Date: **May 16, 2025**

Gregory Nawrotzki
GT Wireless Engineering, PLLC
56 Dearborn Drive
Old Tappan, NJ 07675
617 694 4291
greg@gt-we.com

Albul Engineering, LLC
3840 E. Robinson Road
Amherst, NY 14228
(716) 650-8147
dalbul@albuleng.com

Subject	**Antenna Mounts Structural Analysis Report**	
GT Wireless	**Project Number**	G.T.015.0032
AT&T Mobility	**Site Name**	NWL06362
	Site Number	SINY008246
	FA Number	14652291
Albul Engineering	**Project Number**	35661.GTW.MSA.R231458.0
Site Data	**1 Van Wyck Street, Croton on Hudson, NY, Westchester County**	
	Latitude: 41° 12' 29.91", Longitude: -73° 53' 15.76"	
	55.17-Foot-Tall Building	
	One (1) 10.5-ft Site Pro 1 RT-RRU10HD Ballast Frame	
	Three (3) 9.0-ft Site Pro 1 VFA8-RRU Sector Frame	

Dear Mr. Nawrotzki,

Per your request, Albul Engineering has performed a structural analysis to evaluate the structural capacity of the proposed antenna mounts located at the above-referenced address for the addition of wireless telecommunication appurtenances by AT&T Mobility. The analysis has been performed in accordance with the AISC-LRFD 15th Edition and TIA-222-H standards, and 2020 New York State Uniform Code requirements based upon an ultimate wind speed of 123mph.

Upon reviewing the results of this analysis, it is our opinion that the proposed antenna mounts meet the specified code requirements. The proposed structures are **adequate** to support the final loading as listed in this report.

Antenna Mounts:	**57.9%**	**Pass**
Connections:	**5.6%**	**Pass**
Ballast Frame:	**91.8%**	**Pass**

We at Albul Engineering appreciate the opportunity of providing our continuing professional services to GT Wireless Engineering and AT&T Mobility. If you have any questions or need further assistance on this or any other projects, please give us a call.

Sincerely,

Dmitriy Albul, P.E.
New York Professional Engineer
License Number: 089075

05-16-25
Expiration Date: 04-30-28
Albul Engineering LLC / COA: 106682

CONTENTS

1.0 INTRODUCTION

The proposed mount system consists of 10.5-ft Site Pro 1 RT-RRU10HD Ballast Frame installed on the existing building roof with equipment centerline of 59.5-ft above ground level and of three (3) proposed 9.0- ft Site Pro 1 VFA8-RRU Sector Frames located at Alpha, Beta, Gamma Sectors with the antenna centerline of 71.0-ft above the ground level on Guyed Tower. The objective of this report is to assess the capacity of the proposed antenna mounts for supporting the proposed equipment.

1.1 DOCUMENTS PROVIDED

The mount analysis is based on the following documents:

- Radio Frequency Data Sheet by AT&T Mobility, dated Fabruary 25, 2025
- Construction Drawings by GT Wireless Engineering, dated January 2, 2025
- Site Visit Photos by GT Wireless Engineering, dated December 6, 2024
- Previous Structural Analysis by Azimuth Engineering P.C., dated December 17, 2021

2.0 PROPOSED EQUIPMENT

The mount analysis is based on the following appurtenances:

Mounting Level (ft)	Equipment Centerline (ft)	Q-ty	Equipment Manufacturer	Equipment Model	Number of Feed Lines	Feed Line Type/Size (in)
71.0	72.0	3	Ericsson	AIR 6472 B77G B77M	3	24 Pair Fiber
	71.0	6	Commscope	NNH4-65A-R3-UPM-V2		
59.5	59.5	3	Ericsson	4494 B14/B29	9	6 Gauge DC Power
		3	Ericsson	4890 B25/B66		
		3	Ericsson	4490 B5/B12A		
		3	-	FMB	3	IN 2" Innerduct
		3	Raycap	DC9-48-60-24-PC16-EV		
		1	-	GPS		

3.0 CODES AND LOADING

The analysis has been performed in accordance with the following codes and loading as adopted in Westchester County, New York:

- 2020 New York State Uniform Code (2018 IBC)
- Structural Standard for Antenna Supporting Structures, Antennas and Small Wind Turbine Support Structures - ANSI/TIA-222-H
- AISC 360-16
- ASCE/SEI 7–16
- Ultimate Wind Speed: 123 MPH
- Risk Category: III
- Exposure Category: C
- Topographic Category: 1
- Wind Speed with Ice: 40 MPH
- Ice Thickness: 1”
- Seismic: S_1= 0.061, S_{DS}= 0.304

4.0 STANDARD CONDITIONS FOR ENGINEERING SERVICES ON EXISTING STRUCTURES

The analysis is based on the documents listed in section 1.1. The appurtenance position and condition of the structure has been verified and assumed to be correct. Unless otherwise noted, the structure and the mount are assumed to be in good condition, free of defects, and can achieve theoretical strength.

It is assumed that the structure has been maintained and shall be maintained during its service. The superstructure and the foundation system are assumed to be designed with proper engineering practice and fabricated, constructed, and erected in accordance with the design documents. Albul Engineering will accept no liability which may arise due to any existing deficiency in design, material, fabrication, erection, construction, etc. or lack of maintenance. Contractor should inspect the condition of the existing structure, mounts, and connections and notify Albul Engineering for any discrepancies and deficiencies before proceeding with the construction.

The analysis results presented in this report are only applicable for the previously mentioned proposed loading. Any deviation of the existing or proposed equipment and placement will require Albul Engineering to generate an additional structural analysis.

5.0 ANALYSIS AND ASSUMPTIONS

The proposed antenna mounts were evaluated by RISA-3D version 22 a Finite Element Analysis (FEA) software. The mount connections were calculated by custom developed Excel tools.

6.0 RESULTS AND CONCLUSION

Based on the results of the structural analysis, we have found that the proposed antenna mounts are **adequate** to support the proposed loading as listed in this report. The structure elements would be loaded with the following capacities:

Sector Frame:	57.9%
Connections:	5.6%
Ballast Frame:	91.8%
Slide Check:	95.2%

The Proposed Ballast Blocks Configuration

Tray	Required Ballast Blocks Quantity	Final Ballast Weight, lbs	Note
Front	8	2,092	Add 8 Blocks
Rear	8		Add 8 Blocks

Should you have any questions or need any clarifications about this report, please contact Albul Engineering at (716) 800-1364.

Sincerely,

Albul Engineering, LLC

05-16-25
Expiration Date: 04-30-28
Albul Engineering LLC / COA: 106682

Dmitriy Albul, P.E.
New York Professional Engineer
License Number: 089075

APPENDIX A: PHOTOS AND CALCULATIONS

GUYED TOWER OVERALL VIEW

Date:	5/16/2025
Site Name:	Croton-on-Hudson
Project Engineer:	DVA
Project No:	35661.GTW.MSA.R231458.0
Customer:	GT Wireless Engineering, PLLC
Carrier:	AT&T Mobility

Building Code:	2018	
TIA Standard:	H	
Mount Type:	Sector Frame (Multiple)	
Mount Existing?	Proposed	
Mount Centerline:	71	ft
Superstructure Height:	95	ft
Structure Type:	Rooftop	

Site Information		
Exposure Category:	C	
Risk Category:	III	
Ground Elevation	118.0	ft
Ultimate Wind Speed:	123	mph
Design Wind Speed:	123	mph
Ice Thickness:	1.00	in
Ice Wind Speed:	40.0	mph
Escalated Ice Thickness:	1.24	in
Topographic Method:	2	
Topographic Category:	1	

Factors	
Gh:	1.000
K_{zmin}:	0.850
K_z:	1.178
K_d:	0.950
K_{zt}:	1.000
Ke:	0.996
Ka:	0.900
I ice:	1.150

q_z:	43.14	psf

Run Seismic?	Yes
Site Soil:	D (Default)
Short-Period Accel. (Ss):	0.291
1-Second Accel. (S1):	0.061
Short-Period Design (SDS):	0.304
1-Second Design (SD1):	0.098
Short-Period Coeff. (Fa):	1.567
1-Second Coeff. (Fv):	2.400
Cs	0.190
Cs min	0.030
Amplification Factor (ap):	1.000
Response Mod. (Rp):	2.500
Overstrength (Ωo):	1.000

Service Wind:	30	mph

Table 1. Equipment Specifications and Wind Pressure

Manufacturer	Model	Elevation	Pipe Label	Weight (lb)	Height (in)	Width (in)	Depth (in)	EPA_N	EPA_T	$EPA_{N\ w/\ ice}$	$EPA_{T\ w/\ ice}$	q_z:	$q_{z\ ice}$:	$q_{z\ live}$:
COMMSCOPE	NNH4-65A-R3-UPM-V2	71.0	1, 2, 73, 74, 145, 146	73.9	72.0	19.6	7.1	6.8*	2.4*	14.15	7.07	43.1	4.6	2.6
ERICSSON	AIR 6472 B77G B77M	72.0	26, 98, 170	77.0	36.3	15.8	7.4	4.94*	1.65*	5.83	3.36	43.1	4.6	2.6

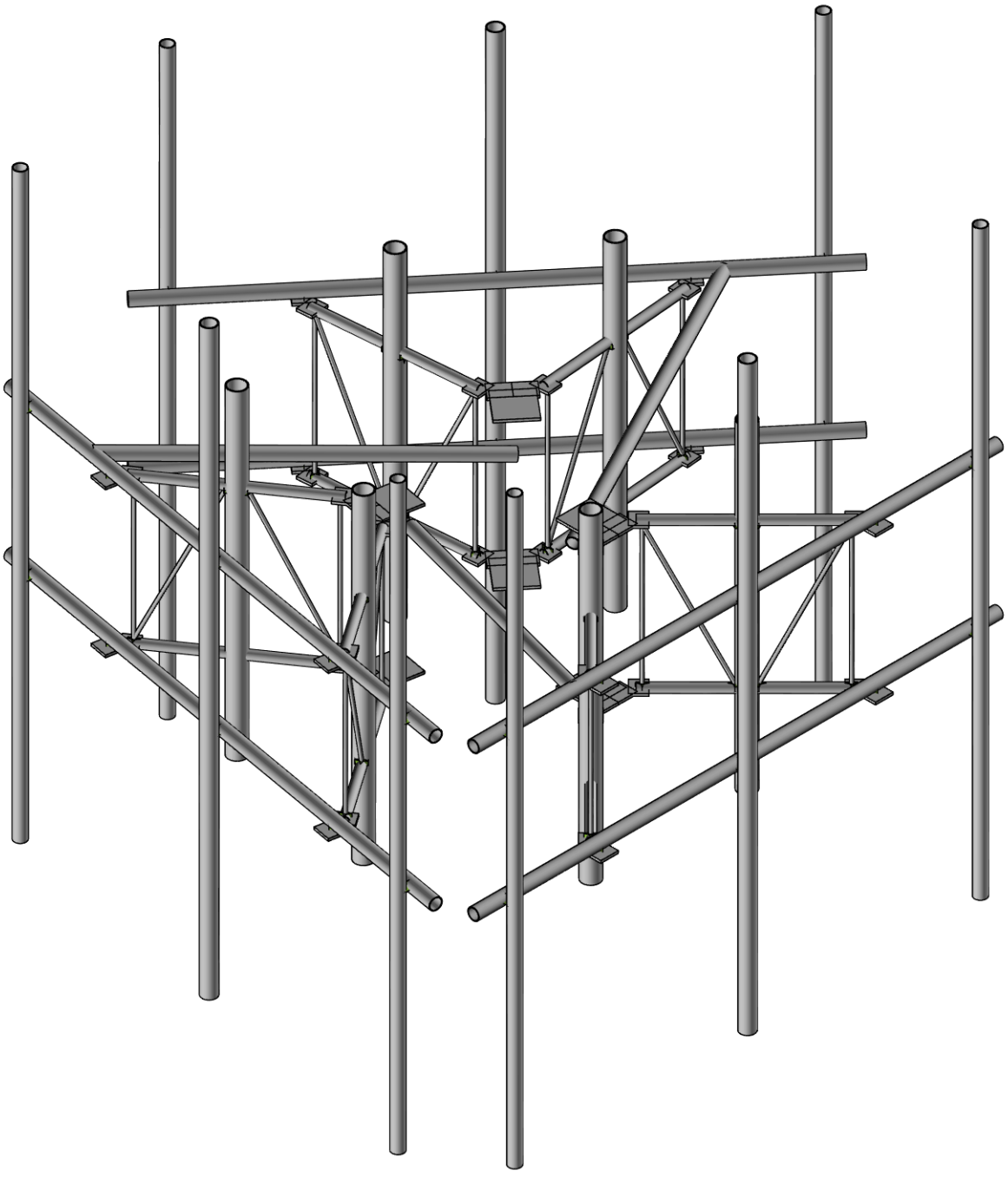
*** Commscope Wind Tunnel Testing (WTT) Data (dated November, 2024) and Ericsson Computational Fluid Design (CFD) Data Use (dated January, 2025)**

Table 2. Equipment Wind and Seismic Loads

Manufacturer	Model	Wind Load (F_A), lb		Wind Load Ice Case (F_A), lb			Wind Load Service Case		Seismic Load, lb
		0 deg	90 deg	0 deg	90 deg	Ice Weight	0 deg	90 deg	
COMMSCOPE	NNH4-65A-R3-UPM-V2	264.0	93.2	58.1	29.0	205.4	15.7	5.5	14.0
ERICSSON	AIR 6472 B77G B77M	191.8	64.1	23.9	13.8	87.6	11.4	3.8	14.6

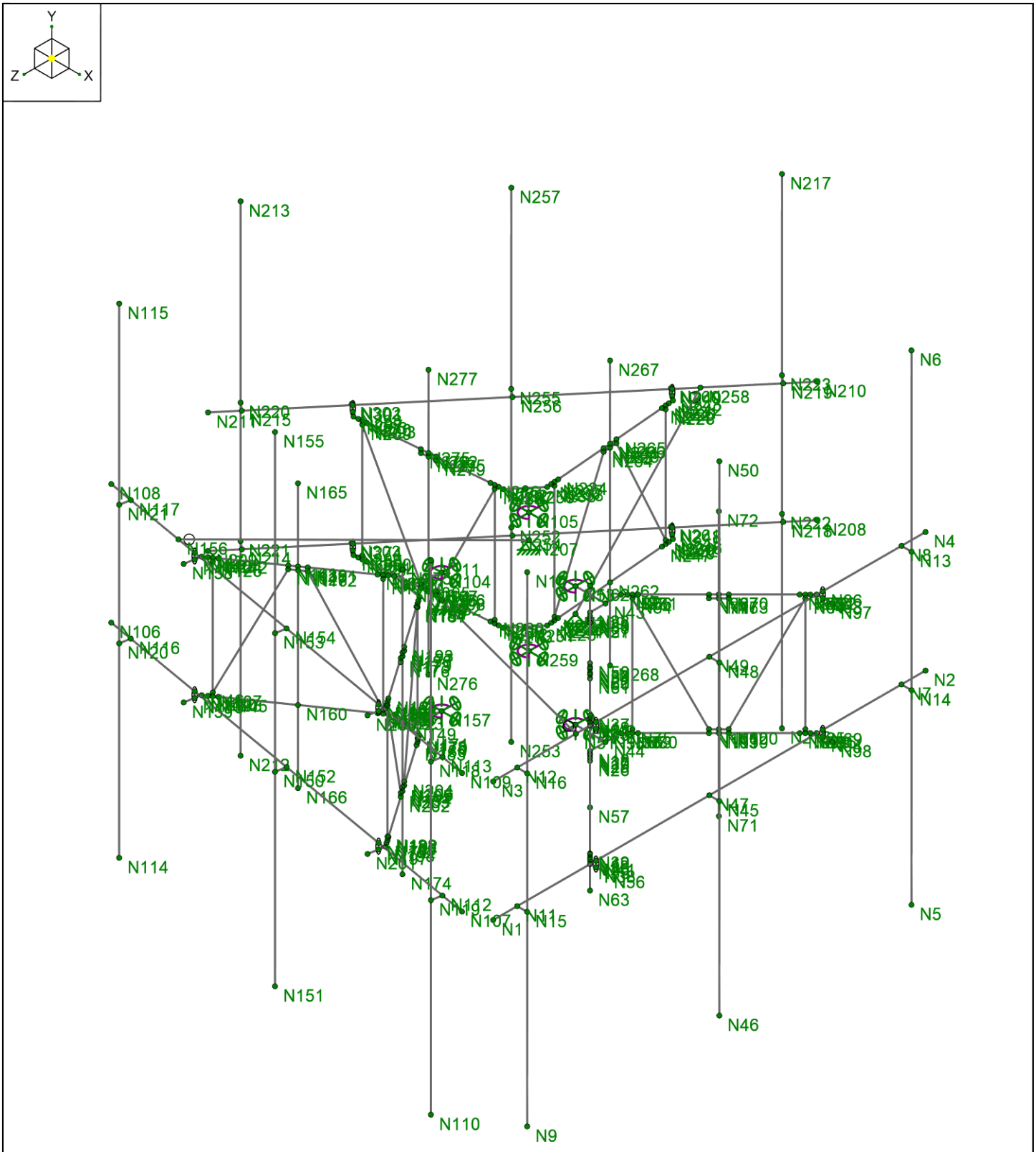
Table 3.1. Hot Rolled Member Capacities

Member Name	Member Shape	Wind load (plf)	Wind Load Ice (plf)	Weight Ice (plf)	Bending Check	Shear Check	Total Capacity	Controlling Capacity
Plate	3.625"X0.5"PLATE	26.07	2.76	0.79	39.3%	26.0%	39.3%	57.9%
Arm	PIPE_1.25	7.16	0.76	0.54	31.3%	6.8%	31.3%	
Bracing	0.625"S.R.	2.70	0.29	0.40	57.9%	4.1%	57.9%	
Frame Rail	PIPE_2.0	10.25	1.08	0.63	37.2%	19.9%	37.2%	
Stabilizer	PIPE_2.0	10.25	1.08	0.63	8.2%	0.3%	8.2%	
Mount Pipes	PIPE_2.0	10.25	1.08	0.63	24.0%	6.2%	24.0%	
Plate 2	7"X0.5"PLATE	50.33	5.32	1.23	29.0%	17.7%	29.0%	
RRU Pipe	PIPE_3.0	15.10	1.60	0.77	3.7%	2.6%	3.7%	



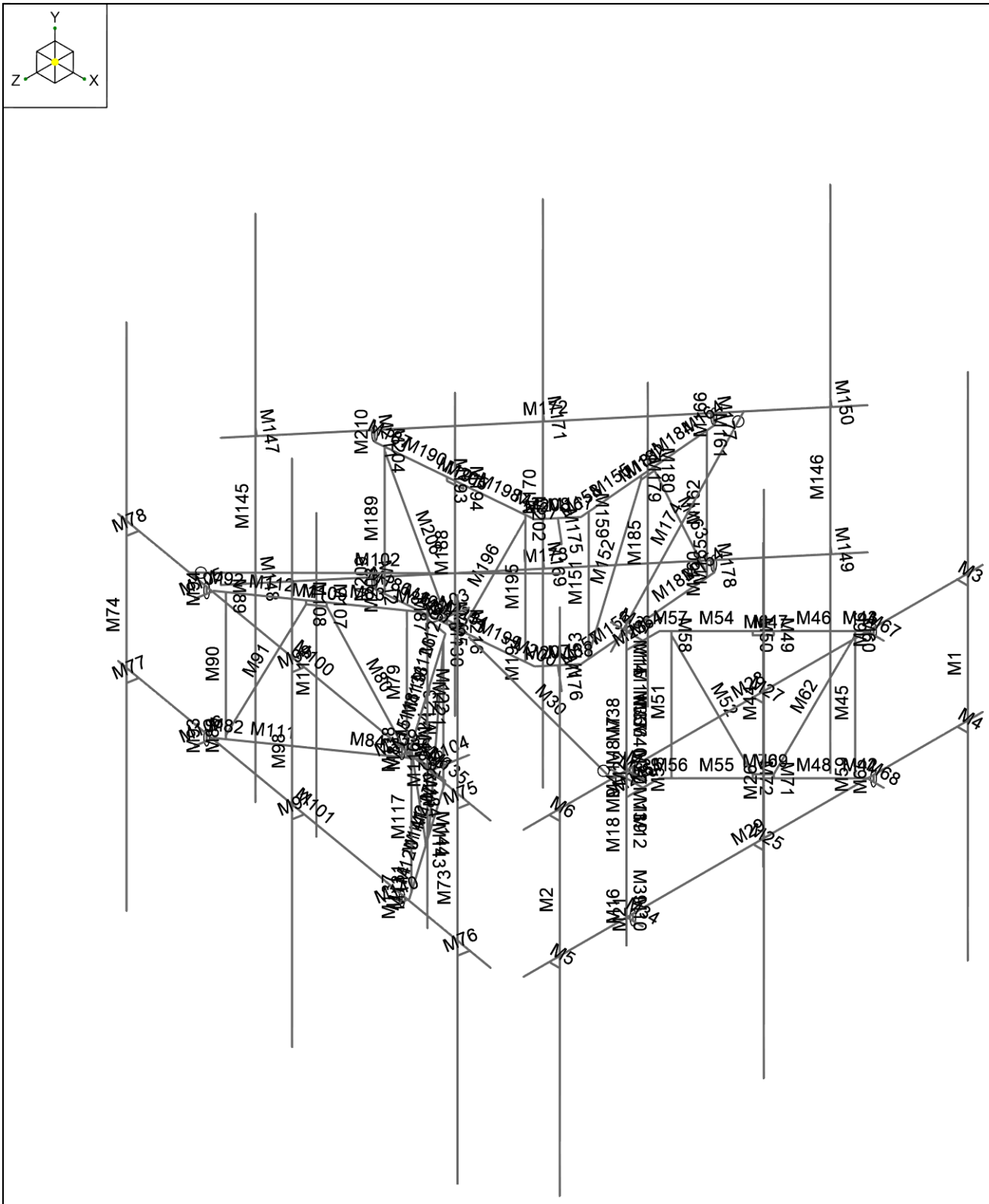
Envelope Only Solution

RISA A NEMETSCHEK COMPANY	Albul Engineering, LLC	Croton-on-Hudson	SK-1
	DVA		14652291 Croton on Hudson…
	35661.GTW.MSA.R23145…	Sector Frame Model	



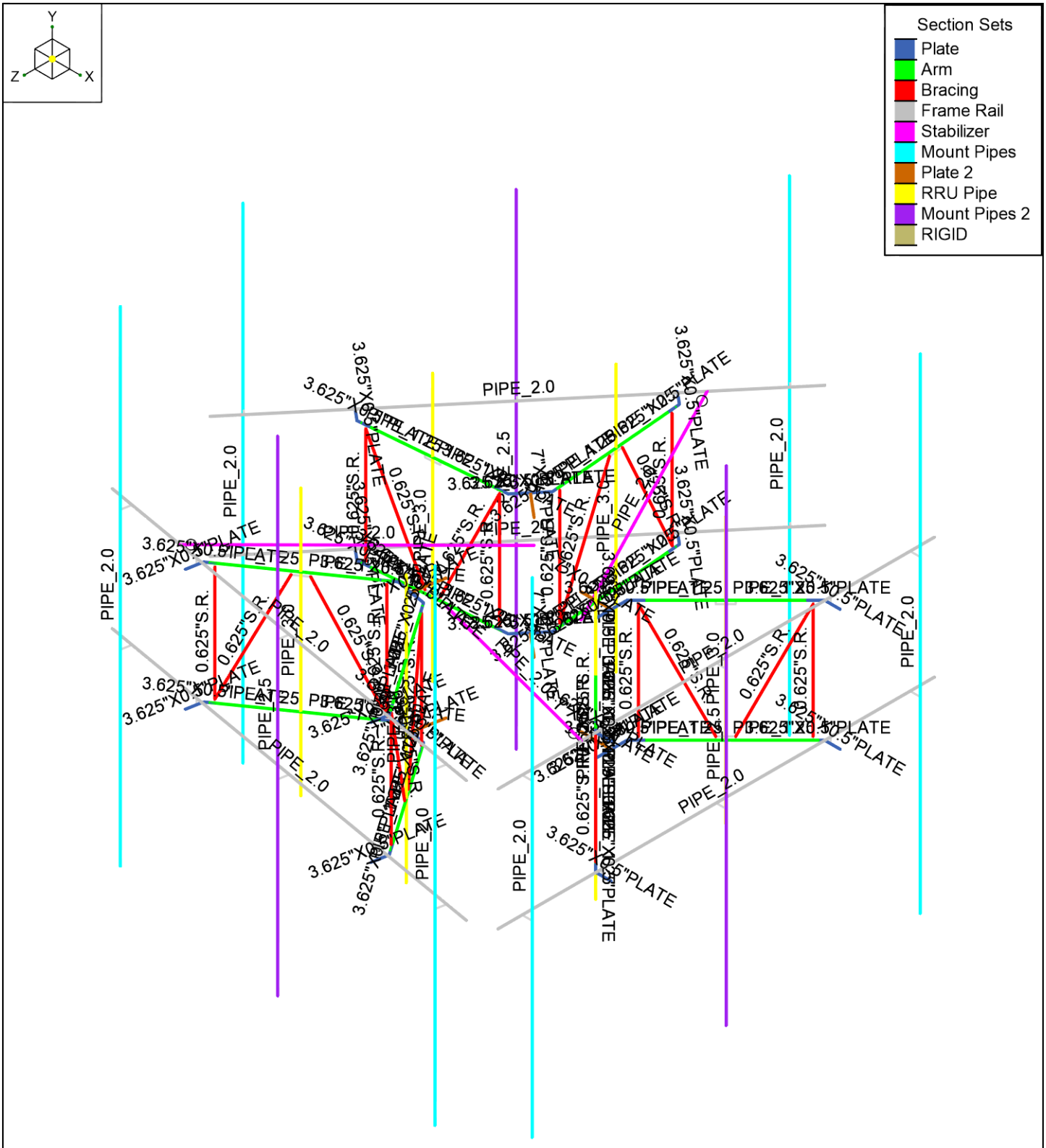
Envelope Only Solution

RISA A NEMETSCHEK COMPANY	Albul Engineering, LLC	Croton-on-Hudson	SK-2
	DVA		14652291 Croton on Hudson…
	35661.GTW.MSA.R23145…	Joint Labels	



