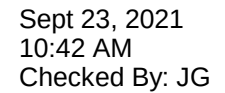
	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed Area(Me...	Surface(P...
20	Distr. Ice + Wind X	WLX						66	
21	Seismic Load Z	ELZ					24	66	
22	Seismic Load X	ELX					24	66	
23	Live Load 1	LL					3		
24	Live Load 2	LL					3		
25	Live Load 3	LL					3		
26	BLC 1 Transient Area..	None						36	
27	BLC 9 Transient Area..	None						36	

Load Combinations

	Description	Solve	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.4D	Yes	Y		1	1.4																		
2	1.2D + 1.6W 0°	Yes	Y		1	1.2	2	1.6	17	1.6	18													
3	1.2D + 1.6W 30°	Yes	Y		1	1.2	3	1.6	17	1.3...	18	.8												
4	1.2D + 1.6W 60°	Yes	Y		1	1.2	4	1.6	17	.8	18	1.3...												
5	1.2D + 1.6W 90°	Yes	Y		1	1.2	5	1.6	17		18	1.6												
6	1.2D + 1.6W 120°	Yes	Y		1	1.2	6	1.6	17	-.8	18	1.3...												
7	1.2D + 1.6W 150°	Yes	Y		1	1.2	7	1.6	17	-1....	18	.8												
8	1.2D + 1.6W 180°	Yes	Y		1	1.2	8	1.6	17	-1.6	18													
9	0.9D + 1.6W 0°	Yes	Y		1	.9	2	1.6	17	1.6	18													
10	0.9D + 1.6W 30°	Yes	Y		1	.9	3	1.6	17	1.3...	18	.8												
11	0.9D + 1.6W 60°	Yes	Y		1	.9	4	1.6	17	.8	18	1.3...												
12	0.9D + 1.6W 90°	Yes	Y		1	.9	5	1.6	17		18	1.6												
13	0.9D + 1.6W 120°	Yes	Y		1	.9	6	1.6	17	-.8	18	1.3...												
14	0.9D + 1.6W 150°	Yes	Y		1	.9	7	1.6	17	-1....	18	.8												
15	0.9D + 1.6W 180°	Yes	Y		1	.9	8	1.6	17	-1.6	18													
16	1.2D + 1.0Di + 1.0Wi 0°	Yes	Y		1	1.2	9	1	10	1	19	1	20											
17	1.2D + 1.0Di + 1.0Wi 3...	Yes	Y		1	1.2	9	1	11	1	19	.866	20	.5										
18	1.2D + 1.0Di + 1.0Wi 6...	Yes	Y		1	1.2	9	1	12	1	19	.5	20	.866										
19	1.2D + 1.0Di + 1.0Wi 9...	Yes	Y		1	1.2	9	1	13	1	19		20	1										
20	1.2D + 1.0Di + 1.0Wi 1...	Yes	Y		1	1.2	9	1	14	1	19	-.5	20	.866										
21	1.2D + 1.0Di + 1.0Wi 1...	Yes	Y		1	1.2	9	1	15	1	19	-.866	20	.5										
22	1.2D + 1.0Di + 1.0Wi 1...	Yes	Y		1	1.2	9	1	16	1	19	-1	20											
23	1.2D + 1.0Eh 0°	Yes	Y		1	1.2	21	1	22															
24	1.2D + 1.0Eh 30°	Yes	Y		1	1.2	21	.866	22	.5														
25	1.2D + 1.0Eh 60°	Yes	Y		1	1.2	21	.5	22	.866														
26	1.2D + 1.0Eh 90°	Yes	Y		1	1.2	21		22	1														
27	1.2D + 1.0Eh 120°	Yes	Y		1	1.2	21	-.5	22	.866														
28	1.2D + 1.0Eh 150°	Yes	Y		1	1.2	21	-.866	22	.5														

Load Combinations (Continued)

