Date: May 5, 2021

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NB+C Engineering Services
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Subject:	**Mount Analysis Report**	
Carrier Designation:	**T-Mobile *ANCHOR***	
	T-Mobile Site Number:	**7WAC050A**
	T-Mobile Site Name:	**White Oak Tower**
Engineering Firm Designation:	**NB+C ES Project Number:**	**100595**
Site Data:	**301 Maple Ave West Vienna, VA 22180** **Latitude: *38.89820100*°, Longitude: *-77.27086100*°** **81.5 ft Penthouse Rooftop** **Pipe Mounts at 79.0 ft**	

Dear Mr. Pugeda,

NB+C Engineering Services is pleased to submit this **"Mount Analysis Report"** to determine the structural integrity of the above-mentioned tower mounts.

The purpose of the analysis is to determine acceptability of the tower mount stress level. Based on our analysis we have determined the tower mount stress level for only the mount structure to be:

Existing + Proposed Equipment **99.7% - Sufficient Capacity**

The analysis has been performed in accordance with the *ANSI/TIA-222-G* standard, *2015 Virginia Uniform Statewide Building Code* and local code requirements based upon a wind speed of 115 mph (ultimate 3-second gust).

All equipment proposed in this report shall be installed in accordance with the information provided for the determined available structural capacity to be effective.

We at *NB+C Engineering Services* appreciate the opportunity of providing our continuing professional services to *T-Mobile*. If you have any questions or need further assistance on this or any other projects, please give us a call.

Structural analysis prepared by: Muritala Adegoke, PhD

Respectfully submitted by:

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5/5/2021

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1] INTRODUCTION

The proposed mounts are 2.0” nom sch 40 Pipe x 6ft long and 2.5” nom sch 40 x 12ft long Pipe Mounts located in Vienna, VA.

2] ANALYSIS CRITERIA

Building Code: *2015 Virginia Uniform Statewide Building Code*
TIA-222 Revision: *ANSI/TIA-222-G*
Risk Category: II
Wind Speed: 115 mph
Exposure Category: B
Topographic Factor: 1
Ice Thickness: 0.75 in
Wind Speed with Ice: 30 mph
Seismic S_{ds}: 0.129

Table 1 - Final Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Carrier	Feed Line Size (in)	Note
74.0 79.0	74.0 79.0	4	Ericsson	AIR6449 B41 (33.10”x20.60”x8.30”, 112lbs)	T-Mobile	(4) 6x12 Hybrid	-
		4	Ericsson	RADIO 4415 B25 (16.5”x13.5”x5.90”. 46lbs)			
		6	-	2.5SCH40	-	-	-
		2	Site Pro 1	WWM03	-	-	-
		2	Site Pro 1	SP250-6	-	-	-

Table 2 - Existing Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Carrier	Feed Line Size (in)	Note
74.0 79.0	74.0 79.0	2	Andrew	TMBXX-6516-A2M	T-Mobile	(4) 6x12 Hybrid[1]	2
		4	Ericsson	Twin Style 1A			
		6	Ericsson	Twin Style 1B			
		4	Ericsson	AIR32 DB B66A/B2A			1
		4	Ericsson	APXVAARR24_43-U-NA20			
		4	Ericsson	Radio 4449 B71+B85			
		6	-	Mount Pipes	-	-	

Notes:
1) Existing Equipment to remain
2) Existing Equipment to be removed; was not considered in this analysis.

3] ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
RFDS	T-Mobile	2/2/2021	On File
Site Audit Photos	NB+C	2/10/2021	On File
Previous Construction Drawings	Advantage Engineers	9/09/2010	On File
Previous structural Analysis	CMX	1/27/2010	On File
Construction Drawings	NB+C	4/19/2021	On File

3.1] Analysis Method

RISA-3D (Version 18.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower mount and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2] Assumptions

This report is based on the theoretical capacity of the existing mount structure and is not an assessment of the overall suitability of the existing mount structure or its components for any particular use other than specified in this report:

1) This report makes no warranties, expressed and/or implied, and disclaims any liability arising from material, fabrication and erection of the existing Structure or proposed equipment, and any other existing or proposed components or appurtenances.
2) Tower mounts were built in accordance with the manufacturer's specifications.
3) The tower mounts have been maintained in accordance with the manufacturer's specifications and current TIA Standards.
4) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Table 1.
5) Material grades were not provided and were assumed to be in accordance with Table 2-4 "Applicable ASTM Specifications for Various Structural Shapes" per the AISC 15th Edition of the Steel Construction Manual. The following material grades were assumed:
    a) Pipe Grade: ASTM A53-B-35
    b) Angle Grade: ASTM A36
    c) HSS Rect. Grade: ASTM A500 Gr. B
    d) Plate Grade: ASTM A36
6) All welds and connections are assumed to develop at least the member capacity unless determine otherwise and explicitly stated in this report.
7) Location of the existing and proposed equipment on the existing mount structure is based on information provided to **NB+C ES**.

This analysis may be affected if any assumptions are not valid or have been made in error. Network Building + Consulting Engineering Services, LLC should be notified to determine the effect on the structural integrity of the tower mount structure.

4] ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Component Type	Size	Bending Capacity %	Shear Capacity %	Pass / Fail
MP2	Pipe 2.5 STD	54.7	3.8	Pass
WWM03	HSS4X4X3	3.7	0.9	Pass
MP1	Pipe 2.0 STD	6.6	1.4	Pass

Table 5 - Connection Capacity (Summary)

Component Type	Size	Capacity %	Pass / Fail
Hilti HY-70 with 4" embedment	1/2" ø Threaded Rods	87.6	Pass
Hilti HY-20 with 6" embedment	5/8" ø Threaded Rods	99.7	Pass
Hilti HY-200 with 5-5/8" embedment	5/8" ø Threaded Rods	35.6	Pass

Notes:
1) See "Appendix A - Mount Analysis Additional Calculations" for additional calculations supporting the % capacity consumed.

Mount Structure Rating (max from all components) =	**99.7%**

5] CONCLUSIONS & RECOMMENDATIONS

Based on the performed analysis of the mount structure for applied gravity and lateral loads, the mount structures were determined to have **adequate** structural capacity per the requirements of the *ANSI/TIA-222-G* standard and the *2015 Uniform Statewide Building Code* to support the proposed T-Mobile antennas and associated equipment. To ensure the requirements of the *ANSI/TIA-222-G* standard and the *2015 Uniform Statewide Building Code* are met with the existing and proposed loading in place, **NB+C ES** has the following recommendation[s]:

1. All mount bolts be checked for tightness prior to the installation of the proposed loading and that all rusted hardware be replaced with galvanized hardware.
2. The *proposed AIR6449 B41* antennas, in *Alpha and Beta* sectors, will be supported on the *existing mount pipes* attached to the penthouse wall. The *proposed AIR6449 B41 antenna*, in *Gamma* sector, will be supported on the **proposed 2.5SCH 40 x 6' LG mount pipe** attached to the penthouse wall with ***Site Pro 1 Standoff arms, P/N: WWM03(typ. of 2) with 5/8" Ø threaded rods & Hilti HIT-HY 200 epoxy, min. 5-5/8" embedment***. The *proposed AIR6449 B41 antenna*, in *Delta* sector, will be supported on the ***proposed 2.5SCH 40 x 6' LG mount pipe*** attached to the penthouse wall with ***Site Pro 1 flush mounts, P/N: SP250-6(typ. of 2) with (2) 5/8" Ø threaded rods & Hilti HIT-HY 200 epoxy, min. 5-5/8" embedment***.
3. The *existing RFS equipment and proposed radios* , in *all* sectors, will be supported on the ***proposed 2.5SCH40 x 12ft long pipe mounts***, attached to the penthouse wall with the *existing wall mounts to be reused(typ. of 3)*.

This engineering analysis is based upon the theoretical capacity of the mount structure. It is not a condition assessment of the mount. If substantial modifications are to be made or the assumptions made in this analysis are not accurate, **NB+C ES** should be notified immediately to perform a revised analysis.

The conclusions reached by **NB+C ES** in this report are only applicable for the previously mentioned existing structural mount members supporting the T-Mobile telecommunications antennas. Furthermore, no structural qualification is made or implied by this report for the existing structural members not supporting the proposed equipment.

APPENDIX A

MOUNT ANALYSIS
ADDITIONAL CALCULATIONS

NB+C ES Project No.:	100595
Client Name:	T-Mobile
Carrier Name:	T-Mobile
Site Name:	White Oak Tower
Site ID:	7WAC050A
Date:	May 5, 2021

6095 Marshalee Drive, Suite 300, Elkridge, MD 21075

Pipe Mount Analysis

Applicable Codes

Interational Building Code	2015 Virginia Uniform Statewide Building Code
ASCE Standard	ASCE 7-10
TIA Standard	ANSI/TIA-222-G

Site Parameters

Tower Height	81.5	ft
Mount Centerline Height	79	ft
Ground Elevation	412.9	ft
State	VA	-
County	Fairfax	-
Basic Wind Speed per ASCE 7-10	115.0	mph
Maintenance Wind Speed	30	mph
Ice Wind Speed	30	mph
Design Ice Thickness	0.75	in
Design Acceleration, S_{ds}	0.129	-
Exposure Category	B	(B,C, or D)
Topographic Factor	1	K_{zt}
Tower Type	Rooftop	-
Risk Category	II	-
Mount Type	Pipe Mount	-

Rooftop Information

Height above roof	16.33	ft
Parapet Height	0	ft
Horizontal Distance	130.19	ft
Width of Windward Face of Building	61.25	ft
Height of Windward Face of Building	65.16	ft
H_1	0.0	ft
H_2	61.3	ft

Wind Parameters per TIA-222-G

Basic Wind Speed Parameters		
G_H	1.00	Gust Factor
K_a	0.90	Shielding Factor
K_z	0.92	Velocity Pressure
K_d	0.95	Wind Direction Probability
K_s	N/A	Rooftop Wind Speed-up factor
K_e	N/A	Ground Elevation factor
I_{wind}	N/A	Importance Factor (Wind w/o Ice)
q_z	29.71	Nominal Wind Pressure (psf)
q_z*K_a	26.74	Design Wind Force (psf)
q_{mz}	2.02	Maintenance Wind Pressure (psf)
C/D	110.54	(in/in)
Ice Wind Speed Parameters		
K_{iz}	1.09	Velocity Pressure
I_{ice}	1.00	Importance Factor (Ice)
t_{iz}	1.64	Escalated Ice Thickness (in)
q_{iz}	2.02	Ice Wind Pressure (psf)
$q_{iz}*K_a$	1.82	Design Ice Wind Force (psf)
C/D_{iz}	28.84	(in/in)
Seismic Parameters		
$I_{seismic}$	1.00	Importance Factor
ρ	1.00	Reducton Factor
R	2.00	Response Modification Factor
C_s	0.06	Seismic Response Coefficient
A_s	3.00	Amplification Factor
E_v	0.0774*D	Vertical Seismic Effect
E_h	0.1935*W	Horizontal Seismic Effect

Appurtenances Table

Manufacturer	Model	Equipment Type	Height (in)	Width (in)	Depth (in)	Weight (lbs)	Ice Weight (lbs)	Front FA (lbs)	Side FA (lbs)
Ericsson	AIR6449 B41	Antenna	33.1	20.6	8.3	112	140.51	151.96	64.60
RFS	APXVAALL24_43-U-NA20	Antenna	95.9	24	8.5	122.8	393.03	541.35	233.55
Ericsson	Radio 4449 B71+B85	RRH	17.9	13.19	9.44	71	70.50	52.62	37.66
Ericsson	Radio 4415 B25	RRH	16.5	13.5	5.9	46	55.31	49.64	21.93

Dishes Table

Manufacturer	Model	Type	Diameter(in)	Weight(lbs)	1/2" Ice Weight (lbs)