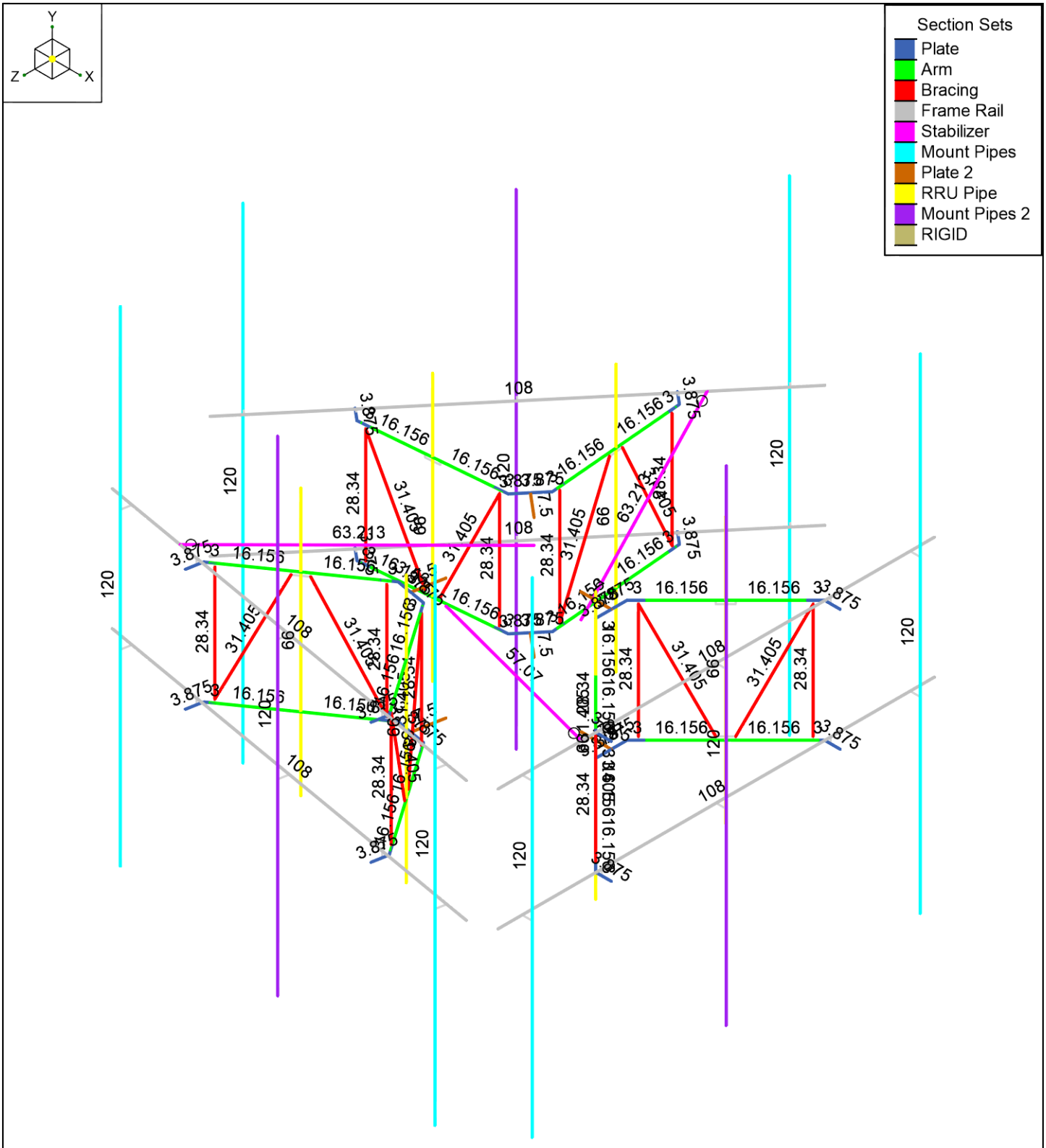
Envelope Only Solution

RISA A NEMETSCHEK COMPANY	Albul Engineering, LLC	Croton-on-Hudson	SK-3
	DVA		14652291 Croton on Hudson…
	35661.GTW.MSA.R23145…	Member Labels	



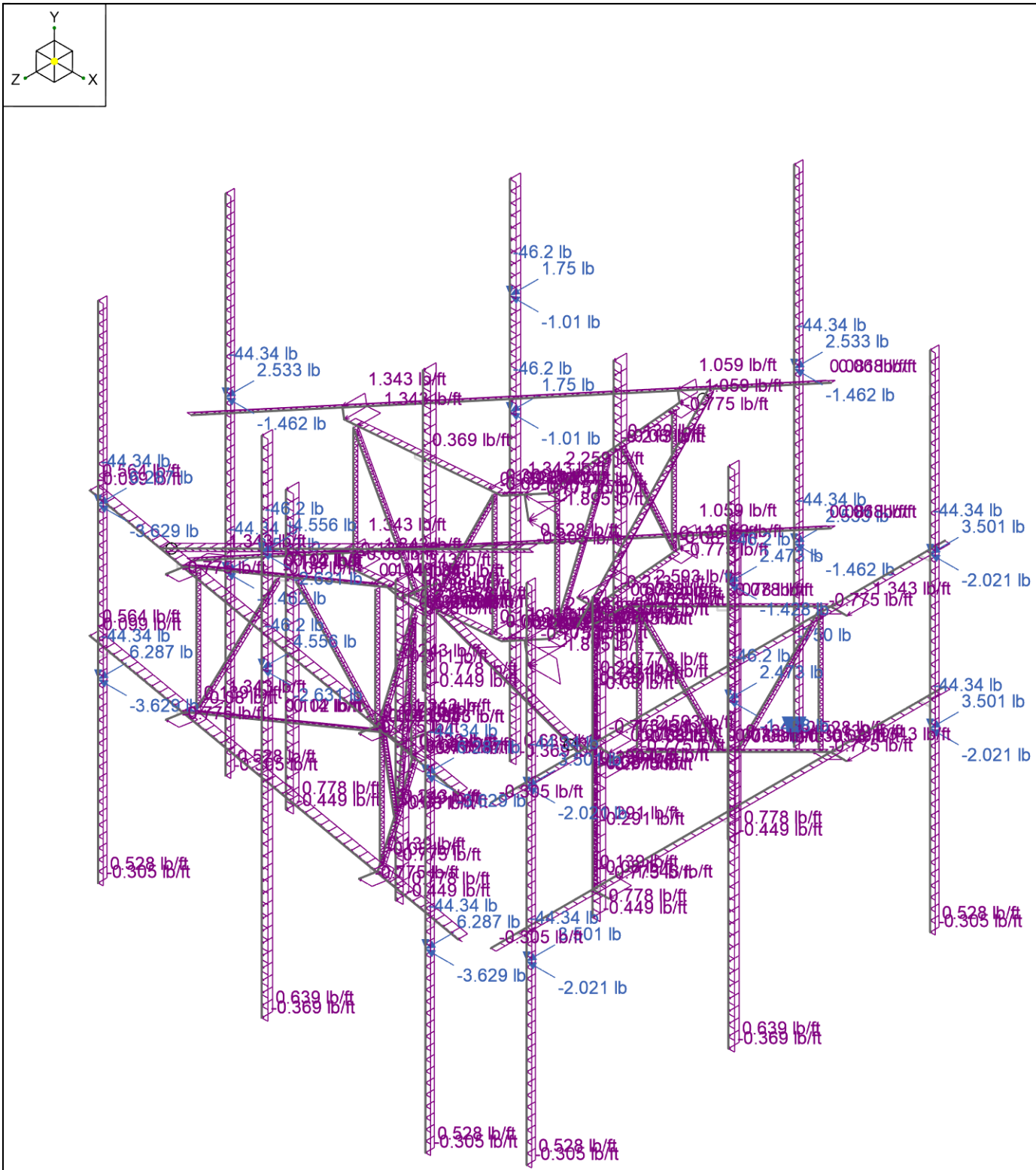
Envelope Only Solution

RISA A NEMETSCHEK COMPANY	Albul Engineering, LLC	Croton-on-Hudson	SK-4
	DVA		14652291 Croton on Hudson…
	35661.GTW.MSA.R23145…	Member Shapes	



Member Length (in) Displayed
Envelope Only Solution

RISA A NEMETSCHEK COMPANY	Albul Engineering, LLC	Croton-on-Hudson	SK-5
	DVA		14652291 Croton on Hudson…
	35661.GTW.MSA.R23145…	Member Lengths	



Loads: LC 169, 1.2DL + 1.5LM8 + 1SWL (30 mph) AZI 300
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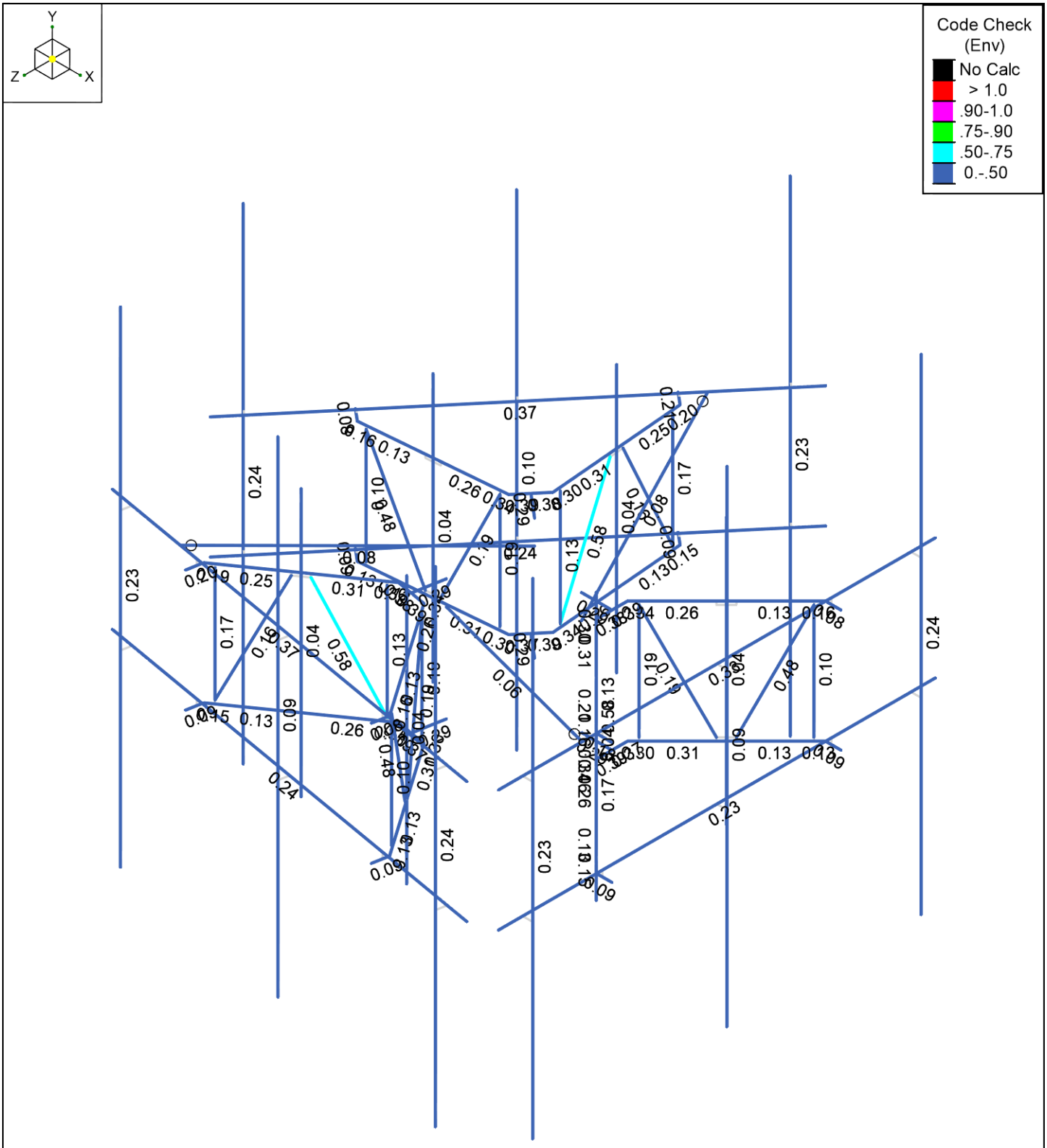
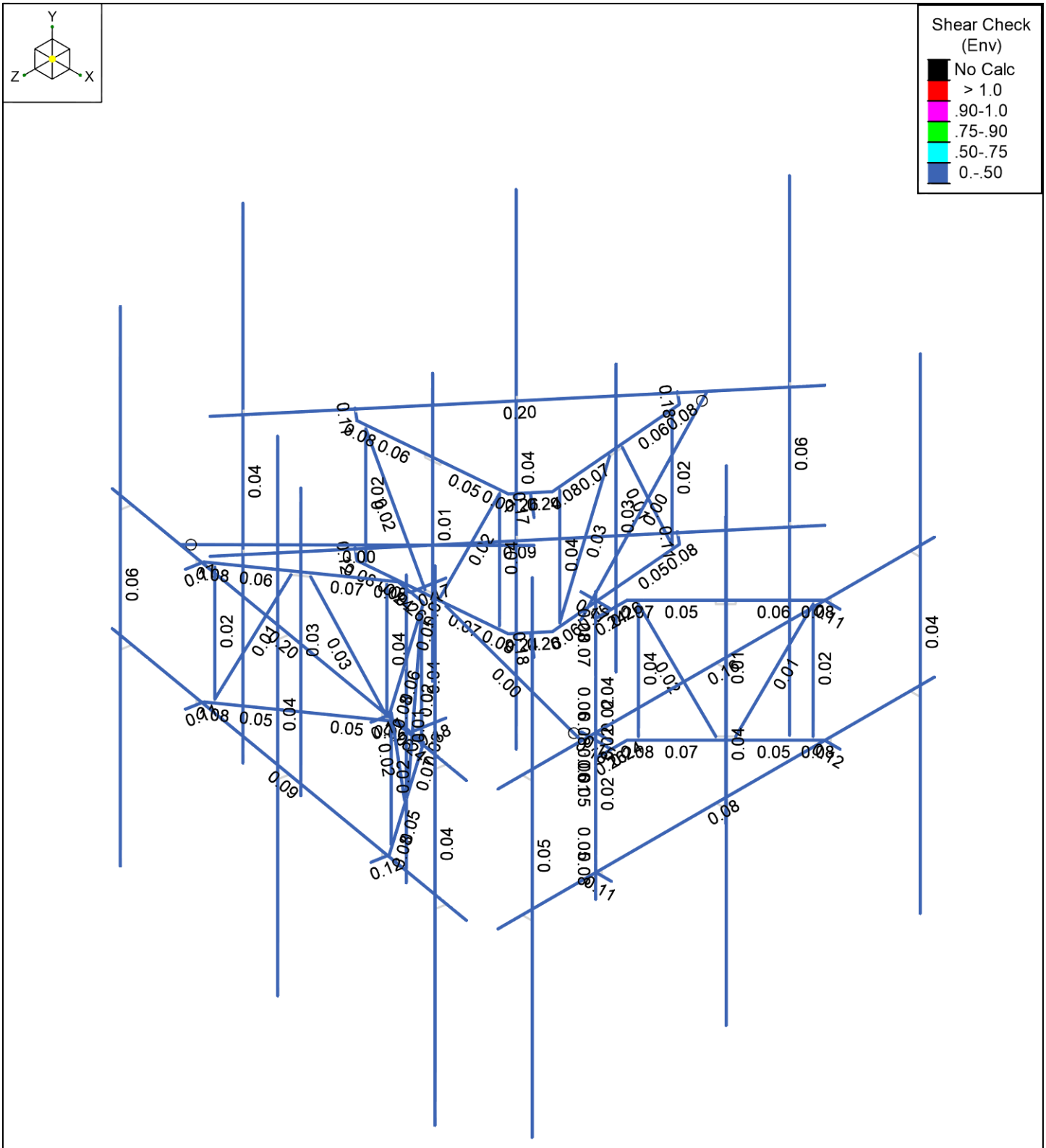
RISA A NEMETSCHEK COMPANY	Albul Engineering, LLC	Croton-on-Hudson	SK-6
	DVA		14652291 Croton on Hudson…
	35661.GTW.MSA.R23145…	Controlling Load Case	



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

IRISA A NEMETSCHEK COMPANY	Albul Engineering, LLC	Croton-on-Hudson	SK-7
	DVA		14652291 Croton on Hudson…
	35661.GTW.MSA.R23145…	Member Bending Check	



Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

RISA A NEMETSCHEK COMPANY	Albul Engineering, LLC	Croton-on-Hudson	SK-8
	DVA		14652291 Croton on Hudson…
	35661.GTW.MSA.R23145…	Member Shear Check	

Model Settings

Number of Reported Sections	5
Number of Internal Sections	100
Member Area Load Mesh Size (in^2)	144
Consider Shear Deformation	Yes
Consider Torsional Warping	Yes
Approximate Mesh Size (in)	12
Transfer Forces Between Intersecting Wood Walls	Yes
Increase Wood Wall Nailing Capacity for Wind Loads	Yes
Include P-Delta for Walls	Yes
Optimize Masonry and Wood Walls	Yes
Maximum Number of Iterations	3
Single	No
Multiple (Optimum)	Yes
Maximum	No

Global Axis corresponding to vertical direction	Y
Convert Existing Data	Yes
Default Global Plane for z-axis	XZ
Plate Local Axis Orientation	Nodal

Hot Rolled Steel	AISC 15th (360-16): LRFD
Stiffness Adjustment	Yes (Iterative)
Notional Annex	None
Connections	AISC 15th (360-16): LRFD
Cold Formed Steel	None
Stiffness Adjustment	Yes (Iterative)
Wood	None
Temperature	< 100F
Concrete	None
Masonry	None
Aluminum	None
Structure Type	Building
Stiffness Adjustment	Yes (Iterative)
Stainless	None
Stiffness Adjustment	Yes (Iterative)

Compression Stress Block	Rectangular Stress Block
Analyze using Cracked Sections	Yes
Leave room for horizontal rebar splices (2*d bar spacing)	Yes
List forces which were ignored for design in the Detail Report	Yes

Column Min Steel	1
Column Max Steel	8
Rebar Material Spec	ASTM A615
Warn if beam-column framing arrangement is not understood	No
Number of Shear Regions	4
Region 2 & 3 Spacing Increase Increment (in)	4

Code	ASCE 7-16
Risk Category	III
Drift Cat	Other

Model Settings (Continued)

Base Elevation (ft)	
Include the weight of the structure in base shear calcs	Yes
S_1 (g)	1
SD_1 (g)	1
SD_s (g)	1
T_L (sec)	5
T Z (sec)	
T X (sec)	
C_tZ	0.02
C_tX	0.02
C_tExp. Z	0.75
C_tExp. X	0.75
R Z	3
R X	3
Ω_0Z	1
Ω_0X	1
C_dZ	4
C_dX	4
ρ Z	1
ρ X	1

Member Primary Data

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
1	M1	N5	N6		Mount Pipes	Column	Pipe	A53 Gr.B	Typical
2	M2	N9	N10		Mount Pipes	Column	Pipe	A53 Gr.B	Typical
3	M3	N8	N13		RIGID	None	None	RIGID	Typical
4	M4	N7	N14		RIGID	None	None	RIGID	Typical
5	M5	N11	N15		RIGID	None	None	RIGID	Typical
6	M6	N12	N16		RIGID	None	None	RIGID	Typical
7	M7	N20	N31	45	Bracing	VBrace	BAR	A36 Gr.36	Typical
8	M8	N20	N59		Bracing	VBrace	BAR	A36 Gr.36	Typical
9	M9	N29	N20	45	RIGID	None	None	RIGID	Typical
10	M10	N40	N39	90	Plate	Beam	RECT	A36 Gr.36	Typical
11	M11	N23	N34		Arm	Beam	Pipe	A53 Gr.B	Typical
12	M12	N17	N57		Arm	Beam	Pipe	A53 Gr.B	Typical
13	M13	N18	N26	90	Plate	Beam	RECT	A36 Gr.36	Typical
14	M14	N28	N27	90	Plate	Beam	RECT	A36 Gr.36	Typical
15	M15	N30	N31	315	RIGID	None	None	RIGID	Typical
16	M16	N33	N32	45	RIGID	None	None	RIGID	Typical
17	M17	N19	N21	315	RIGID	None	None	RIGID	Typical
18	M18	N32	N21	45	Bracing	VBrace	BAR	A36 Gr.36	Typical
19	M19	N61	N32		Bracing	VBrace	BAR	A36 Gr.36	Typical
20	M20	N37	N35	90	Plate	Beam	RECT	A36 Gr.36	Typical
21	M21	N38	N41		RIGID	None	None	RIGID	Typical
22	M22	N36	N42		RIGID	None	None	RIGID	Typical
23	M23	N43	N28	90	Plate	Beam	RECT	A36 Gr.36	Typical
24	M24	N44	N18	90	Plate	Beam	RECT	A36 Gr.36	Typical
25	M25	N47	N45		RIGID	None	None	RIGID	Typical
26	M26	N46	N50		Mount Pipes 2	Column	Pipe	A53 Gr.B	Typical
27	M27	N49	N48		RIGID	None	None	RIGID	Typical
28	M28	N3	N4		Frame Rail	Beam	Pipe	A53 Gr.B	Typical
29	M29	N1	N2		Frame Rail	Beam	Pipe	A53 Gr.B	Typical
30	M30	N52	N51		Stabilizer	HBrace	Pipe	A53 Gr.B	Typical
31	M31	N43	N53	90	Plate 2	Beam	RECT	A36 Gr.36	Typical
32	M32	N44	N54	90	Plate 2	Beam	RECT	A36 Gr.36	Typical
33	M33	N55	N35	90	Plate	Beam	RECT	A36 Gr.36	Typical
34	M34	N56	N39	90	Plate	Beam	RECT	A36 Gr.36	Typical
35	M35	N58	N59	45	RIGID	None	None	RIGID	Typical
36	M36	N60	N61	45	RIGID	None	None	RIGID	Typical
37	M37	N59	N22		RIGID	None	None	RIGID	Typical
38	M38	N61	N22		RIGID	None	None	RIGID	Typical
39	M39	N57	N25		Arm	Beam	Pipe	A53 Gr.B	Typical
40	M40	N34	N24		Arm	Beam	Pipe	A53 Gr.B	Typical
41	M41	N63	N62	315	RRU Pipe	Column	Pipe	A53 Gr.B	Typical
42	M42	N89	N95	90	Plate	Beam	RECT	A36 Gr.36	Typical
43	M43	N88	N92	90	Plate	Beam	RECT	A36 Gr.36	Typical
44	M44	N71	N72	315	RRU Pipe	Column	Pipe	A53 Gr.B	Typical
45	M45	N85	N64	45	Bracing	VBrace	BAR	A36 Gr.36	Typical
46	M46	N87	N78		Arm	Beam	Pipe	A53 Gr.B	Typical
47	M47	N73	N76		RIGID	None	None	RIGID	Typical
48	M48	N91	N79		Arm	Beam	Pipe	A53 Gr.B	Typical
49	M49	N70	N73	45	RIGID	None	None	RIGID	Typical
50	M50	N90	N74	45	RIGID	None	None	RIGID	Typical
51	M51	N75	N84	45	Bracing	VBrace	BAR	A36 Gr.36	Typical
52	M52	N84	N101		Bracing	VBrace	BAR	A36 Gr.36	Typical
53	M53	N83	N75	45	RIGID	None	None	RIGID	Typical
54	M54	N77	N87		Arm	Beam	Pipe	A53 Gr.B	Typical
55	M55	N67	N91		Arm	Beam	Pipe	A53 Gr.B	Typical

Member Primary Data (Continued)

