



Structural Analysis Report

Trylon Project # 204606

March 16, 2022

Project Information	
Client	Mastec
Carrier Name	AT&T Mobility
Carrier Site ID	SD05
Carrier Site Name	Mercer Island
PACE Number	MRW0R052471, MRW0R051810, MRW0R051708
PTN Number	3801A0YFM1, 3801A0XZQE, 3801A0XX22
FA Number	10092489
Site Address	7900 SE 28th Street, Mercer Island, King County, WA 98040
Site Coordinates	47.5856400, -122.2320600
Structure Type	Building
Structure Height	59.0 ft
Mount Type	Rooftop Mount Frames
Mount Elevation	64.3 ft

STRUCTURE RATING =	62.4%	PASS
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Analysis Performed by:
Michelle Prouty, EI, MS

Reviewed and Approved by:
Cliff Abernathy, P.E.



Structural Analysis Report

Subject: Analysis of the Existing Rooftop Mount Frames at 64.3 ft Elevation

Dear Mastec,

We have been provided with RF information, photos and sketches of the structure for the above referenced sites. AT&T Mobility is proposing to change the equipment configuration on the Existing mounting hardware.

A revised antenna, coax and miscellaneous equipment schematic have been provided to us. We have been asked to evaluate this information to determine whether the mounting apparatus is adequate to safely support the proposed loading change.

RISA 3D (Version 17), a commercially available analysis software package, was used to create a three-dimensional model of the antenna mounting system and calculate member stresses for various loading cases.

1. Source Data

Document Type	Source	Reference	Date
RFDS	AT&T Mobility	RFDS ID: 4303477	March 4, 2022
Mount Mapping Report	B+T GRP	Site Name: Mercer Island	February 15, 2018
Mount Analysis	Trylon	Project No.204022	March 14, 2022
Structural Calculations	Cornerstone	Project No. 14-09065	December 31, 2014

2. Analysis Criteria

Adopted Codes and Site Parameters	
Building Code / Local Code	2018 IBC
Code Standard	ASCE7-16
Design Wind Speed (mph)	98
Design Wind Speed with Ice (mph)	30
Design Ice Thickness (in)	1.00
Risk Category/Structure Class	II
Exposure Category	B
Topographic Factor, K_{zt}	1.0
Seismic Response Acceleration, S_s (g)	1.394
Seismic Response Acceleration, S_1 (g)	0.485

3. Final Loading Configuration

Mount CL (ft)	Equipment CL (ft)	Qty.	Manufacturer	Model	Carrier
64.3	67.8	3	Nokia	AEQK	AT&T Mobility
	64.3	3	Commscope	NNH4-65B-R6	
		3	Cellmax	CMA-UBTMLBHH-6516-16-21-21	
		3	Alcatel-Lucent	RRH4x25-WCS-4R	
		3	Nokia	AirScale RRH 4TR B5 160W AHCA	
		3	Nokia	AirScale RRH 4TR B12/14 320W AHLBA	
		3	Nokia	AirScale RRH 4TR B25/66 320W AHFIB	
		3	Raycap	DC6-48-60-18-8C-EV	
		6	Raycap	DC2-48-60-0-9E	

4. Standard Conditions for Providing Structural Consulting Services on Existing Structures

- 1) Mounting hardware is analyzed to the best of our ability using all information that is provided or can be obtained during fieldwork (if authorized by client). If the existing conditions are not as we have represented in this analysis, we should be contacted to evaluate the significance of the deviation and revise the assessment accordingly.
- 2) The structural analysis has been performed assuming that hardware is in “like new” condition. No allowance was made for excessive corrosion, damaged or missing structural members, loose bolts, misaligned parts, or any reduction in strength due to the age or fatigue of the product.
- 3) The structural analysis provided is an assessment of the primary load carrying capacity of the hardware. We provide a limited scope of service. In some cases, we cannot verify the capacity of every weld, plate, connection detail, etc. In some cases, structural fabrication details are unknown at the time of our analysis, and the detailed field measurement of some of the required details may not be possible. In instances where we cannot perform connection capacity calculations, it is assumed that the existing manufactured connections develop the full capacity of the primary members being connected.
- 4) We cannot be held responsible for mounting hardware that is installed improperly or hardware that is loose or has a tendency of working loose over the lifetime of the mounting hardware. Our analysis has been performed assuming fully tightened connections, and proper installation and symmetry of the mounting hardware per manufacturer’s instructions.
- 5) The structural analysis has been performed using information currently provided by the client and potentially field verified. We have been provided with a mounting arrangement for all telecommunications equipment, including antennas RRH’s, TMA’s, RRU’s, diplexers, surge protection devices, etc. Our analysis has been based upon a particular mounting arrangement. We are not responsible for deviations in the mounting arrangement that may occur over time. If deviations in equipment type or mounting arrangements are proposed, then we should be contacted to revise the recommendations of this structural report.
- 6) We cannot be held responsible for temporary and unbalanced loads on mounting hardware. Our analysis is based on a particular mounting arrangement or as-built field condition. We are not responsible for the methods and means of how the mounting arrangement is accomplished by the contractor. These methods and means may include rigging of equipment or hardware to lift and locate, temporary hanging of equipment in locations other than the final arrangement, movement and tie off of tower riggers, personnel, and their equipment, etc.
- 7) Steel grade and strength is unknown and cannot be field tested. We cannot be held responsible for equipment manufactured from inferior steel or bolts. Our analysis assumes that standard structural grade steel has been used by the equipment manufacturer for all assembled parts of the mounting apparatus. Acceptable steels and connection components are specified by the American Institute of Steel Construction. It is assumed all welded connections are performed in the shop under the latest American Welding Society Code. No field welds are permitted or assumed for the existing premanufactured equipment.
- 8) Steel grades have been assumed as follows, unless noted otherwise:

Assumed Steel Grades	
Channel, Solid Round, Angle, Plate	ASTM A36 (GR 36)
HSS (Rectangular)	ASTM 500 (GR B-46)
Pipe	ASTM A53 (GR 35)
Connection Bolts	ASTM A325
U-Bolts, Threaded Rods	SAE J429 Gr. 2

5. Analysis Results

Mount CL (ft.)	Component	% Capacity	Pass/Fail	Notes
64.3	Mount Pipe(s)	25.8	Pass	1
	Horizontal(s)	43.5	Pass	
	Standoff(s)	35.9	Pass	
	Post(s)	32.0	Pass	
	Kicker(s)	17.5	Pass	
	H-Frame(s)	52.1	Pass	
	Connection(s)	5.7	Pass	
	Roof Slab	62.4	Pass	

Structure Rating (max from all components) =	62.4%
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Notes:

1) See additional documentation in "Appendix A – Additional Calculations" for calculations supporting the % capacity consumed.

6. Conclusions and Recommendations

Based on the information provided, our calculations conclude that the Existing AT&T Mobility Rooftop Mount Frames installed at 64.3 ft. elevation has sufficient capacity to carry the final loading configuration.

New H-frame shall be installed behind the existing rooftop mounts.

- H-frame posts shall be 2.0STD x 4'-0" welded to a PL16"x16"x1/4" base plate
- H-frame horizontals shall be L2.5x2.5x1/4" x 8'-4"
- H-frame post shall be attached to existing roof slab with (4) 1/2" diameter Hilti Kwik Bolt TZ2 – SS-304 anchors, minimum embedment depth of 3.25". Anchors at 12" OC

APPENDIX
ADDITIONAL CALCULATIONS

Concrete Beam

LIC# : KW-06012946, Build:20.22.2.15

TRYLON

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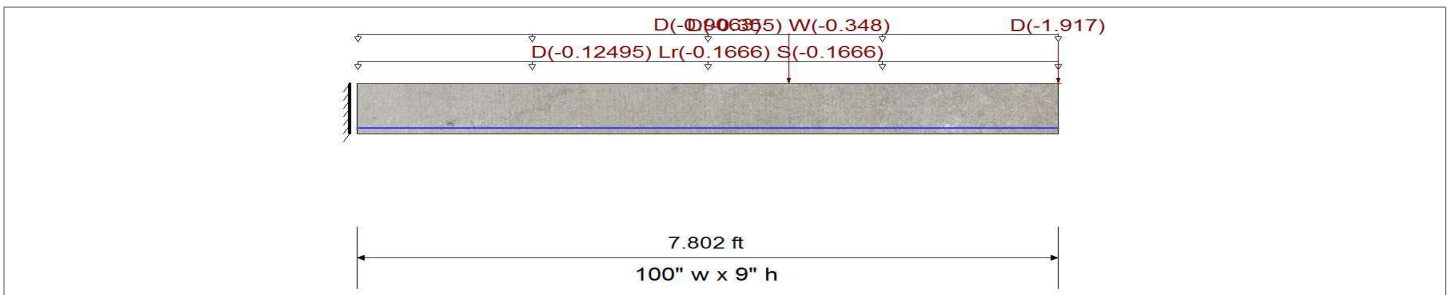
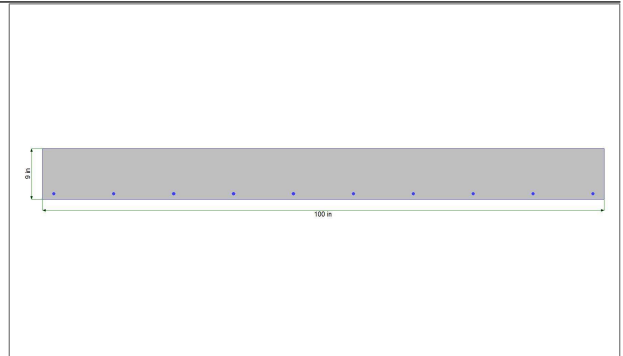
DESCRIPTION: Slab at Mount Location

CODE REFERENCES

Calculations per ACI 318-14, IBC 2018, CBC 2019, ASCE 7-16
 Load Combination Set : IBC 2018

Material Properties

f_c	=	4.0 ksi	ϕ Phi Values	Flexure :	0.90
$f_r = f_c^{1/2} \cdot 7.50$	=	474.342 psi		Shear :	0.750
ψ Density	=	145.0 pcf	β_1	=	0.850
λ LtWt Factor	=	1.0			
Elastic Modulus	=	3,122.0 ksi	Fy - Stirrups	=	40.0 ksi
f_y - Main Rebar	=	60.0 ksi	E - Stirrups	=	29,000.0 ksi
E - Main Rebar	=	29,000.0 ksi	Stirrup Bar Size #	=	3
		Number of Resisting Legs Per Stirrup =		=	2



Cross Section & Reinforcing Details

Rectangular Section, Width = 100.0 in, Height = 9.0 in
 Span #1 Reinforcing....
 10-#5 at 1.0 in from Bottom, from 0.0 to 7.802 ft in this span

Load for Span Number 1

Uniform Load : D = -0.0150, Lr = -0.020, S = -0.020 ksf, Tributary Width = 8.330 ft, (Design Loads)

Point Load : D = -0.3550, W = -0.3480 k @ 4.802 ft, (Unfactored Risa Reactions)

Point Load : D = -1.917 k @ 7.802 ft, (Brick Cladding)

Uniform Load : D = -0.9063 k/ft, Tributary Width = 1.0 ft, (beam weight)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.624 : 1
Section used for this span		Typical Section
Mu : Applied		67.265 k-ft
Mn * Phi : Allowable		107.784 k-ft
Location of maximum on span		0.000 ft
Span # where maximum occurs		Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.000 in	Ratio =	0	<360.0	Lr Only
Max Upward Transient Deflection	-0.007 in	Ratio =	26634	>=360.0	
Max Downward Total Deflection	0.000 in	Ratio =	0	<180.0	
Max Upward Total Deflection	-0.081 in	Ratio =	2324	>=180.0	Span: 1 : +D+S

Cross Section Strength & Inertia

Top & Bottom references are for tension side of sect

Cross Section Bar Layout Description	Phi*Mn (k-ft)		Moment of Inertia (in ⁴)		
	Bottom	Top	I gross	Icr - Bottom	Icr - Top
Section 1 10- #5 @ d=8",	107.78	0.00	6,075.00	1,300.01	11.33

Project Title: SD05 Mercer Island
 Engineer:
 Project ID: 204606
 Project Descr:

Concrete Beam

LIC# : KW-06012946, Build:20.22.2.15

TRYLON

(c) ENERCALC INC 1983-2022

DESCRIPTION: Slab at Mount Location

Vertical Reactions

Support notation : Far left is #1

Load Combination	Support 1	Support 2
Overall MAXimum	-11.618	
Overall MINimum	-0.348	
D Only	-10.318	
+D+Lr	-11.618	
+D+S	-11.618	
+D+0.750Lr	-11.293	
+D+0.750S	-11.293	
+D+0.60W	-10.527	
+D+0.750Lr+0.450W	-11.449	
+D+0.750S+0.450W	-11.449	
+0.60D+0.60W	-6.399	
+0.60D	-6.191	
Lr Only	-1.300	
S Only	-1.300	
W Only	-0.348	

Maximum Forces & Stresses for Load Combinations

Load Combination Segment	Span #	Location (ft) along Beam	Bending Stress Results (k-ft)		
			Mu : Max	Phi*Mnx	Stress Ratio
MAXimum BENDING Envelope					
Span # 1	1	7.802	67.26	107.78	0.62
+1.40D					
Span # 1	1	7.802	67.26	107.78	0.62
+1.20D+0.50Lr					
Span # 1	1	7.802	60.19	107.78	0.56
+1.20D+0.50S					
Span # 1	1	7.802	60.19	107.78	0.56
+1.20D+1.60Lr					
Span # 1	1	7.802	65.77	107.78	0.61
+1.20D+1.60Lr+0.50W					
Span # 1	1	7.802	66.60	107.78	0.62
+1.20D+1.60S					
Span # 1	1	7.802	65.77	107.78	0.61
+1.20D+1.60S+0.50W					
Span # 1	1	7.802	66.60	107.78	0.62
+1.20D+0.50Lr+W					
Span # 1	1	7.802	61.86	107.78	0.57
+1.20D+0.50S+W					
Span # 1	1	7.802	61.86	107.78	0.57
+1.20D+0.70S					
Span # 1	1	7.802	61.20	107.78	0.57
+0.90D+W					
Span # 1	1	7.802	44.91	107.78	0.42
+0.90D					
Span # 1	1	7.802	43.24	107.78	0.40

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl (in)	Location in Span (ft)	Load Combination	Max. "+" Defl (in)	Location in Span (ft)
	1	0.0000	0.000	+D+S	-0.0805	7.802



Trylon

1825 W. Walnut Hill Lane Suite 120
Irving, TX 75038

ASCE ROOFTOP LOAD CALCULATOR 2.3

PROJECT DATA	
Job Code:	204022
Carrier Site ID:	SD05
Carrier Site Name:	Mercer Island

CODE STANDARDS	
Building Code:	2018 IBC
ASCE Standard:	ASCE 7-16
Design Standard:	LRFD

MOUNT INFO	
Mount Type:	Mount Frames
Mount Centerline:	64.3 ft.
Number of Sectors:	3 --
Mean Roof Height:	59.0 ft.
Mount Sectors:	0

SITE INFORMATION	
Structure Risk Category:	II --
Exposure Category:	B --
Site Class:	Default (Section 11) --
Ground Elevation:	94.12 ft.
Topo Category:	1 --

TOPOGRAPHY	
Topographic Feature:	N/A --
Crest Point Elevation:	N/A ft.
Base Point Elevation:	N/A ft.
Crest to Mid Height (Lh):	N/A ft.
Distance from Crest (x):	N/A ft.
Base Topo Factor (K_{zt}):	1.00 --
Mount Topo Factor (K_{zt}):	1.00 --

WIND AND ICE PARAMETERS		
Design Wind Speed:	98	mph
Design Ice Wind Speed:	30	mph
Design Ice Thickness (t):	1.00	in.
Mount Ice Thickness (t_d):	1.07	in.
Velocity Pressure (q_z):	18.14	psf
Ice Velocity Pressure (q_{zi}):	1.70	psf

WIND FACTORS		
Importance Factor (I_w):	1.00	--
Velocity Coefficient (K_z):	0.87	--
Directionality Factor (K_d):	0.85	--
G*Cr	1.9	--
Ground Elev. Factor (K_e):	1.0	--

WIND STRUCTURE CALCULATIONS		
Flat Member Pressure:	34.5	psf
Round Member Pressure:	34.5	psf
Uplift Flat Member Pressure:	27.2	psf
Uplift Round Member	27.2	psf
Ice Wind Pressure:	3.2	psf

SEISMIC PARAMETERS		
Importance Factor (I_e):	1.000	--
Short Period Accel. (S_s):	1.394	g
1 Second Accel. (S_1):	0.485	g
Short Period Des. (S_{DS}):	1.115	g
1 Second Des. (S_{D1}):	0.587	g
Short Period Coeff. (F_a):	1.2	--
1 Second Coeff. (F_v):	1.8	--
Amplification Factor (a_p):	1	--
Response Mod. Factor (R_p):	2.5	--
Comp. Importance Factor (I_p):	1	--

LOAD COMBINATIONS [LRFD]

#	Description
1	1.4D
2	1.2D + 1.6L + 0.5 Lr
3	1.2D + 1.6L + 0.5S
4	1.2D + 1.6L + 0.2Di + 0.5S
5	1.2D + 1.6Lr + L
6	1.2D + 1.6S + L
7	1.2D + 1.6Lr + 0.5W_0°
8	1.2D + 1.6Lr + 0.5W_30°
9	1.2D + 1.6Lr + 0.5W_60°
10	1.2D + 1.6Lr + 0.5W_90°
11	1.2D + 1.6Lr + 0.5W_120°
12	1.2D + 1.6Lr + 0.5W_150°
13	1.2D + 1.6Lr + 0.5W_180°
14	1.2D + 1.6Lr + 0.5W_210°
15	1.2D + 1.6Lr + 0.5W_240°
16	1.2D + 1.6Lr + 0.5W_270°
17	1.2D + 1.6Lr + 0.5W_300°
18	1.2D + 1.6Lr + 0.5W_330°
19	1.2D + 1.6S + 0.5W_0°
20	1.2D + 1.6S + 0.5W_30°
21	1.2D + 1.6S + 0.5W_60°
22	1.2D + 1.6S + 0.5W_90°
23	1.2D + 1.6S + 0.5W_120°
24	1.2D + 1.6S + 0.5W_150°
25	1.2D + 1.6S + 0.5W_180°
26	1.2D + 1.6S + 0.5W_210°
27	1.2D + 1.6S + 0.5W_240°
28	1.2D + 1.6S + 0.5W_270°
29	1.2D + 1.6S + 0.5W_300°
30	1.2D + 1.6S + 0.5W_330°
31	1.2D + L + 0.5Lr + W_0°
32	1.2D + L + 0.5Lr + W_30°
33	1.2D + L + 0.5Lr + W_60°
34	1.2D + L + 0.5Lr + W_90°
35	1.2D + L + 0.5Lr + W_120°
36	1.2D + L + 0.5Lr + W_150°
37	1.2D + L + 0.5Lr + W_180°
38	1.2D + L + 0.5Lr + W_210°
39	1.2D + L + 0.5Lr + W_240°
40	1.2D + L + 0.5Lr + W_270°
41	1.2D + L + 0.5Lr + W_300°
42	1.2D + L + 0.5Lr + W_330°
43	1.2D + L + 0.5S + W_0°