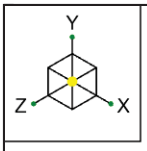
Results

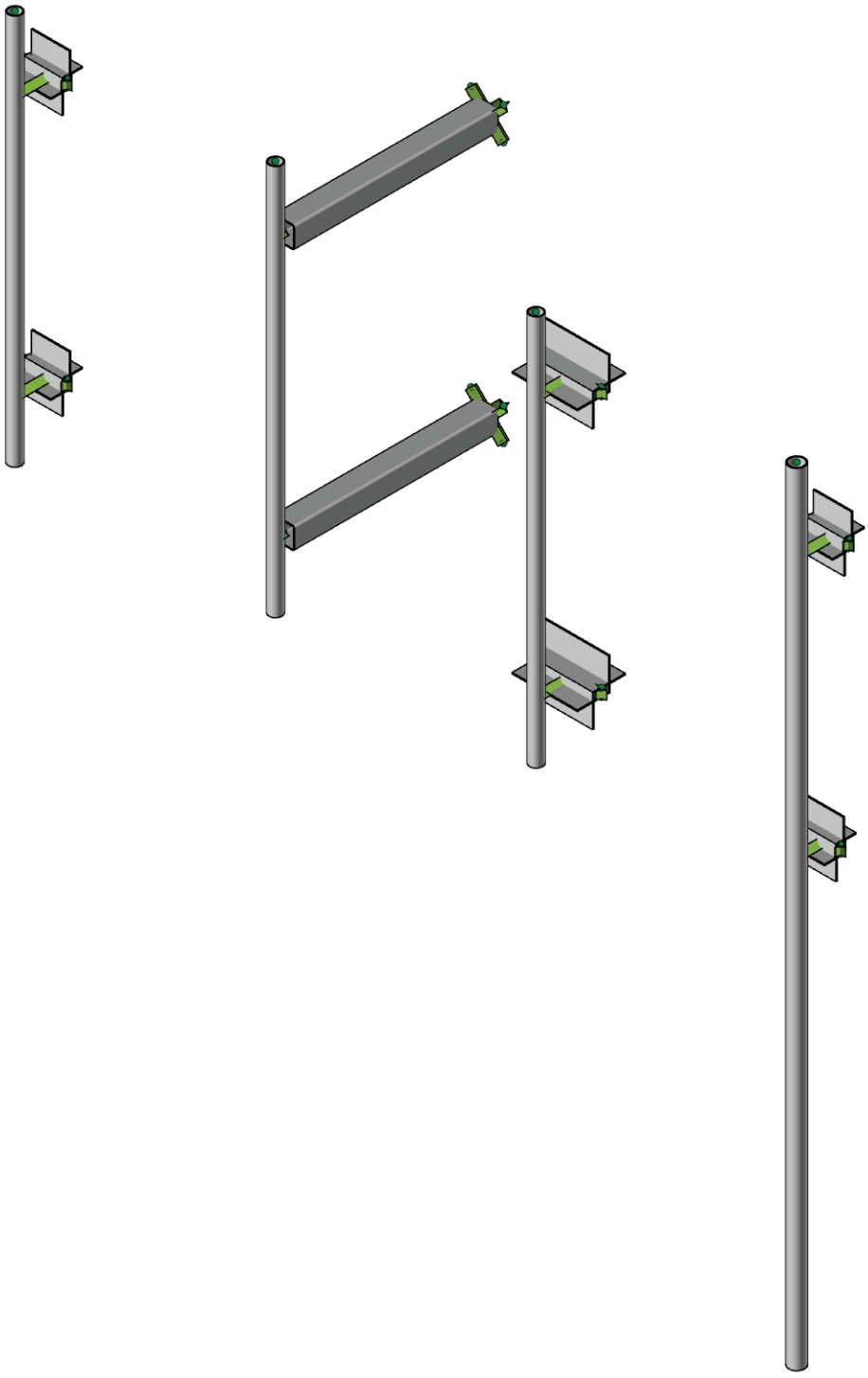
Member Results			
Member	Unity (Bending)	Shear Check	Pass / Fail
PIPE_2.5	54.7%	3.8%	PASS
L6X3.5X6	3.5%	9.6%	PASS
HSS4X4X3	3.7%	0.9%	PASS
PIPE_2.0	6.6%	1.4%	PASS
L6X6X5	0.6%	1.9%	PASS
	0.0%	0.0%	
	0.0%	0.0%	
	0.0%	0.0%	
	0.0%	0.0%	

Capacities up to 105% are considered acceptable based on analysis methods used.

Maximum Mount Deflections

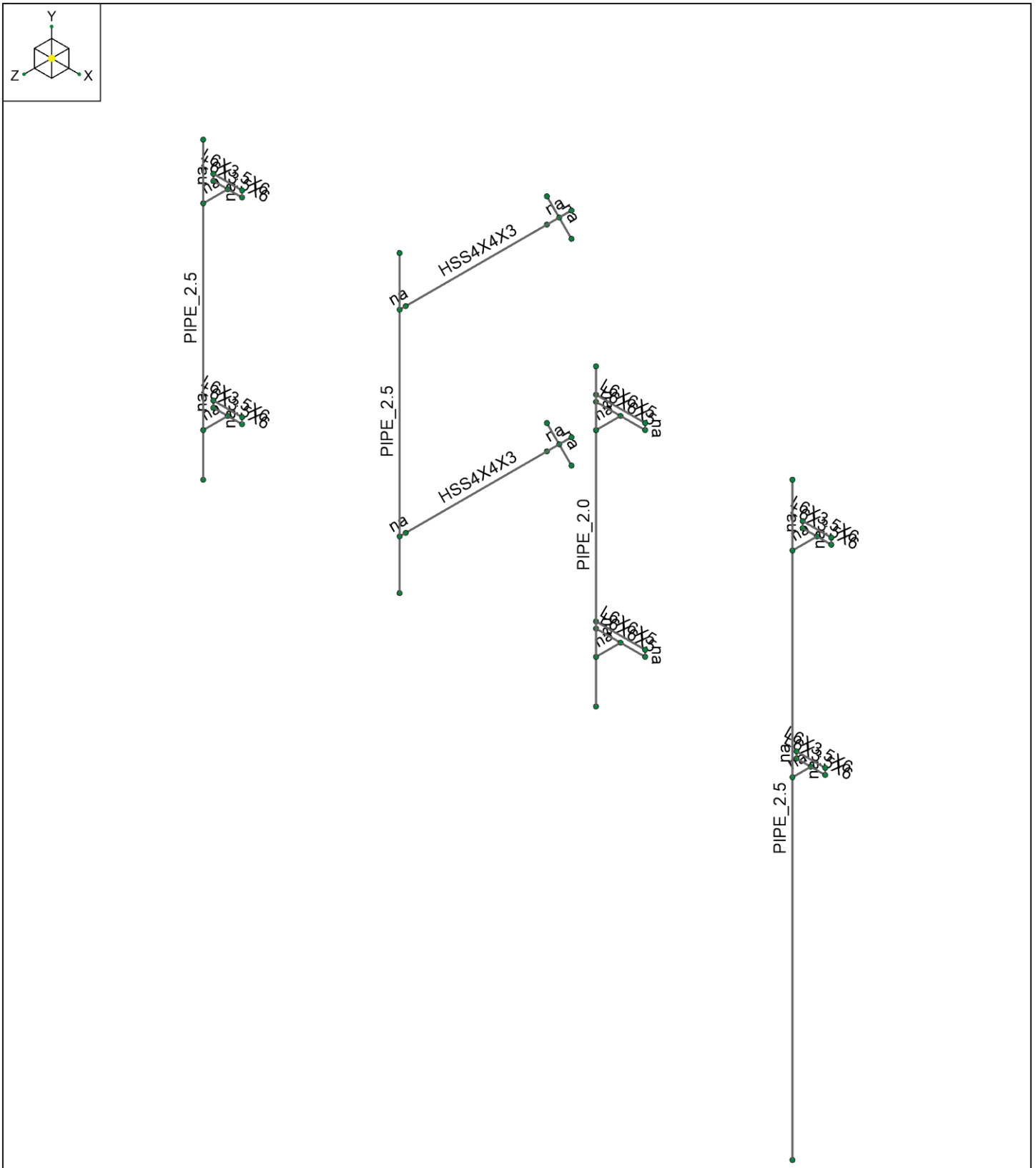
Mount Deflections		
Maximum Tilt	0.041	degrees
Maximum Twist	0.189	degrees
Maximum Vertical Deflection	0.009	inches





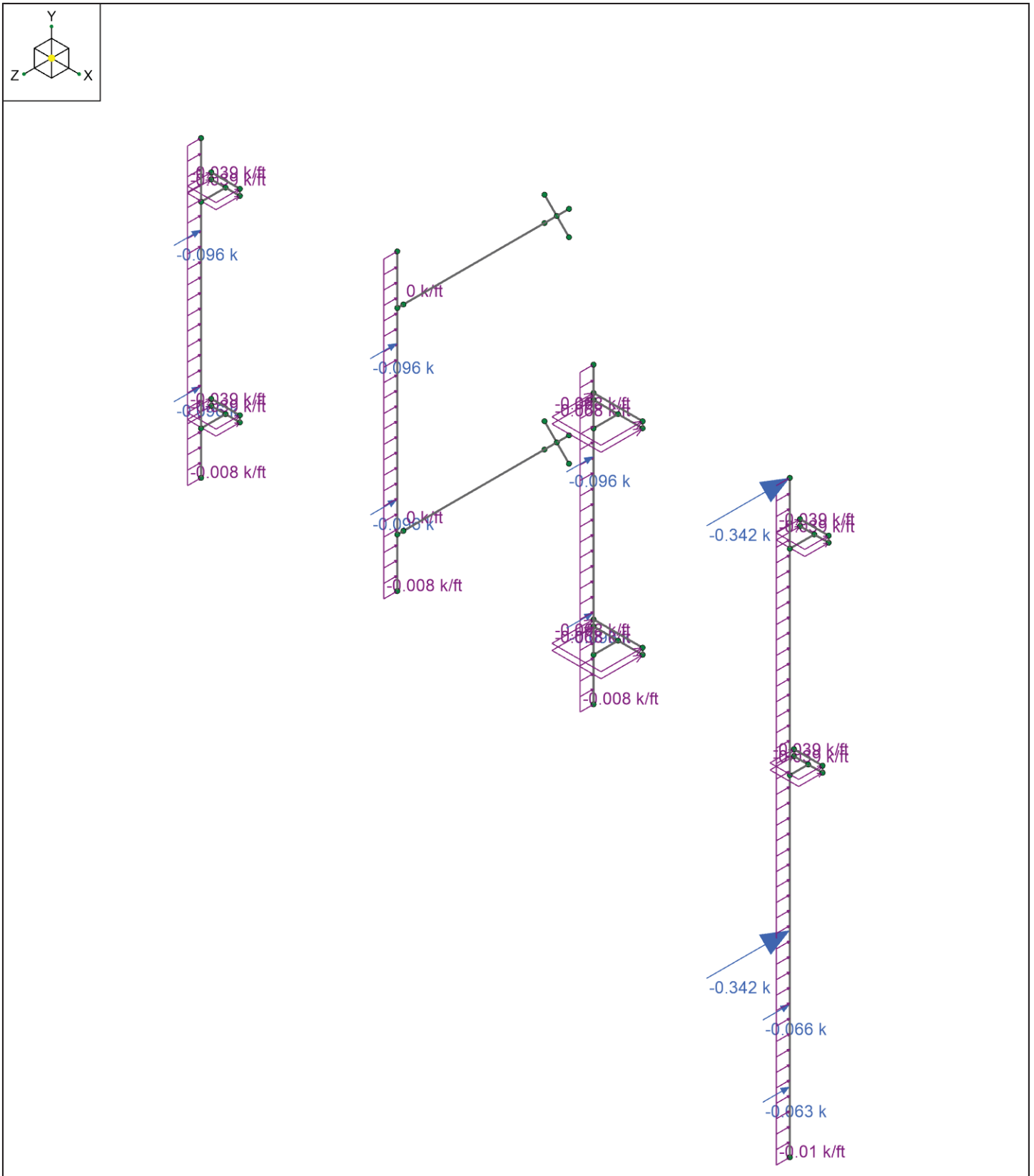
Envelope Only Solution

NB+C ES	7WAC050A	SK-1
MA		May 04, 2021
100595	Rendering	7WAC050A.r3d



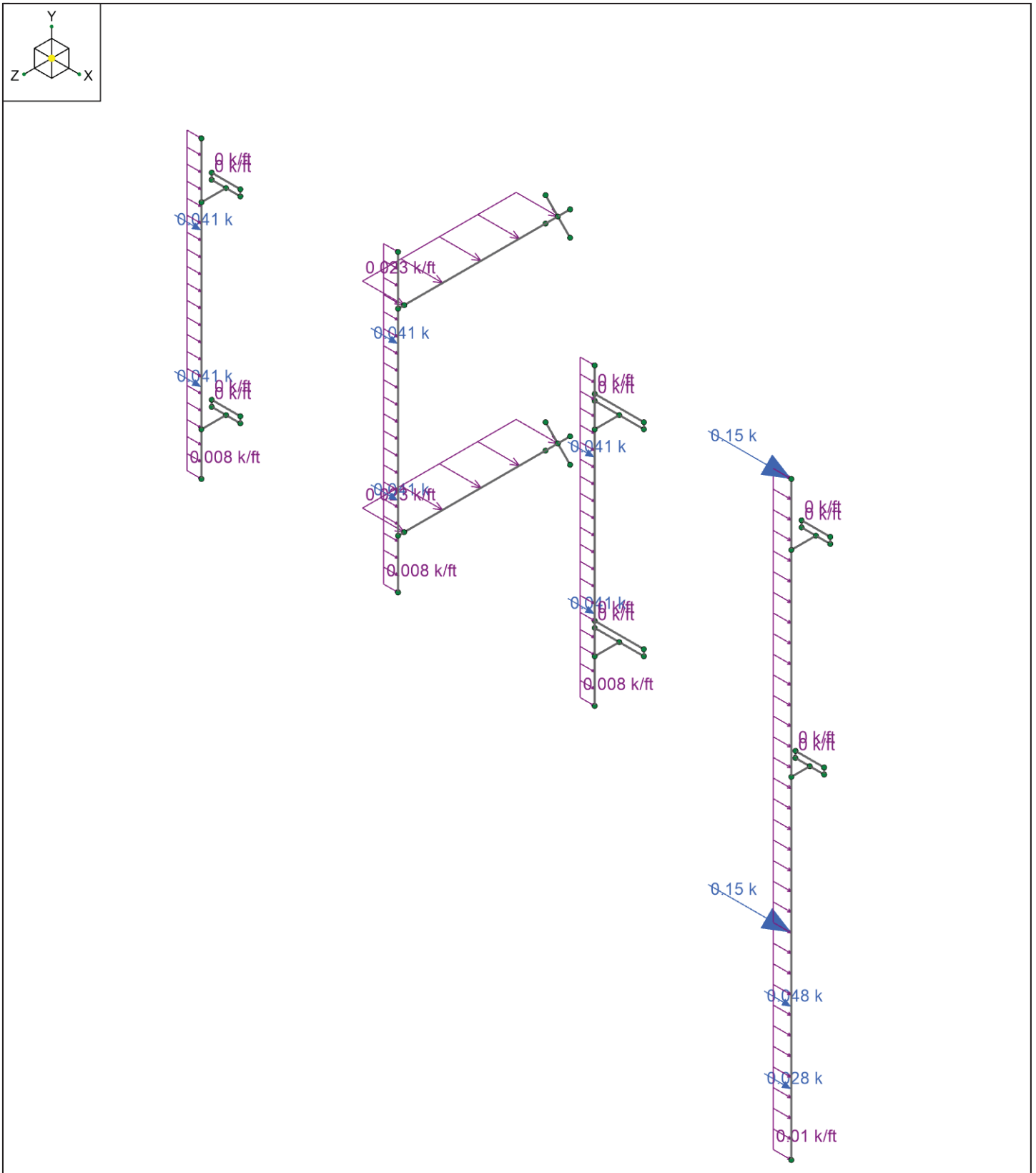
Envelope Only Solution

NB+C ES	7WAC050A	SK-2
MA		May 04, 2021
100595	Member Sizes	7WAC050A.r3d



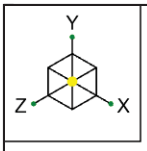
Loads: BLC 1, Front Wind (Wo)
Envelope Only Solution