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
56	M56	N68	N80	90	Plate	Beam	RECT	A36 Gr.36	Typical
57	M57	N82	N81	90	Plate	Beam	RECT	A36 Gr.36	Typical
58	M58	N66	N84	315	RIGID	None	None	RIGID	Typical
59	M59	N86	N85	45	RIGID	None	None	RIGID	Typical
60	M60	N65	N64	315	RIGID	None	None	RIGID	Typical
61	M61	N74	N76		RIGID	None	None	RIGID	Typical
62	M62	N100	N64		Bracing	VBrace	BAR	A36 Gr.36	Typical
63	M63	N44	N68	90	Plate	Beam	RECT	A36 Gr.36	Typical
64	M64	N43	N82	90	Plate	Beam	RECT	A36 Gr.36	Typical
65	M65	N94	N69		RIGID	None	None	RIGID	Typical
66	M66	N93	N96		RIGID	None	None	RIGID	Typical
67	M67	N97	N92	90	Plate	Beam	RECT	A36 Gr.36	Typical
68	M68	N98	N95	90	Plate	Beam	RECT	A36 Gr.36	Typical
69	M69	N100	N102		RIGID	None	None	RIGID	Typical
70	M70	N101	N102		RIGID	None	None	RIGID	Typical
71	M71	N100	N99	45	RIGID	None	None	RIGID	Typical
72	M72	N101	N103	45	RIGID	None	None	RIGID	Typical
73	M73	N110	N111	260	Mount Pipes	Column	Pipe	A53 Gr.B	Typical
74	M74	N114	N115	260	Mount Pipes	Column	Pipe	A53 Gr.B	Typical
75	M75	N113	N118		RIGID	None	None	RIGID	Typical
76	M76	N112	N119		RIGID	None	None	RIGID	Typical
77	M77	N116	N120		RIGID	None	None	RIGID	Typical
78	M78	N117	N121		RIGID	None	None	RIGID	Typical
79	M79	N125	N136	305	Bracing	VBrace	BAR	A36 Gr.36	Typical
80	M80	N125	N162		Bracing	VBrace	BAR	A36 Gr.36	Typical
81	M81	N134	N125	305	RIGID	None	None	RIGID	Typical
82	M82	N145	N144	90	Plate	Beam	RECT	A36 Gr.36	Typical
83	M83	N128	N139		Arm	Beam	Pipe	A53 Gr.B	Typical
84	M84	N122	N160		Arm	Beam	Pipe	A53 Gr.B	Typical
85	M85	N123	N131	90	Plate	Beam	RECT	A36 Gr.36	Typical
86	M86	N133	N132	90	Plate	Beam	RECT	A36 Gr.36	Typical
87	M87	N135	N136	55	RIGID	None	None	RIGID	Typical
88	M88	N138	N137	305	RIGID	None	None	RIGID	Typical
89	M89	N124	N126	55	RIGID	None	None	RIGID	Typical
90	M90	N137	N126	305	Bracing	VBrace	BAR	A36 Gr.36	Typical
91	M91	N164	N137		Bracing	VBrace	BAR	A36 Gr.36	Typical
92	M92	N142	N140	90	Plate	Beam	RECT	A36 Gr.36	Typical
93	M93	N143	N146	260	RIGID	None	None	RIGID	Typical
94	M94	N141	N147	260	RIGID	None	None	RIGID	Typical
95	M95	N148	N133	90	Plate	Beam	RECT	A36 Gr.36	Typical
96	M96	N149	N123	90	Plate	Beam	RECT	A36 Gr.36	Typical
97	M97	N152	N150		RIGID	None	None	RIGID	Typical
98	M98	N151	N155	260	Mount Pipes 2	Column	Pipe	A53 Gr.B	Typical
99	M99	N154	N153		RIGID	None	None	RIGID	Typical
100	M100	N108	N109		Frame Rail	Beam	Pipe	A53 Gr.B	Typical
101	M101	N106	N107		Frame Rail	Beam	Pipe	A53 Gr.B	Typical
102	M102	N207	N156		Stabilizer	HBrace	Pipe	A53 Gr.B	Typical
103	M103	N148	N104	90	Plate 2	Beam	RECT	A36 Gr.36	Typical
104	M104	N149	N157	90	Plate 2	Beam	RECT	A36 Gr.36	Typical
105	M105	N158	N140	90	Plate	Beam	RECT	A36 Gr.36	Typical
106	M106	N159	N144	90	Plate	Beam	RECT	A36 Gr.36	Typical
107	M107	N161	N162	145	RIGID	None	None	RIGID	Typical
108	M108	N163	N164	145	RIGID	None	None	RIGID	Typical
109	M109	N162	N127		RIGID	None	None	RIGID	Typical
110	M110	N164	N127		RIGID	None	None	RIGID	Typical

Member Primary Data (Continued)

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
111	M111	N160	N130		Arm	Beam	Pipe	A53 Gr.B	Typical
112	M112	N139	N129		Arm	Beam	Pipe	A53 Gr.B	Typical
113	M113	N166	N165	215	RRU Pipe	Column	Pipe	A53 Gr.B	Typical
114	M114	N192	N198	90	Plate	Beam	RECT	A36 Gr.36	Typical
115	M115	N191	N195	90	Plate	Beam	RECT	A36 Gr.36	Typical
116	M116	N174	N175	215	RRU Pipe	Column	Pipe	A53 Gr.B	Typical
117	M117	N188	N167	305	Bracing	VBrace	BAR	A36 Gr.36	Typical
118	M118	N190	N181		Arm	Beam	Pipe	A53 Gr.B	Typical
119	M119	N176	N179		RIGID	None	None	RIGID	Typical
120	M120	N194	N182		Arm	Beam	Pipe	A53 Gr.B	Typical
121	M121	N173	N176	145	RIGID	None	None	RIGID	Typical
122	M122	N193	N177	145	RIGID	None	None	RIGID	Typical
123	M123	N178	N187	305	Bracing	VBrace	BAR	A36 Gr.36	Typical
124	M124	N187	N204		Bracing	VBrace	BAR	A36 Gr.36	Typical
125	M125	N186	N178	305	RIGID	None	None	RIGID	Typical
126	M126	N180	N190		Arm	Beam	Pipe	A53 Gr.B	Typical
127	M127	N170	N194		Arm	Beam	Pipe	A53 Gr.B	Typical
128	M128	N171	N183	90	Plate	Beam	RECT	A36 Gr.36	Typical
129	M129	N185	N184	90	Plate	Beam	RECT	A36 Gr.36	Typical
130	M130	N169	N187	55	RIGID	None	None	RIGID	Typical
131	M131	N189	N188	305	RIGID	None	None	RIGID	Typical
132	M132	N168	N167	55	RIGID	None	None	RIGID	Typical
133	M133	N177	N179		RIGID	None	None	RIGID	Typical
134	M134	N203	N167		Bracing	VBrace	BAR	A36 Gr.36	Typical
135	M135	N149	N171	90	Plate	Beam	RECT	A36 Gr.36	Typical
136	M136	N148	N185	90	Plate	Beam	RECT	A36 Gr.36	Typical
137	M137	N197	N172	260	RIGID	None	None	RIGID	Typical
138	M138	N196	N199	260	RIGID	None	None	RIGID	Typical
139	M139	N200	N195	90	Plate	Beam	RECT	A36 Gr.36	Typical
140	M140	N201	N198	90	Plate	Beam	RECT	A36 Gr.36	Typical
141	M141	N203	N205		RIGID	None	None	RIGID	Typical
142	M142	N204	N205		RIGID	None	None	RIGID	Typical
143	M143	N203	N202	145	RIGID	None	None	RIGID	Typical
144	M144	N204	N206	145	RIGID	None	None	RIGID	Typical
145	M145	N212	N213	140	Mount Pipes	Column	Pipe	A53 Gr.B	Typical
146	M146	N216	N217	140	Mount Pipes	Column	Pipe	A53 Gr.B	Typical
147	M147	N215	N220		RIGID	None	None	RIGID	Typical
148	M148	N214	N221		RIGID	None	None	RIGID	Typical
149	M149	N218	N222		RIGID	None	None	RIGID	Typical
150	M150	N219	N223		RIGID	None	None	RIGID	Typical
151	M151	N227	N238	185	Bracing	VBrace	BAR	A36 Gr.36	Typical
152	M152	N227	N264		Bracing	VBrace	BAR	A36 Gr.36	Typical
153	M153	N236	N227	185	RIGID	None	None	RIGID	Typical
154	M154	N247	N246	90	Plate	Beam	RECT	A36 Gr.36	Typical
155	M155	N230	N241		Arm	Beam	Pipe	A53 Gr.B	Typical
156	M156	N224	N262		Arm	Beam	Pipe	A53 Gr.B	Typical
157	M157	N225	N233	90	Plate	Beam	RECT	A36 Gr.36	Typical
158	M158	N235	N234	90	Plate	Beam	RECT	A36 Gr.36	Typical
159	M159	N237	N238	175	RIGID	None	None	RIGID	Typical
160	M160	N240	N239	185	RIGID	None	None	RIGID	Typical
161	M161	N226	N228	175	RIGID	None	None	RIGID	Typical
162	M162	N239	N228	185	Bracing	VBrace	BAR	A36 Gr.36	Typical
163	M163	N266	N239		Bracing	VBrace	BAR	A36 Gr.36	Typical
164	M164	N244	N242	90	Plate	Beam	RECT	A36 Gr.36	Typical
165	M165	N245	N248	140	RIGID	None	None	RIGID	Typical

Member Primary Data (Continued)

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
166	M166	N243	N249	140	RIGID	None	None	RIGID	Typical
167	M167	N250	N235	90	Plate	Beam	RECT	A36 Gr.36	Typical
168	M168	N251	N225	90	Plate	Beam	RECT	A36 Gr.36	Typical
169	M169	N254	N252		RIGID	None	None	RIGID	Typical
170	M170	N253	N257	140	Mount Pipes 2	Column	Pipe	A53 Gr.B	Typical
171	M171	N256	N255		RIGID	None	None	RIGID	Typical
172	M172	N210	N211		Frame Rail	Beam	Pipe	A53 Gr.B	Typical
173	M173	N208	N209		Frame Rail	Beam	Pipe	A53 Gr.B	Typical
174	M174	N309	N258		Stabilizer	HBrace	Pipe	A53 Gr.B	Typical
175	M175	N250	N105	90	Plate 2	Beam	RECT	A36 Gr.36	Typical
176	M176	N251	N259	90	Plate 2	Beam	RECT	A36 Gr.36	Typical
177	M177	N260	N242	90	Plate	Beam	RECT	A36 Gr.36	Typical
178	M178	N261	N246	90	Plate	Beam	RECT	A36 Gr.36	Typical
179	M179	N263	N264	265	RIGID	None	None	RIGID	Typical
180	M180	N265	N266	265	RIGID	None	None	RIGID	Typical
181	M181	N264	N229		RIGID	None	None	RIGID	Typical
182	M182	N266	N229		RIGID	None	None	RIGID	Typical
183	M183	N262	N232		Arm	Beam	Pipe	A53 Gr.B	Typical
184	M184	N241	N231		Arm	Beam	Pipe	A53 Gr.B	Typical
185	M185	N268	N267	95	RRU Pipe	Column	Pipe	A53 Gr.B	Typical
186	M186	N294	N300	90	Plate	Beam	RECT	A36 Gr.36	Typical
187	M187	N293	N297	90	Plate	Beam	RECT	A36 Gr.36	Typical
188	M188	N276	N277	95	RRU Pipe	Column	Pipe	A53 Gr.B	Typical
189	M189	N290	N269	185	Bracing	VBrace	BAR	A36 Gr.36	Typical
190	M190	N292	N283		Arm	Beam	Pipe	A53 Gr.B	Typical
191	M191	N278	N281		RIGID	None	None	RIGID	Typical
192	M192	N296	N284		Arm	Beam	Pipe	A53 Gr.B	Typical
193	M193	N275	N278	265	RIGID	None	None	RIGID	Typical
194	M194	N295	N279	265	RIGID	None	None	RIGID	Typical
195	M195	N280	N289	185	Bracing	VBrace	BAR	A36 Gr.36	Typical
196	M196	N289	N306		Bracing	VBrace	BAR	A36 Gr.36	Typical
197	M197	N288	N280	185	RIGID	None	None	RIGID	Typical
198	M198	N282	N292		Arm	Beam	Pipe	A53 Gr.B	Typical
199	M199	N272	N296		Arm	Beam	Pipe	A53 Gr.B	Typical
200	M200	N273	N285	90	Plate	Beam	RECT	A36 Gr.36	Typical
201	M201	N287	N286	90	Plate	Beam	RECT	A36 Gr.36	Typical
202	M202	N271	N289	175	RIGID	None	None	RIGID	Typical
203	M203	N291	N290	185	RIGID	None	None	RIGID	Typical
204	M204	N270	N269	175	RIGID	None	None	RIGID	Typical
205	M205	N279	N281		RIGID	None	None	RIGID	Typical
206	M206	N305	N269		Bracing	VBrace	BAR	A36 Gr.36	Typical
207	M207	N251	N273	90	Plate	Beam	RECT	A36 Gr.36	Typical
208	M208	N250	N287	90	Plate	Beam	RECT	A36 Gr.36	Typical
209	M209	N299	N274	140	RIGID	None	None	RIGID	Typical
210	M210	N298	N301	140	RIGID	None	None	RIGID	Typical
211	M211	N302	N297	90	Plate	Beam	RECT	A36 Gr.36	Typical
212	M212	N303	N300	90	Plate	Beam	RECT	A36 Gr.36	Typical
213	M213	N305	N307		RIGID	None	None	RIGID	Typical
214	M214	N306	N307		RIGID	None	None	RIGID	Typical
215	M215	N305	N304	265	RIGID	None	None	RIGID	Typical
216	M216	N306	N308	265	RIGID	None	None	RIGID	Typical

Hot Rolled Steel Properties

	Label	E [psi]	G [psi]	Nu	Therm. Coeff. [1e⁵°F⁻¹]	Density [lb/ft³]	Yield [ksi]	Ry	Fu [ksi]	Rt
1	A992	2.9e+7	1.115e+7	0.3	0.65	490	50	1.1	65	1.1
2	A36 Gr.36	2.9e+7	1.115e+7	0.3	0.65	490	36	1.5	58	1.2
3	A572 Gr.50	2.9e+7	1.115e+7	0.3	0.65	490	50	1.1	65	1.1
4	A500 Gr.B RND	2.9e+7	1.115e+7	0.3	0.65	527	42	1.4	58	1.3
5	A500 Gr.B Rect	2.9e+7	1.115e+7	0.3	0.65	527	46	1.4	58	1.3
6	A53 Gr.B	2.9e+7	1.115e+7	0.3	0.65	490	35	1.6	60	1.2
7	A1085	2.9e+7	1.115e+7	0.3	0.65	490	50	1.4	65	1.3

Hot Rolled Steel Design Parameters

	Label	Shape	Length [in]	Lcomp top [in]	K y-y	K z-z	Channel Conn.	a [in]	Function
1	M1	Mount Pipes	120	Lbyy			N/A	N/A	Lateral
2	M2	Mount Pipes	120	Lbyy			N/A	N/A	Lateral
3	M7	Bracing	28.34	Lbyy	0.7	0.7	N/A	N/A	Lateral
4	M8	Bracing	31.405	Lbyy	0.7	0.7	N/A	N/A	Lateral
5	M10	Plate	3	Lbyy			N/A	N/A	Lateral
6	M11	Arm	16.156	Lbyy	0.7	0.7	N/A	N/A	Lateral
7	M12	Arm	16.156	Lbyy	0.7	0.7	N/A	N/A	Lateral
8	M13	Plate	3	Lbyy			N/A	N/A	Lateral
9	M14	Plate	3	Lbyy			N/A	N/A	Lateral
10	M18	Bracing	28.34	Lbyy	0.7	0.7	N/A	N/A	Lateral
11	M19	Bracing	31.405	Lbyy	0.7	0.7	N/A	N/A	Lateral
12	M20	Plate	3	Lbyy			N/A	N/A	Lateral
13	M23	Plate	3.875	Lbyy			N/A	N/A	Lateral
14	M24	Plate	3.875	Lbyy			N/A	N/A	Lateral
15	M26	Mount Pipes 2	120	Lbyy			N/A	N/A	Lateral
16	M28	Frame Rail	108	Lbyy			N/A	N/A	Lateral
17	M29	Frame Rail	108	Lbyy			N/A	N/A	Lateral
18	M30	Stabilizer	57.07	Lbyy			N/A	N/A	Lateral
19	M31	Plate 2	7.5	Lbyy			N/A	N/A	Lateral
20	M32	Plate 2	7.5	Lbyy			N/A	N/A	Lateral
21	M33	Plate	3.875	Lbyy			N/A	N/A	Lateral
22	M34	Plate	3.875	Lbyy			N/A	N/A	Lateral
23	M39	Arm	16.156	Lbyy	0.7	0.7	N/A	N/A	Lateral
24	M40	Arm	16.156	Lbyy	0.7	0.7	N/A	N/A	Lateral
25	M41	RRU Pipe	66	Lbyy			N/A	N/A	Lateral
26	M42	Plate	3	Lbyy			N/A	N/A	Lateral
27	M43	Plate	3	Lbyy			N/A	N/A	Lateral
28	M44	RRU Pipe	66	Lbyy			N/A	N/A	Lateral
29	M45	Bracing	28.34	Lbyy	0.7	0.7	N/A	N/A	Lateral
30	M46	Arm	16.156	Lbyy	0.7	0.7	N/A	N/A	Lateral
31	M48	Arm	16.156	Lbyy	0.7	0.7	N/A	N/A	Lateral
32	M51	Bracing	28.34	Lbyy	0.7	0.7	N/A	N/A	Lateral
33	M52	Bracing	31.405	Lbyy	0.7	0.7	N/A	N/A	Lateral
34	M54	Arm	16.156	Lbyy	0.7	0.7	N/A	N/A	Lateral
35	M55	Arm	16.156	Lbyy	0.7	0.7	N/A	N/A	Lateral
36	M56	Plate	3	Lbyy			N/A	N/A	Lateral
37	M57	Plate	3	Lbyy			N/A	N/A	Lateral
38	M62	Bracing	31.405	Lbyy	0.7	0.7	N/A	N/A	Lateral
39	M63	Plate	3.875	Lbyy			N/A	N/A	Lateral
40	M64	Plate	3.875	Lbyy			N/A	N/A	Lateral
41	M67	Plate	3.875	Lbyy			N/A	N/A	Lateral
42	M68	Plate	3.875	Lbyy			N/A	N/A	Lateral
43	M73	Mount Pipes	120	Lbyy			N/A	N/A	Lateral
44	M74	Mount Pipes	120	Lbyy			N/A	N/A	Lateral

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length [in]	Lcomp top [in]	K y-y	K z-z	Channel Conn.	a [in]	Function
45	M79	Bracing	28.34	Lbyy	0.7	0.7	N/A	N/A	Lateral
46	M80	Bracing	31.405	Lbyy	0.7	0.7	N/A	N/A	Lateral
47	M82	Plate	3	Lbyy			N/A	N/A	Lateral
48	M83	Arm	16.156	Lbyy	0.7	0.7	N/A	N/A	Lateral
49	M84	Arm	16.156	Lbyy	0.7	0.7	N/A	N/A	Lateral
50	M85	Plate	3	Lbyy			N/A	N/A	Lateral
51	M86	Plate	3	Lbyy			N/A	N/A	Lateral
52	M90	Bracing	28.34	Lbyy	0.7	0.7	N/A	N/A	Lateral
53	M91	Bracing	31.405	Lbyy	0.7	0.7	N/A	N/A	Lateral
54	M92	Plate	3	Lbyy			N/A	N/A	Lateral
55	M95	Plate	3.875	Lbyy			N/A	N/A	Lateral
56	M96	Plate	3.875	Lbyy			N/A	N/A	Lateral
57	M98	Mount Pipes 2	120	Lbyy			N/A	N/A	Lateral
58	M100	Frame Rail	108	Lbyy			N/A	N/A	Lateral
59	M101	Frame Rail	108	Lbyy			N/A	N/A	Lateral
60	M102	Stabilizer	63.213	Lbyy			N/A	N/A	Lateral
61	M103	Plate 2	7.5	Lbyy			N/A	N/A	Lateral
62	M104	Plate 2	7.5	Lbyy			N/A	N/A	Lateral
63	M105	Plate	3.875	Lbyy			N/A	N/A	Lateral
64	M106	Plate	3.875	Lbyy			N/A	N/A	Lateral
65	M111	Arm	16.156	Lbyy	0.7	0.7	N/A	N/A	Lateral
66	M112	Arm	16.156	Lbyy	0.7	0.7	N/A	N/A	Lateral
67	M113	RRU Pipe	66	Lbyy			N/A	N/A	Lateral
68	M114	Plate	3	Lbyy			N/A	N/A	Lateral
69	M115	Plate	3	Lbyy			N/A	N/A	Lateral
70	M116	RRU Pipe	66	Lbyy			N/A	N/A	Lateral
71	M117	Bracing	28.34	Lbyy	0.7	0.7	N/A	N/A	Lateral
72	M118	Arm	16.156	Lbyy	0.7	0.7	N/A	N/A	Lateral
73	M120	Arm	16.156	Lbyy	0.7	0.7	N/A	N/A	Lateral
74	M123	Bracing	28.34	Lbyy	0.7	0.7	N/A	N/A	Lateral
75	M124	Bracing	31.405	Lbyy	0.7	0.7	N/A	N/A	Lateral
76	M126	Arm	16.156	Lbyy	0.7	0.7	N/A	N/A	Lateral
77	M127	Arm	16.156	Lbyy	0.7	0.7	N/A	N/A	Lateral
78	M128	Plate	3	Lbyy			N/A	N/A	Lateral
79	M129	Plate	3	Lbyy			N/A	N/A	Lateral
80	M134	Bracing	31.405	Lbyy	0.7	0.7	N/A	N/A	Lateral
81	M135	Plate	3.875	Lbyy			N/A	N/A	Lateral
82	M136	Plate	3.875	Lbyy			N/A	N/A	Lateral
83	M139	Plate	3.875	Lbyy			N/A	N/A	Lateral
84	M140	Plate	3.875	Lbyy			N/A	N/A	Lateral
85	M145	Mount Pipes	120	Lbyy			N/A	N/A	Lateral
86	M146	Mount Pipes	120	Lbyy			N/A	N/A	Lateral
87	M151	Bracing	28.34	Lbyy	0.7	0.7	N/A	N/A	Lateral
88	M152	Bracing	31.405	Lbyy	0.7	0.7	N/A	N/A	Lateral
89	M154	Plate	3	Lbyy			N/A	N/A	Lateral
90	M155	Arm	16.156	Lbyy	0.7	0.7	N/A	N/A	Lateral
91	M156	Arm	16.156	Lbyy	0.7	0.7	N/A	N/A	Lateral
92	M157	Plate	3	Lbyy			N/A	N/A	Lateral
93	M158	Plate	3	Lbyy			N/A	N/A	Lateral
94	M162	Bracing	28.34	Lbyy	0.7	0.7	N/A	N/A	Lateral
95	M163	Bracing	31.405	Lbyy	0.7	0.7	N/A	N/A	Lateral
96	M164	Plate	3	Lbyy			N/A	N/A	Lateral
97	M167	Plate	3.875	Lbyy			N/A	N/A	Lateral
98	M168	Plate	3.875	Lbyy			N/A	N/A	Lateral
99	M170	Mount Pipes 2	120	Lbyy			N/A	N/A	Lateral

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length [in]	Lcomp top [in]	K y-y	K z-z	Channel Conn.	a [in]	Function
100	M172	Frame Rail	108	Lbyy			N/A	N/A	Lateral
101	M173	Frame Rail	108	Lbyy			N/A	N/A	Lateral
102	M174	Stabilizer	63.213	Lbyy			N/A	N/A	Lateral
103	M175	Plate 2	7.5	Lbyy			N/A	N/A	Lateral
104	M176	Plate 2	7.5	Lbyy			N/A	N/A	Lateral
105	M177	Plate	3.875	Lbyy			N/A	N/A	Lateral
106	M178	Plate	3.875	Lbyy			N/A	N/A	Lateral
107	M183	Arm	16.156	Lbyy	0.7	0.7	N/A	N/A	Lateral
108	M184	Arm	16.156	Lbyy	0.7	0.7	N/A	N/A	Lateral
109	M185	RRU Pipe	66	Lbyy			N/A	N/A	Lateral
110	M186	Plate	3	Lbyy			N/A	N/A	Lateral
111	M187	Plate	3	Lbyy			N/A	N/A	Lateral
112	M188	RRU Pipe	66	Lbyy			N/A	N/A	Lateral
113	M189	Bracing	28.34	Lbyy	0.7	0.7	N/A	N/A	Lateral
114	M190	Arm	16.156	Lbyy	0.7	0.7	N/A	N/A	Lateral
115	M192	Arm	16.156	Lbyy	0.7	0.7	N/A	N/A	Lateral
116	M195	Bracing	28.34	Lbyy	0.7	0.7	N/A	N/A	Lateral
117	M196	Bracing	31.405	Lbyy	0.7	0.7	N/A	N/A	Lateral
118	M198	Arm	16.156	Lbyy	0.7	0.7	N/A	N/A	Lateral
119	M199	Arm	16.156	Lbyy	0.7	0.7	N/A	N/A	Lateral
120	M200	Plate	3	Lbyy			N/A	N/A	Lateral
121	M201	Plate	3	Lbyy			N/A	N/A	Lateral
122	M206	Bracing	31.405	Lbyy	0.7	0.7	N/A	N/A	Lateral
123	M207	Plate	3.875	Lbyy			N/A	N/A	Lateral
124	M208	Plate	3.875	Lbyy			N/A	N/A	Lateral
125	M211	Plate	3.875	Lbyy			N/A	N/A	Lateral
126	M212	Plate	3.875	Lbyy			N/A	N/A	Lateral

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rule	Area [in²]	Iyy [in⁴]	Izz [in⁴]	J [in⁴]
1	Plate	3.625"X0.5"PLATE	Beam	RECT	A36 Gr.36	Typical	1.812	0.038	1.985	0.138
2	Arm	PIPE_1.25	Beam	Pipe	A53 Gr.B	Typical	0.625	0.184	0.184	0.368
3	Bracing	0.625"S.R.	VBrace	BAR	A36 Gr.36	Typical	0.307	0.007	0.007	0.015
4	Frame Rail	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	0.627	0.627	1.25
5	Stabilizer	PIPE_2.0	HBrace	Pipe	A53 Gr.B	Typical	1.02	0.627	0.627	1.25
6	Mount Pipes	PIPE_2.0	Column	Pipe	A53 Gr.B	Typical	1.02	0.627	0.627	1.25
7	Plate 2	7"X0.5"PLATE	Beam	RECT	A36 Gr.36	Typical	3.5	0.073	14.292	0.279
8	RRU Pipe	PIPE_3.0	Column	Pipe	A53 Gr.B	Typical	2.07	2.85	2.85	5.69
9	Mount Pipes 2	PIPE_2.5	Column	Pipe	A53 Gr.B	Typical	1.61	1.45	1.45	2.89

Material Take-Off

	Material	Size	Pieces	Length[in]	Weight[LB]
1	General Members				
2	RIGID		90	128.6	0
3	Total General		90	128.6	0
4					
5	Hot Rolled Steel				
6	A36 Gr.36	3.625"X0.5"PLATE	48	165	84.804
7	A36 Gr.36	7"X0.5"PLATE	6	45	44.661
8	A36 Gr.36	0.625"S.R.	24	716.9	62.371
9	A53 Gr.B	PIPE_1.25	24	387.8	68.72
10	A53 Gr.B	PIPE_2.0	15	1551.5	448.749
11	A53 Gr.B	PIPE_2.5	3	360	164.354

Material Take-Off (Continued)

	Material	Size	Pieces	Length[in]	Weight[LB]
12	A53 Gr.B	PIPE 3.0	6	396	232.444
13	Total HR Steel		126	3622.2	1106.103