#	Description
44	1.2D + L + 0.5S + W_30°
45	1.2D + L + 0.5S + W_60°
46	1.2D + L + 0.5S + W_90°
47	1.2D + L + 0.5S + W_120°
48	1.2D + L + 0.5S + W_150°
49	1.2D + L + 0.5S + W_180°
50	1.2D + L + 0.5S + W_210°
51	1.2D + L + 0.5S + W_240°
52	1.2D + L + 0.5S + W_270°
53	1.2D + L + 0.5S + W_300°
54	1.2D + L + 0.5S + W_330°
55	0.9D + W_0°
56	0.9D + W_30°
57	0.9D + W_60°
58	0.9D + W_90°
59	0.9D + W_120°
60	0.9D + W_150°
61	0.9D + W_180°
62	0.9D + W_210°
63	0.9D + W_240°
64	0.9D + W_270°
65	0.9D + W_300°
66	0.9D + W_330°
67	1.2D + Di
68	1.2D + L + 0.5S + Di + Wi_0°
69	1.2D + L + 0.5S + Di + Wi_30°
70	1.2D + L + 0.5S + Di + Wi_60°
71	1.2D + L + 0.5S + Di + Wi_90°
72	1.2D + L + 0.5S + Di + Wi_120°
73	1.2D + L + 0.5S + Di + Wi_150°
74	1.2D + L + 0.5S + Di + Wi_180°
75	1.2D + L + 0.5S + Di + Wi_210°
76	1.2D + L + 0.5S + Di + Wi_240°
77	1.2D + L + 0.5S + Di + Wi_270°
78	1.2D + L + 0.5S + Di + Wi_300°
79	1.2D + L + 0.5S + Di + Wi_330°
80	0.9D + Di + Wi_0°
81	0.9D + Di + Wi_30°
82	0.9D + Di + Wi_60°
83	0.9D + Di + Wi_90°
84	0.9D + Di + Wi_120°
85	0.9D + Di + Wi_150°
86	0.9D + Di + Wi_180°

LOAD COMBINATIONS [LRFD] cont..

#	Description
87	$0.9D + Di + Wi_{210^\circ}$
88	$0.9D + Di + Wi_{240^\circ}$
89	$0.9D + Di + Wi_{270^\circ}$
90	$0.9D + Di + Wi_{300^\circ}$
91	$0.9D + Di + Wi_{330^\circ}$
92	$(1.2 + 0.2Sds)D + L + 0.2S + E_{0^\circ}$
93	$(1.2 + 0.2Sds)D + L + 0.2S + E_{30^\circ}$
94	$(1.2 + 0.2Sds)D + L + 0.2S + E_{60^\circ}$
95	$(1.2 + 0.2Sds)D + L + 0.2S + E_{90^\circ}$
96	$(1.2 + 0.2Sds)D + L + 0.2S + E_{120^\circ}$
97	$(1.2 + 0.2Sds)D + L + 0.2S + E_{150^\circ}$
98	$(1.2 + 0.2Sds)D + L + 0.2S + E_{180^\circ}$
99	$(1.2 + 0.2Sds)D + L + 0.2S + E_{210^\circ}$
100	$(1.2 + 0.2Sds)D + L + 0.2S + E_{240^\circ}$
101	$(1.2 + 0.2Sds)D + L + 0.2S + E_{270^\circ}$
102	$(1.2 + 0.2Sds)D + L + 0.2S + E_{300^\circ}$
103	$(1.2 + 0.2Sds)D + L + 0.2S + E_{330^\circ}$
104	$(0.9 - 0.2Sds)D + E_{0^\circ}$
105	$(0.9 - 0.2Sds)D + E_{30^\circ}$
106	$(0.9 - 0.2Sds)D + E_{60^\circ}$
107	$(0.9 - 0.2Sds)D + E_{90^\circ}$
108	$(0.9 - 0.2Sds)D + E_{120^\circ}$
109	$(0.9 - 0.2Sds)D + E_{150^\circ}$
110	$(0.9 - 0.2Sds)D + E_{180^\circ}$
111	$(0.9 - 0.2Sds)D + E_{210^\circ}$
112	$(0.9 - 0.2Sds)D + E_{240^\circ}$
113	$(0.9 - 0.2Sds)D + E_{270^\circ}$
114	$(0.9 - 0.2Sds)D + E_{300^\circ}$
115	$(0.9 - 0.2Sds)D + E_{330^\circ}$

EQUIPMENT LOADING

<i>Appurtenance</i>	<i>QTY</i>	<i>Sector / Location</i>	<i>Elevation [ft]</i>	<i>Azimuth [deg]</i>	<i>--</i>	<i>A_f Front [ft²]</i>	<i>A_f Side [ft²]</i>	<i>G*Cr [F/S]</i>	<i>Weight [lbs]</i>
AEQK	1	Alpha	67.75	0	No Ice	3.63	1.94	1.90 / 1.90	99.21
--	--	MP1	--	--	w/ Ice	4.37	2.55	1.90 / 1.90	175.56
NNH4-65B-R6	1	Alpha	66.25	0	No Ice	9.80	3.90	1.90 / 1.90	96.60
--	--	MP3	--	--	w/ Ice	11.20	5.12	1.90 / 1.90	259.45
A-UBTMLBMLBHH/6516/16/2	1	Alpha	66.25	0	No Ice	13.68	3.87	1.90 / 1.90	85.00
--	--	MP4	--	--	w/ Ice	15.19	5.10	1.90 / 1.90	291.46
RRH4X25-WCS	1	Alpha	66.25	0	No Ice	3.18	2.72	1.90 / 1.90	91.00
--	--	R1	--	--	w/ Ice	3.93	3.44	1.90 / 1.90	169.59
AHCA	1	Alpha	66.25	0	No Ice	1.07	0.60	1.90 / 1.90	35.27
--	--	R2	--	--	w/ Ice	1.47	0.93	1.90 / 1.90	62.24
AHLBA	1	Alpha	66.25	0	No Ice	3.06	1.88	1.90 / 1.90	101.40
--	--	R3	--	--	w/ Ice	3.75	2.48	1.90 / 1.90	169.23
AHFIB	1	Alpha	66.25	0	No Ice	2.37	1.20	1.90 / 1.90	65.00
--	--	R4	--	--	w/ Ice	2.99	1.72	1.90 / 1.90	113.74
DC6-48-60-18-8C-EV	1	Alpha	66.25	0	No Ice	2.23	2.23	1.90 / 1.90	26.20
--	--	R5	--	--	w/ Ice	2.88	2.88	1.90 / 1.90	86.23
DC2-48-60-0-9E	2	Alpha	66.25	0	No Ice	0.77	0.47	1.90 / 1.90	16.00
--	--	R6	--	--	w/ Ice	1.12	0.76	1.90 / 1.90	37.40

EQUIPMENT WIND CALCULATIONS

<i>Appurtenance</i>	<i>QTY</i>	<i>Sector</i>	<i>Elevation [ft]</i>	<i>K_{zt}</i>	<i>K_z</i>	<i>K_d</i>	<i>t_d</i>	<i>q_z [psf]</i>	<i>q_{zi} [psf]</i>
AEQK	1	Alpha	67.8	1.00	0.88	0.85	1.07	18.42	1.73
NNH4-65B-R6	1	Alpha	66.3	1.00	0.88	0.85	1.07	18.30	1.71
A-UBTMLBMLBHH/6516/16/2	1	Alpha	66.3	1.00	0.88	0.85	1.07	18.30	1.71
RRH4X25-WCS	1	Alpha	66.3	1.00	0.88	0.85	1.07	18.30	1.71
AHCA	1	Alpha	66.3	1.00	0.88	0.85	1.07	18.30	1.71
AHLBA	1	Alpha	66.3	1.00	0.88	0.85	1.07	18.30	1.71
AHFIB	1	Alpha	66.3	1.00	0.88	0.85	1.07	18.30	1.71
DC6-48-60-18-8C-EV	1	Alpha	66.3	1.00	0.88	0.85	1.07	18.30	1.71
DC2-48-60-0-9E	2	Alpha	66.3	1.00	0.88	0.85	1.07	18.30	1.71

EQUIPMENT LATERAL WIND FORCE CALCULATIONS NO ICE [lbs]

<i>Appurtenance</i>	<i>QTY</i>	<i>Sector</i>	<i>Azimuth [deg]</i>	<i>0°</i>	<i>30°</i>	<i>60°</i>	<i>90°</i>	<i>120°</i>	<i>150°</i>
				<i>180°</i>	<i>210°</i>	<i>240°</i>	<i>270°</i>	<i>300°</i>	<i>330°</i>
AEQK	1	Alpha	0.0	127.14	112.31	82.64	67.81	82.64	112.31
NNH4-65B-R6	1	Alpha	0.0	340.71	289.43	186.87	135.59	186.87	289.43
A-UBTMLBMLBHH/6516/16/2	1	Alpha	0.0	475.44	390.23	219.81	134.59	219.81	390.23
RRH4X25-WCS	1	Alpha	0.0	110.58	106.61	98.65	94.67	98.65	106.61
AHCA	1	Alpha	0.0	37.25	33.15	24.97	20.87	24.97	33.15
AHLBA	1	Alpha	0.0	106.36	96.14	75.70	65.48	75.70	96.14
AHFIB	1	Alpha	0.0	82.56	72.34	51.91	41.70	51.91	72.34
DC6-48-60-18-8C-EV	1	Alpha	0.0	77.63	77.63	77.63	77.63	77.63	77.63
DC2-48-60-0-9E	2	Alpha	0.0	53.88	48.57	37.96	32.65	37.96	48.57

**N/A" defines corresponding equipment to be fully shielded from wind.

EQUIPMENT LATERAL WIND FORCE CALCULATIONS W/ ICE [lbs]

<i>Appurtenance</i>	<i>QTY</i>	<i>Sector</i>	<i>Azimuth [deg]</i>	<i>0° 180°</i>	<i>30° 210°</i>	<i>60° 240°</i>	<i>90° 270°</i>	<i>120° 300°</i>	<i>150° 330°</i>
AEQK	1	Alpha	0.0	14.33	12.84	9.86	8.37	9.86	12.84
NNH4-65B-R6	1	Alpha	0.0	36.48	31.53	21.63	16.68	21.63	31.53
A-UBTMLBMLBHH/6516/16/2	1	Alpha	0.0	49.49	41.27	24.82	16.60	24.82	41.27
RRH4X25-WCS	1	Alpha	0.0	12.79	12.39	11.60	11.21	11.60	12.39
AHCA	1	Alpha	0.0	4.80	4.36	3.47	3.02	3.47	4.36
AHLBA	1	Alpha	0.0	12.21	11.18	9.12	8.09	9.12	11.18
AHFIB	1	Alpha	0.0	9.75	8.72	6.65	5.62	6.65	8.72
DC6-48-60-18-8C-EV	1	Alpha	0.0	9.40	9.40	9.40	9.40	9.40	9.40
DC2-48-60-0-9E	2	Alpha	0.0	7.31	6.71	5.52	4.92	5.52	6.71

**N/A" defines corresponding equipment to be fully shielded from wind.

EQUIPMENT WIND UPLIFT FORCE CALCULATIONS NO ICE [lbs]

<i>Appurtenance</i>	<i>QTY</i>	<i>Sector</i>	<i>Azimuth [deg]</i>	<i>--</i>	<i>Ar [ft²]</i>	<i>---</i>	<i>G*C_r</i>	<i>----</i>	<i>F_v [lbs]</i>
AEQK	1	Alpha	0.0	--	1.16	--	1.50	--	32.12
NNH4-65B-R6	1	Alpha	0.0	--	1.06	--	1.50	--	29.14
A-UBTMLBMLBHH/6516/16/2	1	Alpha	0.0	--	1.45	--	1.50	--	39.92
RRH4X25-WCS	1	Alpha	0.0	--	1.04	--	1.50	--	28.43
AHCA	1	Alpha	0.0	--	0.52	--	1.50	--	14.37
AHLBA	1	Alpha	0.0	--	1.01	--	1.50	--	27.65
AHFIB	1	Alpha	0.0	--	0.58	--	1.50	--	15.94
DC6-48-60-18-8C-EV	1	Alpha	0.0	--	0.73	--	1.50	--	19.99
DC2-48-60-0-9E	2	Alpha	0.0	--	0.45	--	1.50	--	12.44

**N/A" defines corresponding equipment to be fully shielded from wind.

EQUIPMENT SEISMIC FORCE CALCULATIONS

<i>Appurtenance</i>	<i>QTY</i>	<i>Sector</i>	<i>Elevation [ft]</i>	<i>Weight [lbs]</i>	<i>z/h</i>	<i>F_p Calc [lbs]</i>	<i>F_{pmin} [lbs]</i>	<i>F_{pmax} [lbs]</i>	<i>F_p [lbs]</i>
AEQK	1	Alpha	67.8	99.21	1.00	53.11	33.19	177.02	53.11
NNH4-65B-R6	1	Alpha	66.3	96.60	1.00	51.71	32.32	172.37	51.71
A-UBTMLBMLBHH/6516/16/2	1	Alpha	66.3	85.00	1.00	45.50	28.44	151.67	45.50
RRH4X25-WCS	1	Alpha	66.3	91.00	1.00	48.71	30.44	162.37	48.71
AHCA	1	Alpha	66.3	35.27	1.00	18.88	11.80	62.93	18.88
AHLBA	1	Alpha	66.3	101.40	1.00	54.28	33.92	180.93	54.28
AHFIB	1	Alpha	66.3	65.00	1.00	34.79	21.75	115.98	34.79
DC6-48-60-18-8C-EV	1	Alpha	66.3	26.20	1.00	14.02	8.77	46.75	14.02
DC2-48-60-0-9E	2	Alpha	66.3	16.00	1.00	8.56	5.35	28.55	8.56

BOLT TOOL 1.5.2

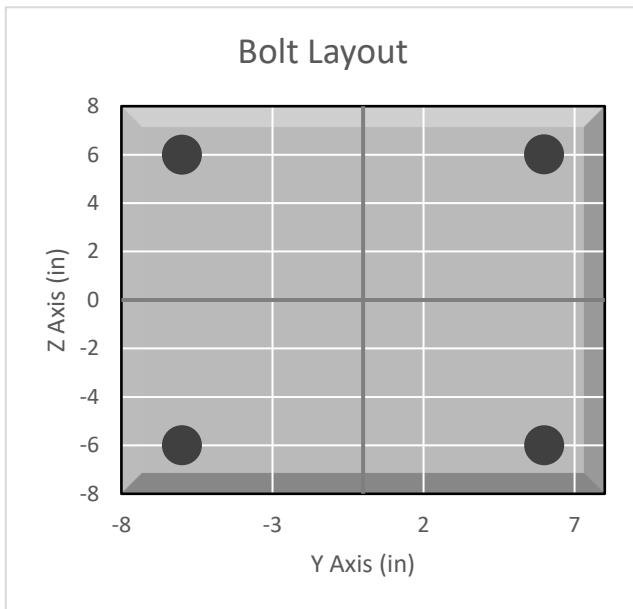
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Carrier Site ID:	SD05
Carrier Site Name:	Mercer Island

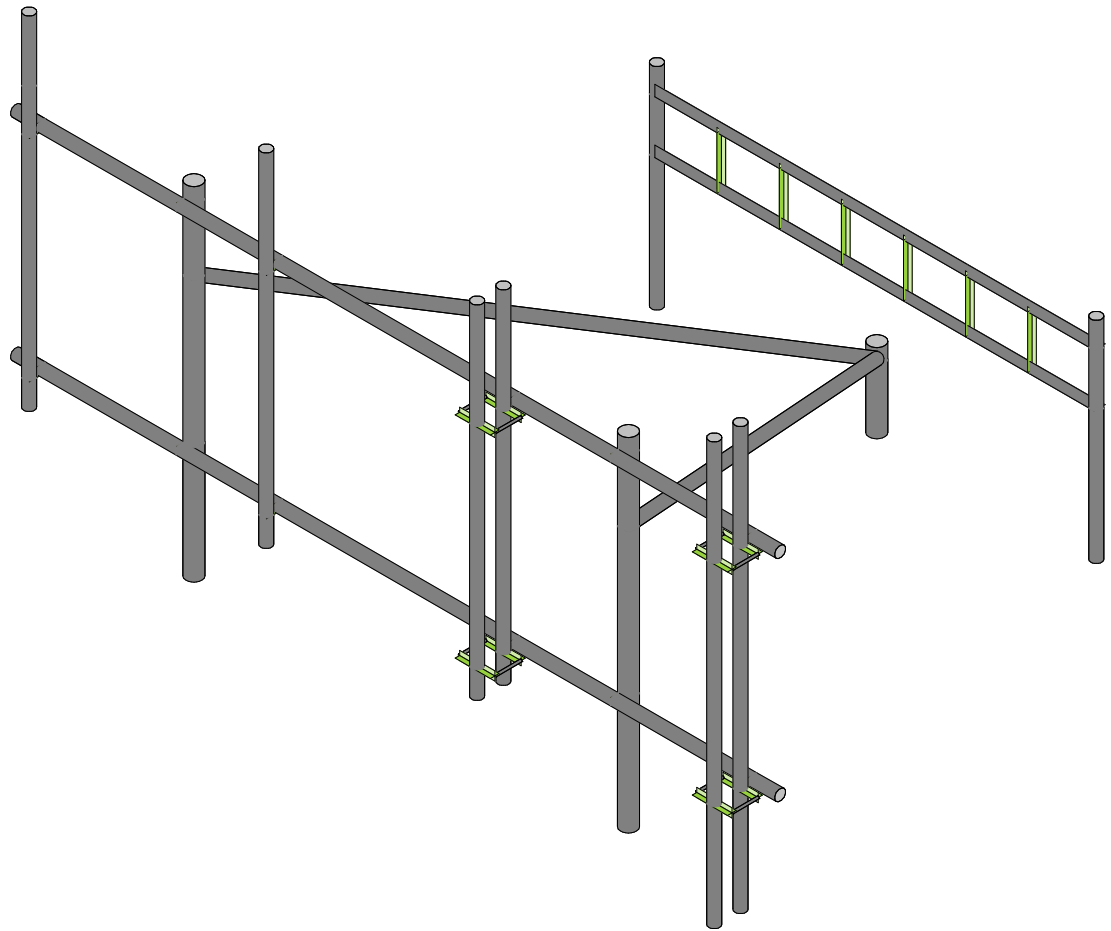
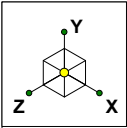
Code	
Design Standard:	AISC
Slip Check:	No
Pretension Standard:	AISC