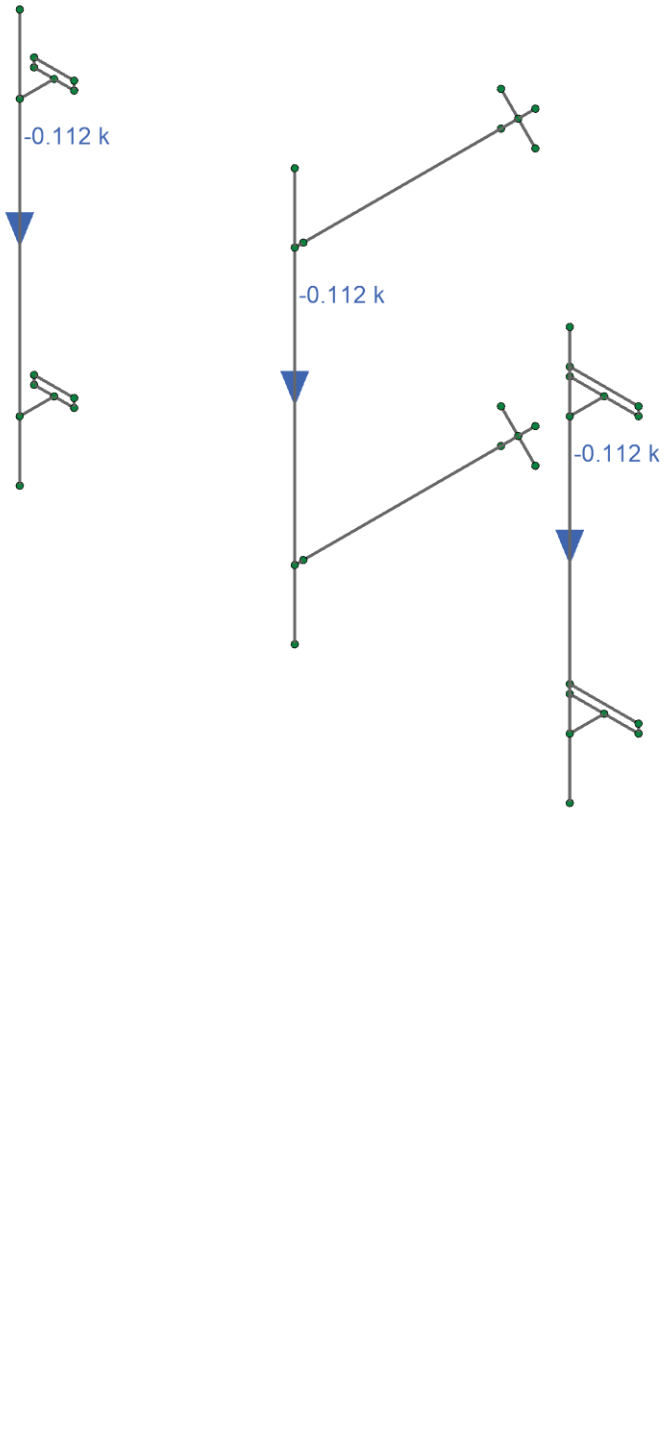
NB+C ES	7WAC050A	SK-3
MA		May 04, 2021
100595	Front Wind	7WAC050A.r3d



Loads: BLC 2, Side Wind (Wo)
Envelope Only Solution

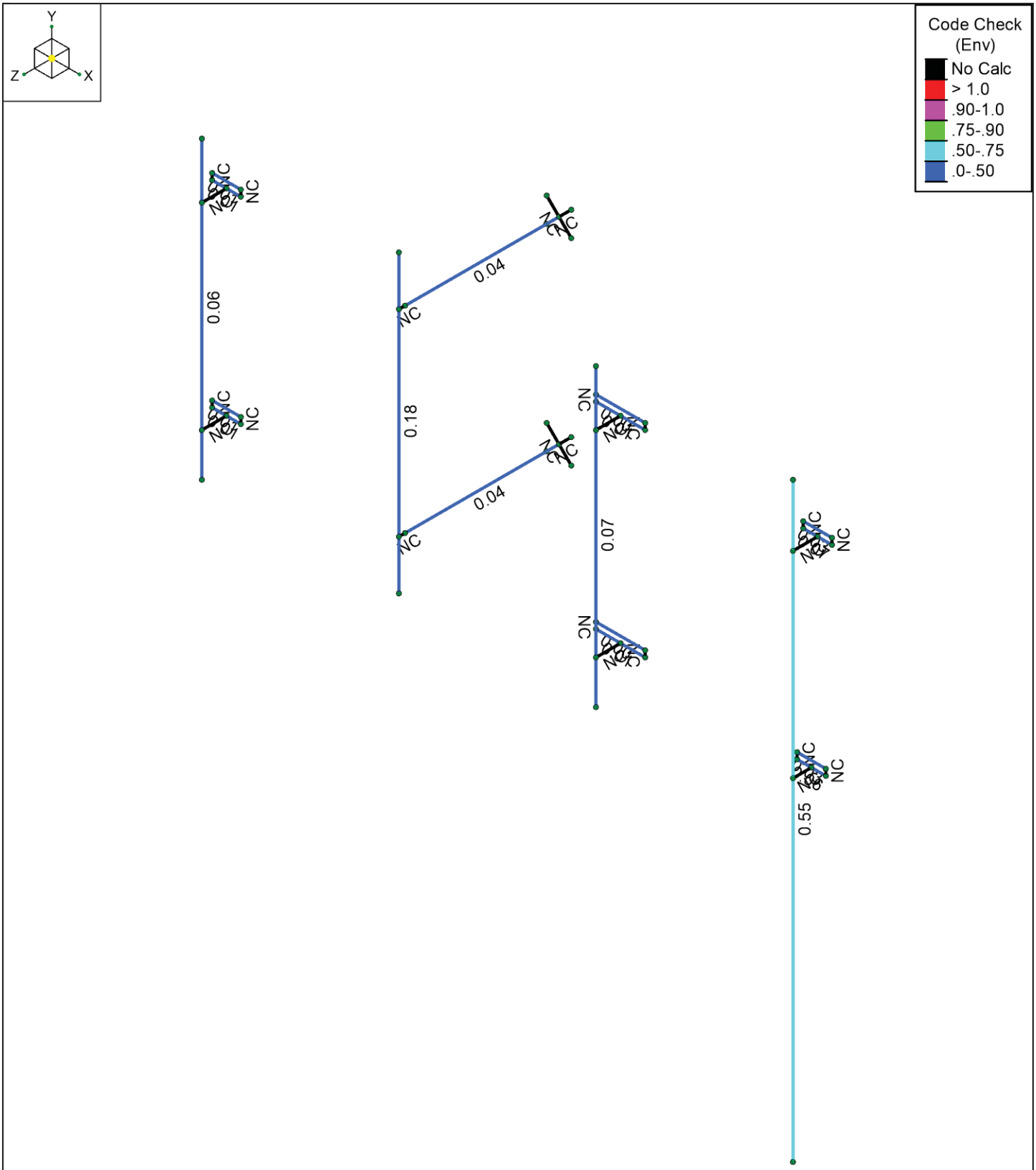
NB+C ES	7WAC050A	SK-4
MA		May 04, 2021
100595	Side Wind	7WAC050A.r3d





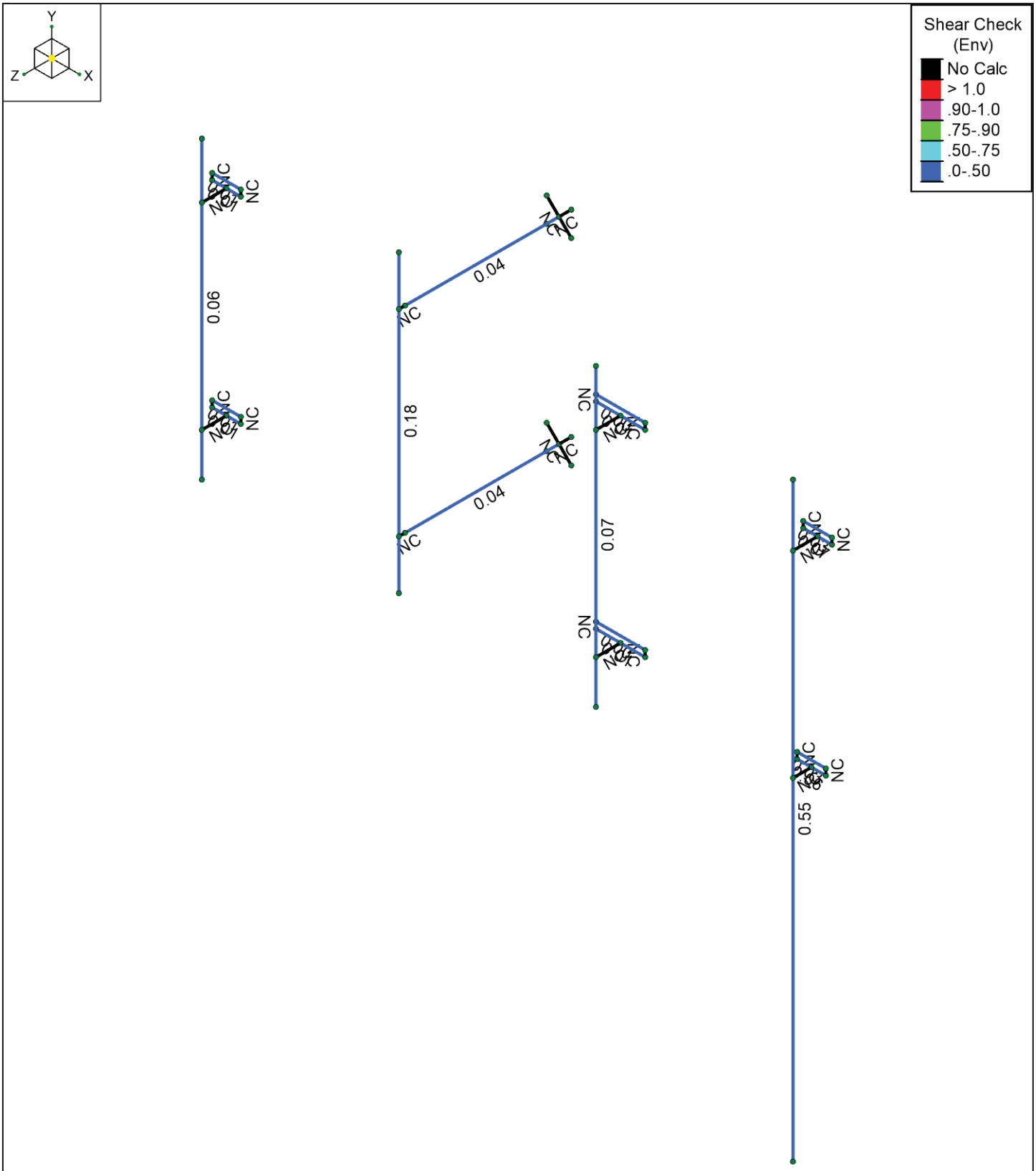
Loads: BLC 5, Dead (D)
Envelope Only Solution

NB+C ES	7WAC050A	SK-5
MA		May 04, 2021
100595	Dead Load	7WAC050A.r3d



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

NB+C ES	7WAC050A	SK-6
MA		May 04, 2021
100595	Unity Check	7WAC050A.r3d



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

NB+C ES	7WAC050A	SK-7
MA		May 04, 2021
100595	Shear Check	7WAC050A.r3d

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [1e^{5}°F^{-1}]	Density [k/ft^{3}]	Yield [ksi]	Ry	Fu [ksi]	Rt
1	A992	29000	11154	0.3	0.65	0.49	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	0.3	0.65	0.49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	0.3	0.65	0.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	0.3	0.65	0.527	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	0.3	0.65	0.527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	0.3	0.65	0.49	35	1.6	60	1.2
7	A1085	29000	11154	0.3	0.65	0.49	50	1.25	65	1.15
8	A913 Gr.65	29000	11154	0.3	0.65	0.49	65	1.1	80	1.1

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rule	Area [in^{2}]	Iyy [in^{4}]	Izz [in^{4}]	J [in^{4}]
1	MP1	PIPE_2.0	Column	None	A53 Gr.B	Typical	1.02	0.627	0.627	1.25
2	MP2	PIPE_2.5	Column	None	A53 Gr.B	Typical	1.61	1.45	1.45	2.89
3	MT-222	L6X3.5X6	Beam	None	A36 Gr.36	Typical	3.44	3.33	12.9	0.168
4	WWM03	HSS4X4X3	Beam	None	A500 Gr.B Rect	Typical	2.58	6.21	6.21	10
5	SP250-6	L6X6X5	Beam	None	A36 Gr.36	Typical	3.67	13	13	0.129