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Point	Distributed
1	Self Weight	DL		-1		18	
2	Wind Load AZI 0	WLX				36	432
3	Wind Load AZI 30	None				36	432
4	Wind Load AZI 60	None				36	432
5	Wind Load AZI 90	WLZ				36	432
6	Wind Load AZI 120	None				36	432
7	Wind Load AZI 150	None				36	432
8	Wind Load AZI 180	None				36	432
9	Wind Load AZI 210	None				36	432
10	Wind Load AZI 240	None				36	432
11	Wind Load AZI 270	None				36	432
12	Wind Load AZI 300	None				36	432
13	Wind Load AZI 330	None				36	432
14	Ice Weight	OL1				18	216
15	Ice Wind Load AZI 0	OL2				36	432
16	Ice Wind Load AZI 30	None				36	432
17	Ice Wind Load AZI 60	None				36	432
18	Ice Wind Load AZI 90	OL3				36	432
19	Ice Wind Load AZI 120	None				36	432
20	Ice Wind Load AZI 150	None				36	432
21	Ice Wind Load AZI 180	None				36	432
22	Ice Wind Load AZI 210	None				36	432
23	Ice Wind Load AZI 240	None				36	432
24	Ice Wind Load AZI 270	None				36	432
25	Ice Wind Load AZI 300	None				36	432
26	Ice Wind Load AZI 330	None				36	432
27	Seismic Load X	ELX			-0.19	18	
28	Seismic Load Z	ELZ	-0.19			18	
29	Service Live Loads	LL					
30	Maintenance Load 1	LL				1	
31	Maintenance Load 2	LL				1	
32	Maintenance Load 3	LL				1	
33	Maintenance Load 4	LL				1	
34	Maintenance Load 5	LL				1	
35	Maintenance Load 6	LL				1	
36	Maintenance Load 7	LL				1	
37	Maintenance Load 8	LL				1	
38	Maintenance Load 9	LL				1	
39	Maintenance Load 10	LL				1	
40	Maintenance Load 11	LL				1	
41	Maintenance Load 12	LL				1	
42	Maintenance Load 13	LL				1	
43	Maintenance Load 14	LL				1	
44	Maintenance Load 15	LL				1	
45	Maintenance Load 16	LL				1	
46	Maintenance Load 17	LL				1	
47	Maintenance Load 18	LL				1	

Load Combinations

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor
1	1.4DL	Yes	Y	1	1.4				
2	1.2DL + 1WL AZI 0	Yes	Y	1	1.2	2	1		
3	1.2DL + 1WL AZI 30	Yes	Y	1	1.2	3	1		
4	1.2DL + 1WL AZI 60	Yes	Y	1	1.2	4	1		
5	1.2DL + 1WL AZI 90	Yes	Y	1	1.2	5	1		
6	1.2DL + 1WL AZI 120	Yes	Y	1	1.2	6	1		
7	1.2DL + 1WL AZI 150	Yes	Y	1	1.2	7	1		
8	1.2DL + 1WL AZI 180	Yes	Y	1	1.2	8	1		
9	1.2DL + 1WL AZI 210	Yes	Y	1	1.2	9	1		
10	1.2DL + 1WL AZI 240	Yes	Y	1	1.2	10	1		
11	1.2DL + 1WL AZI 270	Yes	Y	1	1.2	11	1		
12	1.2DL + 1WL AZI 300	Yes	Y	1	1.2	12	1		
13	1.2DL + 1WL AZI 330	Yes	Y	1	1.2	13	1		
14	0.9DL + 1WL AZI 0	Yes	Y	1	0.9	2	1		
15	0.9DL + 1WL AZI 30	Yes	Y	1	0.9	3	1		
16	0.9DL + 1WL AZI 60	Yes	Y	1	0.9	4	1		
17	0.9DL + 1WL AZI 90	Yes	Y	1	0.9	5	1		
18	0.9DL + 1WL AZI 120	Yes	Y	1	0.9	6	1		
19	0.9DL + 1WL AZI 150	Yes	Y	1	0.9	7	1		
20	0.9DL + 1WL AZI 180	Yes	Y	1	0.9	8	1		
21	0.9DL + 1WL AZI 210	Yes	Y	1	0.9	9	1		
22	0.9DL + 1WL AZI 240	Yes	Y	1	0.9	10	1		
23	0.9DL + 1WL AZI 270	Yes	Y	1	0.9	11	1		
24	0.9DL + 1WL AZI 300	Yes	Y	1	0.9	12	1		
25	0.9DL + 1WL AZI 330	Yes	Y	1	0.9	13	1		
26	1.2D + 1.0Di	Yes	Y	1	1.2	14	1		
27	1.2D + 1.0Di +1.0Wi AZI 0	Yes	Y	1	1.2	14	1	15	1
28	1.2D + 1.0Di +1.0Wi AZI 30	Yes	Y	1	1.2	14	1	16	1
29	1.2D + 1.0Di +1.0Wi AZI 60	Yes	Y	1	1.2	14	1	17	1
30	1.2D + 1.0Di +1.0Wi AZI 90	Yes	Y	1	1.2	14	1	18	1
31	1.2D + 1.0Di +1.0Wi AZI 120	Yes	Y	1	1.2	14	1	19	1
32	1.2D + 1.0Di +1.0Wi AZI 150	Yes	Y	1	1.2	14	1	20	1
33	1.2D + 1.0Di +1.0Wi AZI 180	Yes	Y	1	1.2	14	1	21	1
34	1.2D + 1.0Di +1.0Wi AZI 210	Yes	Y	1	1.2	14	1	22	1
35	1.2D + 1.0Di +1.0Wi AZI 240	Yes	Y	1	1.2	14	1	23	1
36	1.2D + 1.0Di +1.0Wi AZI 270	Yes	Y	1	1.2	14	1	24	1
37	1.2D + 1.0Di +1.0Wi AZI 300	Yes	Y	1	1.2	14	1	25	1
38	1.2D + 1.0Di +1.0Wi AZI 330	Yes	Y	1	1.2	14	1	26	1
39	(1.2 + 0.2Sds)DL + 1.0E AZI 0	Yes	Y	1	1.261	27	1	28	
40	(1.2 + 0.2Sds)DL + 1.0E AZI 30	Yes	Y	1	1.261	27	0.866	28	0.5
41	(1.2 + 0.2Sds)DL + 1.0E AZI 60	Yes	Y	1	1.261	27	0.5	28	0.866
42	(1.2 + 0.2Sds)DL + 1.0E AZI 90	Yes	Y	1	1.261	27		28	1
43	(1.2 + 0.2Sds)DL + 1.0E AZI 120	Yes	Y	1	1.261	27	-0.5	28	0.866
44	(1.2 + 0.2Sds)DL + 1.0E AZI 150	Yes	Y	1	1.261	27	-0.866	28	0.5
45	(1.2 + 0.2Sds)DL + 1.0E AZI 180	Yes	Y	1	1.261	27	-1	28	
46	(1.2 + 0.2Sds)DL + 1.0E AZI 210	Yes	Y	1	1.261	27	-0.866	28	-0.5
47	(1.2 + 0.2Sds)DL + 1.0E AZI 240	Yes	Y	1	1.261	27	-0.5	28	-0.866
48	(1.2 + 0.2Sds)DL + 1.0E AZI 270	Yes	Y	1	1.261	27		28	-1
49	(1.2 + 0.2Sds)DL + 1.0E AZI 300	Yes	Y	1	1.261	27	0.5	28	-0.866
50	(1.2 + 0.2Sds)DL + 1.0E AZI 330	Yes	Y	1	1.261	27	0.866	28	-0.5
51	(0.9 - 0.2Sds)DL + 1.0E AZI 0	Yes	Y	1	0.839	27	1	28	
52	(0.9 - 0.2Sds)DL + 1.0E AZI 30	Yes	Y	1	0.839	27	0.866	28	0.5
53	(0.9 - 0.2Sds)DL + 1.0E AZI 60	Yes	Y	1	0.839	27	0.5	28	0.866
54	(0.9 - 0.2Sds)DL + 1.0E AZI 90	Yes	Y	1	0.839	27		28	1
55	(0.9 - 0.2Sds)DL + 1.0E AZI 120	Yes	Y	1	0.839	27	-0.5	28	0.866

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor
56	(0.9 - 0.2Sds)DL + 1.0E AZI 150	Yes	Y	1	0.839	27	-0.866	28	0.5
57	(0.9 - 0.2Sds)DL + 1.0E AZI 180	Yes	Y	1	0.839	27	-1	28	
58	(0.9 - 0.2Sds)DL + 1.0E AZI 210	Yes	Y	1	0.839	27	-0.866	28	-0.5
59	(0.9 - 0.2Sds)DL + 1.0E AZI 240	Yes	Y	1	0.839	27	-0.5	28	-0.866
60	(0.9 - 0.2Sds)DL + 1.0E AZI 270	Yes	Y	1	0.839	27		28	-1
61	(0.9 - 0.2Sds)DL + 1.0E AZI 300	Yes	Y	1	0.839	27	0.5	28	-0.866
62	(0.9 - 0.2Sds)DL + 1.0E AZI 330	Yes	Y	1	0.839	27	0.866	28	-0.5
63	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 0	Yes	Y	1	1	2	0.059	29	1.5
64	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 30	Yes	Y	1	1	3	0.059	29	1.5
65	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 60	Yes	Y	1	1	4	0.059	29	1.5
66	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 90	Yes	Y	1	1	5	0.059	29	1.5
67	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 120	Yes	Y	1	1	6	0.059	29	1.5
68	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 150	Yes	Y	1	1	7	0.059	29	1.5
69	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 180	Yes	Y	1	1	8	0.059	29	1.5
70	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 210	Yes	Y	1	1	9	0.059	29	1.5
71	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 240	Yes	Y	1	1	10	0.059	29	1.5
72	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 270	Yes	Y	1	1	11	0.059	29	1.5
73	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 300	Yes	Y	1	1	12	0.059	29	1.5
74	1.0DL + 1.5LL + 1.0SWL (30 mph) AZI 330	Yes	Y	1	1	13	0.059	29	1.5
75	1.2DL + 1.5LM1 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	30	1.5	2	0.059
76	1.2DL + 1.5LM1 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	30	1.5	3	0.059
77	1.2DL + 1.5LM1 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	30	1.5	4	0.059
78	1.2DL + 1.5LM1 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	30	1.5	5	0.059
79	1.2DL + 1.5LM1 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	30	1.5	6	0.059
80	1.2DL + 1.5LM1 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	30	1.5	7	0.059
81	1.2DL + 1.5LM1 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	30	1.5	8	0.059
82	1.2DL + 1.5LM1 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	30	1.5	9	0.059
83	1.2DL + 1.5LM1 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	30	1.5	10	0.059
84	1.2DL + 1.5LM1 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	30	1.5	11	0.059
85	1.2DL + 1.5LM1 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	30	1.5	12	0.059
86	1.2DL + 1.5LM1 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	30	1.5	13	0.059
87	1.2DL + 1.5LM2 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	31	1.5	2	0.059
88	1.2DL + 1.5LM2 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	31	1.5	3	0.059
89	1.2DL + 1.5LM2 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	31	1.5	4	0.059
90	1.2DL + 1.5LM2 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	31	1.5	5	0.059
91	1.2DL + 1.5LM2 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	31	1.5	6	0.059
92	1.2DL + 1.5LM2 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	31	1.5	7	0.059
93	1.2DL + 1.5LM2 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	31	1.5	8	0.059
94	1.2DL + 1.5LM2 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	31	1.5	9	0.059
95	1.2DL + 1.5LM2 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	31	1.5	10	0.059
96	1.2DL + 1.5LM2 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	31	1.5	11	0.059
97	1.2DL + 1.5LM2 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	31	1.5	12	0.059
98	1.2DL + 1.5LM2 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	31	1.5	13	0.059
99	1.2DL + 1.5LM3 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	32	1.5	2	0.059
100	1.2DL + 1.5LM3 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	32	1.5	3	0.059
101	1.2DL + 1.5LM3 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	32	1.5	4	0.059
102	1.2DL + 1.5LM3 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	32	1.5	5	0.059
103	1.2DL + 1.5LM3 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	32	1.5	6	0.059
104	1.2DL + 1.5LM3 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	32	1.5	7	0.059
105	1.2DL + 1.5LM3 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	32	1.5	8	0.059
106	1.2DL + 1.5LM3 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	32	1.5	9	0.059
107	1.2DL + 1.5LM3 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	32	1.5	10	0.059
108	1.2DL + 1.5LM3 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	32	1.5	11	0.059
109	1.2DL + 1.5LM3 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	32	1.5	12	0.059
110	1.2DL + 1.5LM3 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	32	1.5	13	0.059

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor
111	1.2DL + 1.5LM4 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	33	1.5	2	0.059
112	1.2DL + 1.5LM4 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	33	1.5	3	0.059
113	1.2DL + 1.5LM4 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	33	1.5	4	0.059
114	1.2DL + 1.5LM4 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	33	1.5	5	0.059
115	1.2DL + 1.5LM4 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	33	1.5	6	0.059
116	1.2DL + 1.5LM4 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	33	1.5	7	0.059
117	1.2DL + 1.5LM4 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	33	1.5	8	0.059
118	1.2DL + 1.5LM4 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	33	1.5	9	0.059
119	1.2DL + 1.5LM4 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	33	1.5	10	0.059
120	1.2DL + 1.5LM4 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	33	1.5	11	0.059
121	1.2DL + 1.5LM4 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	33	1.5	12	0.059
122	1.2DL + 1.5LM4 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	33	1.5	13	0.059
123	1.2DL + 1.5LM5 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	34	1.5	2	0.059
124	1.2DL + 1.5LM5 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	34	1.5	3	0.059
125	1.2DL + 1.5LM5 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	34	1.5	4	0.059
126	1.2DL + 1.5LM5 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	34	1.5	5	0.059
127	1.2DL + 1.5LM5 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	34	1.5	6	0.059
128	1.2DL + 1.5LM5 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	34	1.5	7	0.059
129	1.2DL + 1.5LM5 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	34	1.5	8	0.059
130	1.2DL + 1.5LM5 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	34	1.5	9	0.059
131	1.2DL + 1.5LM5 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	34	1.5	10	0.059
132	1.2DL + 1.5LM5 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	34	1.5	11	0.059
133	1.2DL + 1.5LM5 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	34	1.5	12	0.059
134	1.2DL + 1.5LM5 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	34	1.5	13	0.059
135	1.2DL + 1.5LM6 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	35	1.5	2	0.059
136	1.2DL + 1.5LM6 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	35	1.5	3	0.059
137	1.2DL + 1.5LM6 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	35	1.5	4	0.059
138	1.2DL + 1.5LM6 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	35	1.5	5	0.059
139	1.2DL + 1.5LM6 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	35	1.5	6	0.059
140	1.2DL + 1.5LM6 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	35	1.5	7	0.059
141	1.2DL + 1.5LM6 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	35	1.5	8	0.059
142	1.2DL + 1.5LM6 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	35	1.5	9	0.059
143	1.2DL + 1.5LM6 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	35	1.5	10	0.059
144	1.2DL + 1.5LM6 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	35	1.5	11	0.059
145	1.2DL + 1.5LM6 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	35	1.5	12	0.059
146	1.2DL + 1.5LM6 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	35	1.5	13	0.059
147	1.2DL + 1.5LM7 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	36	1.5	2	0.059
148	1.2DL + 1.5LM7 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	36	1.5	3	0.059
149	1.2DL + 1.5LM7 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	36	1.5	4	0.059
150	1.2DL + 1.5LM7 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	36	1.5	5	0.059
151	1.2DL + 1.5LM7 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	36	1.5	6	0.059
152	1.2DL + 1.5LM7 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	36	1.5	7	0.059
153	1.2DL + 1.5LM7 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	36	1.5	8	0.059
154	1.2DL + 1.5LM7 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	36	1.5	9	0.059
155	1.2DL + 1.5LM7 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	36	1.5	10	0.059
156	1.2DL + 1.5LM7 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	36	1.5	11	0.059
157	1.2DL + 1.5LM7 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	36	1.5	12	0.059
158	1.2DL + 1.5LM7 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	36	1.5	13	0.059
159	1.2DL + 1.5LM8 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	37	1.5	2	0.059
160	1.2DL + 1.5LM8 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	37	1.5	3	0.059
161	1.2DL + 1.5LM8 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	37	1.5	4	0.059
162	1.2DL + 1.5LM8 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	37	1.5	5	0.059
163	1.2DL + 1.5LM8 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	37	1.5	6	0.059
164	1.2DL + 1.5LM8 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	37	1.5	7	0.059
165	1.2DL + 1.5LM8 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	37	1.5	8	0.059

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor
166	1.2DL + 1.5LM8 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	37	1.5	9	0.059
167	1.2DL + 1.5LM8 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	37	1.5	10	0.059
168	1.2DL + 1.5LM8 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	37	1.5	11	0.059
169	1.2DL + 1.5LM8 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	37	1.5	12	0.059
170	1.2DL + 1.5LM8 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	37	1.5	13	0.059
171	1.2DL + 1.5LM9 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	38	1.5	2	0.059
172	1.2DL + 1.5LM9 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	38	1.5	3	0.059
173	1.2DL + 1.5LM9 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	38	1.5	4	0.059
174	1.2DL + 1.5LM9 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	38	1.5	5	0.059
175	1.2DL + 1.5LM9 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	38	1.5	6	0.059
176	1.2DL + 1.5LM9 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	38	1.5	7	0.059
177	1.2DL + 1.5LM9 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	38	1.5	8	0.059
178	1.2DL + 1.5LM9 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	38	1.5	9	0.059
179	1.2DL + 1.5LM9 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	38	1.5	10	0.059
180	1.2DL + 1.5LM9 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	38	1.5	11	0.059
181	1.2DL + 1.5LM9 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	38	1.5	12	0.059
182	1.2DL + 1.5LM9 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	38	1.5	13	0.059
183	1.2DL + 1.5LM10 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	39	1.5	2	0.059
184	1.2DL + 1.5LM10 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	39	1.5	3	0.059
185	1.2DL + 1.5LM10 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	39	1.5	4	0.059
186	1.2DL + 1.5LM10 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	39	1.5	5	0.059
187	1.2DL + 1.5LM10 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	39	1.5	6	0.059
188	1.2DL + 1.5LM10 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	39	1.5	7	0.059
189	1.2DL + 1.5LM10 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	39	1.5	8	0.059
190	1.2DL + 1.5LM10 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	39	1.5	9	0.059
191	1.2DL + 1.5LM10 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	39	1.5	10	0.059
192	1.2DL + 1.5LM10 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	39	1.5	11	0.059
193	1.2DL + 1.5LM10 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	39	1.5	12	0.059
194	1.2DL + 1.5LM10 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	39	1.5	13	0.059
195	1.2DL + 1.5LM11 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	40	1.5	2	0.059
196	1.2DL + 1.5LM11 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	40	1.5	3	0.059
197	1.2DL + 1.5LM11 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	40	1.5	4	0.059
198	1.2DL + 1.5LM11 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	40	1.5	5	0.059
199	1.2DL + 1.5LM11 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	40	1.5	6	0.059
200	1.2DL + 1.5LM11 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	40	1.5	7	0.059
201	1.2DL + 1.5LM11 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	40	1.5	8	0.059
202	1.2DL + 1.5LM11 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	40	1.5	9	0.059
203	1.2DL + 1.5LM11 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	40	1.5	10	0.059
204	1.2DL + 1.5LM11 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	40	1.5	11	0.059
205	1.2DL + 1.5LM11 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	40	1.5	12	0.059
206	1.2DL + 1.5LM11 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	40	1.5	13	0.059
207	1.2DL + 1.5LM12 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	41	1.5	2	0.059
208	1.2DL + 1.5LM12 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	41	1.5	3	0.059
209	1.2DL + 1.5LM12 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	41	1.5	4	0.059
210	1.2DL + 1.5LM12 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	41	1.5	5	0.059
211	1.2DL + 1.5LM12 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	41	1.5	6	0.059
212	1.2DL + 1.5LM12 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	41	1.5	7	0.059
213	1.2DL + 1.5LM12 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	41	1.5	8	0.059
214	1.2DL + 1.5LM12 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	41	1.5	9	0.059
215	1.2DL + 1.5LM12 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	41	1.5	10	0.059
216	1.2DL + 1.5LM12 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	41	1.5	11	0.059
217	1.2DL + 1.5LM12 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	41	1.5	12	0.059
218	1.2DL + 1.5LM12 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	41	1.5	13	0.059
219	1.2DL + 1.5LM13 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	42	1.5	2	0.059
220	1.2DL + 1.5LM13 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	42	1.5	3	0.059

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor
221	1.2DL + 1.5LM13 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	42	1.5	4	0.059
222	1.2DL + 1.5LM13 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	42	1.5	5	0.059
223	1.2DL + 1.5LM13 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	42	1.5	6	0.059
224	1.2DL + 1.5LM13 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	42	1.5	7	0.059
225	1.2DL + 1.5LM13 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	42	1.5	8	0.059
226	1.2DL + 1.5LM13 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	42	1.5	9	0.059
227	1.2DL + 1.5LM13 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	42	1.5	10	0.059
228	1.2DL + 1.5LM13 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	42	1.5	11	0.059
229	1.2DL + 1.5LM13 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	42	1.5	12	0.059
230	1.2DL + 1.5LM13 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	42	1.5	13	0.059
231	1.2DL + 1.5LM14 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	43	1.5	2	0.059
232	1.2DL + 1.5LM14 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	43	1.5	3	0.059
233	1.2DL + 1.5LM14 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	43	1.5	4	0.059
234	1.2DL + 1.5LM14 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	43	1.5	5	0.059
235	1.2DL + 1.5LM14 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	43	1.5	6	0.059
236	1.2DL + 1.5LM14 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	43	1.5	7	0.059
237	1.2DL + 1.5LM14 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	43	1.5	8	0.059
238	1.2DL + 1.5LM14 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	43	1.5	9	0.059
239	1.2DL + 1.5LM14 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	43	1.5	10	0.059
240	1.2DL + 1.5LM14 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	43	1.5	11	0.059
241	1.2DL + 1.5LM14 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	43	1.5	12	0.059
242	1.2DL + 1.5LM14 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	43	1.5	13	0.059
243	1.2DL + 1.5LM15 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	44	1.5	2	0.059
244	1.2DL + 1.5LM15 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	44	1.5	3	0.059
245	1.2DL + 1.5LM15 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	44	1.5	4	0.059
246	1.2DL + 1.5LM15 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	44	1.5	5	0.059
247	1.2DL + 1.5LM15 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	44	1.5	6	0.059
248	1.2DL + 1.5LM15 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	44	1.5	7	0.059
249	1.2DL + 1.5LM15 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	44	1.5	8	0.059
250	1.2DL + 1.5LM15 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	44	1.5	9	0.059
251	1.2DL + 1.5LM15 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	44	1.5	10	0.059
252	1.2DL + 1.5LM15 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	44	1.5	11	0.059
253	1.2DL + 1.5LM15 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	44	1.5	12	0.059
254	1.2DL + 1.5LM15 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	44	1.5	13	0.059
255	1.2DL + 1.5LM16 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	45	1.5	2	0.059
256	1.2DL + 1.5LM16 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	45	1.5	3	0.059
257	1.2DL + 1.5LM16 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	45	1.5	4	0.059
258	1.2DL + 1.5LM16 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	45	1.5	5	0.059
259	1.2DL + 1.5LM16 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	45	1.5	6	0.059
260	1.2DL + 1.5LM16 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	45	1.5	7	0.059
261	1.2DL + 1.5LM16 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	45	1.5	8	0.059
262	1.2DL + 1.5LM16 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	45	1.5	9	0.059
263	1.2DL + 1.5LM16 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	45	1.5	10	0.059
264	1.2DL + 1.5LM16 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	45	1.5	11	0.059
265	1.2DL + 1.5LM16 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	45	1.5	12	0.059
266	1.2DL + 1.5LM16 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	45	1.5	13	0.059
267	1.2DL + 1.5LM17 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	46	1.5	2	0.059
268	1.2DL + 1.5LM17 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	46	1.5	3	0.059
269	1.2DL + 1.5LM17 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	46	1.5	4	0.059
270	1.2DL + 1.5LM17 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	46	1.5	5	0.059
271	1.2DL + 1.5LM17 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	46	1.5	6	0.059
272	1.2DL + 1.5LM17 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	46	1.5	7	0.059
273	1.2DL + 1.5LM17 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	46	1.5	8	0.059
274	1.2DL + 1.5LM17 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	46	1.5	9	0.059
275	1.2DL + 1.5LM17 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	46	1.5	10	0.059

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor
276	1.2DL + 1.5LM17 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	46	1.5	11	0.059
277	1.2DL + 1.5LM17 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	46	1.5	12	0.059
278	1.2DL + 1.5LM17 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	46	1.5	13	0.059
279	1.2DL + 1.5LM18 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	47	1.5	2	0.059
280	1.2DL + 1.5LM18 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	47	1.5	3	0.059
281	1.2DL + 1.5LM18 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	47	1.5	4	0.059
282	1.2DL + 1.5LM18 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	47	1.5	5	0.059
283	1.2DL + 1.5LM18 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	47	1.5	6	0.059
284	1.2DL + 1.5LM18 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	47	1.5	7	0.059
285	1.2DL + 1.5LM18 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	47	1.5	8	0.059
286	1.2DL + 1.5LM18 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	47	1.5	9	0.059
287	1.2DL + 1.5LM18 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	47	1.5	10	0.059
288	1.2DL + 1.5LM18 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	47	1.5	11	0.059
289	1.2DL + 1.5LM18 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	47	1.5	12	0.059
290	1.2DL + 1.5LM18 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	47	1.5	13	0.059