Bolt Properties		
Connection Type:	Bolt	
Diameter:	0.625	in
Grade:	A325	--
Yield Strength (Fy):	92	ksi
Ultimate Strength (Fu):	120	ksi
Number of Bolts:	4	--
Threads Included:	Yes	--
Double Shear:	No	--
Connection Pipe Size:	-	in

Connection Description
Mount Post to Roof

Bolt Check		
Tensile Capacity (ϕT_n):	20708.7	lbs
Shear Capacity (ϕV_n):	12425.2	lbs
Tension Force (T_u):	1173.6	lbs
Shear Force (V_u):	418.9	lbs
Tension Usage:	5.7%	--
Shear Usage:	3.4%	--
Interaction:	5.7%	Pass
Controlling Member:	M5	--
Controlling LC:	37	--



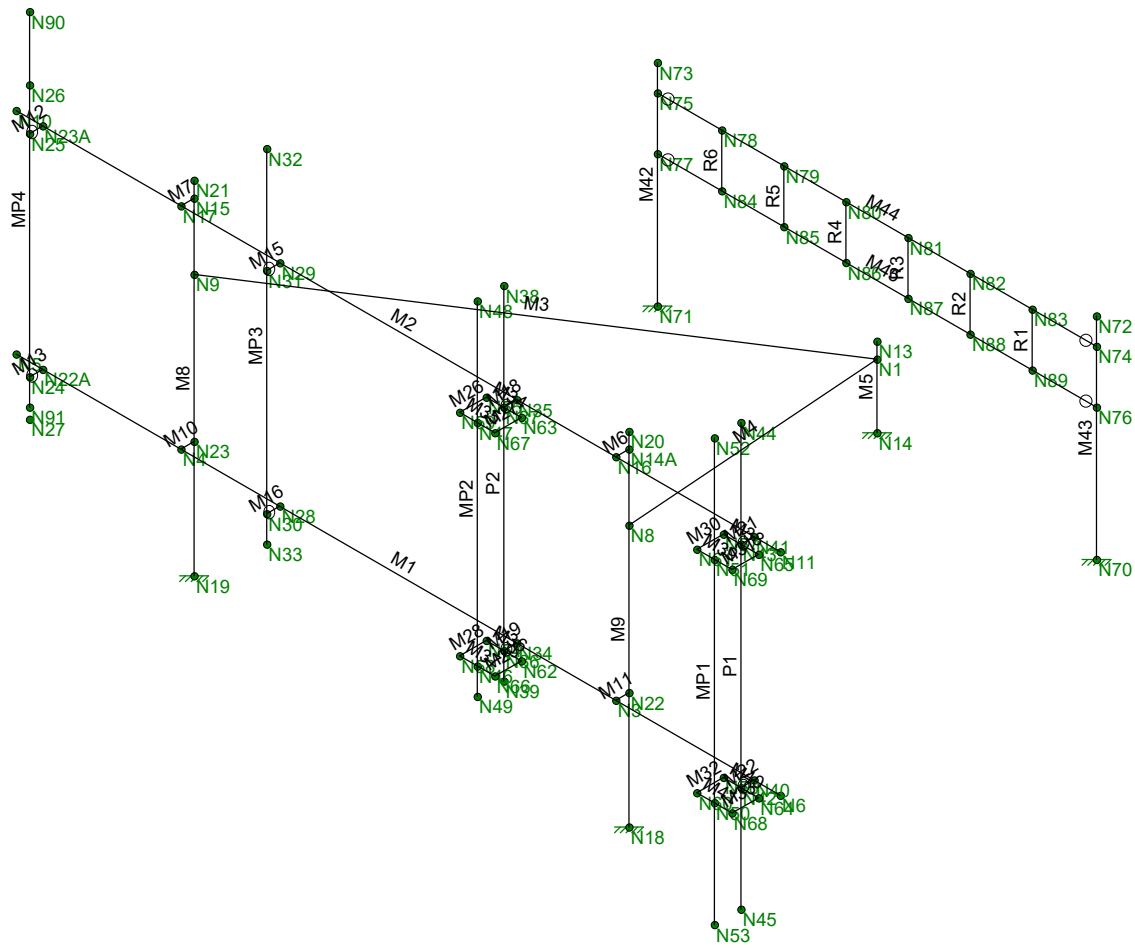
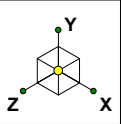


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Trylon
JMP
201048

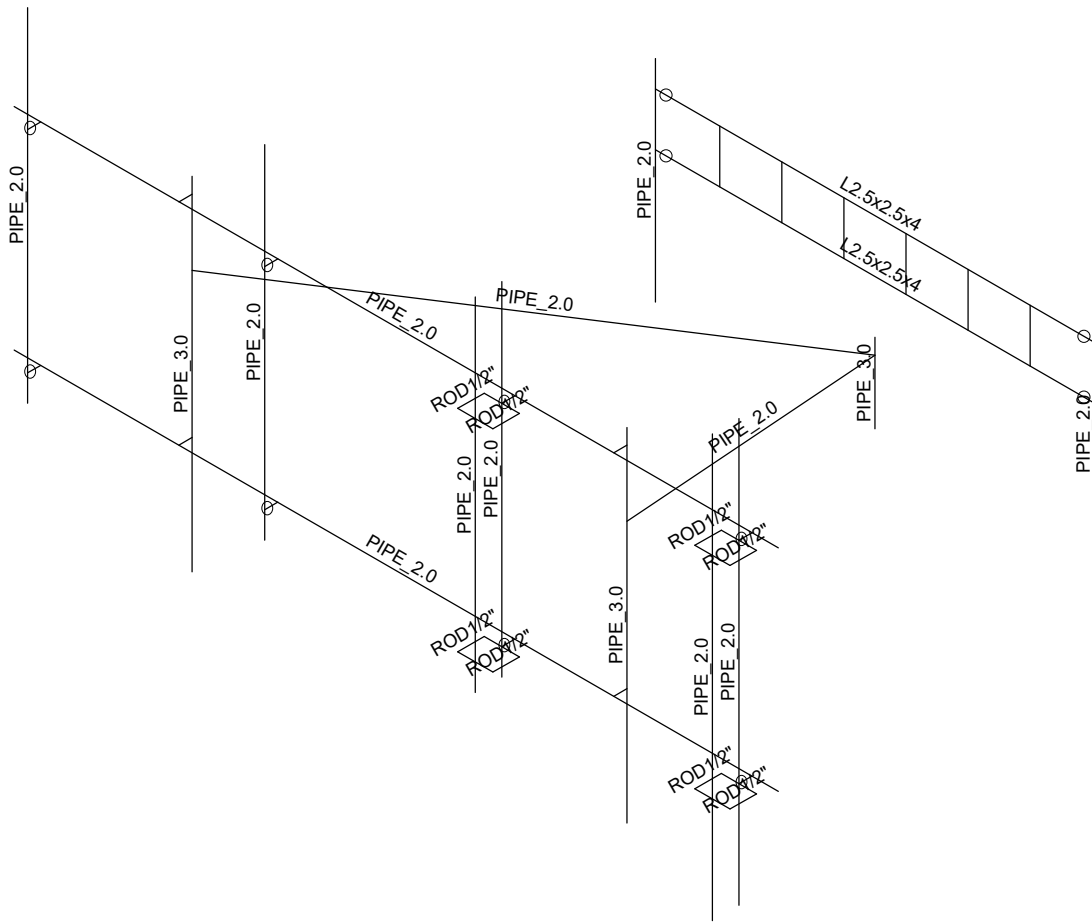
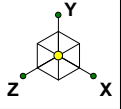
SD05 Mercer Island

Render
Mar 16, 2022 at 5:33 PM
SD05_mount.r3d



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Trylon	SD05 Mercer Island	Wireframe
JMP		Mar 16, 2022 at 5:31 PM
201048		SD05_mount.r3d

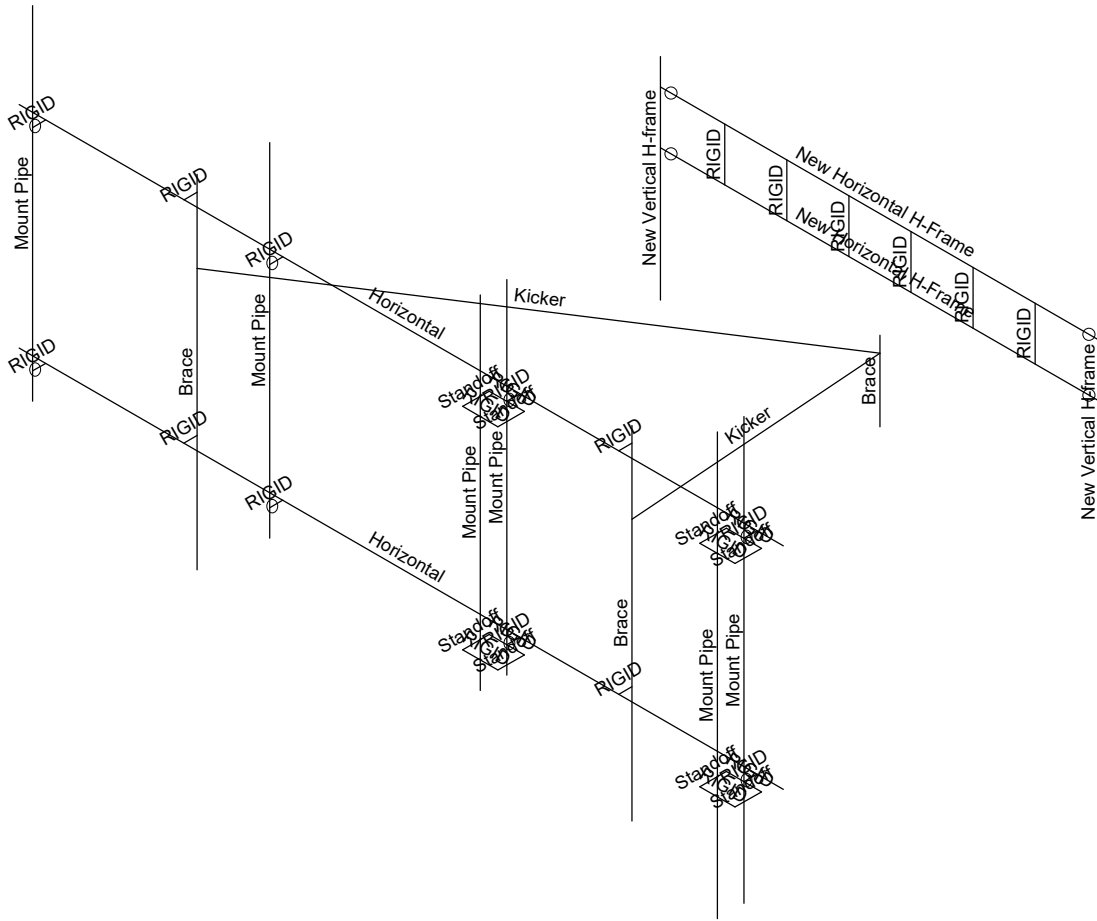
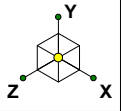


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JMP
201048

SD05 Mercer Island

Shape
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SD05_mount.r3d

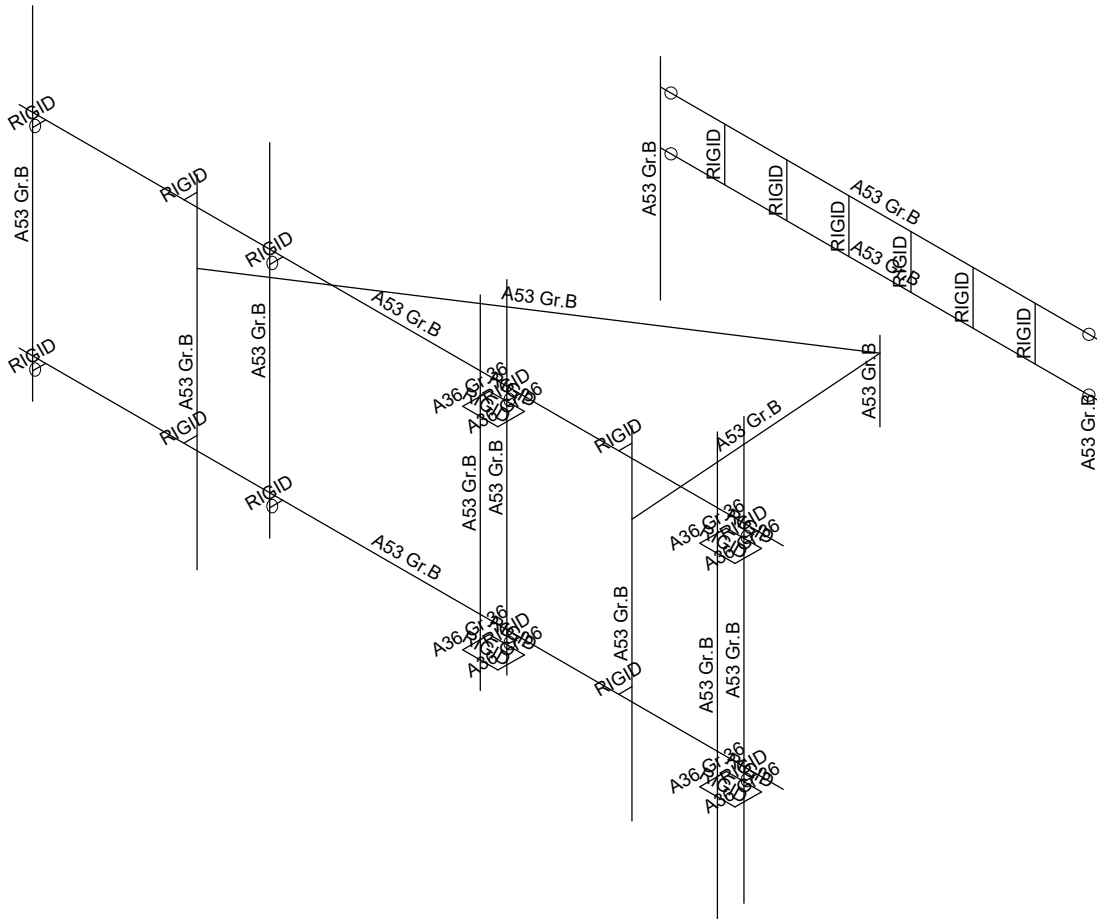
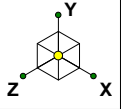


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201048

SD05 Mercer Island

Section Sets
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SD05_mount.r3d

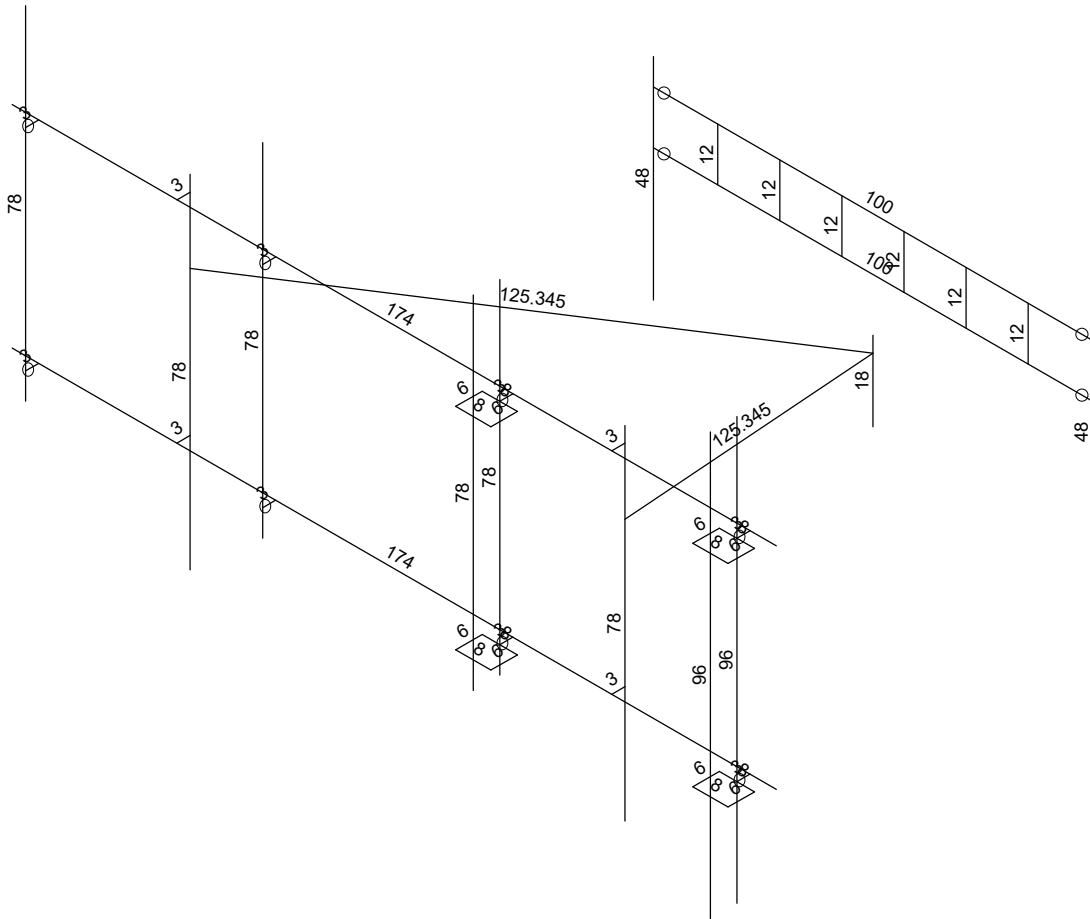
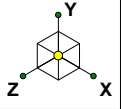


