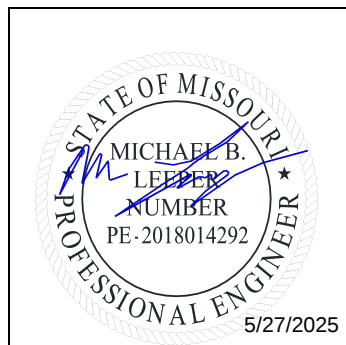


Structural Analysis Report

Tenant Site Name: KS4130
FA#: 10000343
Horvath Site Name: Green
Horvath Site ID: HTMO1589
Client: Horvath Communications
Structure Type: Monopole
Tower Height: 146'
Site Location: 202 East Third Street
Lees Summit, MO 64063
Jackson County
38.91389°N, 94.37417°W

Analysis Result: 47.1%

SEAL



Rev: 0

May 27, 2025

1.0 Introduction

At the request of **Horvath Tower**, an analysis of the existing structure has been performed. All supporting documents have been obtained from the client and are assumed to be accurate and applicable to this site. The structure was analyzed using Tnx Tower engineering software.

2.0 Analysis Procedure & Design Criteria

The following documents were provided for site

- Collo Application
Horvath Towers Tenant AT&T, Dated 04/18/2025
- Mount Analysis
Fullerton Site KSL04130, Dated 04/07/2025
- Previous Structural Analysis
SGS Site HTMO1589, Dated 06/14/2021
- Foundation Design
Drawing GS49710
- Geotechnical Report
Terracon Site Green Cell site, Dated 07/31/1996

The structures have been analyzed pursuant to the following design criteria:

Adopted Codes:	
IBC: 2018	Local Codes:
TIA: 222-H	AISC: 15TH ED.
ASCE: 7-16	ACI: 318-14
Wind Design Loading:	
Design Wind = 109 mph [3-sec gust Ultimate]	
Design Wind W/ ICE = 40 mph [3-sec gust Ultimate], 1.5" Thick	
Exposure Category C	Topographic Category 5
Risk Category II	Ground Elevation = 1024' (NAVD 88)
Seismic Design Loading:	
Site Class B	Importance Factor, $I_p = 1.0$
$S_s = 0.1$, $S_1 = 0.068$, $S_{DS} = 0.107$	

3.0 Proposed Appurtenance & Equipment Information

Table 3.1 –Existing Antenna Configuration

Mount Height (ft)	RAD Height (ft)	Qty.	Appurtenance	Coax	Mount type	Carrier
149'-0"	149'-0"	6	Quintel QS86512-2	(2) 3/8" Fiber (6) 3/4" DC Trunks (2) 2" Conduit (12) 1-5/8" (1) 3/8"	Platform	AT&T
		3	Airscale AEQK			
		3	Commscope SBNHH-1D65C			
		3	Nokia AHLBBA			
		3	Nokia B25-RRH4x30-4R			
		3	Nokia RRH4x45-4R			
		3	Nokia AHCA			
		3	Powerwave TT08-19DB111-001			
		3	Ericsson RRH4x25-WCS-4R			
		2	Raycap DC6-48-60-18-8C			
		1	Raycap DC6-48-60-0-8C			

Bolded is reserved loading

Table 3.2 –AT&T To Be Removed Antennas

Mount Height (ft)	RAD Height (ft)	Qty.	Appurtenance	Coax	Mount type	Carrier
149'-0"	149'-0"	6	Quintel QS86512-2	--	Platform	AT&T
		3	Airscale AEQK			
		3	Commscope SBNHH-1D65C			
		3	Nokia AHLBBA			
		3	Nokia B25-RRH4x30-4R			
		3	Nokia RRH4x45-4R			
		3	Nokia AHCA			
		3	Powerwave TT08-19DB111-001			
		3	Ericsson RRH4x25-WCS-4R			