Envelope Node Reactions

	Node Label		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-in]	LC	MY [lb-in]	LC	MZ [lb-in]	LC
1	N52	max	1365.671	12	199.379	12	479.182	12	0	290	0	290	0	290
2		min	-1363.538	6	-180.577	18	-474.207	18	0	1	0	1	0	1
3	N53	max	1180.424	15	759.518	79	1137.589	79	1616.445	84	265.298	22	3985.257	79
4		min	-2209.861	9	175.455	24	-1157.739	109	-1466.25	102	-277.41	4	936.883	24
5	N54	max	1397.385	75	745.657	102	1135.872	102	1440.816	84	371.444	22	3978.919	102
6		min	-176.403	20	160.362	23	-1116.507	84	-1644.03	102	-389.271	4	870.588	24
7	N104	max	1567.815	2	760.825	118	1255.94	19	-947.413	15	363.503	25	908.574	112
8		min	-1364.282	20	161.013	15	-2258.961	13	-4201.255	118	-379.825	7	-2103.097	141
9	N105	max	1788.577	149	760.911	158	2488.532	5	3557.895	169	369.335	17	-1003.877	60
10		min	-526.222	22	160.155	19	-1815.324	23	119.179	19	-385.922	11	-4056.404	156
11	N157	max	865.812	111	747.182	142	1562.856	114	-871.475	15	455.233	14	772.221	112
12		min	-1360.029	141	144.529	15	-139.011	23	-3971.463	118	-474.574	8	-2313.662	141
13	N207	max	1058.292	21	231.687	3	1528.167	3	0	290	0	290	0	290
14		min	-1065.056	3	-211.41	21	-1532.874	9	0	1	0	1	0	1
15	N259	max	209.374	14	747.24	170	404.834	17	3824.495	169	463.053	18	-943.893	17
16		min	-1771.109	153	143.519	19	-1762.205	168	93.748	19	-482.581	12	-3786.637	156
17	N309	max	805.127	13	233.569	7	1697.623	13	0	290	0	290	0	290
18		min	-797.387	7	-213.307	25	-1700.906	7	0	1	0	1	0	1
19	Totals:	max	4021.359	2	3963.755	32	3828.272	5						
20		min	-4021.356	20	1494.205	54	-3828.265	23						

Envelope AISC 15TH (360-16): LRFD Member Steel Code Checks

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [lb-in]	phi*Mn z-z [lb-in]	Cb	Eqn
1	M152	0.625"S.R.	0.579	0	169	0.026	0		6	3501.373	9940.19	1242.501	1242.501	1	H1-1a
2	M80	0.625"S.R.	0.579	0	141	0.026	0		2	3501.373	9940.19	1242.501	1242.501	1	H1-1a
3	M8	0.625"S.R.	0.577	0	101	0.023	0		11	3501.373	9940.19	1242.501	1242.501	1	H1-1a
4	M62	0.625"S.R.	0.478	31.405	83	0.014	31.405		10	3501.373	9940.19	1242.501	1242.501	1	H1-1a
5	M206	0.625"S.R.	0.478	31.405	150	0.015	31.405		5	3501.373	9940.19	1242.501	1242.501	1	H1-1a
6	M134	0.625"S.R.	0.478	31.405	122	0.015	31.405		13	3501.373	9940.19	1242.501	1242.501	1	H1-1a
7	M168	3.625"X0.5"PLATE	0.393	0	168	0.26	3.875	y	168	56538.489	58725	7340.609	53219.527	1.435	H1-1b
8	M96	3.625"X0.5"PLATE	0.393	0	140	0.26	0	y	140	56538.489	58725	7340.609	53219.527	1.435	H1-1b
9	M24	3.625"X0.5"PLATE	0.392	0	101	0.26	0	y	101	56538.489	58725	7340.609	53219.527	1.436	H1-1b
10	M64	3.625"X0.5"PLATE	0.388	0	81	0.259	0	y	81	56538.489	58725	7340.609	53219.527	1.426	H1-1b
11	M208	3.625"X0.5"PLATE	0.388	0	148	0.259	0	y	148	56538.489	58725	7340.609	53219.527	1.425	H1-1b
12	M136	3.625"X0.5"PLATE	0.388	0	120	0.259	0	y	120	56538.489	58725	7340.609	53219.527	1.425	H1-1b

Envelope AISC 15TH (360-16): LRFD Member Steel Code Checks (Continued)

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [lb-in]	phi*Mn z-z [lb-in]	Cb	Eqn
13	M167	3.625"X0.5"PLATE	0.38	0	162	0.241	0	y	161	56538.489	58725	7340.609	53219.527	1.424	H1-1b
14	M95	3.625"X0.5"PLATE	0.38	0	146	0.241	0	y	145	56538.489	58725	7340.609	53219.527	1.424	H1-1b
15	M23	3.625"X0.5"PLATE	0.378	0	106	0.24	0	y	106	56538.489	58725	7340.609	53219.527	1.424	H1-1b
16	M172	PIPE_2.0	0.372	25.875	5	0.199	24.75		12	12143.947	32130	22459.5	22459.5	1	H1-1b
17	M63	3.625"X0.5"PLATE	0.37	0	85	0.238	0	y	75	56538.489	58725	7340.609	53219.527	1.426	H1-1b
18	M207	3.625"X0.5"PLATE	0.37	0	153	0.238	0	y	155	56538.489	58725	7340.609	53219.527	1.426	H1-1b
19	M135	3.625"X0.5"PLATE	0.37	0	113	0.238	0	y	115	56538.489	58725	7340.609	53219.527	1.427	H1-1b
20	M100	PIPE_2.0	0.366	25.875	13	0.196	24.75		8	12143.947	32130	22459.5	22459.5	1	H1-1b
21	M157	3.625"X0.5"PLATE	0.342	1.125	169	0.064	0	y	158	57404.511	58725	7340.609	53219.527	1.105	H1-1b
22	M85	3.625"X0.5"PLATE	0.342	1.125	141	0.064	0	y	118	57404.511	58725	7340.609	53219.527	1.106	H1-1b
23	M13	3.625"X0.5"PLATE	0.341	1.125	101	0.064	0	y	79	57404.511	58725	7340.609	53219.527	1.107	H1-1b
24	M57	3.625"X0.5"PLATE	0.337	1.125	82	0.068	0	y	101	57404.511	58725	7340.609	53219.527	1.12	H1-1b
25	M201	3.625"X0.5"PLATE	0.337	1.125	148	0.068	0	y	168	57404.511	58725	7340.609	53219.527	1.12	H1-1b
26	M129	3.625"X0.5"PLATE	0.337	1.125	120	0.068	0	y	140	57404.511	58725	7340.609	53219.527	1.12	H1-1b
27	M28	PIPE_2.0	0.326	25.875	9	0.164	24.75		4	12143.947	32130	22459.5	22459.5	1	H1-1b
28	M155	PIPE_1.25	0.313	2.02	162	0.068	14.305		169	19254.559	19687.5	9607.5	9607.5	1	H1-1b
29	M83	PIPE_1.25	0.313	2.02	146	0.068	14.305		141	19254.559	19687.5	9607.5	9607.5	1	H1-1b
30	M11	PIPE_1.25	0.311	2.02	107	0.068	14.305		102	19254.559	19687.5	9607.5	9607.5	1	H1-1b
31	M199	PIPE_1.25	0.307	2.02	152	0.068	14.305		156	19254.559	19687.5	9607.5	9607.5	1	H1-1b
32	M127	PIPE_1.25	0.307	2.02	112	0.068	14.305		116	19254.559	19687.5	9607.5	9607.5	1	H1-1b
33	M55	PIPE_1.25	0.307	2.02	85	0.068	14.305		76	19254.559	19687.5	9607.5	9607.5	1	H1-1b
34	M14	3.625"X0.5"PLATE	0.3	1.125	104	0.08	0	y	77	57404.511	58725	7340.609	53219.527	1.114	H1-1b
35	M86	3.625"X0.5"PLATE	0.3	1.125	143	0.08	1.125	y	117	57404.511	58725	7340.609	53219.527	1.113	H1-1b
36	M158	3.625"X0.5"PLATE	0.3	1.125	159	0.08	1.125	y	157	57404.511	58725	7340.609	53219.527	1.113	H1-1b
37	M56	3.625"X0.5"PLATE	0.298	1.125	85	0.082	0	y	103	57404.511	58725	7340.609	53219.527	1.105	H1-1b
38	M200	3.625"X0.5"PLATE	0.298	1.125	152	0.082	1.125	y	170	57404.511	58725	7340.609	53219.527	1.104	H1-1b
39	M128	3.625"X0.5"PLATE	0.298	1.125	112	0.082	1.125	y	142	57404.511	58725	7340.609	53219.527	1.104	H1-1b
40	M176	7"X0.5"PLATE	0.29	7.5	169	0.177	7.5	y	169	98374.544	113400	14175	198450	1.706	H1-1b
41	M104	7"X0.5"PLATE	0.29	7.5	141	0.177	7.5	y	141	98374.544	113400	14175	198450	1.706	H1-1b
42	M32	7"X0.5"PLATE	0.289	7.5	101	0.177	7.5	y	102	98374.544	113400	14175	198450	1.706	H1-1b
43	M175	7"X0.5"PLATE	0.288	7.5	158	0.172	0	y	151	98374.544	113400	14175	198450	1.69	H1-1b
44	M103	7"X0.5"PLATE	0.288	7.5	118	0.171	0	y	112	98374.544	113400	14175	198450	1.69	H1-1b
45	M31	7"X0.5"PLATE	0.288	7.5	79	0.172	0	y	84	98374.544	113400	14175	198450	1.689	H1-1b
46	M198	PIPE_1.25	0.262	2.02	147	0.051	0		147	19254.559	19687.5	9607.5	9607.5	1	H1-1b
47	M126	PIPE_1.25	0.262	2.02	119	0.051	0		119	19254.559	19687.5	9607.5	9607.5	1	H1-1b
48	M156	PIPE_1.25	0.261	2.02	168	0.052	0		169	19254.559	19687.5	9607.5	9607.5	1	H1-1b
49	M84	PIPE_1.25	0.261	2.02	140	0.052	0		141	19254.559	19687.5	9607.5	9607.5	1	H1-1b
50	M54	PIPE_1.25	0.261	2.02	80	0.051	0		79	19254.559	19687.5	9607.5	9607.5	1	H1-1b
51	M12	PIPE_1.25	0.261	2.02	101	0.051	0		101	19254.559	19687.5	9607.5	9607.5	1	H1-1b
52	M184	PIPE_1.25	0.255	14.137	5	0.056	14.137		156	19254.559	19687.5	9607.5	9607.5	1	H1-1b
53	M112	PIPE_1.25	0.251	14.137	13	0.056	14.137		116	19254.559	19687.5	9607.5	9607.5	1	H1-1b
54	M145	PIPE_2.0	0.24	76.25	147	0.039	47.5		154	9836.597	32130	22459.5	22459.5	1	H1-1b
55	M73	PIPE_2.0	0.24	76.25	119	0.039	47.5		114	9836.597	32130	22459.5	22459.5	1	H1-1b
56	M1	PIPE_2.0	0.24	76.25	80	0.039	47.5		75	9836.597	32130	22459.5	22459.5	1	H1-1b
57	M173	PIPE_2.0	0.235	6.75	163	0.087	24.75		2	12143.947	32130	22459.5	22459.5	1	H1-1b
58	M101	PIPE_2.0	0.235	6.75	135	0.087	24.75		10	12143.947	32130	22459.5	22459.5	1	H1-1b
59	M29	PIPE_2.0	0.235	6.75	107	0.081	24.75		7	12143.947	32130	22459.5	22459.5	1	H1-1b
60	M146	PIPE_2.0	0.232	76.25	162	0.062	76.25		7	9836.597	32130	22459.5	22459.5	1	H1-1b
61	M74	PIPE_2.0	0.232	76.25	146	0.062	76.25		3	9836.597	32130	22459.5	22459.5	1	H1-1b
62	M2	PIPE_2.0	0.232	76.25	107	0.052	76.25		12	9836.597	32130	22459.5	22459.5	1	H1-1b
63	M177	3.625"X0.5"PLATE	0.208	2.382	11	0.178	3.875	y	11	56538.489	58725	7340.609	53219.527	3	H1-1b
64	M40	PIPE_1.25	0.206	14.137	10	0.055	14.137		77	19254.559	19687.5	9607.5	9607.5	1	H1-1b
65	M105	3.625"X0.5"PLATE	0.205	2.382	7	0.175	3.875	y	7	56538.489	58725	7340.609	53219.527	3	H1-1b
66	M164	3.625"X0.5"PLATE	0.195	3	23	0.081	3	y	174	57404.511	58725	7340.609	53219.527	1.155	H1-1b
67	M51	0.625"S.R.	0.193	0	84	0.041	0		102	4254.429	9940.19	1242.501	1242.501	1	H1-1b*

Envelope AISC 15TH (360-16): LRFD Member Steel Code Checks (Continued)

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [lb-in]	phi*Mn z-z [lb-in]	Cb	Eqn
68	M195	0.625"S.R.	0.193	0	151	0.041	0		169	4254.429	9940.19	1242.501	1242.501	1	H1-1b*
69	M123	0.625"S.R.	0.193	0	111	0.041	0		141	4254.429	9940.19	1242.501	1242.501	1	H1-1b*
70	M92	3.625"X0.5"PLATE	0.192	3	19	0.081	1.875	y	134	57404.511	58725	7340.609	53219.527	1.154	H1-1b
71	M52	0.625"S.R.	0.185	0	84	0.018	31.405		109	3501.373	9940.19	1242.501	1242.501	1	H1-1b*
72	M196	0.625"S.R.	0.185	0	151	0.018	31.405		164	3501.373	9940.19	1242.501	1242.501	1	H1-1b*
73	M124	0.625"S.R.	0.185	0	111	0.018	31.405		136	3501.373	9940.19	1242.501	1242.501	1	H1-1b*
74	M33	3.625"X0.5"PLATE	0.178	2.382	4	0.152	3.875	y	4	56538.489	58725	7340.609	53219.527	3	H1-1b
75	M162	0.625"S.R.	0.172	0	169	0.016	28.34		152	4254.429	9940.19	1242.501	1242.501	1	H1-1b*
76	M90	0.625"S.R.	0.172	0	141	0.016	28.34		112	4254.429	9940.19	1242.501	1242.501	1	H1-1b*
77	M18	0.625"S.R.	0.171	0	101	0.016	28.34		84	4254.429	9940.19	1242.501	1242.501	1	H1-1b*
78	M43	3.625"X0.5"PLATE	0.163	1.875	81	0.083	3	y	94	57404.511	58725	7340.609	53219.527	1.493	H1-1b
79	M187	3.625"X0.5"PLATE	0.163	1.875	148	0.083	3	y	174	57404.511	58725	7340.609	53219.527	1.51	H1-1b
80	M115	3.625"X0.5"PLATE	0.163	1.875	120	0.083	3	y	134	57404.511	58725	7340.609	53219.527	1.512	H1-1b
81	M20	3.625"X0.5"PLATE	0.162	3	10	0.081	1.875	y	94	57404.511	58725	7340.609	53219.527	1.163	H1-1b
82	M163	0.625"S.R.	0.16	0	170	0.01	31.405		10	3501.373	9940.19	1242.501	1242.501	1	H1-1b*
83	M91	0.625"S.R.	0.16	0	142	0.01	31.405		6	3501.373	9940.19	1242.501	1242.501	1	H1-1b*
84	M19	0.625"S.R.	0.16	0	103	0.009	31.405		3	3501.373	9940.19	1242.501	1242.501	1	H1-1b*
85	M154	3.625"X0.5"PLATE	0.154	1.875	164	0.076	3	y	180	57404.511	58725	7340.609	53219.527	1.439	H1-1b
86	M82	3.625"X0.5"PLATE	0.154	1.875	136	0.076	1.875	y	128	57404.511	58725	7340.609	53219.527	1.442	H1-1b
87	M10	3.625"X0.5"PLATE	0.154	1.875	109	0.076	3	y	88	57404.511	58725	7340.609	53219.527	1.43	H1-1b
88	M46	PIPE_1.25	0.133	15.315	81	0.056	15.315		95	19254.559	19687.5	9607.5	9607.5	1	H1-1b
89	M190	PIPE_1.25	0.133	15.315	149	0.056	15.315		174	19254.559	19687.5	9607.5	9607.5	1	H1-1b
90	M118	PIPE_1.25	0.133	15.315	121	0.056	15.315		134	19254.559	19687.5	9607.5	9607.5	1	H1-1b
91	M192	PIPE_1.25	0.133	14.137	157	0.053	14.137		170	19254.559	19687.5	9607.5	9607.5	1	H1-1b
92	M120	PIPE_1.25	0.133	14.137	117	0.053	14.137		142	19254.559	19687.5	9607.5	9607.5	1	H1-1b
93	M48	PIPE_1.25	0.133	14.137	78	0.053	14.137		103	19254.559	19687.5	9607.5	9607.5	1	H1-1b
94	M79	0.625"S.R.	0.133	28.34	143	0.041	0		112	4254.429	9940.19	1242.501	1242.501	1	H1-1b
95	M151	0.625"S.R.	0.133	28.34	159	0.041	0		152	4254.429	9940.19	1242.501	1242.501	1	H1-1b
96	M7	0.625"S.R.	0.133	28.34	103	0.041	0		84	4254.429	9940.19	1242.501	1242.501	1	H1-1b
97	M186	3.625"X0.5"PLATE	0.13	1.875	157	0.077	3	y	177	57404.511	58725	7340.609	53219.527	1.523	H1-1b
98	M114	3.625"X0.5"PLATE	0.13	1.875	117	0.077	3	y	125	57404.511	58725	7340.609	53219.527	1.526	H1-1b
99	M42	3.625"X0.5"PLATE	0.13	1.875	77	0.077	1.875	y	97	57404.511	58725	7340.609	53219.527	1.511	H1-1b
100	M183	PIPE_1.25	0.129	15.315	162	0.053	15.315		180	19254.559	19687.5	9607.5	9607.5	1	H1-1b
101	M111	PIPE_1.25	0.129	15.315	146	0.053	15.315		128	19254.559	19687.5	9607.5	9607.5	1	H1-1b
102	M39	PIPE_1.25	0.129	15.315	107	0.053	15.315		89	19254.559	19687.5	9607.5	9607.5	1	H1-1b
103	M45	0.625"S.R.	0.097	0	84	0.016	0		107	4254.429	9940.19	1242.501	1242.501	1	H1-1b
104	M189	0.625"S.R.	0.097	0	152	0.016	0		163	4254.429	9940.19	1242.501	1242.501	1	H1-1b
105	M117	0.625"S.R.	0.097	0	112	0.016	0		135	4254.429	9940.19	1242.501	1242.501	1	H1-1b
106	M170	PIPE_2.5	0.096	76.25	5	0.039	76.25		170	22373.407	50715	43155	43155	1	H1-1b
107	M98	PIPE_2.5	0.095	76.25	13	0.039	76.25		142	22373.407	50715	43155	43155	1	H1-1b
108	M212	3.625"X0.5"PLATE	0.094	2.382	150	0.121	3.875	y	177	56538.489	58725	7340.609	53219.527	3	H1-1b
109	M140	3.625"X0.5"PLATE	0.094	2.382	122	0.121	3.875	y	125	56538.489	58725	7340.609	53219.527	3	H1-1b
110	M68	3.625"X0.5"PLATE	0.094	2.382	82	0.121	3.875	y	97	56538.489	58725	7340.609	53219.527	3	H1-1b
111	M106	3.625"X0.5"PLATE	0.093	2.382	143	0.114	3.875	y	128	56538.489	58725	7340.609	53219.527	3	H1-1b
112	M178	3.625"X0.5"PLATE	0.093	2.382	159	0.114	3.875	y	180	56538.489	58725	7340.609	53219.527	3	H1-1b
113	M34	3.625"X0.5"PLATE	0.092	2.382	103	0.114	3.875	y	89	56538.489	58725	7340.609	53219.527	3	H1-1b
114	M26	PIPE_2.5	0.09	76.25	10	0.04	76.25		102	22373.407	50715	43155	43155	1	H1-1b
115	M174	PIPE_2.0	0.082	63.213	7	0.003	63.213		7	23036.557	32130	22459.5	22459.5	1	H1-1b*
116	M102	PIPE_2.0	0.082	63.213	3	0.003	63.213		3	23036.557	32130	22459.5	22459.5	1	H1-1b*
117	M139	3.625"X0.5"PLATE	0.08	2.382	5	0.112	2.382	y	124	56538.489	58725	7340.609	53219.527	3	H1-1b
118	M211	3.625"X0.5"PLATE	0.079	2.382	9	0.112	2.382	y	176	56538.489	58725	7340.609	53219.527	3	H1-1b
119	M67	3.625"X0.5"PLATE	0.078	2.382	2	0.112	2.382	y	97	56538.489	58725	7340.609	53219.527	3	H1-1b
120	M30	PIPE_2.0	0.06	0	12	0.003	57.07		6	24498.358	32130	22459.5	22459.5	1	H1-1b*
121	M185	PIPE_3.0	0.037	46.75	170	0.026	18.563		6	55456.817	65205	68985	68985	1	H1-1b
122	M113	PIPE_3.0	0.037	46.75	142	0.025	18.563		2	55456.817	65205	68985	68985	1	H1-1b

Envelope AISC 15TH (360-16): LRFD Member Steel Code Checks (Continued)

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [lb-in]	phi*Mn z-z [lb-in]	Cb	Eqn
123	M41	PIPE_3.0	0.037	46.75	103	0.022	18.563		11	55456.817	65205	68985	68985	1	H1-1b
124	M44	PIPE_3.0	0.037	19.25	85	0.011	46.75		6	55456.817	65205	68985	68985	1	H1-1b
125	M188	PIPE_3.0	0.037	19.25	152	0.012	46.75		13	55456.817	65205	68985	68985	1	H1-1b
126	M116	PIPE_3.0	0.037	19.25	112	0.012	46.75		9	55456.817	65205	68985	68985	1	H1-1b

ALBUL ENGINEERING

BOLT CONNECTION CALCULATION

BOLT PROPERTIES

Date:	*5/16/2025*
Site:	*Croton-on-Hudson*
Engineer:	*DVA*
Project No:	*35661.GTW.MSA.R231458.0*
Description:	*Mount plate to pipe*

Bolt Capacity Equation	TIA-222-H	
Connection Type	Steel	
Bolt Size, **d**	3/4	in
Threads per Inch, **n**	10	
Steel Grade	A325	
Bolt Ultimate Tensile Stress, $\mathbf{F_u}$	120	ksi
Threads Exclusion	N	
Shear Plane	1	

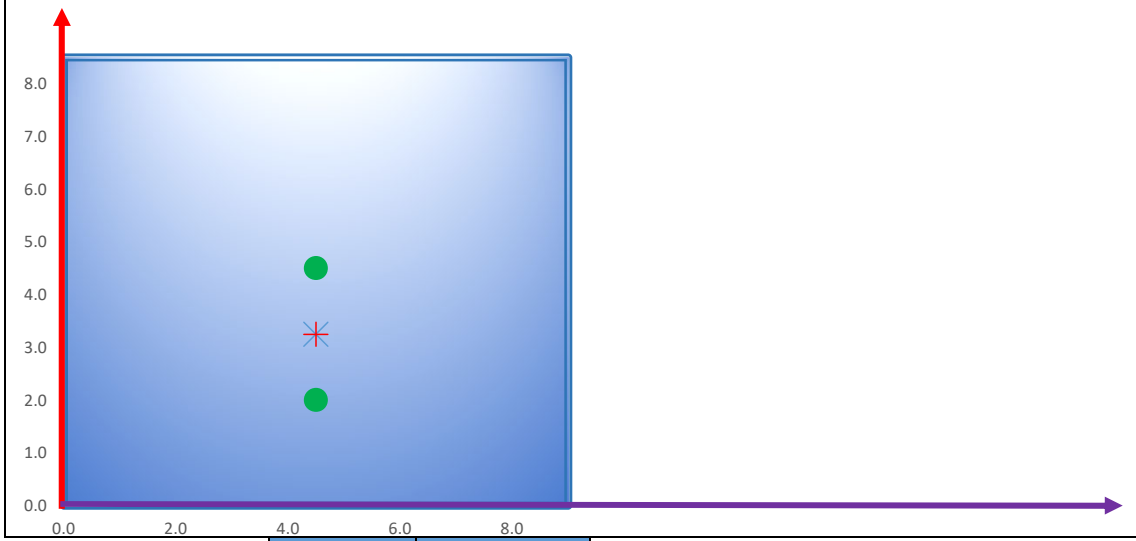
Net Bolt Cross-Sectional Area, **An**	0.334	in^2
Gross Bolt Cross-Sectional Area, **Ag**	0.442	in^2
Tensile Steel Strength (per bolt), $\mathbf{\varphi R_{nt}}$	30101	lbs
Shear Steel Strength (per bolt), $\mathbf{\varphi R_{nv}}$	19880	lbs

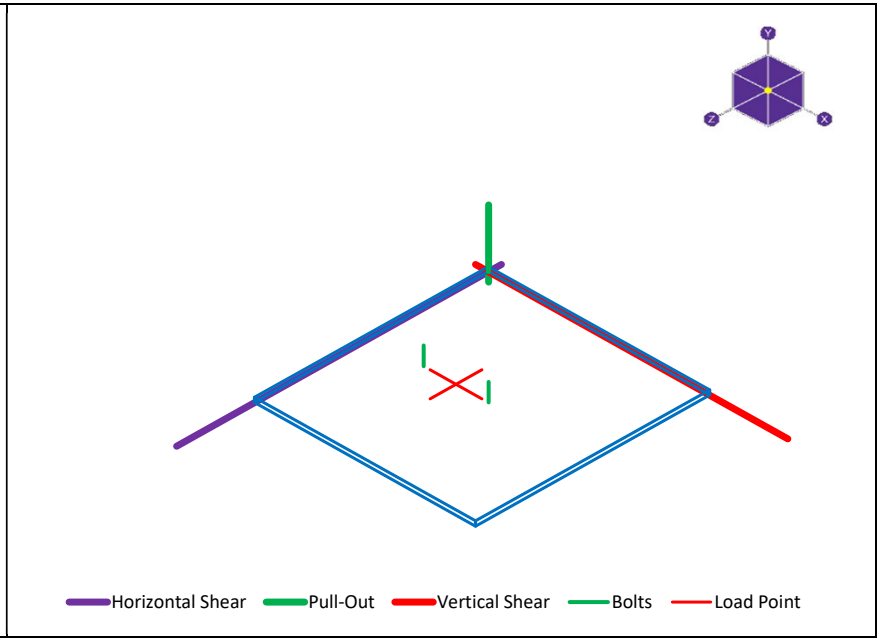
BOLT CONNECTION CALCULATION

BOLT GROUP CHECK

Date:	*5/16/2025*
Site:	*Croton-on-Hudson*
Engineer:	*DVA*
Project No:	*35661.GTW.MSA.R231458.0*
Description:	*Mount plate to pipe*