Node Coordinates

	Label	X [in]	Y [in]	Z [in]	Detach From Diaphragm
1	N1	0	72	0	
2	N2	0	144	0	
3	N3	0	82.5	0	
4	N4	0	130.5	0	
5	N6	0	130.5	-6	
6	N7	0	82.5	-6	
7	N8	-3.5	130.5	-6	
8	N9	3.5	130.5	-6	
9	N10	3.5	82.5	-6	
10	N11	-3.5	82.5	-6	
11	N12	3.5	132	-6	
12	N13	-3.5	132	-6	
13	N14	3.5	84	-6	
14	N15	-3.5	84	-6	
15	N16	144	0	0	
16	N17	144	144	0	
17	N18	144	129	0	
18	N19	144	81	0	
19	N20	144	129	-6	
20	N21	144	81	-4.5	
21	N22	140.5	129	-6	
22	N23	147.5	129	-6	
23	N24	147.5	81	-4.5	
24	N25	140.5	81	-4.5	
25	N26	140.5	130.5	-6	
26	N27	147.5	130.5	-6	
27	N28	140.5	82.5	-4.5	
28	N29	147.5	82.5	-4.5	
29	N30	48	72	0	
30	N31	48	144	0	
31	N32	48	132	0	
32	N33	48	132	-1.5	
33	N34	48	84	0	
34	N35	48	84	-1.5	
35	N36	48	132	-39	
36	N37	51	135	-39	
37	N38	45	135	-39	
38	N39	51	129	-39	

Node Coordinates (Continued)

	Label	X [in]	Y [in]	Z [in]	Detach From Diaphragm
39	N40	45	129	-39	
40	N41	51	87	-39	
41	N42	51	81	-39	
42	N43	45	87	-39	
43	N44	48	84	-39	
44	N45	45	81	-39	
45	N48	96	72	0	
46	N49	96	144	0	
47	N50	96	130.5	0	
48	N51	96	130.5	-6	
49	N52	102	130.5	-6	
50	N53	90	130.5	-6	
51	N54	90	132	-6	
52	N55	102	132	-6	
53	N58	90	82.5	-6	
54	N59	96	82.5	-6	
55	N60	102	82.5	-6	
56	N61	90	84	-6	
57	N62	102	84	-6	
58	N63	96	82.5	0	

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Point	Distributed
1	Front Wind (Wo)	None				10	18
2	Side Wind (Wo)	None				10	18
3	Front Ice Wind (Wi)	None				10	18
4	Side Ice Wind (Wi)	None				10	39
5	Dead (D)	None		-1		6	
6	Ice Dead (Di)	None				6	18
7	Front Seismic	None			-1	6	
8	Side Seismic	None	-1			6	
9	Maintenance 1 (Lm)	None					
10	Maintenance 2 (Lm)	None					
11	Maintenance 3 (Lm)	None					
12	Maintenance 4 (Lm)	None					
13	Maintenance 1 (Lv)	None					
14	Maintenance 2 (Lv)	None					
15	Maintenance 3 (Lv)	None					
16	Maintenance 4 (Lv)	None					

Member Point Loads

	Member Label	Direction	Magnitude [k, k-ft]	Location [(in, %)]	Inactive [(k, k-ft), (in, rad), (k*s²/in, k*s²*in)]
1	ALL SECTORS	Z	-0.342	%100	Active
2	ALPHA/BETA	Z	-0.096	%73	Active
3	GAMMA	Z	-0.096	%73	Active
4	DELTA	Z	-0.096	%73	Active
5	ALL SECTORS	Z	-0.342	%33.4	Active
6	ALPHA/BETA	Z	-0.096	%27	Active
7	GAMMA	Z	-0.096	%27	Active
8	DELTA	Z	-0.096	%27	Active
9	ALL SECTORS	Z	-0.066	%22.5	Active
10	ALL SECTORS	Z	-0.063	%10.4	Active

Member Point Loads

	Member Label	Direction	Magnitude [k, k-ft]	Location [(in, %)]	Inactive [(k, k-ft), (in, rad), (k*s²/in, k*s²*in)]
1	ALL SECTORS	X	0.15	%100	Active
2	ALPHA/BETA	X	0.041	%73	Active

Member Point Loads (Continued)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(in, %)]	Inactive [(k, k-ft), (in, rad), (k*s²/in, k*s²*in)]
3	GAMMA	X	0.041	%73	Active
4	DELTA	X	0.041	%73	Active
5	ALL SECTORS	X	0.15	%33.4	Active
6	ALPHA/BETA	X	0.041	%27	Active
7	GAMMA	X	0.041	%27	Active
8	DELTA	X	0.041	%27	Active
9	ALL SECTORS	X	0.048	%22.5	Active
10	ALL SECTORS	X	0.028	%10.4	Active

Member Point Loads

	Member Label	Direction	Magnitude [k, k-ft]	Location [(in, %)]	Inactive [(k, k-ft), (in, rad), (k*s²/in, k*s²*in)]
1	ALL SECTORS	Z	-0.027	%100	Active
2	ALPHA/BETA	Z	-0.008	%73	Active
3	GAMMA	Z	-0.008	%73	Active
4	DELTA	Z	-0.008	%73	Active
5	ALL SECTORS	Z	-0.027	%33.4	Active
6	ALPHA/BETA	Z	-0.008	%27	Active
7	GAMMA	Z	-0.008	%27	Active
8	DELTA	Z	-0.008	%27	Active
9	ALL SECTORS	Z	-0.007	%22.5	Active
10	ALL SECTORS	Z	-0.006	%10.4	Active

Member Point Loads

	Member Label	Direction	Magnitude [k, k-ft]	Location [(in, %)]	Inactive [(k, k-ft), (in, rad), (k*s²/in, k*s²*in)]
1	ALL SECTORS	X	0.014	%100	Active
2	ALPHA/BETA	X	0.004	%73	Active
3	GAMMA	X	0.004	%73	Active
4	DELTA	X	0.004	%73	Active
5	ALL SECTORS	X	0.014	%33.4	Active
6	ALPHA/BETA	X	0.004	%27	Active
7	GAMMA	X	0.004	%27	Active
8	DELTA	X	0.004	%27	Active
9	ALL SECTORS	X	0.007	%22.5	Active
10	ALL SECTORS	X	0.006	%10.4	Active

Member Point Loads

	Member Label	Direction	Magnitude [k, k-ft]	Location [(in, %)]	Inactive [(k, k-ft), (in, rad), (k*s²/in, k*s²*in)]
1	ALL SECTORS	Y	-0.128	%66.7	Active
2	ALPHA/BETA	Y	-0.112	%50	Active
3	GAMMA	Y	-0.112	%50	Active
4	DELTA	Y	-0.112	%50	Active
5	ALL SECTORS	Y	-0.071	%22.5	Active
6	ALL SECTORS	Y	-0.046	%10.4	Active

Member Point Loads

	Member Label	Direction	Magnitude [k, k-ft]	Location [(in, %)]	Inactive [(k, k-ft), (in, rad), (k*s²/in, k*s²*in)]
1	ALL SECTORS	Y	-0.396	%66.7	Active
2	ALPHA/BETA	Y	-0.141	%50	Active
3	GAMMA	Y	-0.141	%50	Active
4	DELTA	Y	-0.141	%50	Active
5	ALL SECTORS	Y	-0.071	%22.5	Active
6	ALL SECTORS	Y	-0.055	%10.4	Active

Member Point Loads

	Member Label	Direction	Magnitude [k, k-ft]	Location [(in, %)]	Inactive [(k, k-ft), (in, rad), (k*s²/in, k*s²*in)]
1	ALL SECTORS	Z	-0.128	%66.7	Active
2	ALPHA/BETA	Z	-0.112	%50	Active
3	GAMMA	Z	-0.112	%50	Active
4	DELTA	Z	-0.112	%50	Active
5	ALL SECTORS	Z	-0.071	%22.5	Active
6	ALL SECTORS	Z	-0.046	%10.4	Active

Member Point Loads

	Member Label	Direction	Magnitude [k, k-ft]	Location [(in, %)]	Inactive [(k, k-ft), (in, rad), (k*s²/in, k*s²*in)]
1	ALL SECTORS	X	0.128	%66.7	Active
2	ALPHA/BETA	X	0.112	%50	Active
3	GAMMA	X	0.112	%50	Active
4	DELTA	X	0.112	%50	Active
5	ALL SECTORS	X	0.071	%22.5	Active
6	ALL SECTORS	X	0.046	%10.4	Active

Member Distributed Loads

	Member Label	Direction	Start Magnitude [k/ft, F, ksf]	End Magnitude [k/ft, F, ksf]	Start Location [(in, %)]	End Location [(in, %)]	Inactive [(k, k-ft), (in, rad), (k*s²/in, k*s²*in)]
1	ALL SECTORS	PZ	-0.01	-0.01	0	%100	Active
2	ALPHA/BETA	PZ	-0.008	-0.008	0	%100	Active
3	DELTA	PZ	-0.008	-0.008	0	%100	Active
4	GAMMA	PZ	-0.008	-0.008	0	%100	Active
5	M13	PZ	-0.039	-0.039	0	%100	Active
6	M14	PZ	-0.039	-0.039	0	%100	Active
7	M15	PZ	-0.039	-0.039	0	%100	Active
8	M16	PZ	-0.039	-0.039	0	%100	Active
9	M2	PZ	-0.039	-0.039	0	%100	Active
10	M26	PZ	-0.023	-0.023	0	%100	Active
11	M3	PZ	-0.039	-0.039	0	%100	Active
12	M31	PZ	-0.023	-0.023	0	%100	Active
13	M35	PZ	-0.068	-0.068	0	%100	Active
14	M36	PZ	-0.068	-0.068	0	%100	Active
15	M39	PZ	-0.068	-0.068	0	%100	Active
16	M4	PZ	-0.039	-0.039	0	%100	Active
17	M40	PZ	-0.068	-0.068	0	%100	Active
18	M5	PZ	-0.039	-0.039	0	%100	Active

Member Distributed Loads

	Member Label	Direction	Start Magnitude [k/ft, F, ksf]	End Magnitude [k/ft, F, ksf]	Start Location [(in, %)]	End Location [(in, %)]	Inactive [(k, k-ft), (in, rad), (k*s²/in, k*s²*in)]
1	ALL SECTORS	PX	0.01	0.01	0	%100	Active
2	ALPHA/BETA	PX	0.008	0.008	0	%100	Active
3	DELTA	PX	0.008	0.008	0	%100	Active
4	GAMMA	PX	0.008	0.008	0	%100	Active
5	M13	PX	0.039	0.039	0	%100	Active
6	M14	PX	0.039	0.039	0	%100	Active
7	M15	PX	0.039	0.039	0	%100	Active
8	M16	PX	0.039	0.039	0	%100	Active
9	M2	PX	0.039	0.039	0	%100	Active
10	M26	PX	0.023	0.023	0	%100	Active
11	M3	PX	0.039	0.039	0	%100	Active
12	M31	PX	0.023	0.023	0	%100	Active
13	M35	PX	0.068	0.068	0	%100	Active
14	M36	PX	0.068	0.068	0	%100	Active
15	M39	PX	0.068	0.068	0	%100	Active
16	M4	PX	0.039	0.039	0	%100	Active
17	M40	PX	0.068	0.068	0	%100	Active
18	M5	PX	0.039	0.039	0	%100	Active

Member Distributed Loads

	Member Label	Direction	Start Magnitude [k/ft, F, ksf]	End Magnitude [k/ft, F, ksf]	Start Location [(in, %)]	End Location [(in, %)]	Inactive [(k, k-ft), (in, rad), (k*s²/in, k*s²*in)]
1	ALL SECTORS	PZ	-0.001	-0.001	0	%100	Active
2	ALPHA/BETA	PZ	-0.001	-0.001	0	%100	Active
3	DELTA	PZ	-0.001	-0.001	0	%100	Active
4	GAMMA	PZ	-0.001	-0.001	0	%100	Active
5	M13	PZ	-0.002	-0.002	0	%100	Active
6	M14	PZ	-0.002	-0.002	0	%100	Active
7	M15	PZ	-0.002	-0.002	0	%100	Active
8	M16	PZ	-0.002	-0.002	0	%100	Active
9	M2	PZ	-0.002	-0.002	0	%100	Active
10	M26	PZ	-0.001	-0.001	0	%100	Active
11	M3	PZ	-0.002	-0.002	0	%100	Active
12	M31	PZ	-0.001	-0.001	0	%100	Active
13	M35	PZ	-0.003	-0.003	0	%100	Active
14	M36	PZ	-0.003	-0.003	0	%100	Active
15	M39	PZ	-0.003	-0.003	0	%100	Active
16	M4	PZ	-0.002	-0.002	0	%100	Active
17	M40	PZ	-0.003	-0.003	0	%100	Active
18	M5	PZ	-0.002	-0.002	0	%100	Active

Member Distributed Loads

	Member Label	Direction	Start Magnitude [k/ft, F, ksf]	End Magnitude [k/ft, F, ksf]	Start Location [(in, %)]	End Location [(in, %)]	Inactive [(k, k-ft), (in, rad), (k*s²/in, k*s²*in)]
1	ALL SECTORS	PX	0.001	0.001	0	%100	Active
2	ALPHA/BETA	PX	0.001	0.001	0	%100	Active
3	DELTA	PX	0.001	0.001	0	%100	Active
4	GAMMA	PX	0.001	0.001	0	%100	Active
5	M13	PX	0.002	0.002	0	%100	Active
6	M14	PX	0.002	0.002	0	%100	Active
7	M15	PX	0.002	0.002	0	%100	Active
8	M16	PX	0.002	0.002	0	%100	Active
9	M2	PX	0.002	0.002	0	%100	Active
10	M26	PX	0.001	0.001	0	%100	Active
11	M3	PX	0.002	0.002	0	%100	Active
12	M31	PX	0.001	0.001	0	%100	Active
13	M35	PX	0.003	0.003	0	%100	Active
14	M36	PX	0.003	0.003	0	%100	Active
15	M39	PX	0.003	0.003	0	%100	Active
16	M4	PX	0.002	0.002	0	%100	Active
17	M40	PX	0.003	0.003	0	%100	Active
18	M5	PX	0.002	0.002	0	%100	Active
19	M39	PX	0.003	0.003	0	%100	Active
20	M4	PX	0.002	0.002	0	%100	Active
21	M40	PX	0.003	0.003	0	%100	Active
22	ALL SECTORS	PX	0.001	0.001	0	%100	Active
23	ALPHA/BETA	PX	0.001	0.001	0	%100	Active
24	DELTA	PX	0.001	0.001	0	%100	Active
25	GAMMA	PX	0.001	0.001	0	%100	Active
26	M13	PX	0.002	0.002	0	%100	Active
27	M14	PX	0.002	0.002	0	%100	Active
28	M15	PX	0.002	0.002	0	%100	Active
29	M16	PX	0.002	0.002	0	%100	Active
30	M2	PX	0.002	0.002	0	%100	Active
31	M26	PX	0.001	0.001	0	%100	Active
32	M3	PX	0.002	0.002	0	%100	Active
33	M31	PX	0.001	0.001	0	%100	Active
34	M35	PX	0.003	0.003	0	%100	Active
35	M36	PX	0.003	0.003	0	%100	Active
36	M39	PX	0.003	0.003	0	%100	Active
37	M4	PX	0.002	0.002	0	%100	Active