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SD05 Mercer Island

Grade
Mar 16, 2022 at 5:34 PM
SD05_mount.r3d



Member Length (in) Displayed
Envelope Only Solution

Trylon

JMP

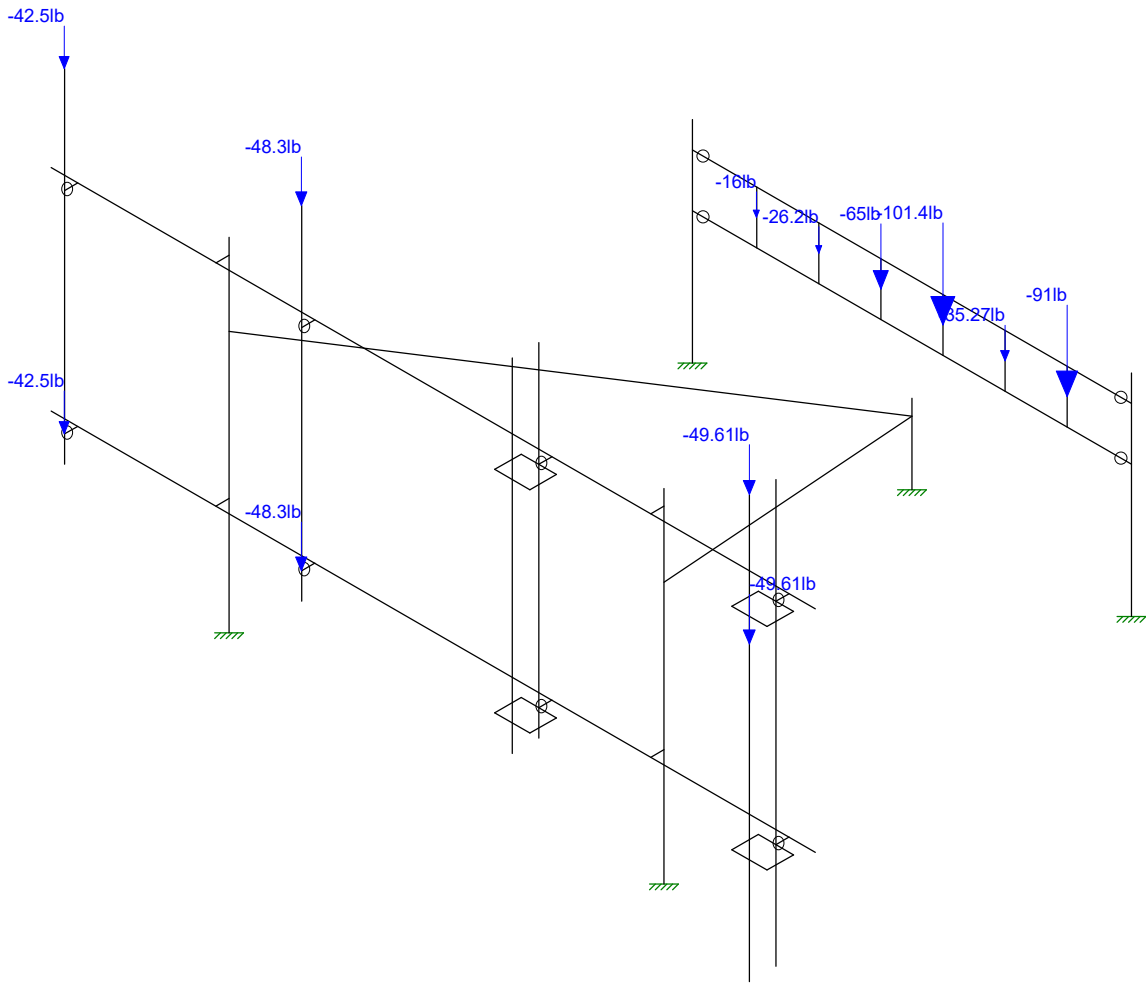
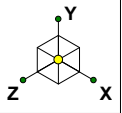
201048

SD05 Mercer Island

Lengths

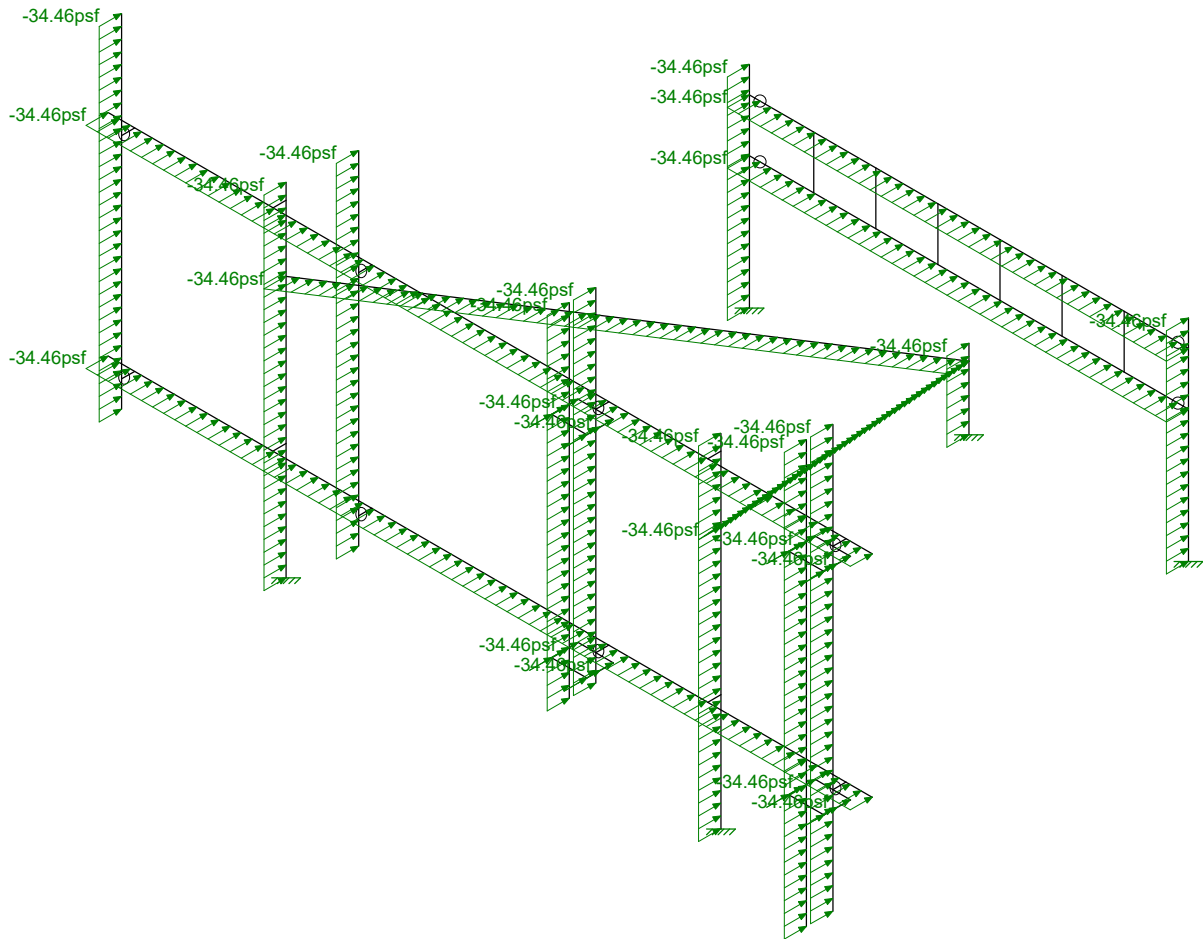
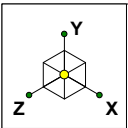
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SD05_mount.r3d



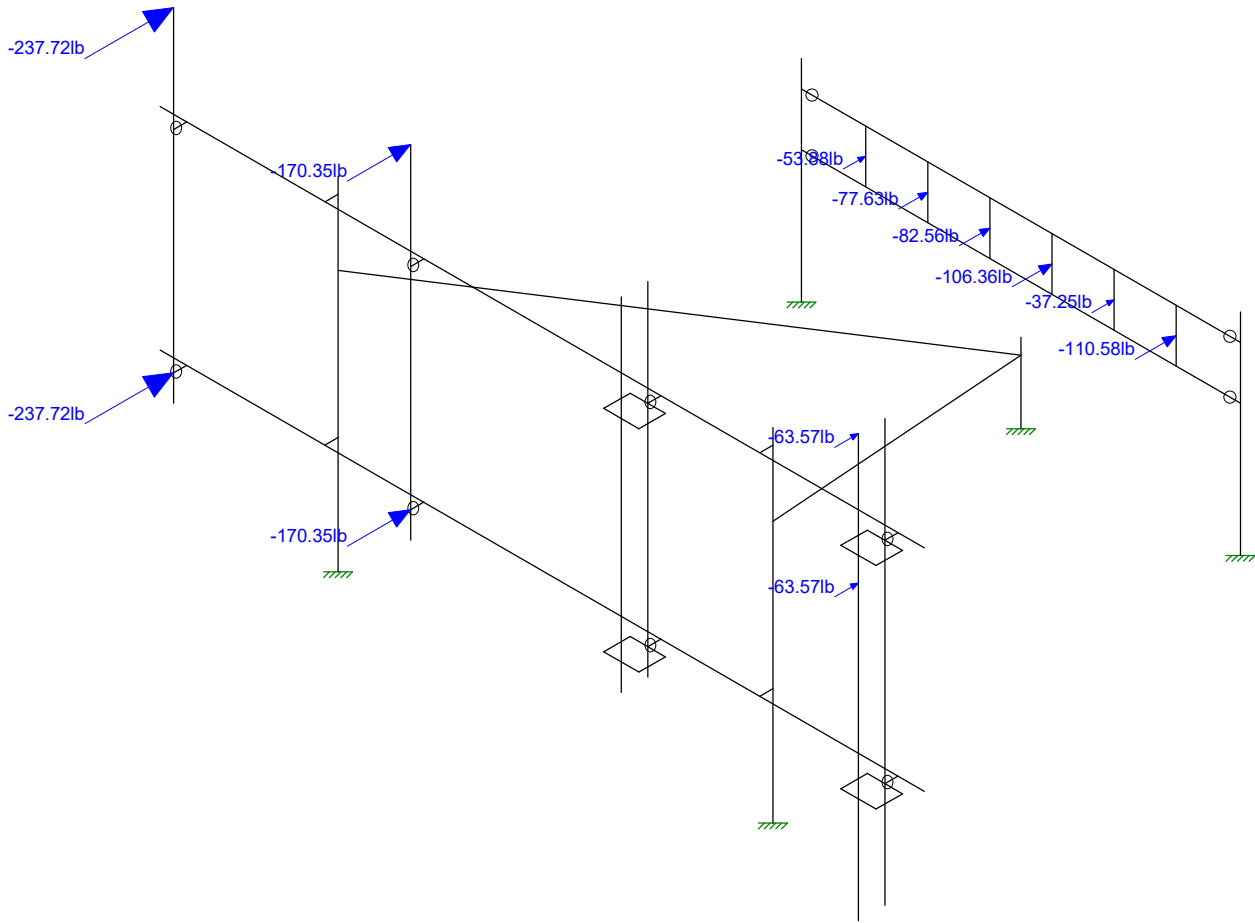
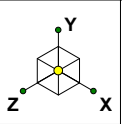
Loads: BLC 1, Dead Load
Envelope Only Solution

Trylon	SD05 Mercer Island	Self Weight
JMP		Mar 16, 2022 at 5:34 PM
201048		SD05_mount.r3d



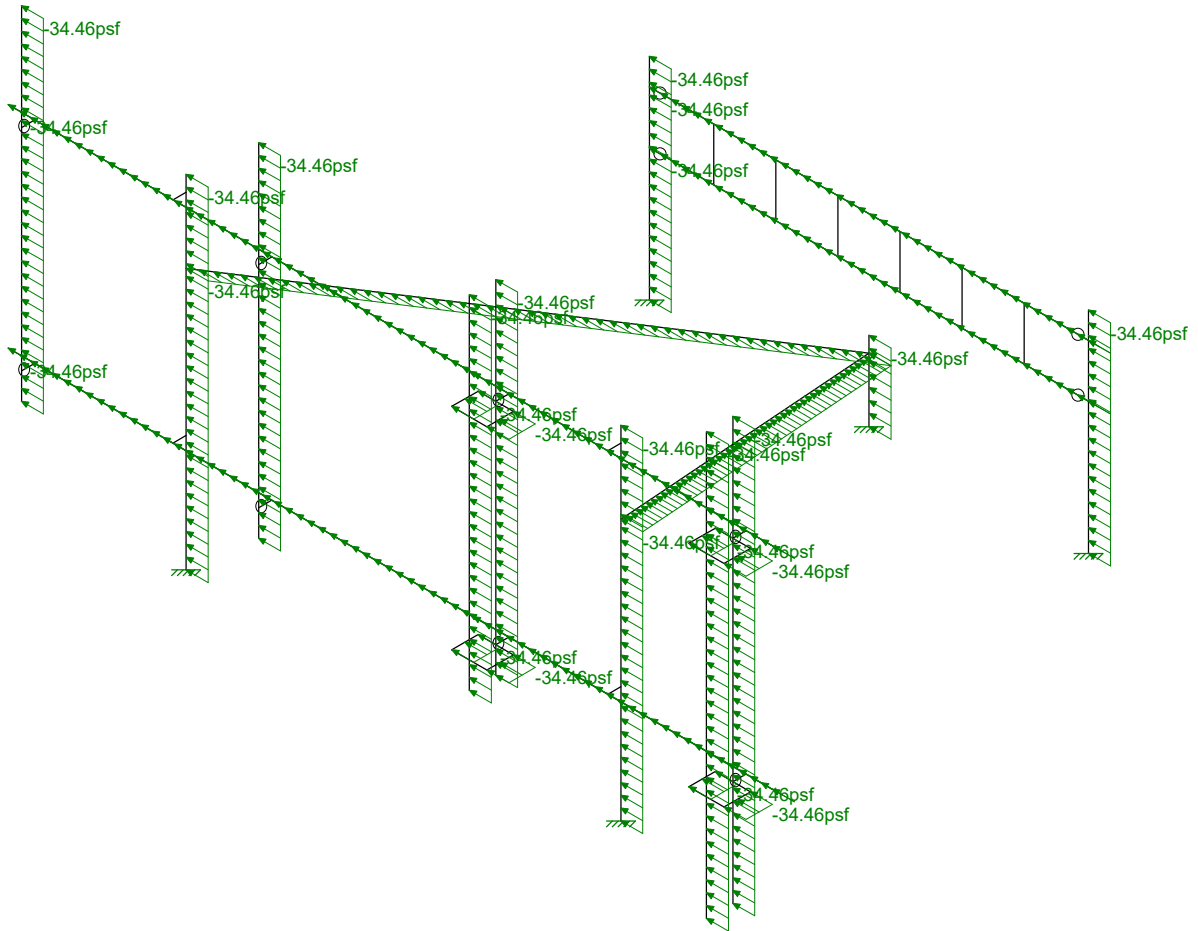
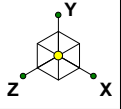
Loads: BLC 6, Structure Wind Z-Direction
Envelope Only Solution

Trylon	SD05 Mercer Island	Wind Loading Z
JMP		Mar 16, 2022 at 5:35 PM
201048		SD05_mount.r3d



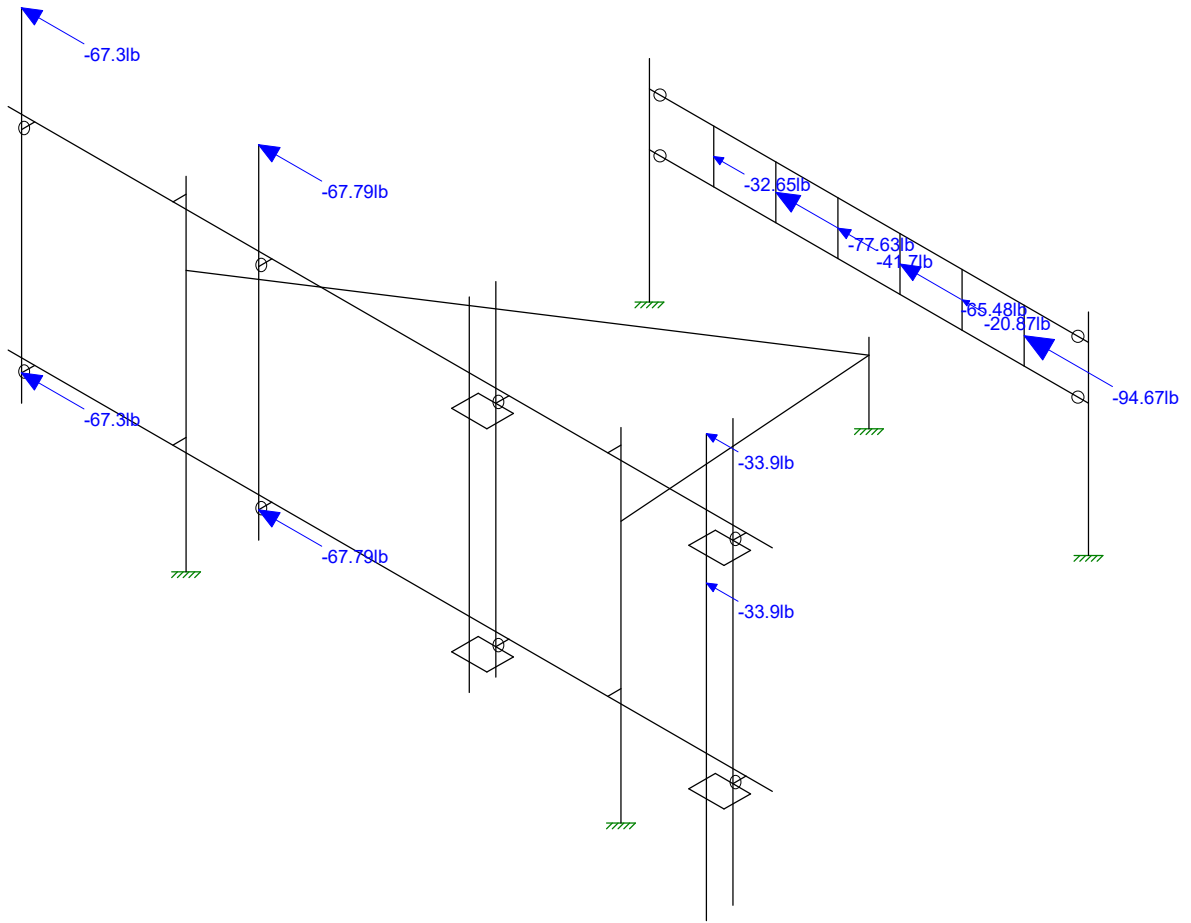
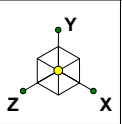
Loads: BLC 11, Wind 0°
Envelope Only Solution