	X	Y
Start Coordinates:	0.00	0.00
Dimensions:	9.00	8.50





		Risa LC:	10							
		Coordinates, (in.)			Loads (lbs, lb-in)					
No.	Load Point Label	X	Y	Z	Shear, Px	Shear, Py	Axial, Pz	Moment, Mx	Moment, My	Moment, Mz
1	N104	4.50	3.25	0.00	858.39	1994.72	-284.53	-1092.50	-549.40	-155.21

		Bolts Q-ty:	2							
		Bolt Coordinates (in.)		Bolt Loads (lbs)		Bolt Usage (%)				
No.	Bolt Type	X	Y	Axial	Shear	Tensile Usage	Shear Usage	Combined Usage	Controlling Usage	Max. Usage
1	Main Type	4.50	2.00	355.77	1111.79	1.2%	5.6%	5.6%	Steel Shear	5.59%
2	Main Type	4.50	4.50	-518.22	1062.78	0.0%	5.3%	5.3%	Steel Shear	5.35%

Total Capacity of Bolt Group: 5.6%

ALBUL ENGINEERING

Date:	5/16/2025
Site Name:	Croton on Hudson
Project Engineer:	DVA
Project No:	35661.GTW.MSA.R231458.0
Customer:	GT Wireless Engineering, PLLC
Carrier:	AT&T Mobility

Building Code:	2018	
TIA Standard:	H	
Mount Type:	Rooftop	
Mount Existing?	Proposed	
Mount Centerline:	59.5	ft
Superstructure Height:	57.8	ft
Structure Type:	Rooftop	

Site Information		
Exposure Category:	C	
Risk Category:	III	
Ground Elevation	118.0	ft
Ultimate Wind Speed:	123	mph
Design Wind Speed:	123	mph
Ice Thickness:	1.00	in
Ice Wind Speed:	40.0	mph
Escalated Ice Thickness:	1.22	in
Topographic Method:	2	
Topographic Category:	1	

Factors	
Gh:	1.000
K_{zmin}:	0.850
K_z:	1.135
K_d:	0.950
K_{zt}:	1.000
Ke:	0.996
Ka:	0.900
I ice:	1.150

q_z:	41.57	psf

Run Seismic?	Yes
Site Soil:	D (Default)
Short-Period Accel. (Ss):	0.291
1-Second Accel. (S1):	0.061
Short-Period Design (SDS):	0.304
1-Second Design (SD1):	0.098
Short-Period Coeff. (Fa):	1.567
1-Second Coeff. (Fv):	2.400
Cs	0.190
Cs min	0.030
Amplification Factor (ap):	1.000
Response Mod. (Rp):	2.500
Overstrength (Ωo):	1.000

Service Wind:	30	mph

Table 1. Equipment Specifications and Wind Pressure

Manufacturer	Model	Elevation	Pipe Label	Weight (lb)	Height (in)	Width (in)	Depth (in)	EPA_N	EPA_T	$EPA_{N\ w/\ ice}$	$EPA_{T\ w/\ ice}$	q_z:	$q_{z\ ice}$:	$q_{z\ live}$:
ERICSSON	4494 B14/B29	59.5	30, 31, 30, 31, 30, 31	57.3	17.5	15.1	5.6	2.09	0.84	2.77	1.33	41.6	4.4	2.5
ERICSSON	4890 B25/B66	59.5	30, 31, 30, 31, 30, 31	55.9	18.8	14.8	6.2	2.21	0.99	2.91	1.53	41.6	4.4	2.5
ERICSSON	4490 B5/B12A	59.5	30, 31, 16, 26, 16, 26	65.0	20.6	15.6	7.0	2.56	1.22	3.31	1.81	41.6	4.4	2.5
-	FMB	59.5	16, 26, 16, 26, 16, 26	13.0	17.0	17.0	6.5	2.27	0.92	2.97	1.43	41.6	4.4	2.5
RAYCAP	DC9-48-60-24-PC16-EV	59.5	16, 26, 16, 26, 16, 26	34.9	17.5	15.2	6.4	2.11	0.94	2.79	1.45	41.6	4.4	2.5
-	GPS	59.5	11	10.0	9.0	3.1	3.1	0.15	0.15	0.3	0.3	41.6	4.4	2.5

Table 2. Equipment Wind and Seismic Loads

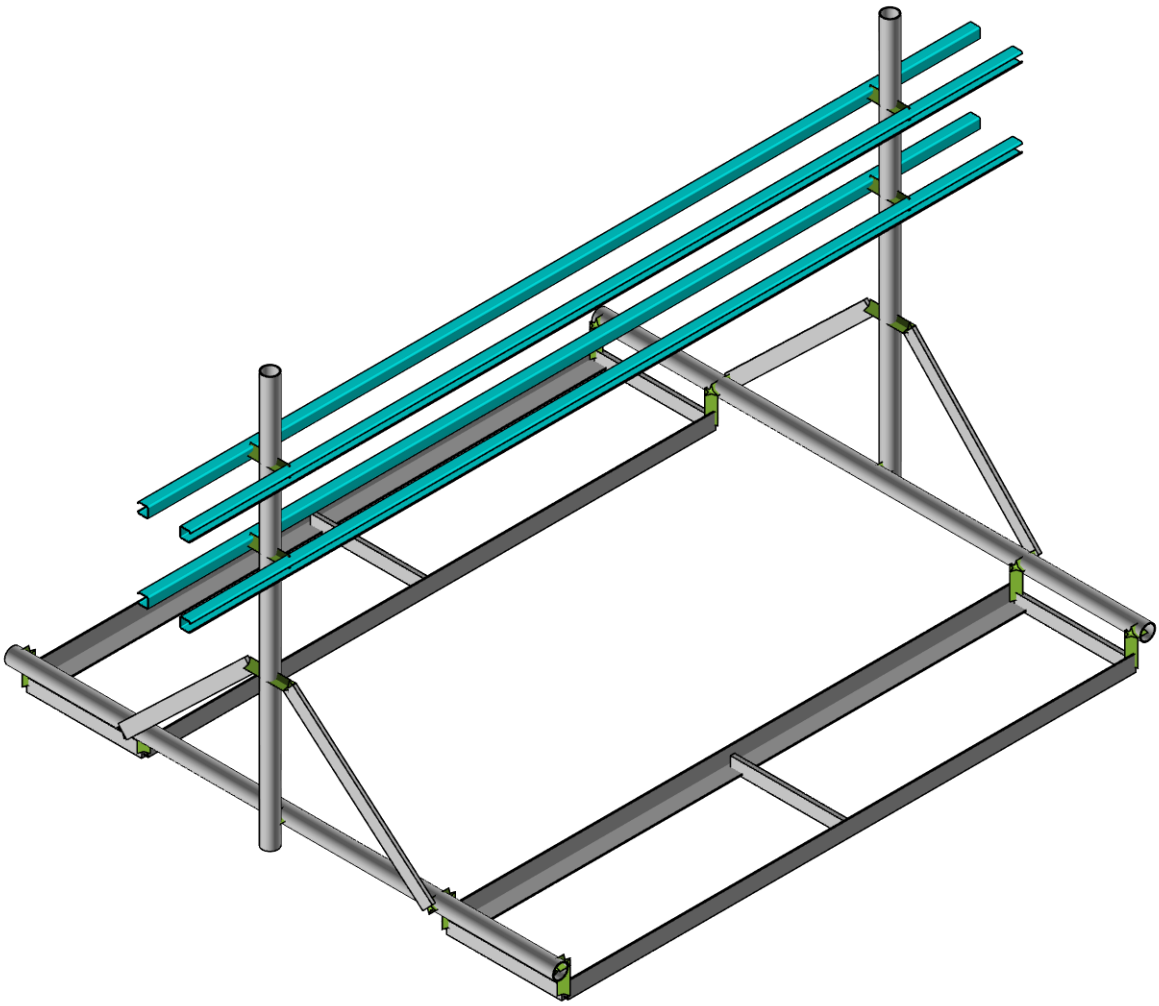
Manufacturer	Model	Wind Load (F_A), lb		Wind Load Ice Case (F_A), lb			Wind Load Service Case		Seismic Load, lb
		0 deg	90 deg	0 deg	90 deg	Ice Weight	0 deg	90 deg	
ERICSSON	4494 B14/B29	78.3	31.3	10.9	5.3	38.5	4.7	1.9	10.9
ERICSSON	4890 B25/B66	82.8	37.1	11.5	6.0	41.2	4.9	2.2	10.6
ERICSSON	4490 B5/B12A	95.8	45.7	13.1	7.2	47.9	5.7	2.7	12.4
-	FMB	85.1	34.6	11.8	5.7	41.9	5.1	2.1	2.5
RAYCAP	DC9-48-60-24-PC16-EV	78.9	35.1	11.0	5.7	39.4	4.7	2.1	6.6
-	GPS	5.5	5.5	1.2	1.2	6.4	0.3	0.3	1.9

Table 3.1. Hot Rolled Member Capacities

Member Name	Member Shape	Wind load (plf)	Wind Load Ice (plf)	Weight Ice (plf)	Bending Check	Shear Check	Total Capacity	Controlling Capacity
Frame Angle	**L2.5X2.5X3**	**17.32**	**1.83**	**0.63**	**60.9%**	**2.0%**	**60.9%**	**91.8%**
Plate	**2"X0.625"PLATE**	**13.86**	**1.47**	**0.56**	**7.8%**	**6.9%**	**7.8%**	
Frame Pipe	**PIPE_2.0**	**9.87**	**1.04**	**0.61**	**34.8%**	**41.9%**	**41.9%**	
Kicker	**2"X0.5"PLATE**	**13.86**	**1.47**	**0.56**	**30.0%**	**20.6%**	**30.0%**	
Mast Pipe	**PIPE_2.0**	**9.87**	**1.04**	**0.61**	**91.8%**	**11.6%**	**91.8%**	

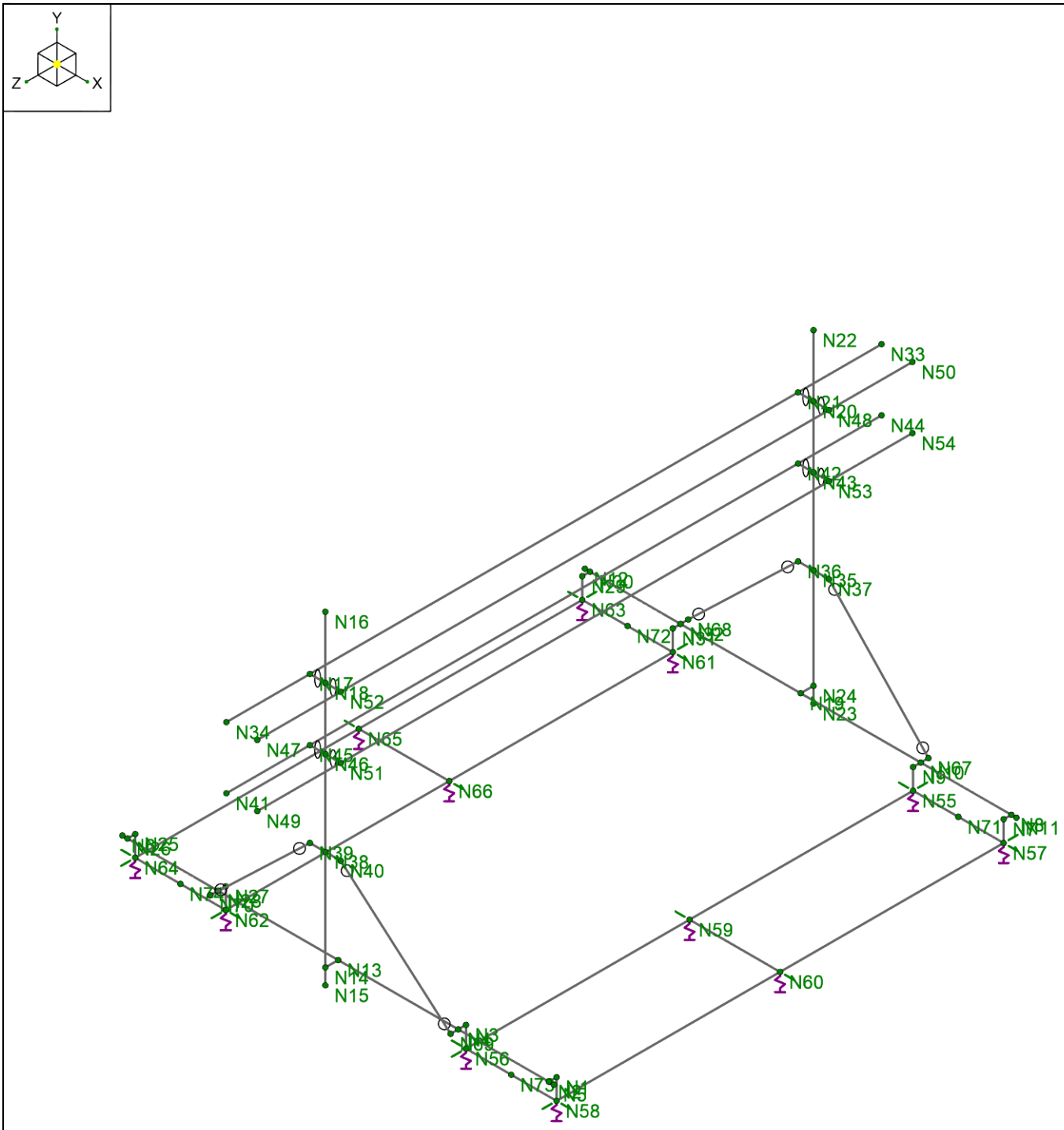
Table 3.2. Cold Formed Member Capacities

Member Name	Member Shape	Wind load (plf)	Wind Load Ice (plf)	Weight Ice (plf)	Bending Check	Shear Check	Total Capacity	Controlling Capacity
Unistrut	**UNISTRUTP1000**	**11.26**	**1.19**	**0.52**	**81.8%**	**6.7%**	**81.8%**	**81.8%**



Envelope Only Solution

IRISA A NEMETSCHEK COMPANY	Albul Engineering, LLC	Croton on Hudson	SK-1
	DVA		14652291 Croton on Hudson…
	35661.GTW.MSA.R23145…	Ballast Frame Model	



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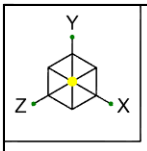
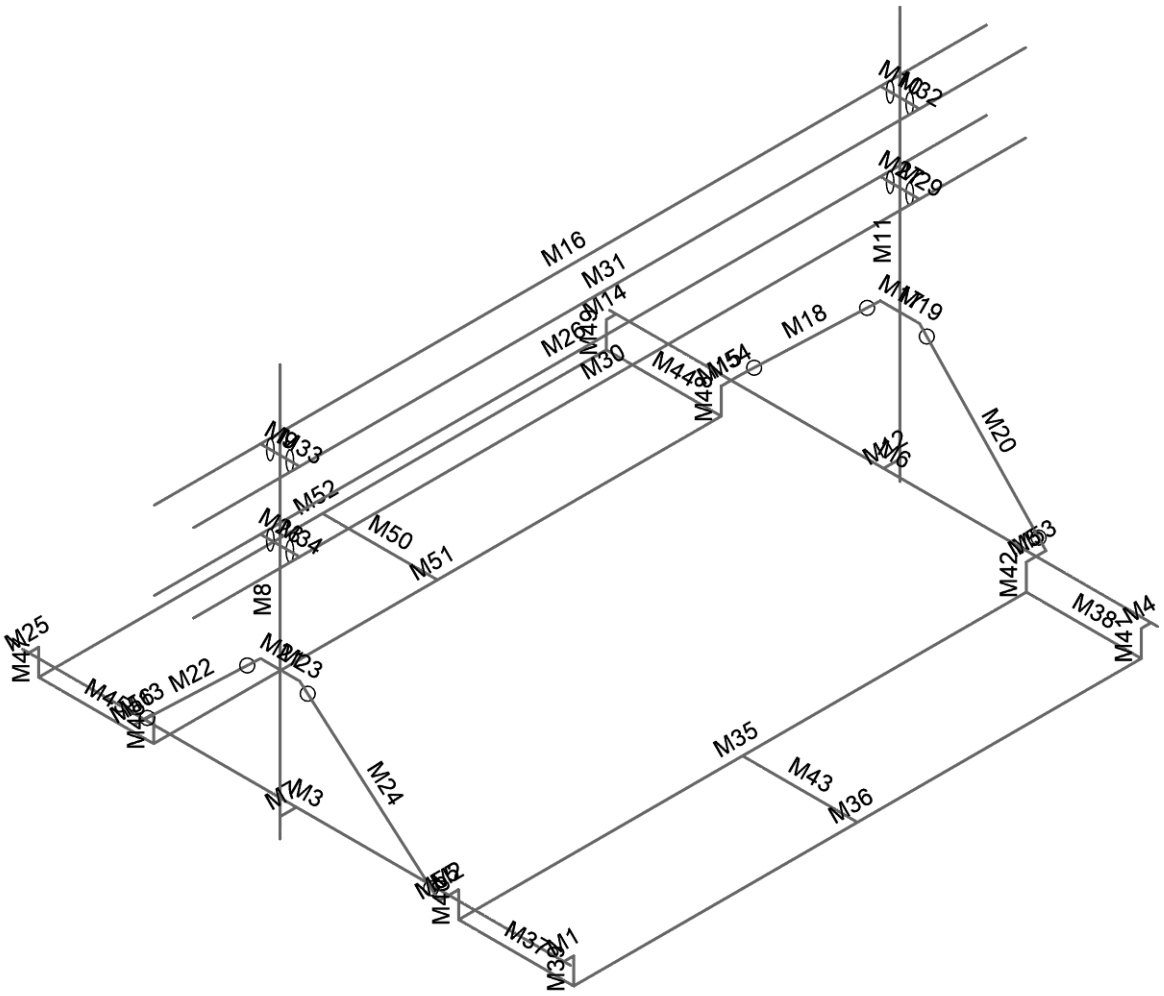
RISA A NEMETSCHEK COMPANY	Albul Engineering, LLC	Croton on Hudson	SK-2
	DVA		14652291 Croton on Hudson…
	35661.GTW.MSA.R23145…	Joint Labels	





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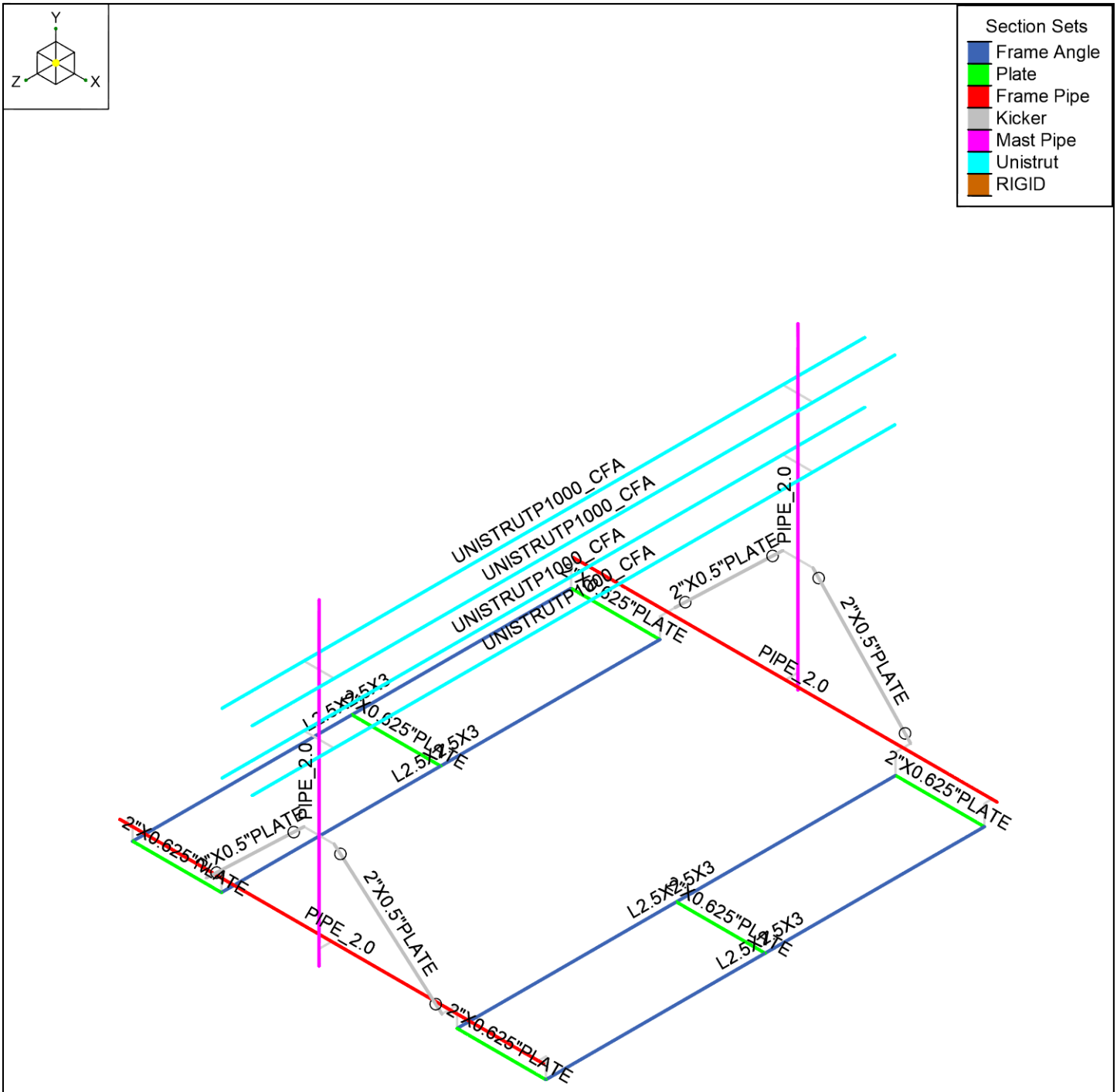
IRISA A NEMETSCHEK COMPANY	Albul Engineering, LLC	Croton on Hudson	SK-3
	DVA		14652291 Croton on Hudson…
	35661.GTW.MSA.R23145…	Member Lables	



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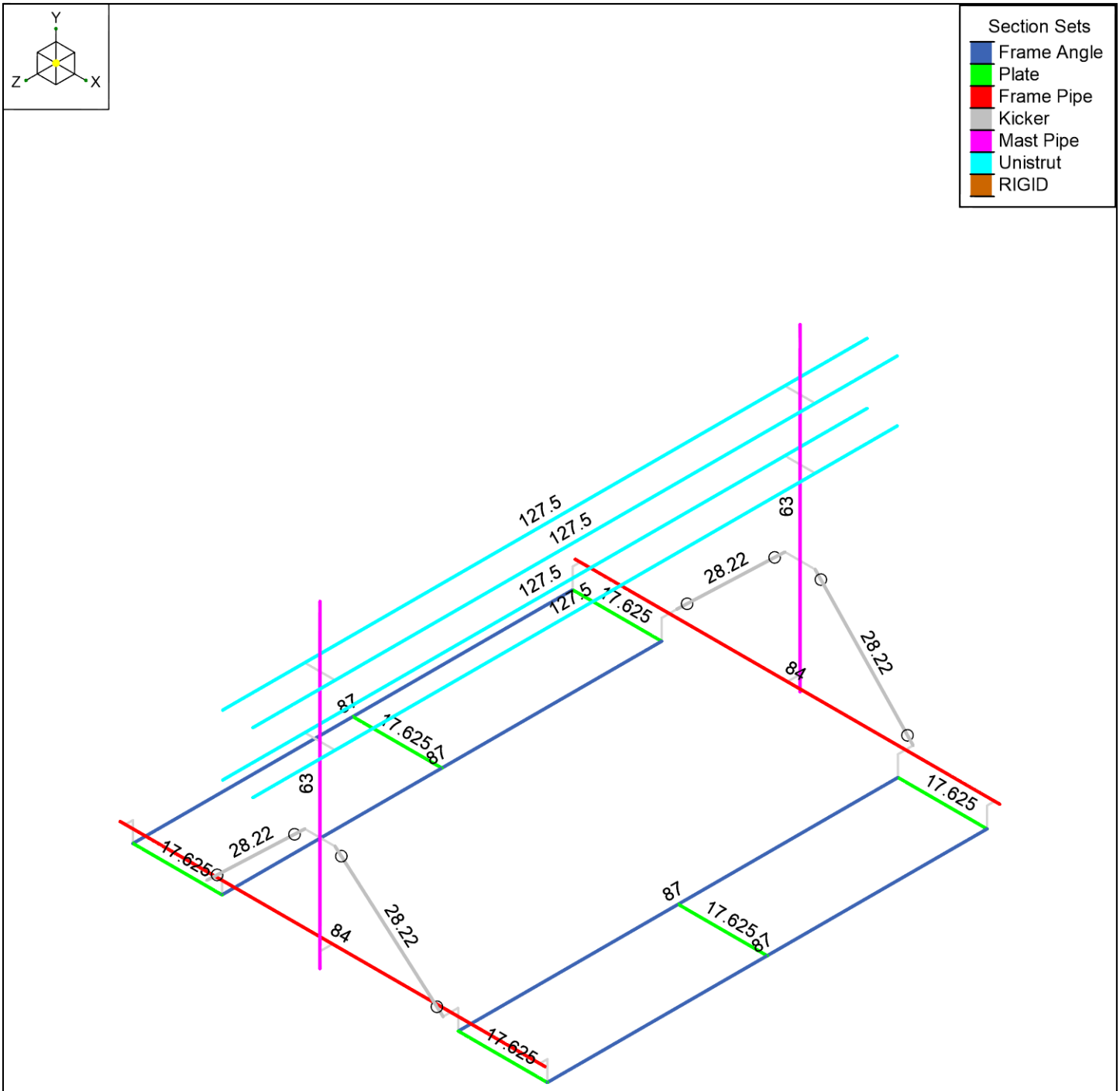
RISA A NEMETSCHEK COMPANY	Albul Engineering, LLC	Croton on Hudson	SK-4
	DVA		14652291 Croton on Hudson…
	35661.GTW.MSA.R23145…	Member Shapes	