Member Distributed Loads (Continued)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf]	End Magnitude [k/ft, F, ksf]	Start Location [(in, %)]	End Location [(in, %)]	Inactive [(k, k-ft), (in, rad), (k*s²/in, k*s²*in)]
38	M40	PX	0.003	0.003	0	%100	Active
39	M5	PX	0.002	0.002	0	%100	Active

Member Distributed Loads

	Member Label	Direction	Start Magnitude [k/ft, F, ksf]	End Magnitude [k/ft, F, ksf]	Start Location [(in, %)]	End Location [(in, %)]	Inactive [(k, k-ft), (in, rad), (k*s²/in, k*s²*in)]
1	ALL SECTORS	Y	-0.009	-0.009	0	%100	Active
2	ALPHA/BETA	Y	-0.008	-0.008	0	%100	Active
3	DELTA	Y	-0.008	-0.008	0	%100	Active
4	GAMMA	Y	-0.008	-0.008	0	%100	Active
5	M13	Y	-0.019	-0.019	0	%100	Active
6	M14	Y	-0.019	-0.019	0	%100	Active
7	M15	Y	-0.019	-0.019	0	%100	Active
8	M16	Y	-0.019	-0.019	0	%100	Active
9	M2	Y	-0.019	-0.019	0	%100	Active
10	M26	Y	-0.015	-0.015	0	%100	Active
11	M3	Y	-0.019	-0.019	0	%100	Active
12	M31	Y	-0.015	-0.015	0	%100	Active
13	M35	Y	-0.03	-0.03	0	%100	Active
14	M36	Y	-0.03	-0.03	0	%100	Active
15	M39	Y	-0.03	-0.03	0	%100	Active
16	M4	Y	-0.019	-0.019	0	%100	Active
17	M40	Y	-0.03	-0.03	0	%100	Active
18	M5	Y	-0.019	-0.019	0	%100	Active

Load Combinations

	Description	Solve	PDelta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	1.4D	Yes	Y	5	1.4						
2	1.2D + 1.5Lv1	Yes	Y	5	1.2	13	1.5				
3	1.2D + 1.5Lv2	Yes	Y	5	1.2	14	1.5				
4	1.2D + 1.5Lv3	Yes	Y	5	1.2	15	1.5				
5	1.2D + 1.5Lv4	Yes	Y	5	1.2	16	1.5				
6	***WIND***										
7	1.2D + 1.0Wo (0°)	Yes	Y	5	1.2	1	1				
8	1.2D + 1.0Wo (30°)	Yes	Y	5	1.2	1	0.866	2	0.5		
9	1.2D + 1.0Wo (45°)	Yes	Y	5	1.2	1	0.707	2	0.707		
10	1.2D + 1.0Wo (60°)	Yes	Y	5	1.2	1	0.5	2	0.866		
11	1.2D + 1.0Wo (90°)	Yes	Y	5	1.2			2	1		
12	1.2D + 1.0Wo (120°)	Yes	Y	5	1.2	1	-0.5	2	0.866		
13	1.2D + 1.0Wo (135°)	Yes	Y	5	1.2	1	-0.707	2	0.707		
14	1.2D + 1.0Wo (150°)	Yes	Y	5	1.2	1	-0.866	2	0.5		
15	1.2D + 1.0Wo (180°)	Yes	Y	5	1.2	1	-1				
16	1.2D + 1.0Wo (210°)	Yes	Y	5	1.2	1	-0.866	2	-0.5		
17	1.2D + 1.0Wo (225°)	Yes	Y	5	1.2	1	-0.707	2	-0.707		
18	1.2D + 1.0Wo (240°)	Yes	Y	5	1.2	1	-0.5	2	-0.866		
19	1.2D + 1.0Wo (270°)	Yes	Y	5	1.2			2	-1		
20	1.2D + 1.0Wo (330°)	Yes	Y	5	1.2	1	0.5	2	-0.866		
21	1.2D + 1.0Wo (315°)	Yes	Y	5	1.2	1	0.707	2	-0.707		
22	1.2D + 1.0Wo (330°)	Yes	Y	5	1.2	1	0.866	2	-0.5		
23	***ICE***										
24	1.2D + 1.0Di + 1.0Wi (0°)	Yes	Y	5	1.2	6	1	3	1		
25	1.2D + 1.0Di + 1.0Wi (30°)	Yes	Y	5	1.2	6	1	3	0.866	4	0.5
26	1.2D + 1.0Di + 1.0Wi (45°)	Yes	Y	5	1.2	6	1	3	0.707	4	0.707
27	1.2D + 1.0Di + 1.0Wi (60°)	Yes	Y	5	1.2	6	1	3	0.5	4	0.866
28	1.2D + 1.0Di + 1.0Wi (90°)	Yes	Y	5	1.2	6	1			4	1
29	1.2D + 1.0Di + 1.0Wi (120°)	Yes	Y	5	1.2	6	1	3	-0.5	4	0.866
30	1.2D + 1.0Di + 1.0Wi (135°)	Yes	Y	5	1.2	6	1	3	-0.707	4	0.707
31	1.2D + 1.0Di + 1.0Wi (150°)	Yes	Y	5	1.2	6	1	3	-0.866	4	0.5
32	1.2D + 1.0Di + 1.0Wi (180°)	Yes	Y	5	1.2	6	1	3	-1		

Load Combinations (Continued)

	Description	Solve	PDelta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
32	1.2D + 1.0Di + 1.0Wi (180º)	Yes	Y	5	1.2	6	1	3	-1		
33	1.2D + 1.0Di + 1.0Wi (210º)	Yes	Y	5	1.2	6	1	3	-0.866	4	-0.5
34	1.2D + 1.0Di + 1.0Wi (225º)	Yes	Y	5	1.2	6	1	3	-0.707	4	-0.707
35	1.2D + 1.0Di + 1.0Wi (240º)	Yes	Y	5	1.2	6	1	3	-0.5	4	-0.866
36	1.2D + 1.0Di + 1.0Wi (270º)	Yes	Y	5	1.2	6	1			4	-1
37	1.2D + 1.0Di + 1.0Wi (300º)	Yes	Y	5	1.2	6	1	3	0.5	4	-0.866
38	1.2D + 1.0Di + 1.0Wi (315º)	Yes	Y	5	1.2	6	1	3	0.707	4	-0.707
39	1.2D + 1.0Di + 1.0Wi (330º)	Yes	Y	5	1.2	6	1	3	0.866	4	-0.5
40	***MAINTENANCE***										
41	1.2D + 1.5Lm + 1.0Wm (0º)	Yes	Y	5	1.2	9	1.5	1	0.068		
42	1.2D + 1.5Lm + 1.0Wm (30º)	Yes	Y	5	1.2	9	1.5	1	0.059	2	0.034
43	1.2D + 1.5Lm + 1.0Wm (45º)	Yes	Y	5	1.2	9	1.5	1	0.048	2	0.048
44	1.2D + 1.5Lm + 1.0Wm (60º)	Yes	Y	5	1.2	9	1.5	1	0.034	2	0.059
45	1.2D + 1.5Lm + 1.0Wm (90º)	Yes	Y	5	1.2	9	1.5			2	0.068
46	1.2D + 1.5Lm + 1.0Wm (120º)	Yes	Y	5	1.2	9	1.5	1	-0.034	2	0.059
47	1.2D + 1.5Lm + 1.0Wm (135º)	Yes	Y	5	1.2	9	1.5	1	-0.048	2	0.048
48	1.2D + 1.5Lm + 1.0Wm (150º)	Yes	Y	5	1.2	9	1.5	1	-0.059	2	0.034
49	1.2D + 1.5Lm + 1.0Wm (180º)	Yes	Y	5	1.2	9	1.5	1	-0.068		
50	1.2D + 1.5Lm + 1.0Wm (210º)	Yes	Y	5	1.2	9	1.5	1	-0.059	2	-0.034
51	1.2D + 1.5Lm + 1.0Wm (225º)	Yes	Y	5	1.2	9	1.5	1	-0.048	2	-0.048
52	1.2D + 1.5Lm + 1.0Wm (240º)	Yes	Y	5	1.2	9	1.5	1	-0.034	2	-0.059
53	1.2D + 1.5Lm + 1.0Wm (270º)	Yes	Y	5	1.2	9	1.5			2	-0.068
54	1.2D + 1.5Lm + 1.0Wm (300º)	Yes	Y	5	1.2	9	1.5	1	0.034	2	-0.059
55	1.2D + 1.5Lm + 1.0Wm (315º)	Yes	Y	5	1.2	9	1.5	1	0.048	2	-0.048
56	1.2D + 1.5Lm + 1.0Wm (330º)	Yes	Y	5	1.2	9	1.5	1	0.059	2	-0.034
57	1.2D + 1.5Lm + 1.0Wm (0º)	Yes	Y	5	1.2	10	1.5	1	0.068		
58	1.2D + 1.5Lm + 1.0Wm (30º)	Yes	Y	5	1.2	10	1.5	1	0.059	2	0.034
59	1.2D + 1.5Lm + 1.0Wm (45º)	Yes	Y	5	1.2	10	1.5	1	0.048	2	0.048
60	1.2D + 1.5Lm + 1.0Wm (60º)	Yes	Y	5	1.2	10	1.5	1	0.034	2	0.059
61	1.2D + 1.5Lm + 1.0Wm (90º)	Yes	Y	5	1.2	10	1.5			2	0.068
62	1.2D + 1.5Lm + 1.0Wm (120º)	Yes	Y	5	1.2	10	1.5	1	-0.034	2	0.059
63	1.2D + 1.5Lm + 1.0Wm (135º)	Yes	Y	5	1.2	10	1.5	1	-0.048	2	0.048
64	1.2D + 1.5Lm + 1.0Wm (150º)	Yes	Y	5	1.2	10	1.5	1	-0.059	2	0.034
65	1.2D + 1.5Lm + 1.0Wm (180º)	Yes	Y	5	1.2	10	1.5	1	-0.068		
66	1.2D + 1.5Lm + 1.0Wm (210º)	Yes	Y	5	1.2	10	1.5	1	-0.059	2	-0.034
67	1.2D + 1.5Lm + 1.0Wm (225º)	Yes	Y	5	1.2	10	1.5	1	-0.048	2	-0.048
68	1.2D + 1.5Lm + 1.0Wm (240º)	Yes	Y	5	1.2	10	1.5	1	-0.034	2	-0.059
69	1.2D + 1.5Lm + 1.0Wm (270º)	Yes	Y	5	1.2	10	1.5			2	-0.068
70	1.2D + 1.5Lm + 1.0Wm (300º)	Yes	Y	5	1.2	10	1.5	1	0.034	2	-0.059
71	1.2D + 1.5Lm + 1.0Wm (315º)	Yes	Y	5	1.2	10	1.5	1	0.048	2	-0.048
72	1.2D + 1.5Lm + 1.0Wm (330º)	Yes	Y	5	1.2	10	1.5	1	0.059	2	-0.034
73	1.2D + 1.5Lm + 1.0Wm (0º)	Yes	Y	5	1.2	11	1.5	1	0.068		
74	1.2D + 1.5Lm + 1.0Wm (30º)	Yes	Y	5	1.2	11	1.5	1	0.059	2	0.034
75	1.2D + 1.5Lm + 1.0Wm (45º)	Yes	Y	5	1.2	11	1.5	1	0.048	2	0.048
76	1.2D + 1.5Lm + 1.0Wm (60º)	Yes	Y	5	1.2	11	1.5	1	0.034	2	0.059
77	1.2D + 1.5Lm + 1.0Wm (90º)	Yes	Y	5	1.2	11	1.5			2	0.068
78	1.2D + 1.5Lm + 1.0Wm (120º)	Yes	Y	5	1.2	11	1.5	1	-0.034	2	0.059
79	1.2D + 1.5Lm + 1.0Wm (135º)	Yes	Y	5	1.2	11	1.5	1	-0.048	2	0.048
80	1.2D + 1.5Lm + 1.0Wm (150º)	Yes	Y	5	1.2	11	1.5	1	-0.059	2	0.034
81	1.2D + 1.5Lm + 1.0Wm (180º)	Yes	Y	5	1.2	11	1.5	1	-0.068		
82	1.2D + 1.5Lm + 1.0Wm (210º)	Yes	Y	5	1.2	11	1.5	1	-0.059	2	-0.034
83	1.2D + 1.5Lm + 1.0Wm (225º)	Yes	Y	5	1.2	11	1.5	1	-0.048	2	-0.048
84	1.2D + 1.5Lm + 1.0Wm (240º)	Yes	Y	5	1.2	11	1.5	1	-0.034	2	-0.059
85	1.2D + 1.5Lm + 1.0Wm (270º)	Yes	Y	5	1.2	11	1.5			2	-0.068
86	1.2D + 1.5Lm + 1.0Wm (300º)	Yes	Y	5	1.2	11	1.5	1	0.034	2	-0.059
87	1.2D + 1.5Lm + 1.0Wm (315º)	Yes	Y	5	1.2	11	1.5	1	0.048	2	-0.048
88	1.2D + 1.5Lm + 1.0Wm (330º)	Yes	Y	5	1.2	11	1.5	1	0.059	2	-0.034
89	1.2D + 1.5Lm + 1.0Wm (0º)	Yes	Y	5	1.2	12	1.5	1	0.068		