	Description	Solve	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
29	1.2D + 1.0Eh 180°	Yes	Y		1	1.2	21	-1	22															
30	0.9D + 1.0Eh 0°	Yes	Y		1	.9	21	1	22															
31	0.9D + 1.0Eh 30°	Yes	Y		1	.9	21	.866	22	.5														
32	0.9D + 1.0Eh 60°	Yes	Y		1	.9	21	.5	22	.866														
33	0.9D + 1.0Eh 90°	Yes	Y		1	.9	21		22	1														
34	0.9D + 1.0Eh 120°	Yes	Y		1	.9	21	-.5	22	.866														
35	0.9D + 1.0Eh 150°	Yes	Y		1	.9	21	-.866	22	.5														
36	0.9D + 1.0Eh 180°	Yes	Y		1	.9	21	-1	22															
37	1.0D + 1.5Lv + 1.0W (6...	Yes	Y		1	1	23	1.5	2	.318	17	.318	18											
38	1.0D + 1.5Lv + 1.0W (6...	Yes	Y		1	1	23	1.5	3	.318	17	.275	18	.159										
39	1.0D + 1.5Lv + 1.0W (6...	Yes	Y		1	1	23	1.5	4	.318	17	.159	18	.275										
40	1.0D + 1.5Lv + 1.0W (6...	Yes	Y		1	1	23	1.5	5	.318	17		18	.318										
41	1.0D + 1.5Lv + 1.0W (6...	Yes	Y		1	1	23	1.5	6	.318	17	-.159	18	.275										
42	1.0D + 1.5Lv + 1.0W (6...	Yes	Y		1	1	23	1.5	7	.318	17	-.275	18	.159										
43	1.0D + 1.5Lv + 1.0W (6...	Yes	Y		1	1	23	1.5	8	.318	17	-.318	18											
44	1.0D + 1.5Lv + 1.0W (6...	Yes	Y		1	1	24	1.5	2	.318	17	.318	18											
45	1.0D + 1.5Lv + 1.0W (6...	Yes	Y		1	1	24	1.5	3	.318	17	.275	18	.159										
46	1.0D + 1.5Lv + 1.0W (6...	Yes	Y		1	1	24	1.5	4	.318	17	.159	18	.275										
47	1.0D + 1.5Lv + 1.0W (6...	Yes	Y		1	1	24	1.5	5	.318	17		18	.318										
48	1.0D + 1.5Lv + 1.0W (6...	Yes	Y		1	1	24	1.5	6	.318	17	-.159	18	.275										
49	1.0D + 1.5Lv + 1.0W (6...	Yes	Y		1	1	24	1.5	7	.318	17	-.275	18	.159										
50	1.0D + 1.5Lv + 1.0W (6...	Yes	Y		1	1	24	1.5	8	.318	17	-.318	18											
51	1.0D + 1.5Lv + 1.0W (6...	Yes	Y		1	1	25	1.5	2	.318	17	.318	18											
52	1.0D + 1.5Lv + 1.0W (6...	Yes	Y		1	1	25	1.5	3	.318	17	.275	18	.159										
53	1.0D + 1.5Lv + 1.0W (6...	Yes	Y		1	1	25	1.5	4	.318	17	.159	18	.275										
54	1.0D + 1.5Lv + 1.0W (6...	Yes	Y		1	1	25	1.5	5	.318	17		18	.318										
55	1.0D + 1.5Lv + 1.0W (6...	Yes	Y		1	1	25	1.5	6	.318	17	-.159	18	.275										
56	1.0D + 1.5Lv + 1.0W (6...	Yes	Y		1	1	25	1.5	7	.318	17	-.275	18	.159										
57	1.0D + 1.5Lv + 1.0W (6...	Yes	Y		1	1	25	1.5	8	.318	17	-.318	18											
58	1.2D + 1.0Lv + 1.0W (...)	Yes	Y		1	1.2	23	1	2	.089	17	.089	18											
59	1.2D + 1.0Lv + 1.0W (...)	Yes	Y		1	1.2	23	1	3	.089	17	.077	18	.044										
60	1.2D + 1.0Lv + 1.0W (...)	Yes	Y		1	1.2	23	1	4	.089	17	.044	18	.077										
61	1.2D + 1.0Lv + 1.0W (...)	Yes	Y		1	1.2	23	1	5	.089	17		18	.089										
62	1.2D + 1.0Lv + 1.0W (...)	Yes	Y		1	1.2	23	1	6	.089	17	-.044	18	.077										
63	1.2D + 1.0Lv + 1.0W (...)	Yes	Y		1	1.2	23	1	7	.089	17	-.077	18	.044										
64	1.2D + 1.0Lv + 1.0W (...)	Yes	Y		1	1.2	23	1	8	.089	17	-.089	18											
65	1.2D + 1.0Lv + 1.0W (...)	Yes	Y		1	1.2	24	1	2	.089	17	.089	18											
66	1.2D + 1.0Lv + 1.0W (...)	Yes	Y		1	1.2	24	1	3	.089	17	.077	18	.044										
67	1.2D + 1.0Lv + 1.0W (...)	Yes	Y		1	1.2	24	1	4	.089	17	.044	18	.077										
68	1.2D + 1.0Lv + 1.0W (...)	Yes	Y		1	1.2	24	1	5	.089	17		18	.089										



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Envelope AISC 14th(360-10): LRFD Steel Code Checks (Continued)

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*P...	phi*P...	phi*M...	phi*M....	Eqn
27	HK31	L2.5x2.5...	.185	0	5	.071	18.0...	z	5	35824...	38556	1113....	2537....	H2-1
28	SB40	LL2.5x2....	.172	0	16	.005	0	z	5	42711...	58320	4643....	2549....	1 H1-1...
29	SB41	LL2.5x2....	.171	0	20	.006	54.0...	z	3	42711...	58320	4643....	2549....	H1-1...
30	SB42	LL2.5x2....	.165	0	22	.005	54.0...	z	7	42711...	58320	4643....	2549....	H1-1...
31	MP8	PIPE_2.5	.164	54	4	.080	54		12	30038...	50715	3596....	3596....	H1-1b
32	MP12	PIPE_2.5	.157	54	7	.079	54		4	30038...	50715	3596....	3596....	H1-1b
33	HK36	PIPE_2.5	.153	131.25	14	.106	129....		8	14558...	50715	3596....	3596....	H1-1b
34	MP5	PIPE_2.5	.152	54	3	.065	12		13	30038...	50715	3596....	3596....	H1-1b
35	MP9	PIPE_2.5	.150	54	7	.083	54		5	30038...	50715	3596....	3596....	H1-1b
36	HK34	PIPE_2.5	.147	131.255	5	.105	140....		5	14557...	50715	3596....	3596....	H1-1b
37	HK35	PIPE_2.5	.144	18.751	10	.095	20.3...		12	14557...	50715	3596....	3596....	H1-1b
38	MP4	PIPE_2.5	.132	12	6	.093	54		8	30038...	50715	3596....	3596....	H1-1b
39	H1	PIPE_3.0	.117	59.375	7	.145	59.3...		8	28250...	65205	5748....	5748....	H1-1b
40	MP1	PIPE_2.5	.112	54	12	.082	12		8	30038...	50715	3596....	3596....	H1-1b
41	H2	PIPE_3.0	.109	59.377	3	.134	59.3...		4	28248...	65205	5748....	5748....	H1-1b
42	H3	PIPE_3.0	.108	60.94	22	.115	59.3...		6	28248...	65205	5748....	5748....	H1-1b