Trylon	SD05 Mercer Island	Wind Loading Z
JMP		Mar 16, 2022 at 5:35 PM
201048		SD05_mount.r3d



Loads: BLC 7, Structure Wind X-Direction
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Trylon	SD05 Mercer Island	Wind Loading X
JMP		Mar 16, 2022 at 5:35 PM
201048		SD05_mount.r3d



Loads: BLC 14, Wind 90°
Envelope Only Solution

Trylon

JMP

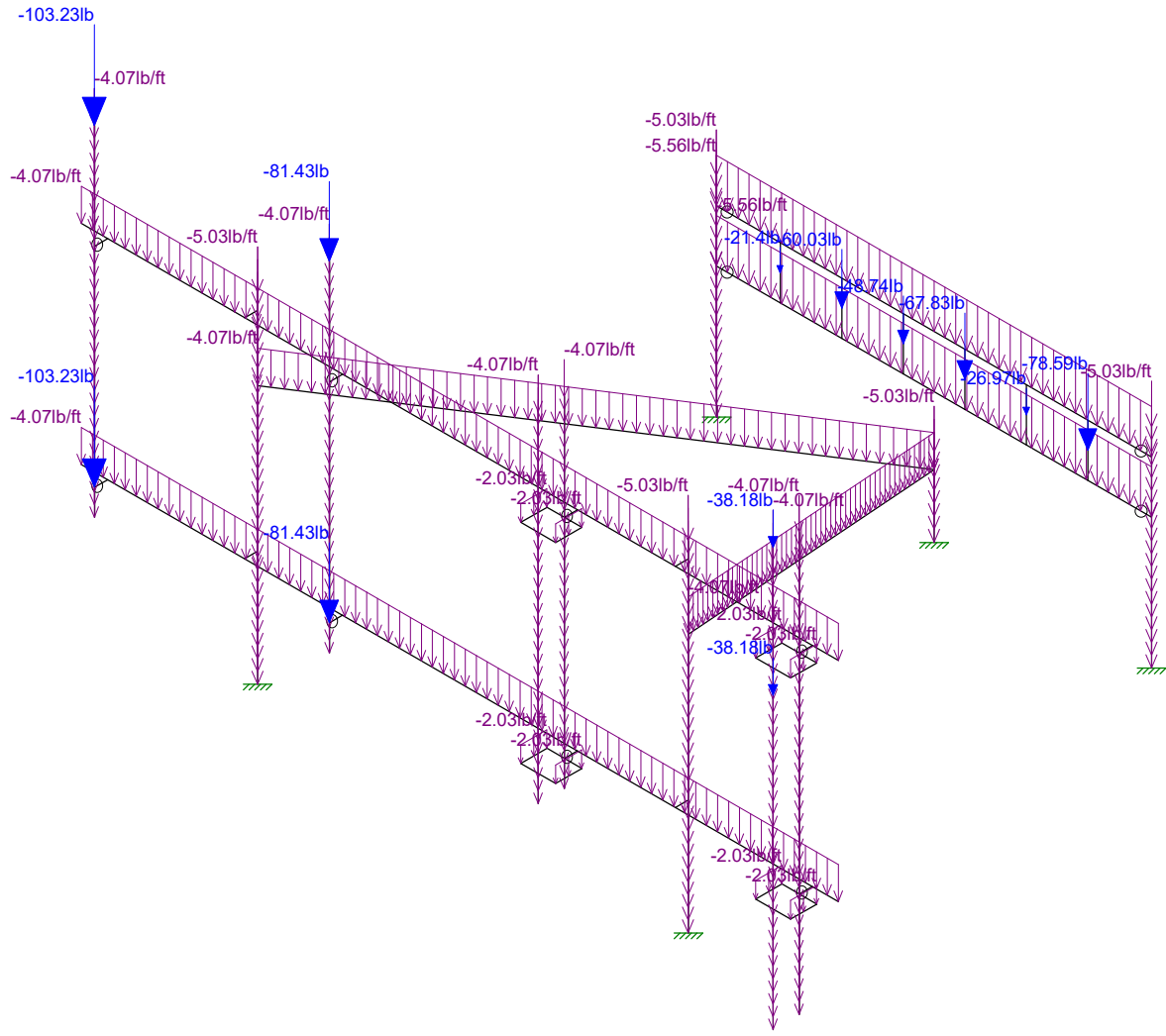
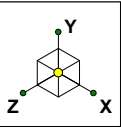
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SD05 Mercer Island

Wind Loading X

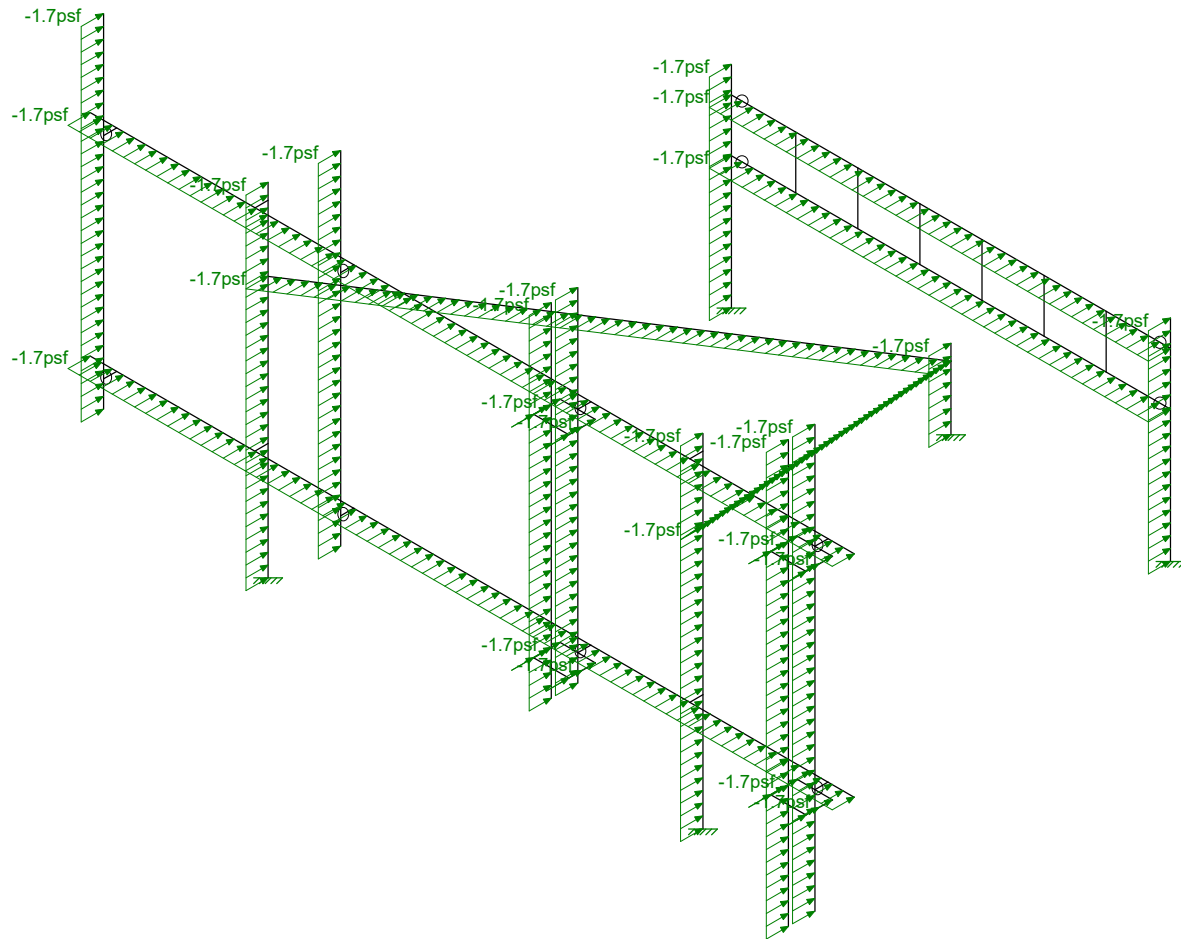
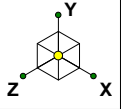
Mar 16, 2022 at 5:35 PM

SD05_mount.r3d



Loads: BLC 5, Ice Dead Load
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Trylon	SD05 Mercer Island	Ice Loading
JMP		Mar 16, 2022 at 5:35 PM
201048		SD05_mount.r3d



Loads: BLC 9, Structure Ice Wind Z-Direction
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Trylon

JMP

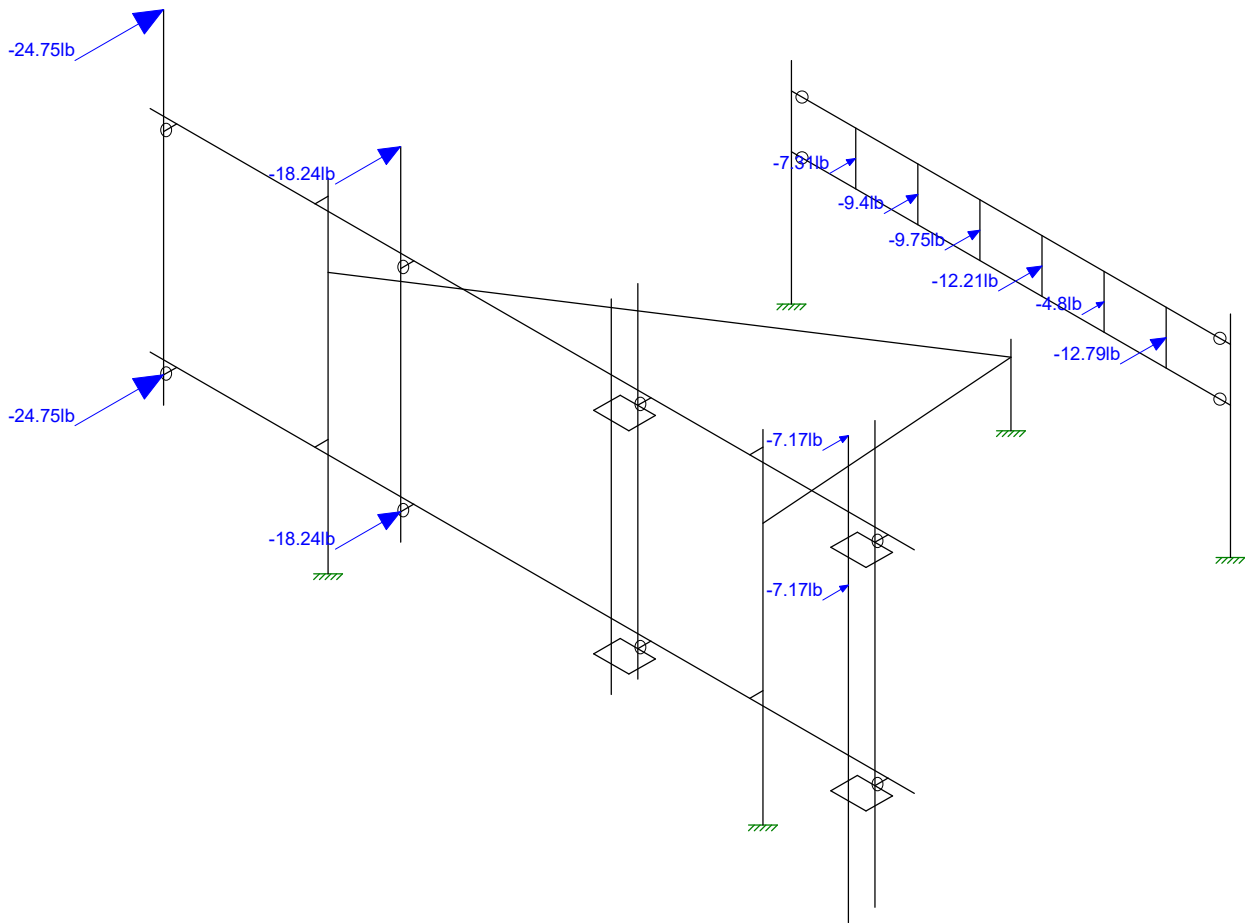
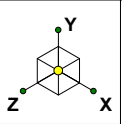
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SD05 Mercer Island

Ice Wind Loading Z

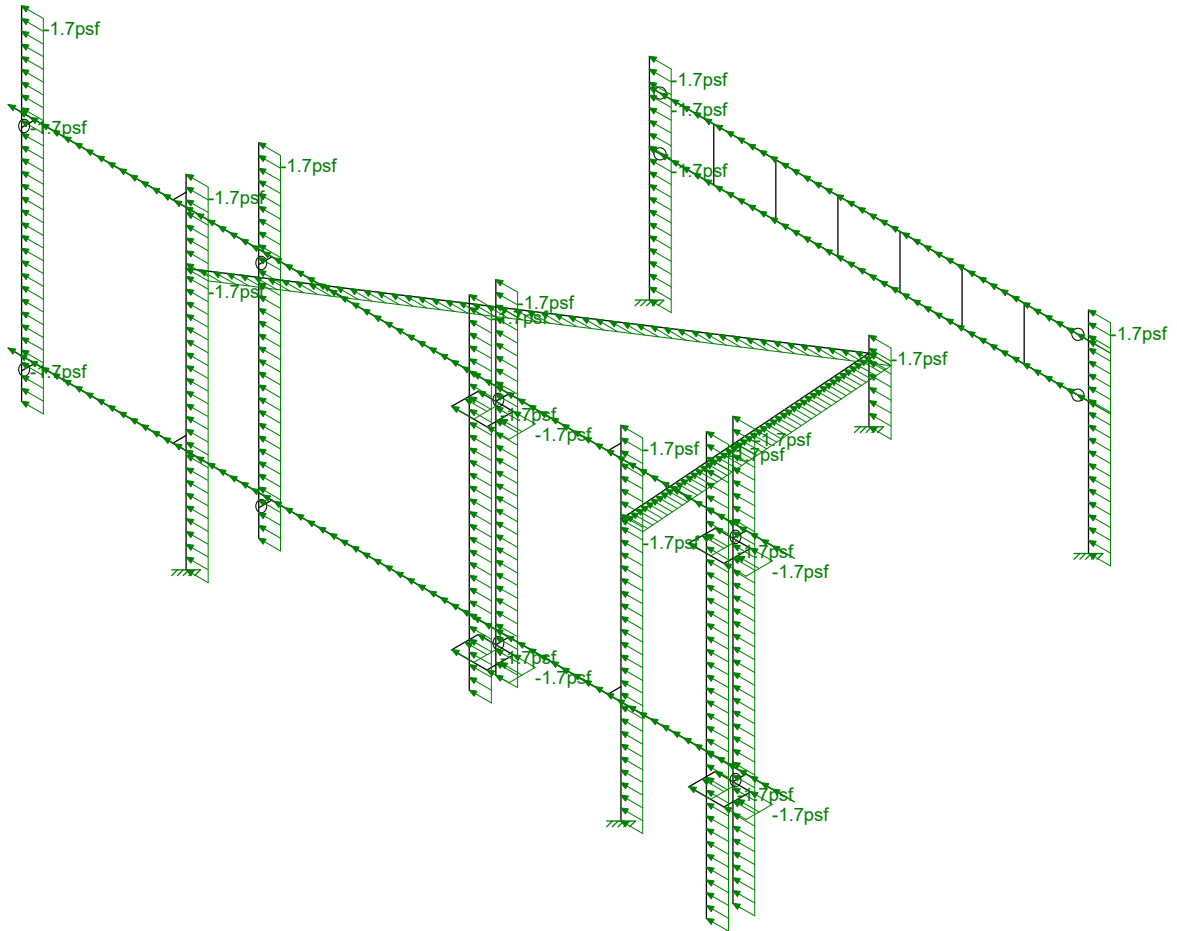
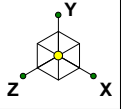
Mar 16, 2022 at 5:36 PM

SD05_mount.r3d



Loads: BLC 17, Wind 0° with ice
Envelope Only Solution

Trylon	SD05 Mercer Island	Ice Wind Loading Z
JMP		Mar 16, 2022 at 5:36 PM
201048		SD05_mount.r3d



Loads: BLC 10, Structure Ice Wind X-Direction
Envelope Only Solution

Trylon

JMP

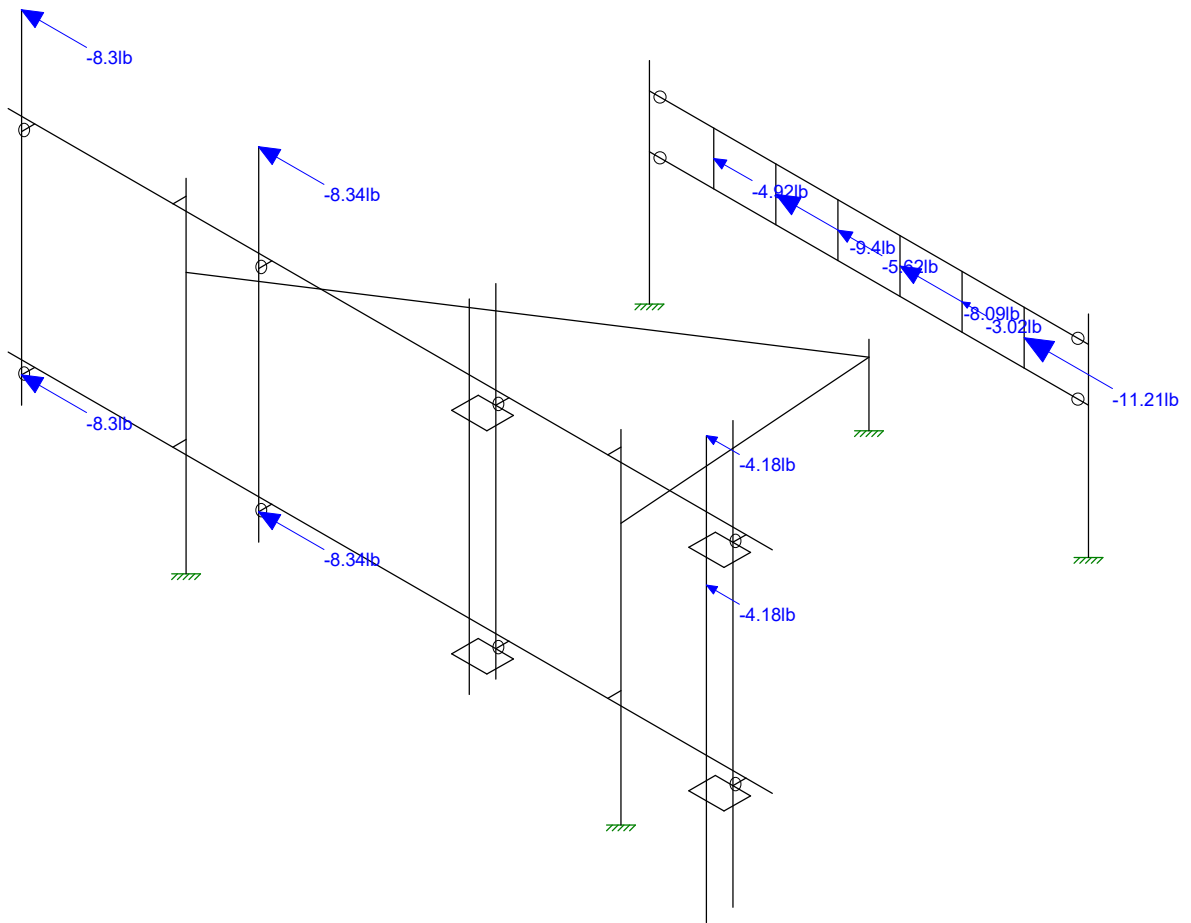
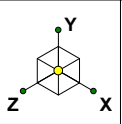
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SD05 Mercer Island