Member Length (in) Displayed
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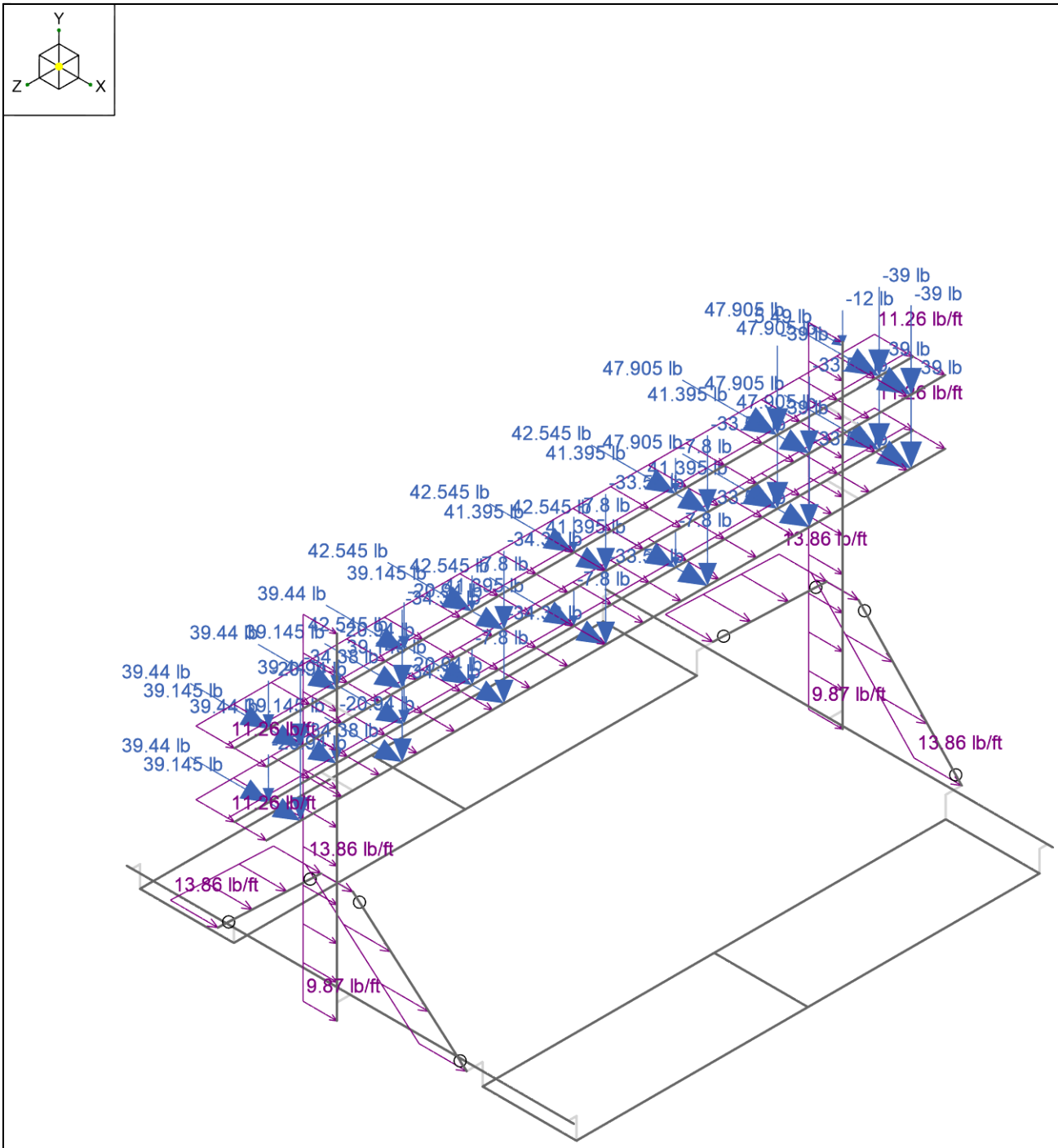
RISA A NEMETSCHEK COMPANY	Albul Engineering, LLC	Croton on Hudson	SK-5
	DVA		14652291 Croton on Hudson…
	35661.GTW.MSA.R23145…	Member Lengths	



Loads: LC 8, 1.2DL + 1WL AZI 180
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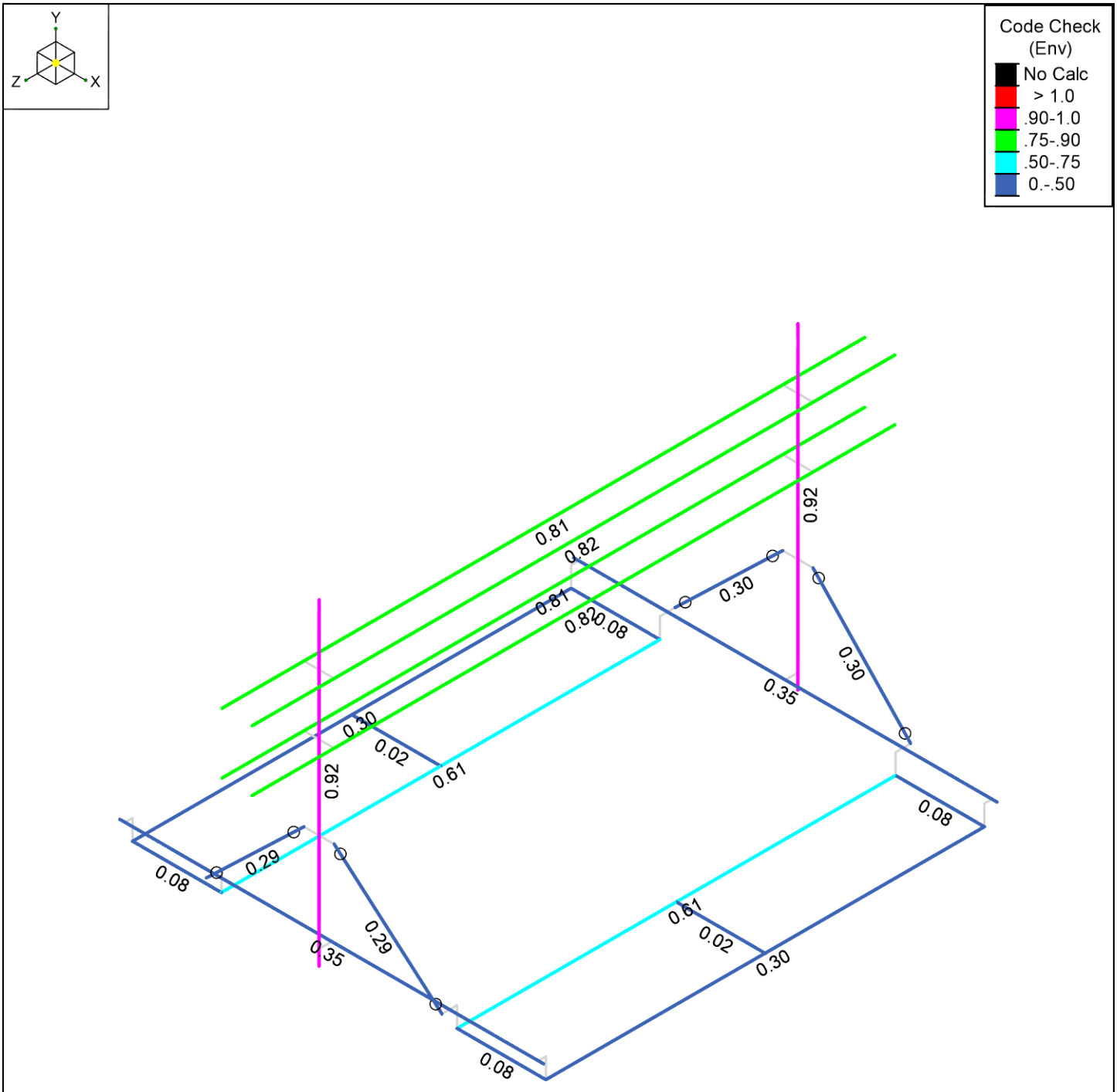
IRISA A NEMETSCHEK COMPANY	Albul Engineering, LLC	Croton on Hudson	SK-6
	DVA		14652291 Croton on Hudson…
	35661.GTW.MSA.R23145…	Controlling Load Combination	



Member Code Checks Displayed (Enveloped)
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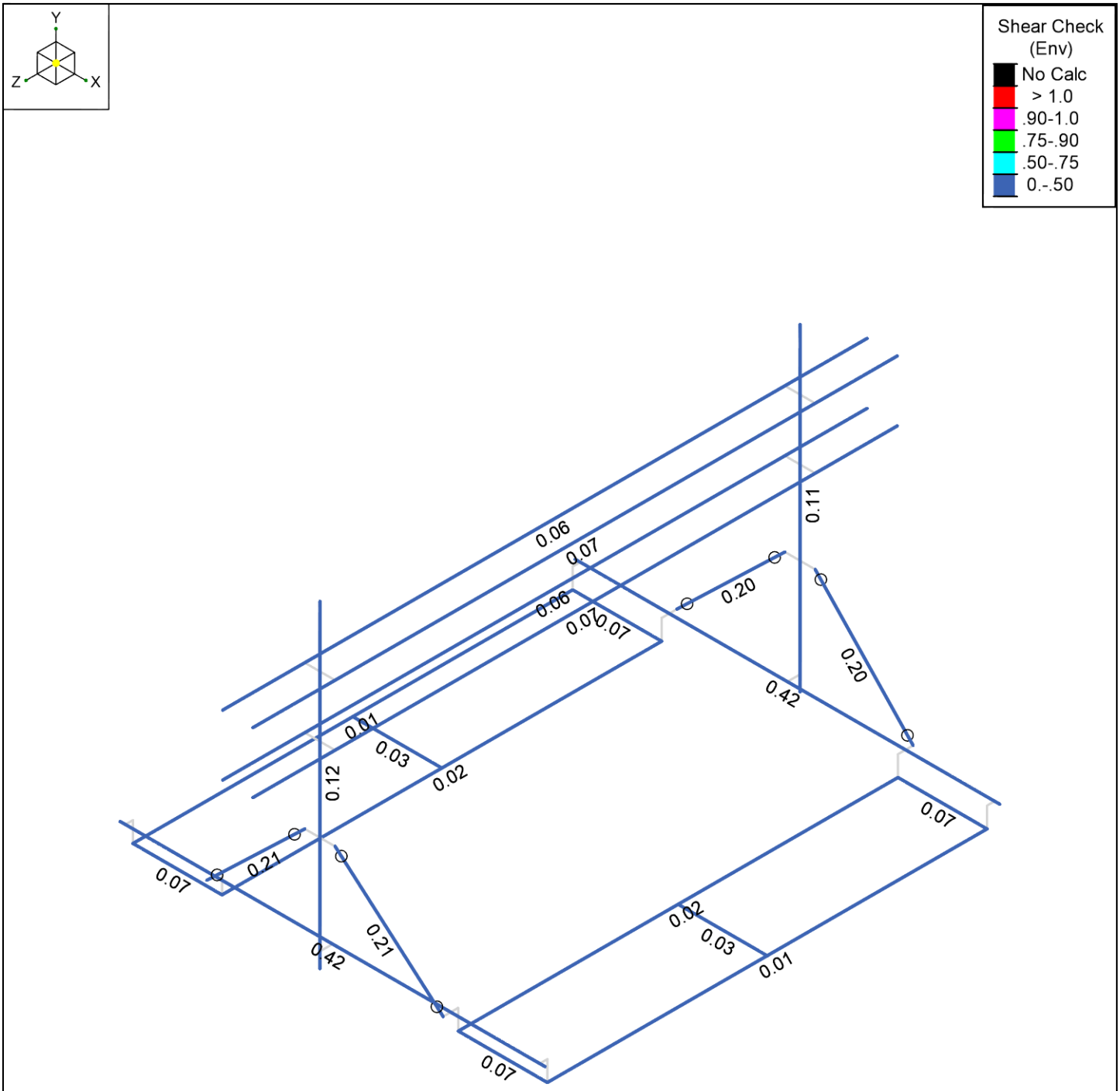
RISA A NEMETSCHEK COMPANY	Albul Engineering, LLC	Croton on Hudson	SK-7
	DVA		14652291 Croton on Hudson…
	35661.GTW.MSA.R23145…	Member Code Check	



Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

RISA A NEMETSCHEK COMPANY	Albul Engineering, LLC	Croton on Hudson	SK-8
	DVA		14652291 Croton on Hudson…
	35661.GTW.MSA.R23145…	Member Code Check	

Model Settings

Number of Reported Sections	5
Number of Internal Sections	100
Member Area Load Mesh Size (in^2)	144
Consider Shear Deformation	Yes
Consider Torsional Warping	Yes
Approximate Mesh Size (in)	12
Transfer Forces Between Intersecting Wood Walls	Yes
Increase Wood Wall Nailing Capacity for Wind Loads	Yes
Include P-Delta for Walls	Yes
Optimize Masonry and Wood Walls	Yes
Maximum Number of Iterations	3
Single	No
Multiple (Optimum)	Yes
Maximum	No

Global Axis corresponding to vertical direction	Y
Convert Existing Data	Yes
Default Global Plane for z-axis	XZ
Plate Local Axis Orientation	Nodal

Hot Rolled Steel	AISC 15th (360-16): LRFD
Stiffness Adjustment	Yes (Iterative)
Notional Annex	None
Connections	AISC 15th (360-16): LRFD
Cold Formed Steel	AISI S100-20: LRFD
Stiffness Adjustment	Yes (Iterative)
Wood	None
Temperature	< 100F
Concrete	None
Masonry	None
Aluminum	None
Structure Type	Building
Stiffness Adjustment	Yes (Iterative)
Stainless	None
Stiffness Adjustment	Yes (Iterative)

Compression Stress Block	Rectangular Stress Block
Analyze using Cracked Sections	Yes
Leave room for horizontal rebar splices (2*d bar spacing)	Yes
List forces which were ignored for design in the Detail Report	Yes

Column Min Steel	1
Column Max Steel	8
Rebar Material Spec	ASTM A615
Warn if beam-column framing arrangement is not understood	No
Number of Shear Regions	4
Region 2 & 3 Spacing Increase Increment (in)	4

Code	ASCE 7-16
Risk Category	III
Drift Cat	Other

Model Settings (Continued)

Base Elevation (ft)	
Include the weight of the structure in base shear calcs	Yes
S_1 (g)	1
SD_1 (g)	1
SD_s (g)	1
T_L (sec)	5
T Z (sec)	
T X (sec)	
C_tZ	0.02
C_tX	0.02
C_tExp. Z	0.75
C_tExp. X	0.75
R Z	3
R X	3
Ω_0Z	1
Ω_0X	1
C_dZ	4
C_dX	4
ρ Z	1
ρ X	1

Member Primary Data

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
1	M1	N1	N2		RIGID	None	None	RIGID	Typical
2	M2	N3	N4		RIGID	None	None	RIGID	Typical
3	M3	N6	N5		Frame Pipe	Beam	Pipe	A53 Gr.B	Typical
4	M4	N7	N8		RIGID	None	None	RIGID	Typical
5	M5	N9	N10		RIGID	None	None	RIGID	Typical
6	M6	N12	N11		Frame Pipe	Beam	Pipe	A53 Gr.B	Typical
7	M7	N13	N14		RIGID	None	None	RIGID	Typical
8	M8	N15	N16		Mast Pipe	Column	Pipe	A53 Gr.B	Typical
9	M9	N17	N18		RIGID	None	None	RIGID	Typical
10	M10	N21	N20		RIGID	None	None	RIGID	Typical
11	M11	N23	N22		Mast Pipe	Column	Pipe	A53 Gr.B	Typical
12	M12	N19	N24		RIGID	None	None	RIGID	Typical
13	M13	N27	N28		RIGID	None	None	RIGID	Typical
14	M14	N29	N30		RIGID	None	None	RIGID	Typical
15	M15	N31	N32		RIGID	None	None	RIGID	Typical
16	M16	N33	N34		Unistrut	Beam	CS	A653 SS Gr33	Typical
17	M17	N36	N35		RIGID	None	None	RIGID	Typical
18	M18	N36	N68		Kicker	VBrace	RECT	A36 Gr.36	Typical
19	M19	N37	N35		RIGID	None	None	RIGID	Typical
20	M20	N67	N37		Kicker	VBrace	RECT	A36 Gr.36	Typical
21	M21	N39	N38		RIGID	None	None	RIGID	Typical
22	M22	N70	N39		Kicker	VBrace	RECT	A36 Gr.36	Typical
23	M23	N40	N38		RIGID	None	None	RIGID	Typical
24	M24	N40	N69		Kicker	VBrace	RECT	A36 Gr.36	Typical
25	M25	N25	N26		RIGID	None	None	RIGID	Typical
26	M26	N44	N41		Unistrut	Beam	CS	A653 SS Gr33	Typical
27	M27	N42	N43		RIGID	None	None	RIGID	Typical
28	M28	N45	N46		RIGID	None	None	RIGID	Typical
29	M29	N53	N43		RIGID	None	None	RIGID	Typical
30	M30	N49	N54		Unistrut	Beam	CS	A653 SS Gr33	Typical
31	M31	N47	N50		Unistrut	Beam	CS	A653 SS Gr33	Typical
32	M32	N48	N20		RIGID	None	None	RIGID	Typical
33	M33	N52	N18		RIGID	None	None	RIGID	Typical
34	M34	N51	N46		RIGID	None	None	RIGID	Typical
35	M35	N56	N55		Frame Angle	Beam	Single Angle	A36 Gr.36	Typical
36	M36	N57	N58		Frame Angle	Beam	Single Angle	A36 Gr.36	Typical
37	M37	N56	N58		Plate	Beam	RECT	A36 Gr.36	Typical
38	M38	N55	N57		Plate	Beam	RECT	A36 Gr.36	Typical
39	M39	N58	N1	270	RIGID	None	None	RIGID	Typical
40	M40	N56	N3	270	RIGID	None	None	RIGID	Typical
41	M41	N57	N7	270	RIGID	None	None	RIGID	Typical
42	M42	N55	N9	270	RIGID	None	None	RIGID	Typical
43	M43	N59	N60		Plate	Beam	RECT	A36 Gr.36	Typical
44	M44	N63	N61		Plate	Beam	RECT	A36 Gr.36	Typical
45	M45	N64	N62		Plate	Beam	RECT	A36 Gr.36	Typical
46	M46	N62	N27	270	RIGID	None	None	RIGID	Typical
47	M47	N64	N25	270	RIGID	None	None	RIGID	Typical
48	M48	N61	N31	270	RIGID	None	None	RIGID	Typical
49	M49	N63	N29	270	RIGID	None	None	RIGID	Typical
50	M50	N65	N66		Plate	Beam	RECT	A36 Gr.36	Typical
51	M51	N61	N62		Frame Angle	Beam	Single Angle	A36 Gr.36	Typical
52	M52	N64	N63		Frame Angle	Beam	Single Angle	A36 Gr.36	Typical
53	M53	N10	N67		RIGID	None	None	RIGID	Typical
54	M54	N32	N68		RIGID	None	None	RIGID	Typical
55	M55	N4	N69		RIGID	None	None	RIGID	Typical

Member Primary Data (Continued)

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
56	M56	N28	N70		RIGID	None	None	RIGID	Typical

Hot Rolled Steel Properties

	Label	E [psi]	G [psi]	Nu	Therm. Coeff. [1e⁵°F⁻¹]	Density [lb/ft³]	Yield [ksi]	Ry	Fu [ksi]	Rt
1	A992	2.9e+7	1.115e+7	0.3	0.65	490	50	1.1	65	1.1
2	A36 Gr.36	2.9e+7	1.115e+7	0.3	0.65	490	36	1.5	58	1.2
3	A572 Gr.50	2.9e+7	1.115e+7	0.3	0.65	490	50	1.1	65	1.1
4	A500 Gr.B RND	2.9e+7	1.115e+7	0.3	0.65	527	42	1.4	58	1.3
5	A500 Gr.B Rect	2.9e+7	1.115e+7	0.3	0.65	527	46	1.4	58	1.3
6	A53 Gr.B	2.9e+7	1.115e+7	0.3	0.65	490	35	1.6	60	1.2
7	A1085	2.9e+7	1.115e+7	0.3	0.65	490	50	1.4	65	1.3

Cold Formed Steel Properties

	Label	E [psi]	G [psi]	Nu	Therm. Coeff. [1e⁵°F⁻¹]	Density [lb/ft³]	Yield [ksi]	Fu [ksi]
1	A653 SS Gr33	2.95e+7	1.135e+7	0.3	0.65	490	33	45
2	A653 SS Gr50/1	2.95e+7	1.135e+7	0.3	0.65	490	50	65

Hot Rolled Steel Design Parameters

	Label	Shape	Length [in]	Lcomp top [in]	K y-y	K z-z	Channel Conn.	a [in]	Function
1	M3	Frame Pipe	84	Lbyy			N/A	N/A	Lateral
2	M6	Frame Pipe	84	Lbyy			N/A	N/A	Lateral
3	M8	Mast Pipe	63				N/A	N/A	Lateral
4	M11	Mast Pipe	63				N/A	N/A	Lateral
5	M18	Kicker	28.22	Lbyy			N/A	N/A	Lateral
6	M20	Kicker	28.22	Lbyy			N/A	N/A	Lateral
7	M22	Kicker	28.22	Lbyy			N/A	N/A	Lateral
8	M24	Kicker	28.22	Lbyy			N/A	N/A	Lateral
9	M35	Frame Angle	87	Lbyy	0.7	0.7	N/A	N/A	Lateral
10	M36	Frame Angle	87	Lbyy	0.7	0.7	N/A	N/A	Lateral
11	M37	Plate	17.625	Lbyy	0.7	0.7	N/A	N/A	Lateral
12	M38	Plate	17.625	Lbyy	0.7	0.7	N/A	N/A	Lateral
13	M43	Plate	17.625	Lbyy	0.7	0.7	N/A	N/A	Lateral
14	M44	Plate	17.625	Lbyy	0.7	0.7	N/A	N/A	Lateral
15	M45	Plate	17.625	Lbyy	0.7	0.7	N/A	N/A	Lateral
16	M50	Plate	17.625	Lbyy	0.7	0.7	N/A	N/A	Lateral
17	M51	Frame Angle	87	Lbyy	0.7	0.7	N/A	N/A	Lateral
18	M52	Frame Angle	87	Lbyy	0.7	0.7	N/A	N/A	Lateral

Cold Formed Steel Design Parameters

	Label	Shape	Length [in]	Lb y-y [in]	Lb z-z [in]	Lcomp top [in]	Lcomp bot [in]	L-Torque [in]	Function
1	M16	Unistrut	127.5	Segment	Segment	Segment	Segment	Segment	Lateral
2	M26	Unistrut	127.5	Segment	Segment	Segment	Segment	Segment	Lateral
3	M30	Unistrut	127.5	Segment	Segment	Segment	Segment	Segment	Lateral
4	M31	Unistrut	127.5	Segment	Segment	Segment	Segment	Segment	Lateral

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rule	Area [in²]	Iyy [in⁴]	Izz [in⁴]	J [in⁴]
1	Frame Angle	L2.5X2.5X3	Beam	Single Angle	A36 Gr.36	Typical	0.901	0.535	0.535	0.011
2	Plate	2"X0.625"PLATE	Beam	RECT	A36 Gr.36	Typical	1.25	0.041	0.417	0.131

Hot Rolled Steel Section Sets (Continued)

	Label	Shape	Type	Design List	Material	Design Rule	Area [in²]	Iyy [in⁴]	Izz [in⁴]	J [in⁴]
3	Frame Pipe	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	0.627	0.627	1.25
4	Kicker	2"X0.5"PLATE	VBrace	RECT	A36 Gr.36	Typical	1	0.021	0.333	0.07
5	Mast Pipe	PIPE_2.0	Column	Pipe	A53 Gr.B	Typical	1.02	0.627	0.627	1.25

Cold Formed Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rule	Area [in²]	Iyy [in⁴]	Izz [in⁴]	J [in⁴]
1	Unistrut	UNISTRUTP1000_CFA	Beam	CS	A653 SS Gr33	Typical	0.49	0.144	0.212	0.002
2	CF1	162T125-18	Beam	CU	A653 SS Gr33	Typical	0.078	0.013	0.042	9e-6

Node Boundary Conditions

	Node Label	X [lb/in]	Y [lb/in]	Z [lb/in]
1	N1			
2	N2			
3	N3			
4	N4			
5	N7			
6	N8			
7	N9			
8	N10			
9	N13			
10	N17			
11	N19			
12	N21			
13	N25			
14	N26			
15	N27			
16	N28			
17	N29			
18	N30			
19	N31			
20	N32			
21	N42			
22	N45			
23	N48			
24	N51			
25	N52			
26	N53			
27	N55	Reaction	S1e+6	Reaction
28	N56	Reaction	S1e+6	Reaction
29	N57	Reaction	S1e+6	Reaction
30	N58	Reaction	S1e+6	Reaction
31	N59	Reaction	S1e+6	Reaction
32	N60	Reaction	S1e+6	Reaction
33	N61	Reaction	S1e+6	Reaction
34	N62	Reaction	S1e+6	Reaction
35	N63	Reaction	S1e+6	Reaction
36	N64	Reaction	S1e+6	Reaction
37	N65	Reaction	S1e+6	Reaction
38	N66	Reaction	S1e+6	Reaction
39	N67			
40	N68			
41	N69			
42	N70			