Load Combinations (Continued)

	Description	Solve	PDelta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
90	1.2D + 1.5Lm + 1.0Wm (30°)	Yes	Y	5	1.2	12	1.5	1	0.059	2	0.034
91	1.2D + 1.5Lm + 1.0Wm (45°)	Yes	Y	5	1.2	12	1.5	1	0.048	2	0.048
92	1.2D + 1.5Lm + 1.0Wm (60°)	Yes	Y	5	1.2	12	1.5	1	0.034	2	0.059
93	1.2D + 1.5Lm + 1.0Wm (90°)	Yes	Y	5	1.2	12	1.5			2	0.068
94	1.2D + 1.5Lm + 1.0Wm (120°)	Yes	Y	5	1.2	12	1.5	1	-0.034	2	0.059
95	1.2D + 1.5Lm + 1.0Wm (135°)	Yes	Y	5	1.2	12	1.5	1	-0.048	2	0.048
96	1.2D + 1.5Lm + 1.0Wm (150°)	Yes	Y	5	1.2	12	1.5	1	-0.059	2	0.034
97	1.2D + 1.5Lm + 1.0Wm (180°)	Yes	Y	5	1.2	12	1.5	1	-0.068		
98	1.2D + 1.5Lm + 1.0Wm (210°)	Yes	Y	5	1.2	12	1.5	1	-0.059	2	-0.034
99	1.2D + 1.5Lm + 1.0Wm (225°)	Yes	Y	5	1.2	12	1.5	1	-0.048	2	-0.048
100	1.2D + 1.5Lm + 1.0Wm (240°)	Yes	Y	5	1.2	12	1.5	1	-0.034	2	-0.059
101	1.2D + 1.5Lm + 1.0Wm (270°)	Yes	Y	5	1.2	12	1.5			2	-0.068
102	1.2D + 1.5Lm + 1.0Wm (300°)	Yes	Y	5	1.2	12	1.5	1	0.034	2	-0.059
103	1.2D + 1.5Lm + 1.0Wm (315°)	Yes	Y	5	1.2	12	1.5	1	0.048	2	-0.048
104	1.2D + 1.5Lm + 1.0Wm (330°)	Yes	Y	5	1.2	12	1.5	1	0.059	2	-0.034
105	***SEISMIC***										
106	1.2D + 1.0Ev + 1.0Eh (0°)	Yes	Y	5	1.2	5	0.077	7	0.194		
107	1.2D + 1.0Ev + 1.0Eh (30°)	Yes	Y	5	1.2	5	0.077	7	0.168	8	0.097
108	1.2D + 1.0Ev + 1.0Eh (45°)	Yes	Y	5	1.2	5	0.077	7	0.137	8	0.137
109	1.2D + 1.0Ev + 1.0Eh (60°)	Yes	Y	5	1.2	5	0.077	7	0.097	8	0.168
110	1.2D + 1.0Ev + 1.0Eh (90°)	Yes	Y	5	1.2	5	0.077			8	0.194
111	1.2D + 1.0Ev + 1.0Eh (120°)	Yes	Y	5	1.2	5	0.077	7	-0.097	8	0.168
112	1.2D + 1.0Ev + 1.0Eh (135°)	Yes	Y	5	1.2	5	0.077	7	-0.137	8	0.137
113	1.2D + 1.0Ev + 1.0Eh (150°)	Yes	Y	5	1.2	5	0.077	7	-0.168	8	0.124
114	1.2D + 1.0Ev + 1.0Eh (180°)	Yes	Y	5	1.2	5	0.077	7	-0.194		
115	1.2D + 1.0Ev + 1.0Eh (210°)	Yes	Y	5	1.2	5	0.077	7	-0.168	8	-0.097
116	1.2D + 1.0Ev + 1.0Eh (225°)	Yes	Y	5	1.2	5	0.077	7	-0.137	8	-0.137
117	1.2D + 1.0Ev + 1.0Eh (240°)	Yes	Y	5	1.2	5	0.077	7	-0.097	8	-0.168
118	1.2D + 1.0Ev + 1.0Eh (270°)	Yes	Y	5	1.2	5	0.077			8	-0.194
119	1.2D + 1.0Ev + 1.0Eh (300°)	Yes	Y	5	1.2	5	0.077	7	0.097	8	-0.168
120	1.2D + 1.0Ev + 1.0Eh (315°)	Yes	Y	5	1.2	5	0.077	7	0.137	8	-0.137
121	1.2D + 1.0Ev + 1.0Eh (330°)	Yes	Y	5	1.2	5	0.077	7	0.168	8	-0.097

Envelope Node Reactions

	Node Label		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N62	max	0.032	19	0.132	25	0.14	7	0	121	0	121	0	121
2		min	-0.031	11	0	16	-0.12	15	0	1	0	1	0	1
3	N27	max	0.019	19	0.987	8	0.075	11	0	121	0	121	0	121
4		min	-0.019	11	-0.801	16	-0.115	19	0	1	0	1	0	1
5	N28	max	0.229	19	1.257	13	0.579	22	0	121	0	121	0	121
6		min	-0.229	11	-1.036	21	-0.538	14	0	1	0	1	0	1
7	N61	max	0.031	19	0.132	39	0.14	7	0	121	0	121	0	121
8		min	-0.032	11	0	14	-0.12	15	0	1	0	1	0	1
9	N26	max	0.019	19	0.987	22	0.075	19	0	121	0	121	0	121
10		min	-0.019	11	-0.801	14	-0.115	11	0	1	0	1	0	1
11	N29	max	0.229	19	1.257	17	0.579	8	0	121	0	121	0	121
12		min	-0.229	11	-1.036	9	-0.538	16	0	1	0	1	0	1
13	N54	max	0.033	19	0.143	30	0.116	7	0	121	0	121	0	121
14		min	-0.034	11	0.001	22	-0.136	15	0	1	0	1	0	1
15	N55	max	0.034	19	0.143	34	0.116	7	0	121	0	121	0	121
16		min	-0.033	11	0.001	8	-0.136	15	0	1	0	1	0	1
17	N12	max	0.033	19	0.119	34	0.088	8	0	121	0	121	0	121
18		min	-0.033	11	0.004	8	-0.11	16	0	1	0	1	0	1
19	N13	max	0.033	19	0.119	30	0.088	22	0	121	0	121	0	121
20		min	-0.033	11	0.004	22	-0.11	14	0	1	0	1	0	1
21	N14	max	0.032	19	0.11	26	0.111	8	0	121	0	121	0	121
22		min	-0.032	11	0.002	16	-0.089	16	0	1	0	1	0	1
23	N15	max	0.032	19	0.11	38	0.111	22	0	121	0	121	0	121

Envelope Node Reactions (Continued)

	Node Label		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
24		min	-0.032	11	0.002	14	-0.089	14	0	1	0	1	0	1
25	N39	max	0.042	19	0.067	35	0.431	11	0	121	0	121	0	121
26		min	-0.042	11	0.022	10	-0.216	19	0	1	0	1	0	1
27	N45	max	0.026	19	0.067	37	0.482	19	0	121	0	121	0	121
28		min	-0.026	11	0.022	12	-0.165	11	0	1	0	1	0	1
29	N41	max	0.042	19	0.067	27	0.216	11	0	121	0	121	0	121
30		min	-0.042	11	0.022	18	-0.431	19	0	1	0	1	0	1
31	N43	max	0.042	19	0.067	37	0.216	19	0	121	0	121	0	121
32		min	-0.042	11	0.022	12	-0.431	11	0	1	0	1	0	1
33	N37	max	0.026	19	0.067	35	0.165	11	0	121	0	121	0	121
34		min	-0.026	11	0.022	10	-0.482	19	0	1	0	1	0	1
35	N38	max	0.026	19	0.067	29	0.165	19	0	121	0	121	0	121
36		min	-0.026	11	0.022	20	-0.482	11	0	1	0	1	0	1
37	N40	max	0.042	19	0.067	29	0.431	19	0	121	0	121	0	121
38		min	-0.042	11	0.022	20	-0.216	11	0	1	0	1	0	1
39	N42	max	0.026	19	0.067	27	0.482	11	0	121	0	121	0	121
40		min	-0.026	11	0.022	18	-0.165	19	0	1	0	1	0	1
41	Totals:	max	1.03	19	2.576	26	2.107	7						
42		min	-1.03	11	1.076	16	-2.107	15						

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

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*Pnc [k]	phi*Pnt [k]	phi*Mn y-y [k-ft]	phi*Mn z-z [k-ft]	Cb	Eqn
1	ALPHA/BETA	PIPE_2.5	0.032	10.5	7	0.009	10.5		7	37.774	50.715	3.596	3.596	1	H1-1b
2	M2	L6X3.5X6	0.006	3.5	17	0.015	7	z	15	101.19	111.456	4.002	14.35	1.5	H2-1
3	M3	L6X3.5X6	0.003	0	18	0.003	7	z	19	101.19	111.456	4.002	13.644	1.5	H2-1
4	M4	L6X3.5X6	0.009	3.5	9	0.015	7	z	7	101.19	111.456	4.002	14.35	1.5	H2-1
5	M5	L6X3.5X6	0.004	7	20	0.003	7	z	19	101.19	111.456	4.002	14.35	1.5	H2-1
6	ALL SECTORS	PIPE_2.5	0.547	81	15	0.038	81		22	15.797	50.715	3.596	3.596	1	H1-1b
7	M13	L6X3.5X6	0.035	3.5	8	0.027	3.5	y	8	101.19	111.456	4.002	14.35	1.5	H2-1
8	M14	L6X3.5X6	0.033	3.5	22	0.096	7	z	7	101.19	111.456	4.002	13.644	1.5	H2-1
9	M15	L6X3.5X6	0.012	0	8	0.005	7	z	19	101.19	111.456	3.896	12.767	1.067	H2-1
10	M16	L6X3.5X6	0.015	7	20	0.011	7	y	19	101.19	111.456	4.002	14.35	1.5	H2-1
11	GAMMA	PIPE_2.5	0.125	12	24	0.015	12		24	37.774	50.715	3.596	3.596	1	H1-1b
12	M26	HSS4X4X3	0.037	37.5	19	0.009	37.5	y	36	102.696	106.812	12.662	12.662	2.104	H1-1b
13	M31	HSS4X4X3	0.037	37.5	11	0.009	37.5	y	28	102.696	106.812	12.662	12.662	2.104	H1-1b
14	DELTA	PIPE_2.0	0.066	10.5	7	0.014	10.5		7	20.867	32.13	1.872	1.872	1	H1-1b
15	M35	L6X6X5	0.004	6	35	0.019	12	z	15	97.867	118.908	9.302	19.858	1.481	H2-1
16	M36	L6X6X5	0.002	6	32	0.002	12	z	9	97.867	118.908	8.085	16.791	1.04	H2-1
17	M39	L6X6X5	0.006	6	8	0.019	12	z	7	97.867	118.908	9.302	16.791	1.5	H2-1
18	M40	L6X6X5	0.003	6	7	0.002	12	z	17	97.867	118.908	9.302	16.791	1.096	H2-1

Antenna Mount Frame Analysis

Ref. to attached RISA 3D output

Envelope Node Reactions

	Node Label		X [k]	LC	Y [k]	LC	Z [k]	LC
1	N29	max	0.229	19	1.257	17	0.579	8
2		min	-0.229	11	-1.036	9	-0.538	16
3	N28	max	0.229	19	1.257	13	0.579	22
4		min	-0.229	11	-1.036	21	-0.538	14
5	N40	max	0.042	19	0.067	29	0.431	19
6		min	-0.042	11	0.022	20	-0.216	11
7	N39	max	0.042	19	0.067	35	0.431	11
8		min	-0.042	11	0.022	10	-0.216	19
9	N41	max	0.042	19	0.067	27	0.216	11
10		min	-0.042	11	0.022	18	-0.431	19
11	N43	max	0.042	19	0.067	37	0.216	19
12		min	-0.042	11	0.022	12	-0.431	11
13	N55	max	0.034	19	0.143	34	0.116	7
14		min	-0.033	11	0.001	8	-0.136	15
15	N54	max	0.033	19	0.143	30	0.116	7
16		min	-0.034	11	0.001	22	-0.136	15
17	N12	max	0.033	19	0.119	34	0.088	8
18		min	-0.033	11	0.004	8	-0.11	16
19	N13	max	0.033	19	0.119	30	0.088	22
20		min	-0.033	11	0.004	22	-0.11	14
21	N14	max	0.032	19	0.11	26	0.111	8
22		min	-0.032	11	0.002	16	-0.089	16
23	N15	max	0.032	19	0.11	38	0.111	22
24		min	-0.032	11	0.002	14	-0.089	14
25	N62	max	0.032	19	0.132	25	0.14	7
26		min	-0.031	11	0	16	-0.12	15
27	N61	max	0.031	19	0.132	39	0.14	7
28		min	-0.032	11	0	14	-0.12	15
29	N45	max	0.026	19	0.067	37	0.482	19
30		min	-0.026	11	0.022	12	-0.165	11
31	N42	max	0.026	19	0.067	27	0.482	11
32		min	-0.026	11	0.022	18	-0.165	19
33	N37	max	0.026	19	0.067	35	0.165	11
34		min	-0.026	11	0.022	10	-0.482	19
35	N38	max	0.026	19	0.067	29	0.165	19
36		min	-0.026	11	0.022	20	-0.482	11
37	N27	max	0.019	19	0.987	8	0.075	11
38		min	-0.019	11	-0.801	16	-0.115	19
39	N26	max	0.019	19	0.987	22	0.075	19
40		min	-0.019	11	-0.801	14	-0.115	11

ALPHA/BETA, ALL SECTORS ANCHORAGE.