Ice Wind Loading X

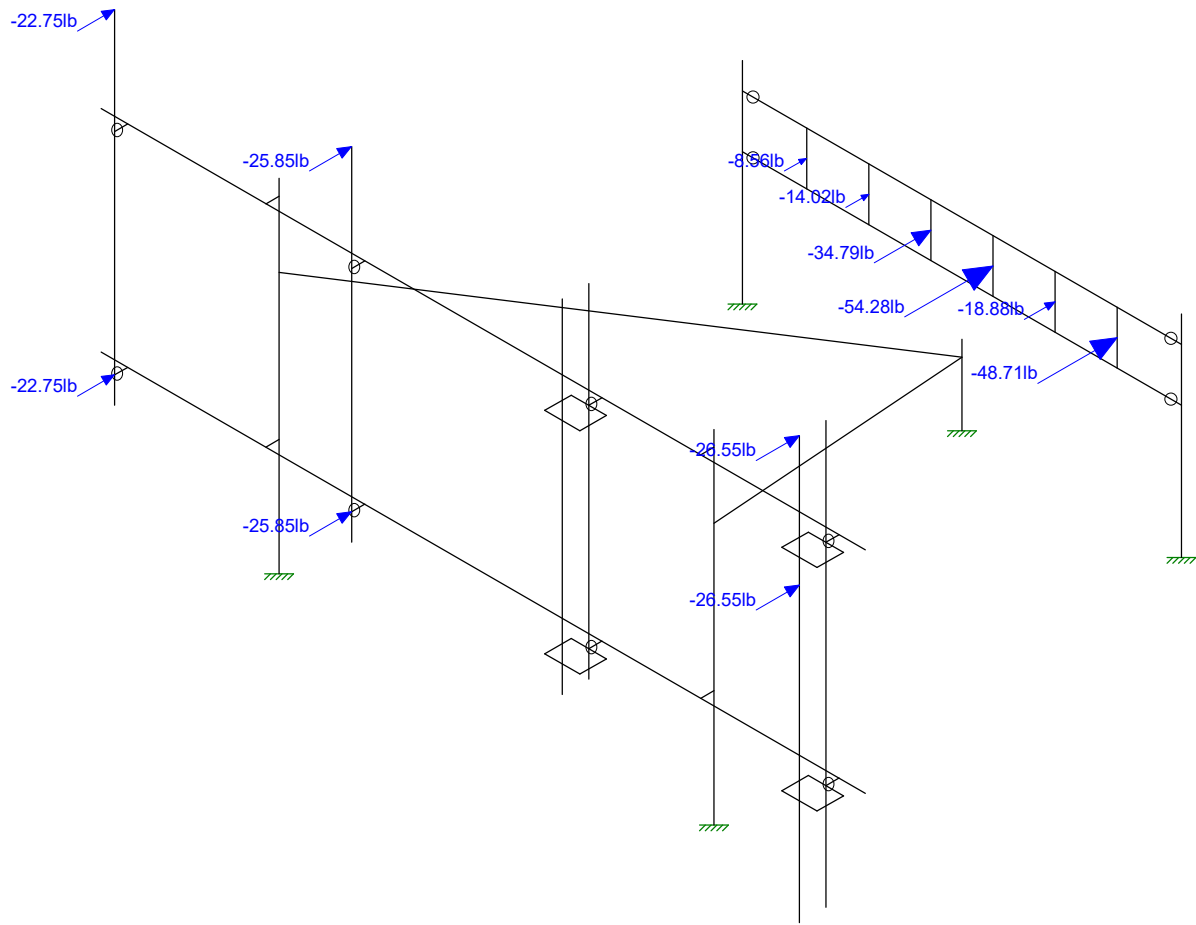
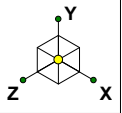
Mar 16, 2022 at 5:36 PM

SD05_mount.r3d



Loads: BLC 20, Wind 90° with ice
Envelope Only Solution

Trylon	SD05 Mercer Island	Ice Wind Loading X
JMP		Mar 16, 2022 at 5:36 PM
201048		SD05_mount.r3d



Loads: BLC 23, Horizontal Seismic Load Z
Envelope Only Solution

Trylon

JMP

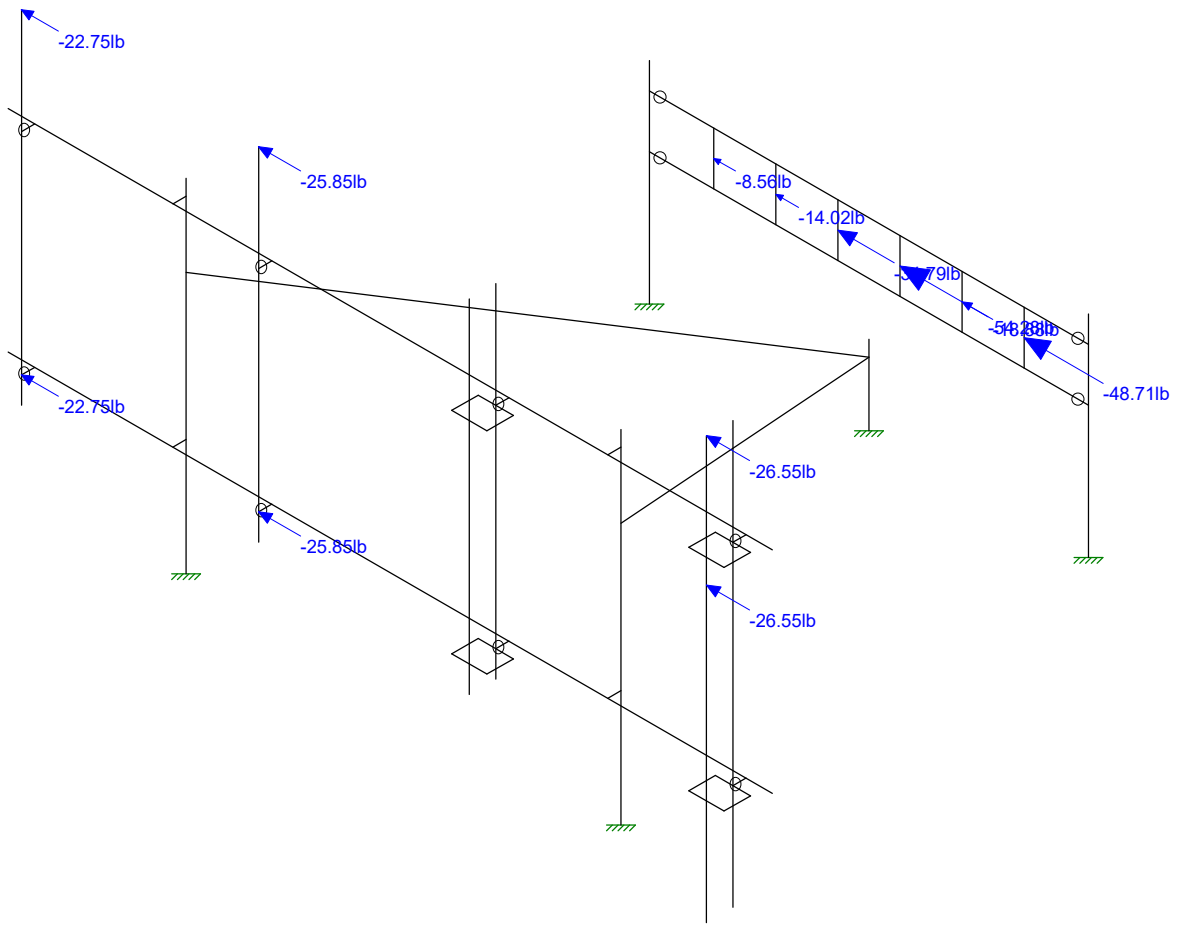
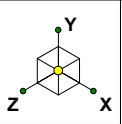
201048

SD05 Mercer Island

Seismic Loading Z

Mar 16, 2022 at 5:37 PM

SD05_mount.r3d



Loads: BLC 24, Horizontal Seismic Load X
Envelope Only Solution

Trylon	SD05 Mercer Island	Seismic Loading X
JMP		Mar 16, 2022 at 5:37 PM
201048		SD05_mount.r3d

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (in/sec^2)	386.4
Wall Mesh Size (in)	24
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 15th(360-16): LRFD
Adjust Stiffness?	Yes(Iterative)
RISACONNECTION CODE	AISC 15th(360-16): LRFD
Cold Formed Steel Code	AISI S100-16: LRFD
Wood Code	None
Wood Temperature	< 100F
Concrete Code	ACI 318-14
Masonry Code	TMS 402-16: ASD
Aluminum Code	None - Building
Stainless Steel Code	None

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	Exact Integration
Parame Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections?	Yes
Use Cracked Sections Slab?	No
Bad Framing Warnings?	No
Unused Force Warnings?	Yes
Min 1 Bar Diam. Spacing?	No
Concrete Rebar Set	REBAR SET ASTMA615
Min % Steel for Column	1
Max % Steel for Column	8

(Global) Model Settings, Continued

Seismic Code	ASCE 7-16
Seismic Base Elevation (in)	Not Entered
Add Base Weight?	Yes
Ct X	0
Ct Z	0
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	1
R Z	1
Ct Exp. X	0
Ct Exp. Z	0
SD1	0
SDS	0
S1	0
TL (sec)	Not Entered
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	1
Cd X	1
Rho Z	1
Rho X	1

Hot Rolled Steel Properties

	Label	E [psi]	G [psi]	Nu	Therm (/1E...	Density[lb/f...	Yield[psi]	Ry	Fu[psi]	Rt
1	A992	2.9e+7	1.115e+7	.3	.65	490	50000	1.1	65000	1.1
2	A36 Gr.36	2.9e+7	1.115e+7	.3	.65	490	36000	1.5	58000	1.2
3	A572 Gr.50	2.9e+7	1.115e+7	.3	.65	490	50000	1.1	65000	1.1
4	A500 Gr.B RND	2.9e+7	1.115e+7	.3	.65	527	42000	1.4	58000	1.3
5	A500 Gr.B RECT	2.9e+7	1.115e+7	.3	.65	527	46000	1.4	58000	1.3
6	A500 Gr.C RND	2.9e+7	1.115e+7	.3	.65	527	46000	1.4	62000	1.3
7	A500 Gr.C RECT	2.9e+7	1.115e+7	.3	.65	527	50000	1.4	62000	1.3
8	A53 Gr.B	2.9e+7	1.115e+7	.3	.65	490	35000	1.6	60000	1.2
9	A1085	2.9e+7	1.115e+7	.3	.65	490	50000	1.4	65000	1.3
10	A913 Gr.65	2.9e+7	1.115e+7	.3	.65	490	65000	1.1	80000	1.1

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Horizontal	PIPE 2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
2	Kicker	PIPE 2.0	Column	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
3	Brace	PIPE 3.0	Beam	Pipe	A53 Gr.B	Typical	2.07	2.85	2.85	5.69
4	Mount Pipe	PIPE 2.0	Column	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
5	Standoff	ROD1/2"	Beam	BAR	A36 Gr.36	Typical	.196	.003	.003	.006
6	New Vertical H-frame	PIPE 2.0	Column	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
7	New Horizontal H-Frame	L2.5x2.5x4	Beam	Single Angle	A53 Gr.B	Typical	1.19	.692	.692	.026

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N14	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N19	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	N18	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
4	N70	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction



Company : Trylon
 Designer : JMP
 Job Number : 201048
 Model Name : Gloria

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 Checked By: KDC

Joint Boundary Conditions (Continued)

Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
5	N71	Reaction	Reaction	Reaction	Reaction	Reaction

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N5	N6			Horizontal	Beam	Pipe	A53 Gr.B	Typical
2	M2	N10	N11			Horizontal	Beam	Pipe	A53 Gr.B	Typical
3	M3	N9	N1			Kicker	Column	Pipe	A53 Gr.B	Typical
4	M4	N8	N1			Kicker	Column	Pipe	A53 Gr.B	Typical
5	M5	N13	N14			Brace	Beam	Pipe	A53 Gr.B	Typical
6	M6	N14A	N16			RIGID	None	None	RIGID	Typical
7	M7	N15	N17			RIGID	None	None	RIGID	Typical
8	M8	N21	N19			Brace	Beam	Pipe	A53 Gr.B	Typical
9	M9	N20	N18			Brace	Beam	Pipe	A53 Gr.B	Typical
10	M10	N4	N23			RIGID	None	None	RIGID	Typical
11	M11	N3	N22			RIGID	None	None	RIGID	Typical
12	M12	N23A	N25			RIGID	None	None	RIGID	Typical
13	M13	N22A	N24			RIGID	None	None	RIGID	Typical
14	MP4	N90	N91			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
15	M15	N29	N31			RIGID	None	None	RIGID	Typical
16	M16	N28	N30			RIGID	None	None	RIGID	Typical
17	MP3	N32	N33			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
18	M18	N35	N37			RIGID	None	None	RIGID	Typical
19	M19	N34	N36			RIGID	None	None	RIGID	Typical
20	P2	N38	N39			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
21	M21	N41	N43			RIGID	None	None	RIGID	Typical
22	M22	N40	N42			RIGID	None	None	RIGID	Typical
23	P1	N44	N45			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
24	MP2	N48	N49			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
25	MP1	N52	N53			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
26	M26	N55	N59			Standoff	Beam	BAR	A36 Gr.36	Typical
27	M27	N63	N67			Standoff	Beam	BAR	A36 Gr.36	Typical
28	M28	N54	N58			Standoff	Beam	BAR	A36 Gr.36	Typical
29	M29	N62	N66			Standoff	Beam	BAR	A36 Gr.36	Typical
30	M30	N57	N61			Standoff	Beam	BAR	A36 Gr.36	Typical
31	M31	N65	N69			Standoff	Beam	BAR	A36 Gr.36	Typical
32	M32	N56	N60			Standoff	Beam	BAR	A36 Gr.36	Typical
33	M33	N64	N68			Standoff	Beam	BAR	A36 Gr.36	Typical
34	M34	N55	N63			RIGID	None	None	RIGID	Typical
35	M35	N59	N67			RIGID	None	None	RIGID	Typical
36	M36	N54	N62			RIGID	None	None	RIGID	Typical
37	M37	N58	N66			RIGID	None	None	RIGID	Typical
38	M38	N57	N65			RIGID	None	None	RIGID	Typical
39	M39	N61	N69			RIGID	None	None	RIGID	Typical
40	M40	N56	N64			RIGID	None	None	RIGID	Typical
41	M41	N60	N68			RIGID	None	None	RIGID	Typical
42	M42	N73	N71			New Vertical H...	Column	Pipe	A53 Gr.B	Typical
43	M43	N72	N70			New Vertical H...	Column	Pipe	A53 Gr.B	Typical
44	M44	N75	N74		270	New Horizonta...	Beam	Single Angle	A53 Gr.B	Typical
45	M45	N77	N76		270	New Horizonta...	Beam	Single Angle	A53 Gr.B	Typical
46	R1	N83	N89			RIGID	None	None	RIGID	Typical
47	R2	N82	N88			RIGID	None	None	RIGID	Typical
48	R3	N81	N87			RIGID	None	None	RIGID	Typical
49	R4	N80	N86			RIGID	None	None	RIGID	Typical
50	R5	N79	N85			RIGID	None	None	RIGID	Typical
51	R6	N78	N84			RIGID	None	None	RIGID	Typical

Member Advanced Data

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Rat..	Analysis ...	Inactive	Seismic...
1	M1						Yes				None
2	M2						Yes				None
3	M3						Yes	** NA **			None
4	M4						Yes	** NA **			None
5	M5						Yes				None
6	M6						Yes	** NA **			None
7	M7						Yes	** NA **			None
8	M8						Yes				None
9	M9						Yes				None
10	M10						Yes	** NA **			None
11	M11						Yes	** NA **			None
12	M12	OOOXOO					Yes	** NA **			None
13	M13	OOOXOO					Yes	** NA **			None
14	MP4						Yes	** NA **			None
15	M15	OOOXOO					Yes	** NA **			None
16	M16	OOOXOO					Yes	** NA **			None
17	MP3						Yes	** NA **			None
18	M18	OOOXOO					Yes	** NA **			None
19	M19	OOOXOO					Yes	** NA **			None
20	P2						Yes	** NA **			None
21	M21	OOOXOO					Yes	** NA **			None
22	M22	OOOXOO					Yes	** NA **			None
23	P1						Yes	** NA **			None
24	MP2						Yes	** NA **			None
25	MP1						Yes	** NA **			None
26	M26						Yes				None
27	M27						Yes				None
28	M28						Yes				None
29	M29						Yes				None
30	M30						Yes				None
31	M31						Yes				None
32	M32						Yes				None
33	M33						Yes				None
34	M34						Yes	** NA **			None
35	M35						Yes	** NA **			None
36	M36						Yes	** NA **			None
37	M37						Yes	** NA **			None
38	M38						Yes	** NA **			None
39	M39						Yes	** NA **			None
40	M40						Yes	** NA **			None
41	M41						Yes	** NA **			None
42	M42						Yes	** NA **			None
43	M43						Yes	** NA **			None
44	M44	BenPIN	BenPIN				Yes				None
45	M45	BenPIN	BenPIN				Yes				None
46	R1						Yes	** NA **			None
47	R2						Yes	** NA **			None
48	R3						Yes	** NA **			None
49	R4						Yes	** NA **			None
50	R5						Yes	** NA **			None
51	R6						Yes	** NA **			None