Material Take-Off

	Material	Size	Pieces	Length[in]	Weight[LB]
1	General Members				
2	RIGID		34	91	0
3	Total General		34	91	0
4					
5	Hot Rolled Steel				
6	A36 Gr.36	2"X0.625"PLATE	6	105.8	37.484
7	A36 Gr.36	L2.5X2.5X3	4	348	88.911
8	A36 Gr.36	2"X0.5"PLATE	4	112.9	32.009
9	A53 Gr.B	PIPE_2.0	4	294	85.035
10	Total HR Steel		18	860.6	243.44
11					
12	Cold Formed Steel				
13	A653 SS Gr33	UNISTRUTP1000_CFA	4	510	70.903
14	Total CF Steel		4	510	70.903

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Point	Distributed
1	Self Weight	DL		-1		31	
2	Wind Load AZI 0	WLX				31	10
3	Wind Load AZI 30	None				62	18
4	Wind Load AZI 60	None				62	18
5	Wind Load AZI 90	WLZ				31	8
6	Wind Load AZI 120	None				62	18
7	Wind Load AZI 150	None				62	18
8	Wind Load AZI 180	None				31	10
9	Wind Load AZI 210	None				62	18
10	Wind Load AZI 240	None				62	18
11	Wind Load AZI 270	None				62	8
12	Wind Load AZI 300	None				62	18
13	Wind Load AZI 330	None				62	18
14	Ice Weight	OL1				31	22
15	Ice Wind Load AZI 0	OL2				31	10
16	Ice Wind Load AZI 30	None				62	18
17	Ice Wind Load AZI 60	None				62	18
18	Ice Wind Load AZI 90	OL3				31	8
19	Ice Wind Load AZI 120	None				62	18
20	Ice Wind Load AZI 150	None				62	18
21	Ice Wind Load AZI 180	None				31	10
22	Ice Wind Load AZI 210	None				62	18
23	Ice Wind Load AZI 240	None				62	18
24	Ice Wind Load AZI 270	None				62	8
25	Ice Wind Load AZI 300	None				62	18
26	Ice Wind Load AZI 330	None				62	18
27	Seismic Load X	ELX			-0.19	31	
28	Seismic Load Z	ELZ	-0.19			31	

Load Combinations

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor
1	1.4DL	Yes	Y	1	1.4				
2	1.2DL + 1WL AZI 0	Yes	Y	1	1.2	2	1		
3	1.2DL + 1WL AZI 30	Yes	Y	1	1.2	3	1		
4	1.2DL + 1WL AZI 60	Yes	Y	1	1.2	4	1		

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor
5	1.2DL + 1WL AZI 90	Yes	Y	1	1.2	5	1		
6	1.2DL + 1WL AZI 120	Yes	Y	1	1.2	6	1		
7	1.2DL + 1WL AZI 150	Yes	Y	1	1.2	7	1		
8	1.2DL + 1WL AZI 180	Yes	Y	1	1.2	8	1		
9	1.2DL + 1WL AZI 210	Yes	Y	1	1.2	9	1		
10	1.2DL + 1WL AZI 240	Yes	Y	1	1.2	10	1		
11	1.2DL + 1WL AZI 270	Yes	Y	1	1.2	11	1		
12	1.2DL + 1WL AZI 300	Yes	Y	1	1.2	12	1		
13	1.2DL + 1WL AZI 330	Yes	Y	1	1.2	13	1		
14	0.9DL + 1WL AZI 0	Yes	Y	1	0.9	2	1		
15	0.9DL + 1WL AZI 30	Yes	Y	1	0.9	3	1		
16	0.9DL + 1WL AZI 60	Yes	Y	1	0.9	4	1		
17	0.9DL + 1WL AZI 90	Yes	Y	1	0.9	5	1		
18	0.9DL + 1WL AZI 120	Yes	Y	1	0.9	6	1		
19	0.9DL + 1WL AZI 150	Yes	Y	1	0.9	7	1		
20	0.9DL + 1WL AZI 180	Yes	Y	1	0.9	8	1		
21	0.9DL + 1WL AZI 210	Yes	Y	1	0.9	9	1		
22	0.9DL + 1WL AZI 240	Yes	Y	1	0.9	10	1		
23	0.9DL + 1WL AZI 270	Yes	Y	1	0.9	11	1		
24	0.9DL + 1WL AZI 300	Yes	Y	1	0.9	12	1		
25	0.9DL + 1WL AZI 330	Yes	Y	1	0.9	13	1		
26	1.2D + 1.0Di	Yes	Y	1	1.2	14	1		
27	1.2D + 1.0Di +1.0Wi AZI 0	Yes	Y	1	1.2	14	1	15	1
28	1.2D + 1.0Di +1.0Wi AZI 30	Yes	Y	1	1.2	14	1	16	1
29	1.2D + 1.0Di +1.0Wi AZI 60	Yes	Y	1	1.2	14	1	17	1
30	1.2D + 1.0Di +1.0Wi AZI 90	Yes	Y	1	1.2	14	1	18	1
31	1.2D + 1.0Di +1.0Wi AZI 120	Yes	Y	1	1.2	14	1	19	1
32	1.2D + 1.0Di +1.0Wi AZI 150	Yes	Y	1	1.2	14	1	20	1
33	1.2D + 1.0Di +1.0Wi AZI 180	Yes	Y	1	1.2	14	1	21	1
34	1.2D + 1.0Di +1.0Wi AZI 210	Yes	Y	1	1.2	14	1	22	1
35	1.2D + 1.0Di +1.0Wi AZI 240	Yes	Y	1	1.2	14	1	23	1
36	1.2D + 1.0Di +1.0Wi AZI 270	Yes	Y	1	1.2	14	1	24	1
37	1.2D + 1.0Di +1.0Wi AZI 300	Yes	Y	1	1.2	14	1	25	1
38	1.2D + 1.0Di +1.0Wi AZI 330	Yes	Y	1	1.2	14	1	26	1
39	(1.2 + 0.2Sds)DL + 1.0E AZI 0	Yes	Y	1	1.261	27	1	28	
40	(1.2 + 0.2Sds)DL + 1.0E AZI 30	Yes	Y	1	1.261	27	0.866	28	0.5
41	(1.2 + 0.2Sds)DL + 1.0E AZI 60	Yes	Y	1	1.261	27	0.5	28	0.866
42	(1.2 + 0.2Sds)DL + 1.0E AZI 90	Yes	Y	1	1.261	27		28	1
43	(1.2 + 0.2Sds)DL + 1.0E AZI 120	Yes	Y	1	1.261	27	-0.5	28	0.866
44	(1.2 + 0.2Sds)DL + 1.0E AZI 150	Yes	Y	1	1.261	27	-0.866	28	0.5
45	(1.2 + 0.2Sds)DL + 1.0E AZI 180	Yes	Y	1	1.261	27	-1	28	
46	(1.2 + 0.2Sds)DL + 1.0E AZI 210	Yes	Y	1	1.261	27	-0.866	28	-0.5
47	(1.2 + 0.2Sds)DL + 1.0E AZI 240	Yes	Y	1	1.261	27	-0.5	28	-0.866
48	(1.2 + 0.2Sds)DL + 1.0E AZI 270	Yes	Y	1	1.261	27		28	-1
49	(1.2 + 0.2Sds)DL + 1.0E AZI 300	Yes	Y	1	1.261	27	0.5	28	-0.866
50	(1.2 + 0.2Sds)DL + 1.0E AZI 330	Yes	Y	1	1.261	27	0.866	28	-0.5
51	(0.9 - 0.2Sds)DL + 1.0E AZI 0	Yes	Y	1	0.839	27	1	28	
52	(0.9 - 0.2Sds)DL + 1.0E AZI 30	Yes	Y	1	0.839	27	0.866	28	0.5
53	(0.9 - 0.2Sds)DL + 1.0E AZI 60	Yes	Y	1	0.839	27	0.5	28	0.866
54	(0.9 - 0.2Sds)DL + 1.0E AZI 90	Yes	Y	1	0.839	27		28	1
55	(0.9 - 0.2Sds)DL + 1.0E AZI 120	Yes	Y	1	0.839	27	-0.5	28	0.866
56	(0.9 - 0.2Sds)DL + 1.0E AZI 150	Yes	Y	1	0.839	27	-0.866	28	0.5
57	(0.9 - 0.2Sds)DL + 1.0E AZI 180	Yes	Y	1	0.839	27	-1	28	
58	(0.9 - 0.2Sds)DL + 1.0E AZI 210	Yes	Y	1	0.839	27	-0.866	28	-0.5
59	(0.9 - 0.2Sds)DL + 1.0E AZI 240	Yes	Y	1	0.839	27	-0.5	28	-0.866

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor
60	(0.9 - 0.2Sds)DL + 1.0E AZI 270	Yes	Y	1	0.839	27		28	-1
61	(0.9 - 0.2Sds)DL + 1.0E AZI 300	Yes	Y	1	0.839	27	0.5	28	-0.866
62	(0.9 - 0.2Sds)DL + 1.0E AZI 330	Yes	Y	1	0.839	27	0.866	28	-0.5

Envelope Node Reactions

	Node Label		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-in]	LC	MY [lb-in]	LC	MZ [lb-in]	LC
1	N55	max	100.899	14	941.398	8	222.833	18	0	62	0	62	0	62
2		min	-264.812	8	-447.823	14	-234.085	24	0	1	0	1	0	1
3	N56	max	109.765	14	911.706	8	236.979	16	0	62	0	62	0	62
4		min	-254.358	8	-467.876	14	-223.48	22	0	1	0	1	0	1
5	N57	max	360.818	15	258.125	7	68.632	15	0	62	0	62	0	62
6		min	-450.545	9	-189.155	25	-93.799	9	0	1	0	1	0	1
7	N58	max	361.67	25	254.101	9	92.204	7	0	62	0	62	0	62
8		min	-445.211	7	-190.186	15	-70.014	25	0	1	0	1	0	1
9	N59	max	90.613	8	89.987	14	9.589	12	0	62	0	62	0	62
10		min	-54.323	14	-109.291	8	-9.771	6	0	1	0	1	0	1
11	N60	max	4.44	14	41.182	2	9.771	6	0	62	0	62	0	62
12		min	-7.497	8	-24.3	20	-9.589	12	0	1	0	1	0	1
13	N61	max	267.604	2	935.047	2	223.057	16	0	62	0	62	0	62
14		min	-98.791	20	-452.567	20	-236.703	22	0	1	0	1	0	1
15	N62	max	258.589	2	902.953	2	240.21	6	0	62	0	62	0	62
16		min	-106.567	20	-474.482	20	-223.973	24	0	1	0	1	0	1
17	N63	max	447.853	13	255.904	3	69.126	19	0	62	0	62	0	62
18		min	-363.924	19	-190.173	21	-93.109	13	0	1	0	1	0	1
19	N64	max	441.266	3	251.191	13	91.309	3	0	62	0	62	0	62
20		min	-365.703	21	-191.741	19	-70.637	21	0	1	0	1	0	1
21	N65	max	7.394	2	41.646	8	9.78	4	0	62	0	62	0	62
22		min	-4.517	20	-23.951	14	-9.584	10	0	1	0	1	0	1
23	N66	max	55.056	20	91.036	20	9.584	10	0	62	0	62	0	62
24		min	-89.63	2	-107.888	2	-9.78	4	0	1	0	1	0	1
25	Totals:	max	1980.578	2	1992.04	31	958.616	6						
26		min	-1980.576	20	841.417	60	-958.615	10						

Envelope AISC 15TH (360-16): LRFD Member Steel Code Checks

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [lb-in]	phi*Mn z-z [lb-in]	Cb	Eqn
1	M11	PIPE_2.0	0.918	22.969	8	0.11	22.313		8	23088.171	32130	22459.5	22459.5	1	H1-1b
2	M8	PIPE_2.0	0.915	22.969	8	0.116	22.313		8	23088.171	32130	22459.5	22459.5	1	H1-1b
3	M35	L2.5X2.5X3	0.609	87	6	0.02	87	y	6	12597.457	29192.4	10470.885	18885.394	1.5	H2-1
4	M51	L2.5X2.5X3	0.608	0	4	0.02	0	y	4	12597.457	29192.4	10470.885	18885.394	1.5	H2-1
5	M3	PIPE_2.0	0.348	42	7	0.419	42		6	17855.085	32130	22459.5	22459.5	1	H3-6
6	M6	PIPE_2.0	0.345	42	9	0.418	42		10	17855.085	32130	22459.5	22459.5	1	H3-6
7	M36	L2.5X2.5X3	0.303	0	6	0.01	0	y	6	12597.457	29192.4	10470.885	18885.394	1.5	H2-1
8	M52	L2.5X2.5X3	0.303	87	4	0.01	87	y	4	12597.457	29192.4	10470.885	18885.394	1.5	H2-1
9	M20	2"X0.5"PLATE	0.3	9.995	8	0.204	28.22	y	12	5909.701	32400	4050	16200	1.136	H1-1a
10	M18	2"X0.5"PLATE	0.297	18.226	2	0.205	28.22	y	10	5909.701	32400	4050	16200	1.136	H1-1a
11	M24	2"X0.5"PLATE	0.293	18.226	8	0.206	28.22	y	4	5909.701	32400	4050	16200	1.136	H1-1a
12	M22	2"X0.5"PLATE	0.289	9.995	2	0.206	28.22	y	6	5909.701	32400	4050	16200	1.136	H1-1a
13	M44	2"X0.625"PLATE	0.078	0	6	0.069	17.625	y	4	31662.575	40500	6328.109	20250	2.13	H1-1b
14	M38	2"X0.625"PLATE	0.078	17.625	4	0.069	0	y	6	31662.575	40500	6328.109	20250	2.129	H1-1b
15	M45	2"X0.625"PLATE	0.078	0	10	0.068	17.625	y	12	31662.575	40500	6328.109	20250	2.13	H1-1b
16	M37	2"X0.625"PLATE	0.077	17.625	12	0.068	0	y	10	31662.575	40500	6328.109	20250	2.128	H1-1b
17	M50	2"X0.625"PLATE	0.019	0	6	0.028	17.625	y	6	31662.575	40500	6328.109	20250	1.138	H1-1b
18	M43	2"X0.625"PLATE	0.019	17.625	4	0.028	0	y	4	31662.575	40500	6328.109	20250	1.138	H1-1b

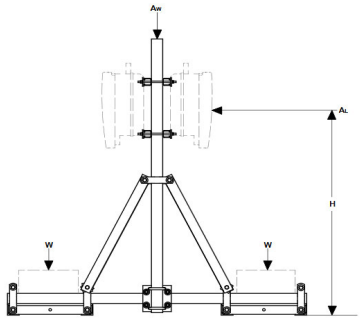
Envelope AISI S100-20: LRFD Member Cold Formed Steel Code Checks

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*Pn[lb]	phi*Tn[lb]	phi*Mnyy[lb-in]	phi*Mnzz[lb-in]	phi*Vny[lb]	phi*Vnz[lb]	Cb	Eqn
1	M31	UNISTRUTP1000_CFA	0.818	63.75	2	0.067	110.234	y	31	3147.427	14561.346	3692.837	6930.535	2202.181	4404.362	2.53	H1.2-1
2	M30	UNISTRUTP1000_CFA	0.815	63.75	2	0.067	110.234	y	31	3147.427	14561.346	3692.837	6930.535	2202.181	4404.362	2.53	H1.2-1
3	M16	UNISTRUTP1000_CFA	0.814	17.266	8	0.06	110.234	y	37	3147.427	14561.346	4144.184	6886.851	2202.181	4404.362	2.52	H1.2-1
4	M26	UNISTRUTP1000_CFA	0.809	17.266	8	0.06	110.234	y	37	3147.427	14561.346	4144.184	6886.851	2202.181	4404.362	2.52	H1.2-1

RRH BALLAST FRAME CALCULATIONS

Date:	***5/16/2025***
Site Name:	***Croton on Hudson***
Site Number:	***14652291***
Engineer:	***DVA***
Project No:	***35661.GTW.MSA.R231458.0***

IBC:	**2018**	
ASCE Standard:	**ASCE 7-16**	
Frame Length:	**7.00**	ft
Frame Width:	**7.53**	ft
Friction Coefficient:	**0.8**	
Ballast Block Type:	**8x8x16 Solid CMU**	
Assumed Block Weight:	**63**	lbs



Proposed Ballast Blocks: **16**

Overturning Forces	Type of Load	Wind Force (lbs)	Moment Arm (ft)	Load Factor	Safety Factor	Overturning Moment (lb-ft)
Frame	Wind Load	326	1.94	1.0	1.0	633
RRH & TMA	Wind Load	1268	3.50	1.0	1.0	4439

Total Overturning Moment: **5,072** lb-ft

Resisting Overturning Forces	Type of Load	Weight (lbs)	Moment Arm (ft)	Load Factor	Safety Factor	Resisting Moment (lb-ft)
Frame	Dead Load	396	3.50	0.9	1.0	1247
RRH & TMA	Dead Load	688	3.50	0.9	1.0	2168
Ballast	Dead Load	1008	3.50	0.9	1.0	2977

Total Resisting Moment: **6,591** lb-ft
Total of Ballast Blocks: **16**
Total of Ballast : **1008** **lbs**

SLIDING CHECK

Frame Weight:	**396**	lbs
Equipment Weight:	**688**	lbs
Ballast Weight:	**1008**	lbs
Sliding Force:	**1,673.8**	lbs
Total Wind Force:	**1,593.8**	lbs
		lbs
Tributary Area:	**52.72**	

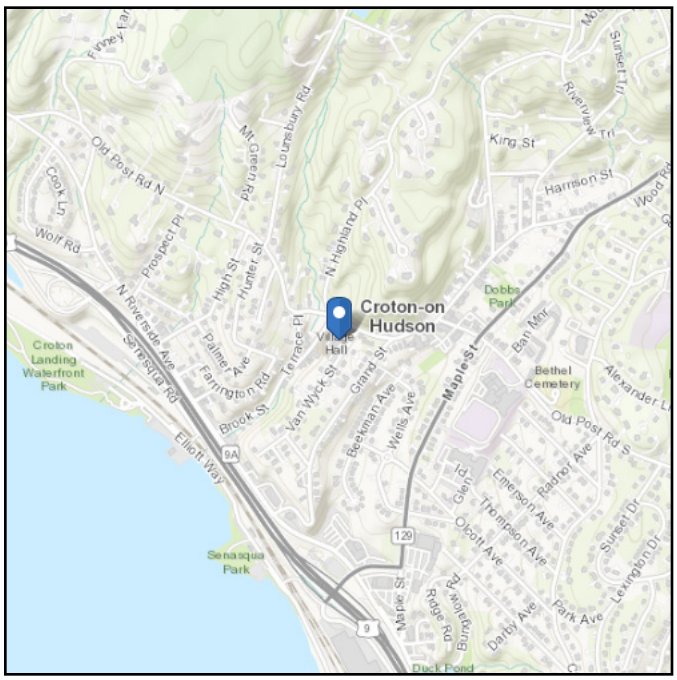
Total Weight: **2,029** lbs

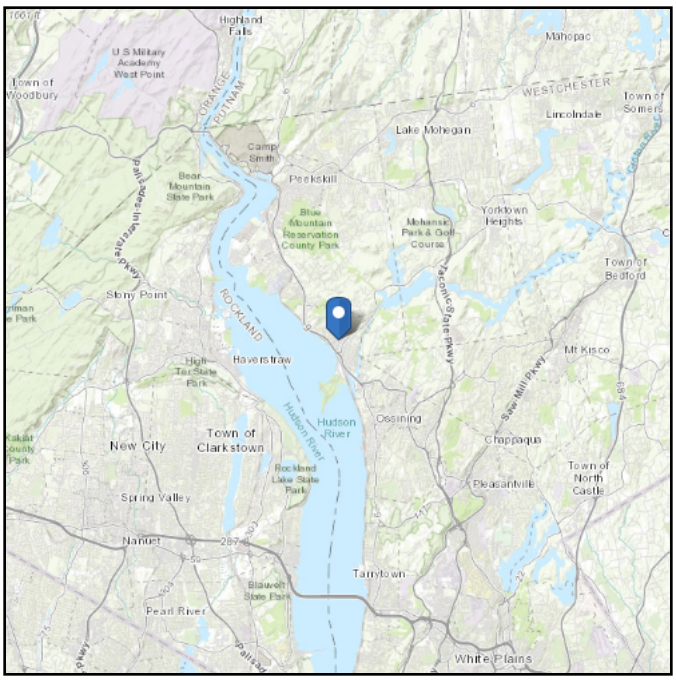
Slide Check: **95.2%**

ASCE Hazards Report

Address:
No Address at This Location

Standard:	ASCE/SEI 7-16	**Latitude:**	41.208303
Risk Category:	III	**Longitude:**	-73.887708
Soil Class:	D - Stiff Soil	**Elevation:**	118.0688890800416 ft (NAVD 88)





Wind

Results:

Wind Speed	123 Vmph
10-year MRI	75 Vmph
25-year MRI	84 Vmph
50-year MRI	89 Vmph
100-year MRI	95 Vmph

Data Source:	ASCE/SEI 7-16, Fig. 26.5-1C and Figs. CC.2-1–CC.2-4, and Section 26.5.2
Date Accessed:	Wed May 07 2025

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 3% probability of exceedance in 50 years (annual exceedance probability = 0.000588, MRI = 1,700 years).

Site is not in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2.

Seismic

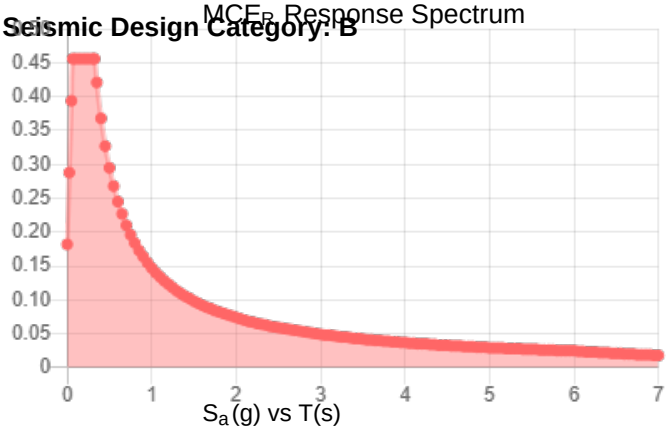
Site Soil Class: D - Stiff Soil

Results:

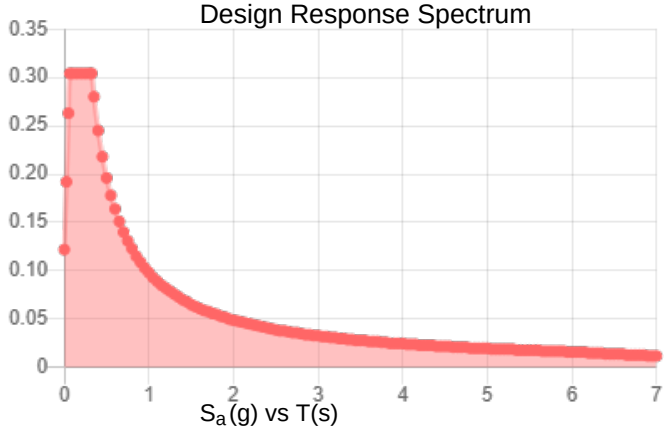
S_S :	0.291	S_{D1} :	0.098
S_1 :	0.061	T_L :	6
F_a :	1.567	PGA :	0.18
F_v :	2.4	PGA_M :	0.259
S_{MS} :	0.456	F_{PGA} :	1.441
S_{M1} :	0.147	I_e :	1.25
S_{DS} :	0.304	C_v :	0.882

Seismic Design Category: B

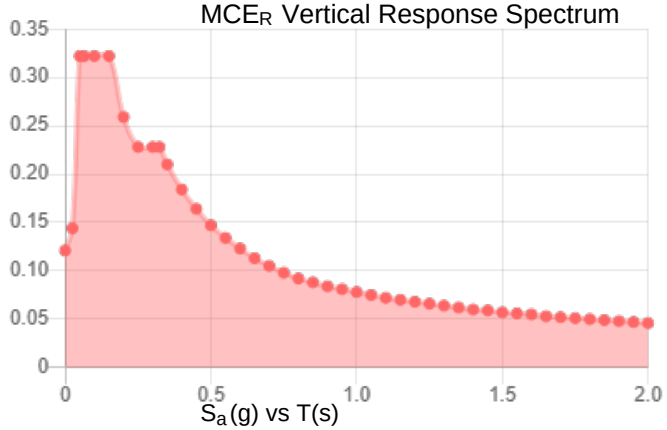
MCE_R Response Spectrum



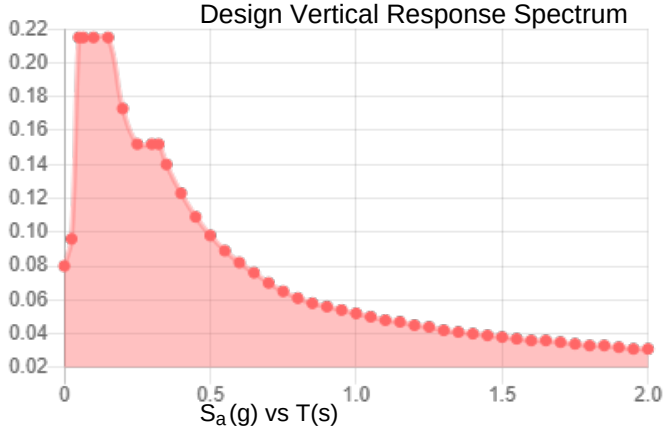
Design Response Spectrum



MCE_R Vertical Response Spectrum



Design Vertical Response Spectrum



Data Accessed: **Wed May 07 2025**

Date Source:

USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.

Ice

Results:

Ice Thickness:	1.00 in.
Concurrent Temperature:	15 F
Gust Speed	40 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Wed May 07 2025

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 500-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.