Check Connection

Proposed 1/2" Dia. threaded rods w/ 4" min. embedment and Hilti HY 70 adhesive

Tmax = Tension Load

$Fy := 1257lbf$

$Tmax := Fy$

Vmax = Resultant Shear Load

$Fx := 229lbf$

$Fz := 579lbf$

$Fr := \sqrt{Fx^2 + Fz^2}$

$Vmax := Fr = 622.641 \cdot lbf$

Account for two (2) anchor bolts

$Tallow := 2 \cdot 905lbf = 1810\,lbf$

$Vallow := 2 \cdot 1685 \cdot lbf = 3370\,lbf$

Interaction.

$\frac{Tmax}{Tallow} + \frac{Vmax}{Vallow} = 0.879 \qquad 0.876 < 1.0$ **Bolts OKAY.**

ALPHA/BETA, ALL SECTORS ANCHORAGE.

Check Connection

Existing 5/8" Dia. threaded rods w/ 6" min. embedment Hilti HY 20 adhesive

Tmax = Tension Load

$Fy := 1257lbf$

$Tmax := Fy$

Vmax = Resultant Shear Load

$Fx := 229lbf$

$Fz := 579lbf$

$Fr := \sqrt{Fx^2 + Fz^2}$

$Vmax := Fr = 622.641 \cdot lbf$

Account for two (2) anchor bolts

$Tallow := 2 \cdot 815lbf = 1630\,lbf$

$Vallow := 2 \cdot 1355 \cdot lbf = 2710\,lbf$

Interaction.

$\frac{Tmax}{Tallow} + \frac{Vmax}{Vallow} = 1.001 \qquad 0.997 < 1.0$ **Bolts OKAY.**

GAMMA, DELTA ANCHORAGE.

Check Connection

Proposed 5/8" Dia. threaded rods w/ 5 5/8" min. embedment and Hilti HY 200 adhesive

Tmax = Tension Load

$Fz := 482lbf$

$Tmax := Fz$

Vmax = Resultant Shear Load

$Fx := 42lbf$

$Fy := 67lbf$

$Fr := \sqrt{Fx^2 + Fy^2}$

$Vmax := Fr = 79.076 \cdot lbf$

$Tallow := 4010 \cdot 0.61 \cdot 0.6 \cdot lbf = 1467.66\,lbf$

$Vallow := 8640 \cdot 0.54 \cdot 0.61 \cdot lbf = 2846.016\,lbf$

Interaction.

$\frac{Tmax}{Tallow} + \frac{Vmax}{Vallow} = 0.356 \qquad 0.356 < 1.0$ **Bolts OKAY.**

Conclusion:
The proposed and existing antennas mounts and connections are sufficient to support the T-Mobile appurtenances.

Adhesive Anchoring Systems

3.2.6 HIT-HY 70 Hybrid for Masonry Construction

Table 10 - HIT-HY 70 allowable adhesive bond loads for threaded rods in the face of hollow brick[1, 2, 3, 4, 5, 10]

Nominal anchor diameter	Effective embedment in. (mm)[6]	Tension lb (kN)[7, 8]	Minimum edge distance c_{min} in. (mm)[9]	Load reduction factor @ c_{min}	Shear lb (kN)[7, 8]	Edge distance[6] Critical c_{cr} in. (mm)	Edge distance[6] Minimum c_{min} in. (mm)	Edge distance[6] Load reduction factor @ c_{min}
1/4	3-1/8 (79)	530 (2.4)	8 (203)	1.00	370 (1.6)	12 (304.8)	8 (203)	1.00
5/16		735 (3.3)			595 (2.6)			1.00
3/8		905 (4.0)			1,045 (4.7)			0.76
1/2		905 (4.0)			1,685 (7.5)			0.52

Table 11 - HIT-HY 70 allowable adhesive bond loads for HIT-IC inserts in the face of hollow brick[1, 2, 3, 4, 5, 10]

Thread size	Effective embedment in. (mm)[6]	Tension lb (kN)[7, 8]	Minimum edge distance c_{min} in. (mm)[9]	Load reduction factor @ c_{min}	Shear lb (kN)[7, 8]	Edge distance[6] Critical c_{cr} in. (mm)	Edge distance[6] Minimum c_{min} in. (mm)	Edge distance[6] Load reduction factor @ c_{min}
#14 Screw	2 (51)	170 (0.8)	8 (203)	1.00	222 (1.0)	12 (304.8)	8 (203)	1.00
5/16-18 UNC	3-1/8 (79)	880 (3.9)			650 (2.9)			1.00
3/8-16 UNC		880 (3.9)			1,290 (5.7)			0.63
1/2-13 UNC		990 (4.4)			1,780 (7.9)			0.47

HIT-HY 20 Allowable Loads for Threaded HAS-E Rods in Multi-Wythe Solid Brick Walls[1, 2]

Anchor Diameter in. (mm)	Embedment Depth in. (mm)	Allowable Tension lb (kN)	Allowable Shear lb (kN)
3/8 (9.5)	6 (152)	685 (3.1)	590 (2.6)
	10 (254)	815 (3.6)	590 (2.6)
1/2 (12.7)	6 (152)	745 (3.3)	930 (4.1)
	10 (254)	1270 (5.6)	930 (4.1)
5/8 (15.9)	6 (152)	815 (3.6)	1355 (6.0)
	10 (254)	1285 (5.7)	1355 (6.0)
3/4 (19.1)	8 (203)	1400 (6.2)	1800 (8.0)
	13 (330)	2100 (9.3)	1800 (8.0)

1 Values based on mortar shear strength of 45 psi or greater.
2 Based on using a safety factor of 5.

Combined Shear and Tension Loading

$$\left(\frac{N_c}{N_{rec}}\right) + \left(\frac{V_d}{V_{rec}}\right) \leq 1.0 \text{ (Ref. Section 3.1.8.3)}$$

Table 4 - HIT-HY 200 design strength with concrete/pullout failure for HIT-Z(-R) rods in cracked concrete [1,2,3,4,5,6,7,8,9,10]

Nominal anchor diameter in.	Effective embed. in. (mm)	Tension — ΦN_n				Shear — ΦV_n			
		f'_c = 2,500 psi (17.2 MPa) lb (kN)	f'_c = 3,000 psi (20.7 MPa) lb (kN)	f'_c = 4,000 psi (27.6 MPa) lb (kN)	f'_c = 6,000 psi (41.4 MPa) lb (kN)	f'_c = 2,500 psi (17.2 MPa) lb (kN)	f'_c = 3,000 psi (20.7 MPa) lb (kN)	f'_c = 4,000 psi (27.6 MPa) lb (kN)	f'_c = 6,000 psi (41.4 MPa) lb (kN)
3/8	2-3/8 (60)	2,020 (9.0)	2,215 (9.9)	2,560 (11.4)	3,135 (13.9)	2,180 (9.7)	2,385 (10.6)	2,755 (12.3)	3,375 (15.0)
	3-3/8 (86)	3,425 (15.2)	3,755 (16.7)	4,335 (19.3)	5,170 (23.0)	7,380 (32.8)	8,085 (36.0)	9,335 (41.5)	11,430 (50.8)
	4-1/2 (114)	5,170 (23.0)	5,170 (23.0)	5,170 (23.0)	5,170 (23.0)	11,360 (50.5)	12,445 (55.4)	14,370 (63.9)	17,600 (78.3)
1/2	2-3/4 (70)	2,520 (11.2)	2,760 (12.3)	3,185 (14.2)	3,905 (17.4)	5,425 (24.1)	5,945 (26.4)	6,865 (30.5)	8,405 (37.4)
	4-1/2 (114)	5,275 (23.5)	5,780 (25.7)	6,670 (29.7)	7,110 (31.6)	11,360 (50.5)	12,445 (55.4)	14,370 (63.9)	17,600 (78.3)
	6 (152)	7,110 (31.6)	7,110 (31.6)	7,110 (31.6)	7,110 (31.6)	17,490 (77.8)	19,160 (85.2)	22,120 (98.4)	27,095 (120.5)
5/8	3-3/4 (95)	4,010 (17.8)	4,395 (19.5)	5,075 (22.6)	6,215 (27.6)	8,640 (38.4)	9,465 (42.1)	10,930 (48.6)	13,390 (59.6)
	5-5/8 (143)	7,370 (32.8)	8,075 (35.9)	9,325 (41.5)	11,420 (50.8)	15,875 (70.6)	17,390 (77.4)	20,080 (89.3)	24,595 (109.4)
	7-1/2 (191)	11,350 (50.5)	12,430 (55.3)	13,905 (61.9)	13,905 (61.9)	24,440 (108.7)	26,775 (119.1)	30,915 (137.5)	37,865 (168.4)
3/4	4 (102)	4,420 (19.7)	4,840 (21.5)	5,590 (24.9)	6,845 (30.4)	9,520 (42.3)	10,430 (46.4)	12,040 (53.6)	14,750 (65.6)
	6-3/4 (171)	9,690 (43.1)	10,615 (47.2)	12,255 (54.5)	15,010 (66.8)	20,870 (92.8)	22,860 (101.7)	26,395 (117.4)	32,330 (143.8)
	8-1/2 (216)	13,690 (60.9)	15,000 (66.7)	17,320 (77.0)	18,155 (80.8)	29,490 (131.2)	32,305 (143.7)	37,300 (165.9)	45,685 (203.2)

Table 15 - Load adjustment factors for 5/8-in. diameter HIT-Z and HIT-Z-R rods in cracked concrete [1,2]

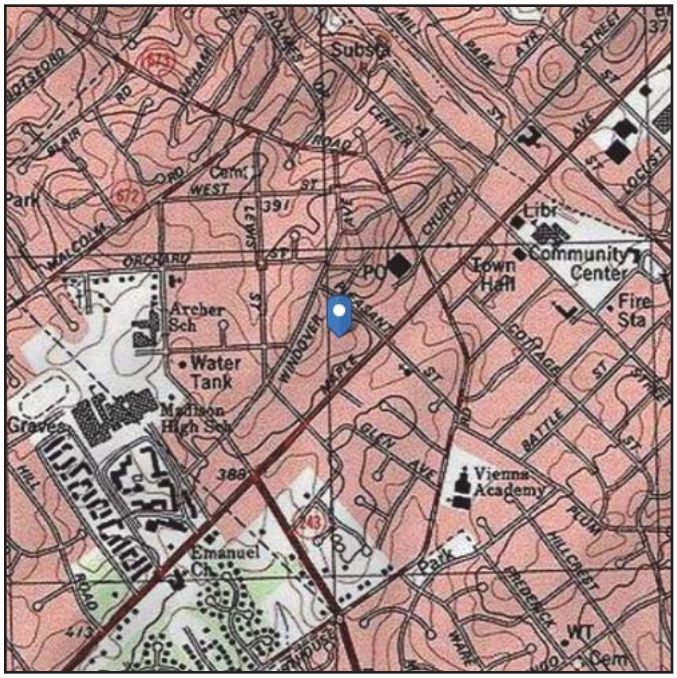
5/8-in. HIT-Z(-R) cracked concrete			Spacing factor in tension f_{AN}			Edge distance factor in tension f_{RN}			Spacing factor in shear[3] f_{AV}			Edge distance in shear						Concrete thickness factor in shear[4] f_{HV}		
												⊥ Toward edge f_{RV}			∥ To edge f_{RV}					
Embedment h_{ef}		in. (mm)	3-3/4 (95)	5-5/8 (143)	7-1/2 (191)	3-3/4 (95)	5-5/8 (143)	7-1/2 (191)	3-3/4 (95)	5-5/8 (143)	7-1/2 (191)	3-3/4 (95)	5-5/8 (143)	7-1/2 (191)	3-3/4 (95)	5-5/8 (143)	7-1/2 (191)	3-3/4 (95)	5-5/8 (143)	7-1/2 (191)
Spacing (s) / Edge Distance (c_a) / Concrete thickness (h), - in. (mm)	3-1/8	(79)	0.64	0.59	0.57	0.67	0.56	0.50	0.55	0.54	0.53	0.18	0.10	0.07	0.35	0.20	0.13	n/a	n/a	n/a
	3-1/4	(83)	0.64	0.60	0.57	0.69	0.56	0.51	0.55	0.54	0.53	0.19	0.11	0.07	0.38	0.22	0.14	n/a	n/a	n/a
	3-3/4	(95)	0.67	0.61	0.58	0.75	0.60	0.53	0.56	0.54	0.53	0.23	0.13	0.09	0.47	0.27	0.17	n/a	n/a	n/a
	4	(102)	0.68	0.62	0.59	0.78	0.62	0.55	0.57	0.55	0.53	0.26	0.15	0.10	0.51	0.30	0.19	n/a	n/a	n/a
	5	(127)	0.72	0.65	0.61	0.91	0.70	0.60	0.58	0.56	0.54	0.36	0.21	0.13	0.72	0.41	0.27	n/a	n/a	n/a
	5-1/2	(140)	0.74	0.66	0.62	0.98	0.74	0.63	0.59	0.56	0.55	0.41	0.24	0.15	0.83	0.48	0.31	0.61	n/a	n/a
	6	(152)	0.77	0.68	0.63	1.00	0.78	0.66	0.60	0.57	0.55	0.47	0.27	0.18	0.94	0.54	0.35	0.64	n/a	n/a
	7	(178)	0.81	0.71	0.66	1.00	0.87	0.72	0.62	0.58	0.56	0.59	0.34	0.22	1.00	0.68	0.44	0.69	n/a	n/a
	7-3/8	(187)	0.83	0.72	0.66	1.00	0.90	0.74	0.62	0.59	0.56	0.64	0.37	0.24	1.00	0.74	0.48	0.70	0.59	n/a
	8	(203)	0.86	0.74	0.68	1.00	0.96	0.78	0.63	0.59	0.57	0.73	0.42	0.27	1.00	0.84	0.54	0.73	0.61	n/a
	9	(229)	0.90	0.77	0.70	1.00	1.00	0.85	0.65	0.60	0.58	0.87	0.50	0.32	1.00	1.00	0.65	0.78	0.65	n/a
	9-1/4	(235)	0.91	0.77	0.71			0.86	0.66	0.61	0.58	0.90	0.52	0.34			0.68	0.79	0.66	0.57
	10	(254)	0.94	0.80	0.72			0.91	0.67	0.62	0.59	1.00	0.58	0.38			0.76	0.82	0.68	0.59
	11	(279)	0.99	0.83	0.74			0.98	0.69	0.63	0.60		0.67	0.44			0.88	0.86	0.72	0.62
	12	(305)	1.00	0.86	0.77			1.00	0.70	0.64	0.60		0.77	0.50			1.00	0.90	0.75	0.65
	14	(356)	1.00	0.91	0.81				0.74	0.66	0.62		0.97	0.63			1.00	0.97	0.81	0.70
	16	(406)		0.97	0.86				0.77	0.69	0.64		1.00	0.77				1.00	0.86	0.75
	18	(457)		1.00	0.90				0.80	0.71	0.66			0.92					0.92	0.79
	24	(610)			1.00				0.90	0.78	0.71			1.00					1.00	0.92
	30	(762)							1.00	0.85	0.76									1.00
	36	(914)								0.92	0.81									
	> 48	(1219)								1.00	0.92									