Hot Rolled Steel Design Parameters

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torqu...	Kyy	Kzz	Cb	Function
1	M1	Horizontal	174			Lbyy						Lateral
2	M2	Horizontal	174			Lbyy						Lateral
3	M3	Kicker	125.345			Lbyy						Lateral
4	M4	Kicker	125.345			Lbyy						Lateral
5	M5	Brace	18			Lbyy						Lateral
6	M8	Brace	78			Lbyy						Lateral
7	M9	Brace	78			Lbyy						Lateral
8	MP4	Mount Pipe	78			Lbyy						Lateral
9	MP3	Mount Pipe	78			Lbyy						Lateral
10	P2	Mount Pipe	78			Lbyy						Lateral
11	P1	Mount Pipe	96			Lbyy						Lateral
12	MP2	Mount Pipe	78			Lbyy						Lateral
13	MP1	Mount Pipe	96			Lbyy						Lateral
14	M26	Standoff	6			Lbyy						Lateral
15	M27	Standoff	6			Lbyy						Lateral
16	M28	Standoff	6			Lbyy						Lateral
17	M29	Standoff	6			Lbyy						Lateral
18	M30	Standoff	6			Lbyy						Lateral
19	M31	Standoff	6			Lbyy						Lateral
20	M32	Standoff	6			Lbyy						Lateral
21	M33	Standoff	6			Lbyy						Lateral
22	M42	New Vertica...	48			Lbyy						Lateral
23	M43	New Vertica...	48			Lbyy						Lateral
24	M44	New Horizo...	100			Lbyy						Lateral
25	M45	New Horizo...	100			Lbyy						Lateral

Member Point Loads (BLC 1 : Dead Load)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	Y	-49.61	0
2	MP1	Y	-49.61	29.5
3	MP3	Y	-48.3	0
4	MP3	Y	-48.3	72
5	MP4	Y	-42.5	0
6	MP4	Y	-42.5	72
7	R1	Y	-91	%50
8	R2	Y	-35.27	%50
9	R3	Y	-101.4	%50
10	R4	Y	-65	%50
11	R5	Y	-26.2	%50
12	R6	Y	-16	%50

Member Point Loads (BLC 5 : Ice Dead Load)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	Y	-38.18	0
2	MP1	Y	-38.18	29.5
3	MP3	Y	-81.43	0
4	MP3	Y	-81.43	72
5	MP4	Y	-103.23	0
6	MP4	Y	-103.23	72
7	R1	Y	-78.59	%50
8	R2	Y	-26.97	%50
9	R3	Y	-67.83	%50
10	R4	Y	-48.74	%50
11	R5	Y	-60.03	%50



Member Point Loads (BLC 5 : Ice Dead Load) (Continued)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
12	R6	Y	-21.4	%50

Member Point Loads (BLC 8 : Wind Y-Direction)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	Y	16.06	0
2	MP1	Y	16.06	29.5
3	MP3	Y	14.57	0
4	MP3	Y	14.57	72
5	MP4	Y	19.96	0
6	MP4	Y	19.96	72
7	R1	Y	28.43	%50
8	R2	Y	14.37	%50
9	R3	Y	27.65	%50
10	R4	Y	15.94	%50
11	R5	Y	19.99	%50
12	R6	Y	12.44	%50

Member Point Loads (BLC 11 : Wind 0°)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	Z	-63.57	0
2	MP1	Z	-63.57	29.5
3	MP3	Z	-170.35	0
4	MP3	Z	-170.35	72
5	MP4	Z	-237.72	0
6	MP4	Z	-237.72	72
7	R1	Z	-110.58	%50
8	R2	Z	-37.25	%50
9	R3	Z	-106.36	%50
10	R4	Z	-82.56	%50
11	R5	Z	-77.63	%50
12	R6	Z	-53.88	%50
13	MP1	X	0	0
14	MP1	X	0	29.5
15	MP3	X	0	0
16	MP3	X	0	72
17	MP4	X	0	0
18	MP4	X	0	72
19	R1	X	0	%50
20	R2	X	0	%50
21	R3	X	0	%50
22	R4	X	0	%50
23	R5	X	0	%50
24	R6	X	0	%50

Member Point Loads (BLC 12 : Wind 30°)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	Z	-48.63	0
2	MP1	Z	-48.63	29.5
3	MP3	Z	-125.33	0
4	MP3	Z	-125.33	72
5	MP4	Z	-168.97	0
6	MP4	Z	-168.97	72
7	R1	Z	-92.32	%50
8	R2	Z	-28.71	%50
9	R3	Z	-83.26	%50

Member Point Loads (BLC 12 : Wind 30°) (Continued)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in, %]
10	R4	Z	-62.65	%50
11	R5	Z	-67.23	%50
12	R6	Z	-42.06	%50
13	MP1	X	-28.08	0
14	MP1	X	-28.08	29.5
15	MP3	X	-72.36	0
16	MP3	X	-72.36	72
17	MP4	X	-97.56	0
18	MP4	X	-97.56	72
19	R1	X	-53.3	%50
20	R2	X	-16.58	%50
21	R3	X	-48.07	%50
22	R4	X	-36.17	%50
23	R5	X	-38.81	%50
24	R6	X	-24.29	%50

Member Point Loads (BLC 13 : Wind 60°)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in, %]
1	MP1	Z	-20.66	0
2	MP1	Z	-20.66	29.5
3	MP3	Z	-46.72	0
4	MP3	Z	-46.72	72
5	MP4	Z	-54.95	0
6	MP4	Z	-54.95	72
7	R1	Z	-49.32	%50
8	R2	Z	-12.48	%50
9	R3	Z	-37.85	%50
10	R4	Z	-25.96	%50
11	R5	Z	-38.81	%50
12	R6	Z	-18.98	%50
13	MP1	X	-35.78	0
14	MP1	X	-35.78	29.5
15	MP3	X	-80.92	0
16	MP3	X	-80.92	72
17	MP4	X	-95.18	0
18	MP4	X	-95.18	72
19	R1	X	-85.43	%50
20	R2	X	-21.62	%50
21	R3	X	-65.56	%50
22	R4	X	-44.96	%50
23	R5	X	-67.23	%50
24	R6	X	-32.87	%50

Member Point Loads (BLC 14 : Wind 90°)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in, %]
1	MP1	Z	0	0
2	MP1	Z	0	29.5
3	MP3	Z	0	0
4	MP3	Z	0	72
5	MP4	Z	0	0
6	MP4	Z	0	72
7	R1	Z	0	%50
8	R2	Z	0	%50
9	R3	Z	0	%50
10	R4	Z	0	%50
11	R5	Z	0	%50



Member Point Loads (BLC 14 : Wind 90°) (Continued)

	Member Label	Direction	Magnitude[lb.,lb-ft]	Location[in, %]
12	R6	Z	0	%50
13	MP1	X	-33.9	0
14	MP1	X	-33.9	29.5
15	MP3	X	-67.79	0
16	MP3	X	-67.79	72
17	MP4	X	-67.3	0
18	MP4	X	-67.3	72
19	R1	X	-94.67	%50
20	R2	X	-20.87	%50
21	R3	X	-65.48	%50
22	R4	X	-41.7	%50
23	R5	X	-77.63	%50
24	R6	X	-32.65	%50

Member Point Loads (BLC 15 : Wind 120°)

	Member Label	Direction	Magnitude[lb.,lb-ft]	Location[in, %]
1	MP1	Z	20.66	0
2	MP1	Z	20.66	29.5
3	MP3	Z	46.72	0
4	MP3	Z	46.72	72
5	MP4	Z	54.95	0
6	MP4	Z	54.95	72
7	R1	Z	49.32	%50
8	R2	Z	12.48	%50
9	R3	Z	37.85	%50
10	R4	Z	25.96	%50
11	R5	Z	38.81	%50
12	R6	Z	18.98	%50
13	MP1	X	-35.78	0
14	MP1	X	-35.78	29.5
15	MP3	X	-80.92	0
16	MP3	X	-80.92	72
17	MP4	X	-95.18	0
18	MP4	X	-95.18	72
19	R1	X	-85.43	%50
20	R2	X	-21.62	%50
21	R3	X	-65.56	%50
22	R4	X	-44.96	%50
23	R5	X	-67.23	%50
24	R6	X	-32.87	%50

Member Point Loads (BLC 16 : Wind 150°)

	Member Label	Direction	Magnitude[lb.,lb-ft]	Location[in, %]
1	MP1	Z	48.63	0
2	MP1	Z	48.63	29.5
3	MP3	Z	125.33	0
4	MP3	Z	125.33	72
5	MP4	Z	168.97	0
6	MP4	Z	168.97	72
7	R1	Z	92.32	%50
8	R2	Z	28.71	%50
9	R3	Z	83.26	%50
10	R4	Z	62.65	%50
11	R5	Z	67.23	%50
12	R6	Z	42.06	%50
13	MP1	X	-28.08	0



Member Point Loads (BLC 16 : Wind 150°) (Continued)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in, %]
14	MP1	X	-28.08	29.5
15	MP3	X	-72.36	0
16	MP3	X	-72.36	72
17	MP4	X	-97.56	0
18	MP4	X	-97.56	72
19	R1	X	-53.3	%50
20	R2	X	-16.58	%50
21	R3	X	-48.07	%50
22	R4	X	-36.17	%50
23	R5	X	-38.81	%50
24	R6	X	-24.29	%50

Member Point Loads (BLC 17 : Wind 0° with ice)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in, %]
1	MP1	Z	-7.17	0
2	MP1	Z	-7.17	29.5
3	MP3	Z	-18.24	0
4	MP3	Z	-18.24	72
5	MP4	Z	-24.75	0
6	MP4	Z	-24.75	72
7	R1	Z	-12.79	%50
8	R2	Z	-4.8	%50
9	R3	Z	-12.21	%50
10	R4	Z	-9.75	%50
11	R5	Z	-9.4	%50
12	R6	Z	-7.31	%50
13	MP1	X	0	0
14	MP1	X	0	29.5
15	MP3	X	0	0
16	MP3	X	0	72
17	MP4	X	0	0
18	MP4	X	0	72
19	R1	X	0	%50
20	R2	X	0	%50
21	R3	X	0	%50
22	R4	X	0	%50
23	R5	X	0	%50
24	R6	X	0	%50

Member Point Loads (BLC 18 : Wind 30° with ice)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in, %]
1	MP1	Z	-5.56	0
2	MP1	Z	-5.56	29.5
3	MP3	Z	-13.65	0
4	MP3	Z	-13.65	72
5	MP4	Z	-17.87	0
6	MP4	Z	-17.87	72
7	R1	Z	-10.73	%50
8	R2	Z	-3.77	%50
9	R3	Z	-9.68	%50
10	R4	Z	-7.55	%50
11	R5	Z	-8.14	%50
12	R6	Z	-5.81	%50
13	MP1	X	-3.21	0
14	MP1	X	-3.21	29.5
15	MP3	X	-7.88	0



Member Point Loads (BLC 18 : Wind 30° with ice) (Continued)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
16	MP3	X	-7.88	72
17	MP4	X	-10.32	0
18	MP4	X	-10.32	72
19	R1	X	-6.2	%50
20	R2	X	-2.18	%50
21	R3	X	-5.59	%50
22	R4	X	-4.36	%50
23	R5	X	-4.7	%50
24	R6	X	-3.36	%50

Member Point Loads (BLC 19 : Wind 60° with ice)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	Z	-2.46	0
2	MP1	Z	-2.46	29.5
3	MP3	Z	-5.41	0
4	MP3	Z	-5.41	72
5	MP4	Z	-6.21	0
6	MP4	Z	-6.21	72
7	R1	Z	-5.8	%50
8	R2	Z	-1.73	%50
9	R3	Z	-4.56	%50
10	R4	Z	-3.33	%50
11	R5	Z	-4.7	%50
12	R6	Z	-2.76	%50
13	MP1	X	-4.27	0
14	MP1	X	-4.27	29.5
15	MP3	X	-9.37	0
16	MP3	X	-9.37	72
17	MP4	X	-10.75	0
18	MP4	X	-10.75	72
19	R1	X	-10.05	%50
20	R2	X	-3	%50
21	R3	X	-7.9	%50
22	R4	X	-5.76	%50
23	R5	X	-8.14	%50
24	R6	X	-4.78	%50

Member Point Loads (BLC 20 : Wind 90° with ice)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	Z	0	0
2	MP1	Z	0	29.5
3	MP3	Z	0	0
4	MP3	Z	0	72
5	MP4	Z	0	0
6	MP4	Z	0	72
7	R1	Z	0	%50
8	R2	Z	0	%50
9	R3	Z	0	%50
10	R4	Z	0	%50
11	R5	Z	0	%50
12	R6	Z	0	%50
13	MP1	X	-4.18	0
14	MP1	X	-4.18	29.5
15	MP3	X	-8.34	0
16	MP3	X	-8.34	72
17	MP4	X	-8.3	0



Member Point Loads (BLC 20 : Wind 90° with ice) (Continued)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in, %]
18	MP4	X	-8.3	72
19	R1	X	-11.21	%50
20	R2	X	-3.02	%50
21	R3	X	-8.09	%50
22	R4	X	-5.62	%50
23	R5	X	-9.4	%50
24	R6	X	-4.92	%50

Member Point Loads (BLC 21 : Wind 120° with ice)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in, %]
1	MP1	Z	2.46	0
2	MP1	Z	2.46	29.5
3	MP3	Z	5.41	0
4	MP3	Z	5.41	72
5	MP4	Z	6.21	0
6	MP4	Z	6.21	72
7	R1	Z	5.8	%50
8	R2	Z	1.73	%50
9	R3	Z	4.56	%50
10	R4	Z	3.33	%50
11	R5	Z	4.7	%50
12	R6	Z	2.76	%50
13	MP1	X	-4.27	0
14	MP1	X	-4.27	29.5
15	MP3	X	-9.37	0
16	MP3	X	-9.37	72
17	MP4	X	-10.75	0
18	MP4	X	-10.75	72
19	R1	X	-10.05	%50
20	R2	X	-3	%50
21	R3	X	-7.9	%50
22	R4	X	-5.76	%50
23	R5	X	-8.14	%50
24	R6	X	-4.78	%50

Member Point Loads (BLC 22 : Wind 150° with ice)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in, %]
1	MP1	Z	5.56	0
2	MP1	Z	5.56	29.5
3	MP3	Z	13.65	0
4	MP3	Z	13.65	72
5	MP4	Z	17.87	0
6	MP4	Z	17.87	72
7	R1	Z	10.73	%50
8	R2	Z	3.77	%50
9	R3	Z	9.68	%50
10	R4	Z	7.55	%50
11	R5	Z	8.14	%50
12	R6	Z	5.81	%50
13	MP1	X	-3.21	0
14	MP1	X	-3.21	29.5
15	MP3	X	-7.88	0
16	MP3	X	-7.88	72
17	MP4	X	-10.32	0
18	MP4	X	-10.32	72
19	R1	X	-6.2	%50

Member Point Loads (BLC 22 : Wind 150° with ice) (Continued)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in, %]
20	R2	X	-2.18	%50
21	R3	X	-5.59	%50
22	R4	X	-4.36	%50
23	R5	X	-4.7	%50
24	R6	X	-3.36	%50

Member Point Loads (BLC 23 : Horizontal Seismic Load Z)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in, %]
1	MP1	Z	-26.55	0
2	MP1	Z	-26.55	29.5
3	MP3	Z	-25.85	0
4	MP3	Z	-25.85	72
5	MP4	Z	-22.75	0
6	MP4	Z	-22.75	72
7	R1	Z	-48.71	%50
8	R2	Z	-18.88	%50
9	R3	Z	-54.28	%50
10	R4	Z	-34.79	%50
11	R5	Z	-14.02	%50
12	R6	Z	-8.56	%50

Member Point Loads (BLC 24 : Horizontal Seismic Load X)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in, %]
1	MP1	X	-26.55	0
2	MP1	X	-26.55	29.5
3	MP3	X	-25.85	0
4	MP3	X	-25.85	72
5	MP4	X	-22.75	0
6	MP4	X	-22.75	72
7	R1	X	-48.71	%50
8	R2	X	-18.88	%50
9	R3	X	-54.28	%50
10	R4	X	-34.79	%50
11	R5	X	-14.02	%50
12	R6	X	-8.56	%50

Member Distributed Loads (BLC 5 : Ice Dead Load)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft, F...	Start Location[in, %]	End Location[in, %]
1	M1	Y	-4.07	-4.07	0	0
2	M2	Y	-4.07	-4.07	0	0
3	M3	Y	-4.07	-4.07	0	0
4	M4	Y	-4.07	-4.07	0	0
5	M5	Y	-5.03	-5.03	0	0
6	M8	Y	-5.03	-5.03	0	0
7	M9	Y	-5.03	-5.03	0	0
8	MP4	Y	-4.07	-4.07	0	0
9	MP3	Y	-4.07	-4.07	0	0
10	P2	Y	-4.07	-4.07	0	0
11	P1	Y	-4.07	-4.07	0	0
12	MP2	Y	-4.07	-4.07	0	0
13	MP1	Y	-4.07	-4.07	0	0
14	M26	Y	-2.03	-2.03	0	0
15	M27	Y	-2.03	-2.03	0	0
16	M28	Y	-2.03	-2.03	0	0

Member Distributed Loads (BLC 5 : Ice Dead Load) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in, %]	End Location[in, %]
17	M29	Y	-2.03	-2.03	0	0
18	M30	Y	-2.03	-2.03	0	0
19	M31	Y	-2.03	-2.03	0	0
20	M32	Y	-2.03	-2.03	0	0
21	M33	Y	-2.03	-2.03	0	0
22	M42	Y	-5.03	-5.03	0	0
23	M43	Y	-5.03	-5.03	0	0
24	M44	Y	-5.56	-5.56	0	0
25	M45	Y	-5.56	-5.56	0	0