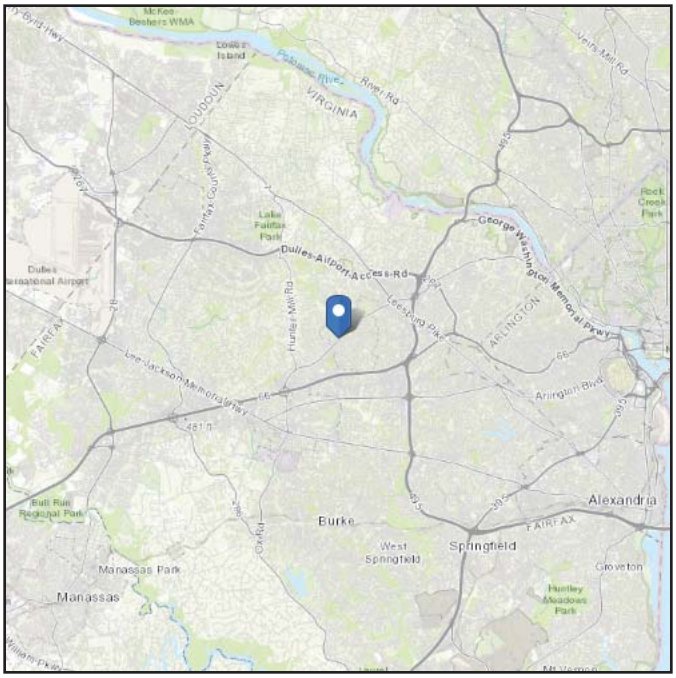
ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-10
Risk Category: II
Soil Class: D - Stiff Soil

Elevation: 412.92 ft (NAVD 88)
Latitude: 38.898201
Longitude: -77.270861





Wind

Results:

Wind Speed:	115 Vmph
10-year MRI	76 Vmph
25-year MRI	84 Vmph
50-year MRI	90 Vmph
100-year MRI	96 Vmph

Data Accessed: Fri Apr 16 2021

Data Source: ASCE/SEI 7-10, Fig. 26.5-1A and Figs. CC-1–CC-4, and Section 26.5.2, incorporating errata of March 12, 2014

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 7-10 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is not in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2.

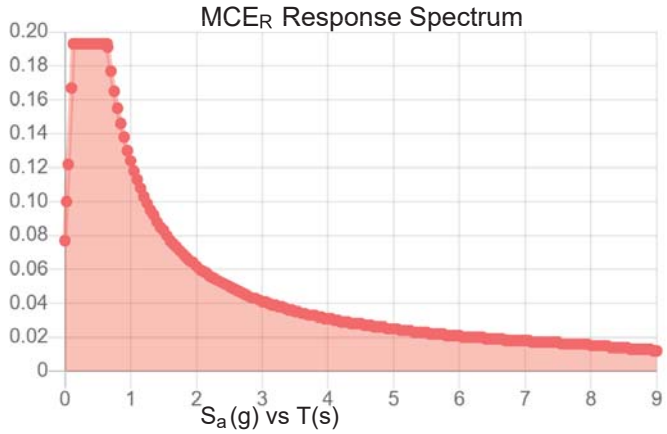
Seismic

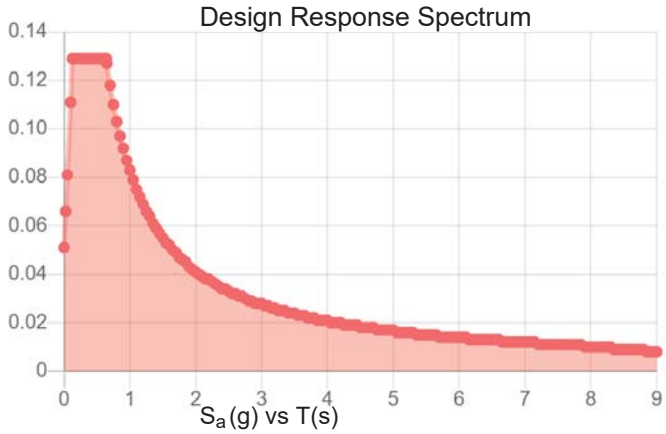
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.121	S_{DS} :	0.129
S_1 :	0.052	S_{D1} :	0.083
F_a :	1.6	T_L :	8
F_v :	2.4	PGA :	0.057
S_{MS} :	0.193	PGA_M :	0.091
S_{M1} :	0.124	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B





Data Accessed: Fri Apr 16 2021

Date Source: USGS Seismic Design Maps based on ASCE/SEI 7-10, incorporating Supplement 1 and errata of March 31, 2013, and ASCE/SEI 7-10 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-10 Ch. 21 are available from USGS.

Ice

Results:

Ice Thickness:	0.75 in.
Concurrent Temperature:	15 F
Gust Speed:	30 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Fri Apr 16 2021

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 50-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.

Snow

Results:

Ground Snow Load, p_g:	25 lb/ft^2
Elevation:	412.9 ft
Data Source:	ASCE/SEI 7-10, Fig. 7-1.
Date Accessed:	Fri Apr 16 2021

Values provided are ground snow loads. In areas designated "case study required," extreme local variations in ground snow loads preclude mapping at this scale. Site-specific case studies are required to establish ground snow loads at elevations not covered.

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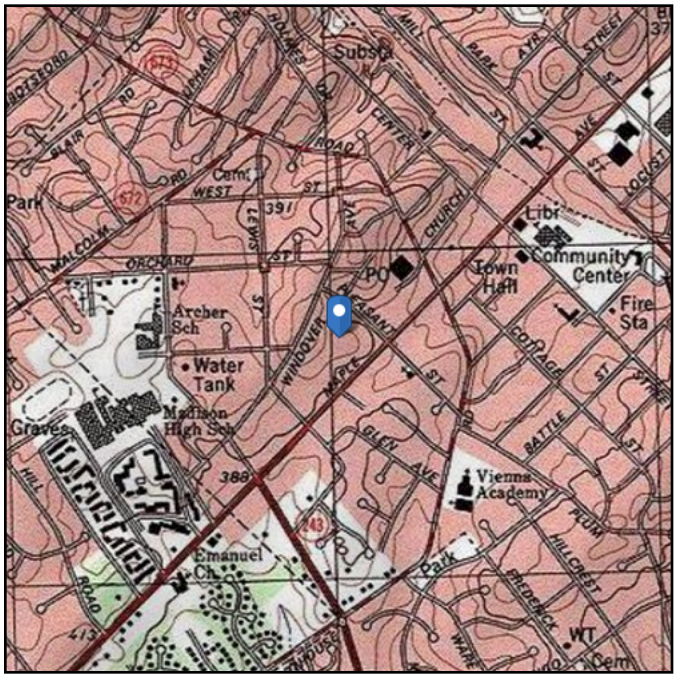
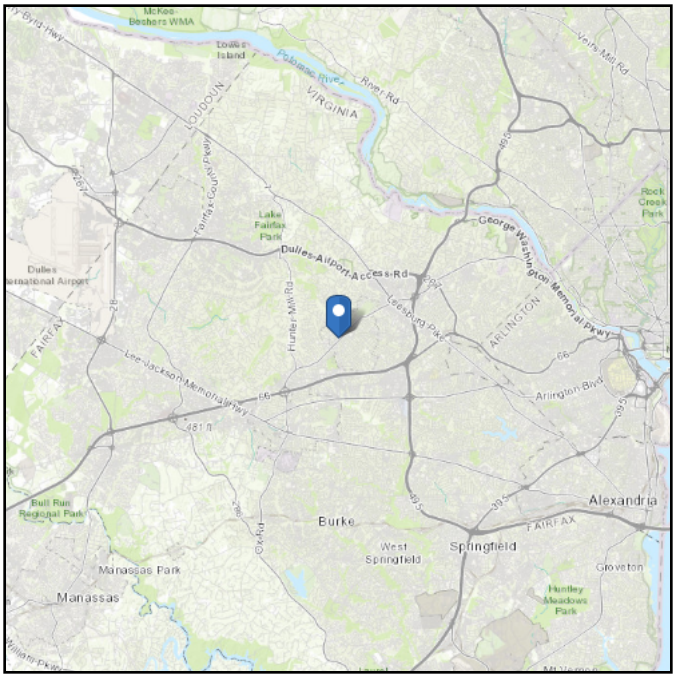
ASCE 7 Hazards Report

Address:
301 Maple Ave W
Vienna, Virginia
22180

Standard: ASCE/SEI 7-10
Risk Category: II
Soil Class: D - Stiff Soil

Elevation: 412.42 ft (NAVD 88)
Latitude: 38.898269
Longitude: -77.270956





Wind

Results:

Wind Speed:	115 Vmph
10-year MRI	76 Vmph
25-year MRI	84 Vmph
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100-year MRI	96 Vmph

Data Source: ASCE/SEI 7-10, Fig. 26.5-1A and Figs. CC-1–CC-4, and Section 26.5.2, incorporating errata of March 12, 2014

Date Accessed: Wed May 05 2021

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 7-10 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is not in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2.

Seismic

Site Soil Class: D - Stiff Soil

Results:

S_S :	0.121	S_{DS} :	0.129
S_1 :	0.052	S_{D1} :	0.083
F_a :	1.6	T_L :	8
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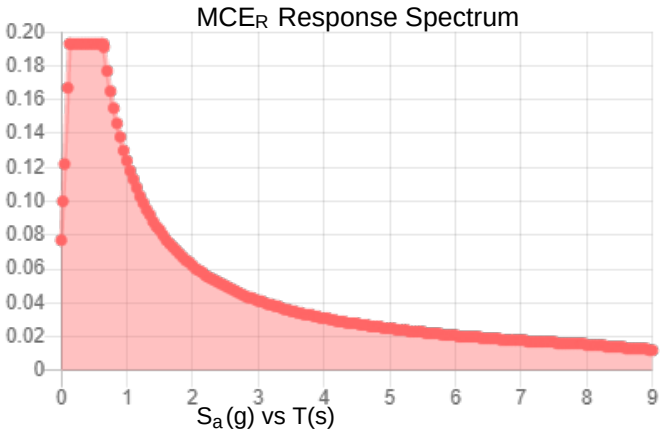
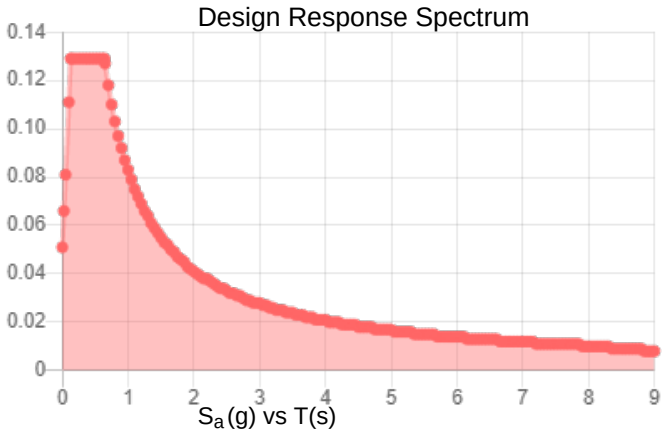
		I_e :	1

Seismic Design Category B





Data Accessed: Wed May 05 2021

Date Source: USGS Seismic Design Maps based on ASCE/SEI 7-10, incorporating Supplement 1 and errata of March 31, 2013, and ASCE/SEI 7-10 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-10 Ch. 21 are available from USGS.

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Results:

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Concurrent Temperature:	15 F
Gust Speed:	30 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
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Snow

Results:

Ground Snow Load, p_g:	25 lb/ft^2
Elevation:	412.4 ft
Data Source:	ASCE/SEI 7-10, Fig. 7-1.
Date Accessed:	Wed May 05 2021

Values provided are ground snow loads. In areas designated "case study required," extreme local variations in ground snow loads preclude mapping at this scale. Site-specific case studies are required to establish ground snow loads at elevations not covered.

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