Member Distributed Loads (BLC 6 : Structure Wind Z-Direction)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in, %]	End Location[in, %]
1	M1	SZ	-34.46	-34.46	0	0
2	M2	SZ	-34.46	-34.46	0	0
3	M3	SZ	-34.46	-34.46	0	0
4	M4	SZ	-34.46	-34.46	0	0
5	M5	SZ	-34.46	-34.46	0	0
6	M8	SZ	-34.46	-34.46	0	0
7	M9	SZ	-34.46	-34.46	0	0
8	MP4	SZ	-34.46	-34.46	0	0
9	MP3	SZ	-34.46	-34.46	0	0
10	P2	SZ	-34.46	-34.46	0	0
11	P1	SZ	-34.46	-34.46	0	0
12	MP2	SZ	-34.46	-34.46	0	0
13	MP1	SZ	-34.46	-34.46	0	0
14	M26	SZ	-34.46	-34.46	0	0
15	M27	SZ	-34.46	-34.46	0	0
16	M28	SZ	-34.46	-34.46	0	0
17	M29	SZ	-34.46	-34.46	0	0
18	M30	SZ	-34.46	-34.46	0	0
19	M31	SZ	-34.46	-34.46	0	0
20	M32	SZ	-34.46	-34.46	0	0
21	M33	SZ	-34.46	-34.46	0	0
22	M42	SZ	-34.46	-34.46	0	0
23	M43	SZ	-34.46	-34.46	0	0
24	M44	SZ	-34.46	-34.46	0	0
25	M45	SZ	-34.46	-34.46	0	0

Member Distributed Loads (BLC 7 : Structure Wind X-Direction)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in, %]	End Location[in, %]
1	M1	SX	-34.46	-34.46	0	0
2	M2	SX	-34.46	-34.46	0	0
3	M3	SX	-34.46	-34.46	0	0
4	M4	SX	-34.46	-34.46	0	0
5	M5	SX	-34.46	-34.46	0	0
6	M8	SX	-34.46	-34.46	0	0
7	M9	SX	-34.46	-34.46	0	0
8	MP4	SX	-34.46	-34.46	0	0
9	MP3	SX	-34.46	-34.46	0	0
10	P2	SX	-34.46	-34.46	0	0
11	P1	SX	-34.46	-34.46	0	0
12	MP2	SX	-34.46	-34.46	0	0
13	MP1	SX	-34.46	-34.46	0	0
14	M26	SX	-34.46	-34.46	0	0
15	M27	SX	-34.46	-34.46	0	0
16	M28	SX	-34.46	-34.46	0	0



Member Distributed Loads (BLC 7 : Structure Wind X-Direction) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in, %]	End Location[in, %]
17	M29	SX	-34.46	-34.46	0	0
18	M30	SX	-34.46	-34.46	0	0
19	M31	SX	-34.46	-34.46	0	0
20	M32	SX	-34.46	-34.46	0	0
21	M33	SX	-34.46	-34.46	0	0
22	M42	SX	-34.46	-34.46	0	0
23	M43	SX	-34.46	-34.46	0	0
24	M44	SX	-34.46	-34.46	0	0
25	M45	SX	-34.46	-34.46	0	0

Member Distributed Loads (BLC 8 : Wind Y-Direction)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in, %]	End Location[in, %]
1	M1	SY	27.21	27.21	0	0
2	M2	SY	27.21	27.21	0	0
3	M3	SY	27.21	27.21	0	0
4	M4	SY	27.21	27.21	0	0
5	M5	SY	27.21	27.21	0	0
6	M8	SY	27.21	27.21	0	0
7	M9	SY	27.21	27.21	0	0
8	MP4	SY	27.21	27.21	0	0
9	MP3	SY	27.21	27.21	0	0
10	P2	SY	27.21	27.21	0	0
11	P1	SY	27.21	27.21	0	0
12	MP2	SY	27.21	27.21	0	0
13	MP1	SY	27.21	27.21	0	0
14	M26	SY	27.21	27.21	0	0
15	M27	SY	27.21	27.21	0	0
16	M28	SY	27.21	27.21	0	0
17	M29	SY	27.21	27.21	0	0
18	M30	SY	27.21	27.21	0	0
19	M31	SY	27.21	27.21	0	0
20	M32	SY	27.21	27.21	0	0
21	M33	SY	27.21	27.21	0	0
22	M42	SY	27.21	27.21	0	0
23	M43	SY	27.21	27.21	0	0
24	M44	SY	27.21	27.21	0	0
25	M45	SY	27.21	27.21	0	0

Member Distributed Loads (BLC 9 : Structure Ice Wind Z-Direction)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in, %]	End Location[in, %]
1	M1	SZ	-1.7	-1.7	0	0
2	M2	SZ	-1.7	-1.7	0	0
3	M3	SZ	-1.7	-1.7	0	0
4	M4	SZ	-1.7	-1.7	0	0
5	M5	SZ	-1.7	-1.7	0	0
6	M8	SZ	-1.7	-1.7	0	0
7	M9	SZ	-1.7	-1.7	0	0
8	MP4	SZ	-1.7	-1.7	0	0
9	MP3	SZ	-1.7	-1.7	0	0
10	P2	SZ	-1.7	-1.7	0	0
11	P1	SZ	-1.7	-1.7	0	0
12	MP2	SZ	-1.7	-1.7	0	0
13	MP1	SZ	-1.7	-1.7	0	0
14	M26	SZ	-1.7	-1.7	0	0
15	M27	SZ	-1.7	-1.7	0	0
16	M28	SZ	-1.7	-1.7	0	0



Member Distributed Loads (BLC 9 : Structure Ice Wind Z-Direction) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in, %]	End Location[in, %]
17	M29	SZ	-1.7	-1.7	0	0
18	M30	SZ	-1.7	-1.7	0	0
19	M31	SZ	-1.7	-1.7	0	0
20	M32	SZ	-1.7	-1.7	0	0
21	M33	SZ	-1.7	-1.7	0	0
22	M42	SZ	-1.7	-1.7	0	0
23	M43	SZ	-1.7	-1.7	0	0
24	M44	SZ	-1.7	-1.7	0	0
25	M45	SZ	-1.7	-1.7	0	0

Member Distributed Loads (BLC 10 : Structure Ice Wind X-Direction)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,F...	Start Location[in, %]	End Location[in, %]
1	M1	SX	-1.7	-1.7	0	0
2	M2	SX	-1.7	-1.7	0	0
3	M3	SX	-1.7	-1.7	0	0
4	M4	SX	-1.7	-1.7	0	0
5	M5	SX	-1.7	-1.7	0	0
6	M8	SX	-1.7	-1.7	0	0
7	M9	SX	-1.7	-1.7	0	0
8	MP4	SX	-1.7	-1.7	0	0
9	MP3	SX	-1.7	-1.7	0	0
10	P2	SX	-1.7	-1.7	0	0
11	P1	SX	-1.7	-1.7	0	0
12	MP2	SX	-1.7	-1.7	0	0
13	MP1	SX	-1.7	-1.7	0	0
14	M26	SX	-1.7	-1.7	0	0
15	M27	SX	-1.7	-1.7	0	0
16	M28	SX	-1.7	-1.7	0	0
17	M29	SX	-1.7	-1.7	0	0
18	M30	SX	-1.7	-1.7	0	0
19	M31	SX	-1.7	-1.7	0	0
20	M32	SX	-1.7	-1.7	0	0
21	M33	SX	-1.7	-1.7	0	0
22	M42	SX	-1.7	-1.7	0	0
23	M43	SX	-1.7	-1.7	0	0
24	M44	SX	-1.7	-1.7	0	0
25	M45	SX	-1.7	-1.7	0	0

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut...	Area(Me...Surface(...
1	Dead Load	DL		-1			12		
2	Live Load	LL							
3	Roof Live Load	RLL							
4	Snow Load	SL							
5	Ice Dead Load	None					12	25	
6	Structure Wind Z-Direction	WLZ						25	
7	Structure Wind X-Direction	WLX						25	
8	Wind Y-Direction	WLY					12	25	
9	Structure Ice Wind Z-Direction	WL						25	
10	Structure Ice Wind X-Direction	WL						25	
11	Wind 0°	WL					24		
12	Wind 30°	WL					24		
13	Wind 60°	WL					24		
14	Wind 90°	WL					24		
15	Wind 120°	WL					24		



Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut...	Area(Me...Surface(...
16	Wind 150°	WL					24		
17	Wind 0° with ice	WL					24		
18	Wind 30° with ice	WL					24		
19	Wind 60° with ice	WL					24		
20	Wind 90° with ice	WL					24		
21	Wind 120° with ice	WL					24		
22	Wind 150° with ice	WL					24		
23	Horizontal Seismic Load Z	ELZ			-.535		12		
24	Horizontal Seismic Load X	ELX	-.535				12		

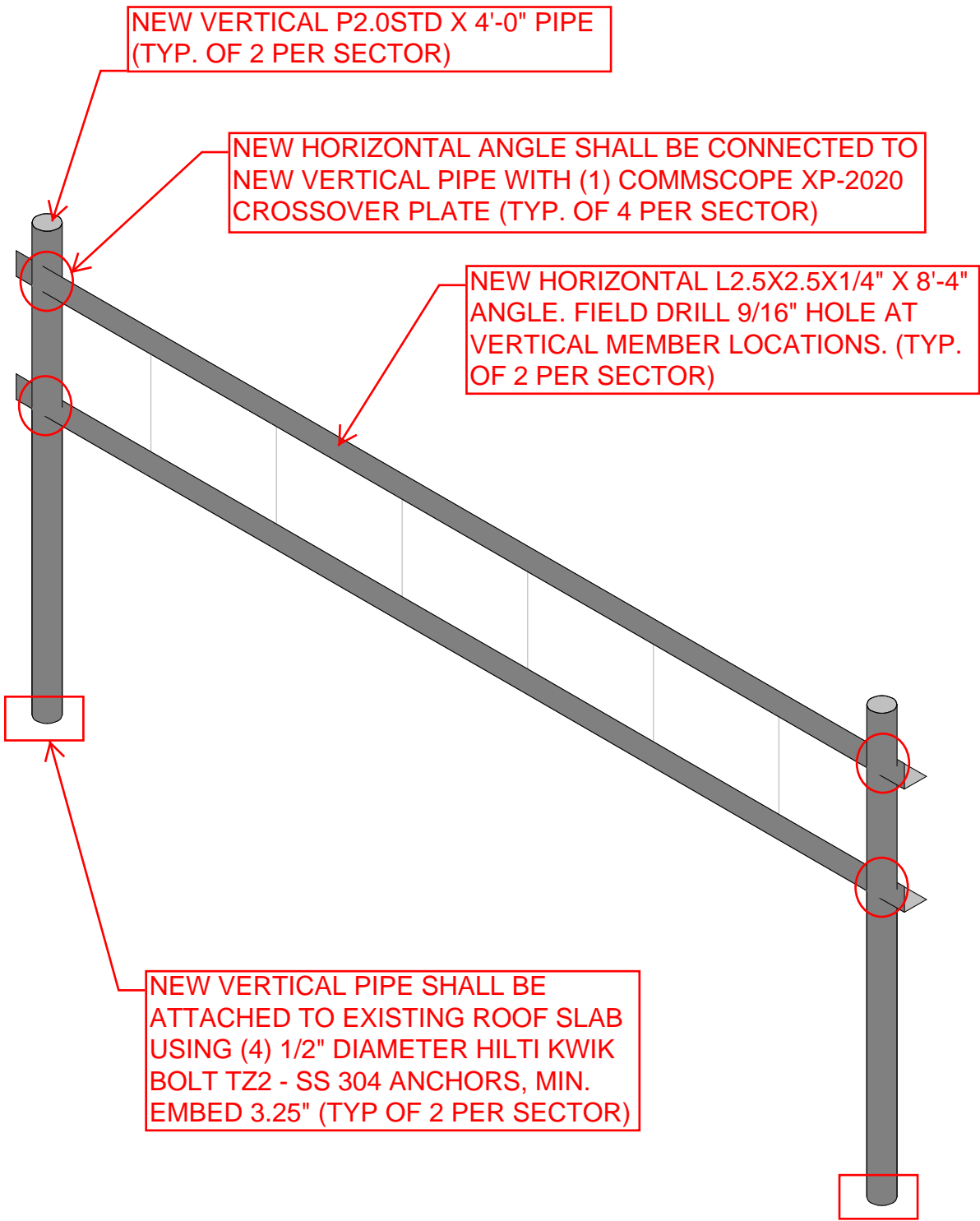
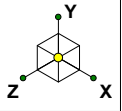
Envelope Joint Reactions

Joint	X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC		
1	N14	max	425.969	117	668.54	43	1544.646	55	1712.344	55	132.657	117	415.589	54
2		min	-300.074	42	-729.746	61	-1665.194	37	-1800.758	37	-128.375	40	-590.836	117
3	N19	max	372.639	59	984.585	73	212.638	44	588.328	57	447.527	55	1196.763	51
4		min	-409.627	41	-337.494	66	-181.881	62	-586.431	38	-454.717	37	-1107.94	57
5	N18	max	473.631	44	802.317	75	214.391	53	604.296	53	228.551	60	1223.379	51
6		min	-406.259	62	-348.464	117	-125.667	59	-482.092	59	-242.118	42	-1208.169	33
7	N70	max	190.937	58	536.01	77	334.399	43	967.858	43	0	117	274.875	52
8		min	-198.812	40	-158.673	117	-334.416	37	-968.005	37	0	1	-265.254	58
9	N71	max	198.808	46	433.098	71	308.078	55	913.207	43	0	117	266.282	64
10		min	-190.908	64	-54.626	117	-308.061	61	-913.068	37	0	1	-273.099	34
11	Totals:	max	1314.252	58	2698.816	76	2322.398	55						
12		min	-1314.254	40	-575.661	117	-2322.405	37						

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

Member	Shape	Code Check	Loc[in]	LC	Shear ...	Loc[in]	Dir	LC	phi*Pnc ...	phi*Pnt [...]	phi*Mn y...	phi*Mn z...	Cb	Eqn	
1	M43	PIPE 2.0	.521	48	49	.035	48	49	26521.4...	32130	1871.625	1871.625	1...	H1-1b	
2	M42	PIPE 2.0	.490	48	43	.032	48	49	26521.4...	32130	1871.625	1871.625	2...	H1-1b	
3	M2	PIPE 2.0	.435	36.25	43	.135	36.25	49	4678.524	32130	1871.625	1871.625	2...	H1-1b	
4	M44	L2.5x2.5x4	.427	56.25	49	.021	100	z	75	6245.697	37485	1082.622	1947.78	1...	H2-1
5	M31	ROD1/2"	.359	6	53	.046	0	53	5610.827	6350.4	51.84	51.84	2...	H1-1b	
6	M30	ROD1/2"	.353	6	45	.045	0	47	5610.827	6350.4	51.84	51.84	2...	H1-1b	
7	M32	ROD1/2"	.342	0	74	.027	0	74	5610.827	6350.4	51.84	51.84	2...	H1-1b	
8	M45	L2.5x2.5x4	.332	43.75	55	.021	100	z	79	6245.697	37485	1082.622	1936.573	1...	H2-1
9	M33	ROD1/2"	.324	0	74	.026	0	74	5610.827	6350.4	51.84	51.84	2...	H1-1b	
10	M1	PIPE 2.0	.321	36.25	49	.056	36.25	49	4678.524	32130	1871.625	1871.625	2...	H1-1b	
11	M5	PIPE 3.0	.320	18	49	.086	18	49	64424.35	65205	5748.75	5748.75	2...	H1-1b	
12	MP4	PIPE 2.0	.258	23.563	49	.057	24.375	49	19360.2...	32130	1871.625	1871.625	1...	H1-1b	
13	M9	PIPE 3.0	.239	78	51	.062	17.875	48	52006.4...	65205	5748.75	5748.75	2...	H1-1b	
14	M8	PIPE 3.0	.233	78	51	.101	78	50	52006.4...	65205	5748.75	5748.75	2.2	H1-1b	
15	MP3	PIPE 2.0	.187	23.563	49	.036	24.375	50	19360.2...	32130	1871.625	1871.625	1...	H1-1b	
16	M3	PIPE 2.0	.175	0	55	.027	0	65	9015.642	32130	1871.625	1871.625	2...	H1-1b	
17	M4	PIPE 2.0	.105	0	55	.030	0	50	9015.642	32130	1871.625	1871.625	2...	H1-1b	
18	M29	ROD1/2"	.093	0	50	.010	0	50	5610.827	6350.4	51.84	51.84	2...	H1-1b	
19	M26	ROD1/2"	.092	0	44	.011	0	45	5610.827	6350.4	51.84	51.84	2...	H1-1b	
20	M27	ROD1/2"	.090	6	52	.011	0	52	5610.827	6350.4	51.84	51.84	2...	H1-1b	
21	M28	ROD1/2"	.081	0	74	.009	0	46	5610.827	6350.4	51.84	51.84	2...	H1-1b	
22	MP1	PIPE 2.0	.080	24	49	.040	24	48	14916.0...	32130	1871.625	1871.625	1...	H1-1b	
23	P2	PIPE 2.0	.052	24.375	49	.028	24.375	50	19360.2...	32130	1871.625	1871.625	2...	H1-1b	
24	P1	PIPE 2.0	.044	72	54	.033	72	48	14916.0...	32130	1871.625	1871.625	1...	H1-1b	
25	MP2	PIPE 2.0	.010	23.563	117	.025	24.375	50	19360.2...	32130	1871.625	1871.625	1...	H1-1b	

**APPENDIX
NEW H-FRAME**



Trylon

JMP

201048

Gloria

New H-Frame

Mar 14, 2022 at 4:23 PM

SD05_new H-frame only.r3d

XP-2020



Crossover Plate, joins 2-3/8 in to 2-3/8 in OD round members

Product Classification

Product Type Clamp plate

General Specifications

Mounting Crossover plate

Tower Taper Non-tapered

Dimensions

Height 76.2 mm | 3 in

Width 254 mm | 10 in

Length 254 mm | 10 in

Mounting Diameter, maximum 60.96 mm | 2.4 in

Mounting Diameter, minimum 60.96 mm | 2.4 in

Material Specifications

Material Type Hot dip galvanized steel

Packaging and Weights

Included Plates | U-bolts

Packaging quantity 1

Weight, net 4.5 kg | 9.921 lb

Regulatory Compliance/Certifications

Agency

ISO 9001:2015

Classification

Designed, manufactured and/or distributed under this quality management system

XP-2020