Bolded is reserved loading

Table 3.2 –AT&T Proposed Antennas

Mount Height (ft)	RAD Height (ft)	Qty.	Appurtenance	Coax	Mount type	Carrier
149'-0"	148'-0"	6	Commscope NNH4-65C-R6-V4	--	Sabre C10855721 C w/ Handrail	AT&T
		3	Ericsson AIR6472 B77G B77M			
		3	Ericsson 4490 B5/B12A			
		3	Ericsson 4471 B30			
		3	Ericsson 4890 B25/B66			
		3	Ericsson 4494 B14/B29			

Table 3.3 –Final Antenna Configuration

Mount Height (ft)	RAD Height (ft)	Qty.	Appurtenance	Coax	Mount type	Carrier
149'-0"	148'-0"	6	Commscope NNH4-65C-R6-V4	(2) 3/8" Fiber (6) 3/4" DC Trunks (2) 2" Conduit (12) 1-5/8" (1) 3/8"	Sabre C10855721 C w/ Handrail	AT&T
		3	Ericsson AIR6472 B77G B77M			
		3	Ericsson 4490 B5/B12A			
		3	Ericsson 4471 B30			
		3	Ericsson 4890 B25/B66			
		3	Ericsson 4494 B14/B29			
	149'-0"	2	Raycap DC6-48-60-18-8C			
		1	Raycap DC6-48-60-0-8C			

Bolded is reserved loading

4.0 Structural Analysis Results and Conclusion

Upon reviewing the results of this analysis, it is our opinion that the existing/proposed structure meets the specified code requirements. **The structure and foundation(s) are considered acceptable to support the final loading configuration** as listed within this report. The controlling structure and foundation usages are displayed in the tables below:

Table 4.1 –Tower Structure Capacity

Load Case	Governing Assembly Components	Capacity	Results
Worst Case	Pole (L1)	36.5%	Pass
	Foundation	27.3%	Pass
	Soil	23.1%	Pass
	Base Plate/Anchor	47.1%	Pass

Table 4.2 – Structural Component Material Strengths

Structural Component	Nominal Strength/Material ¹
Pipe	$F_y = 35$ ksi (A53, Gr. B)
Tube	$F_y = 46$ ksi (A500, Gr. B)
Structural Shapes (L, C, W, etc.), Plate & Bar	$F_y = 36$ ksi (A36)
Wood	Dimension Lumber: DF-L No. 2 GluLam: DF/DF 24F-V4
Uni-Strut (P1000, etc.)	$F_y = 33$ ksi (A570, Gr. 33)
Connection Bolts	A325
U-Bolts / Threaded Rod	SAE J429 Grade 2 (Substitution: ASTM A449) $F_y = 57$ ksi (Yield) & $F_u = 74$ ksi (Tension)
	SAE J429 Grade 5 (¼" to 1" Nominal ϕ) $F_y = 92$ ksi (Yield) & $F_u = 120$ ksi (Tension)
Mechanical Anchors	Concrete: HILTI KWIK Bolt TZ2 Stainless Steel Expansion Anchors (ICC-ES ESR-4266)
	CMU: Threaded Rod / Rebar HILTI HIT-HY 270 Epoxy (ICC-ES-ESR-4143)
Stainless Steel Bolts	18-8 Stainless, Grade 316/304 $F_y = 74$ ksi (Yield) & $F_u = 29$ ksi (Tension)
Welds	E70XX Electrodes
Platform Steel Grating	McNichols GW Series – 1-1/2"x1/8" (8.3 psf) (Or Equivalent)
Fiberglass Reinforced Plastic (FRP)	$F_u = 33,000$ psi $E = 2,600,000$ psi
Concrete / Reinforcing	$f'_c = 3,000$ psi / $F_y = 60$ ksi
Concrete Slab Post-Tensioning	$F_y = 270$ ksi Ultimate Strength
CMU	$f'_m = 1,500$ psi

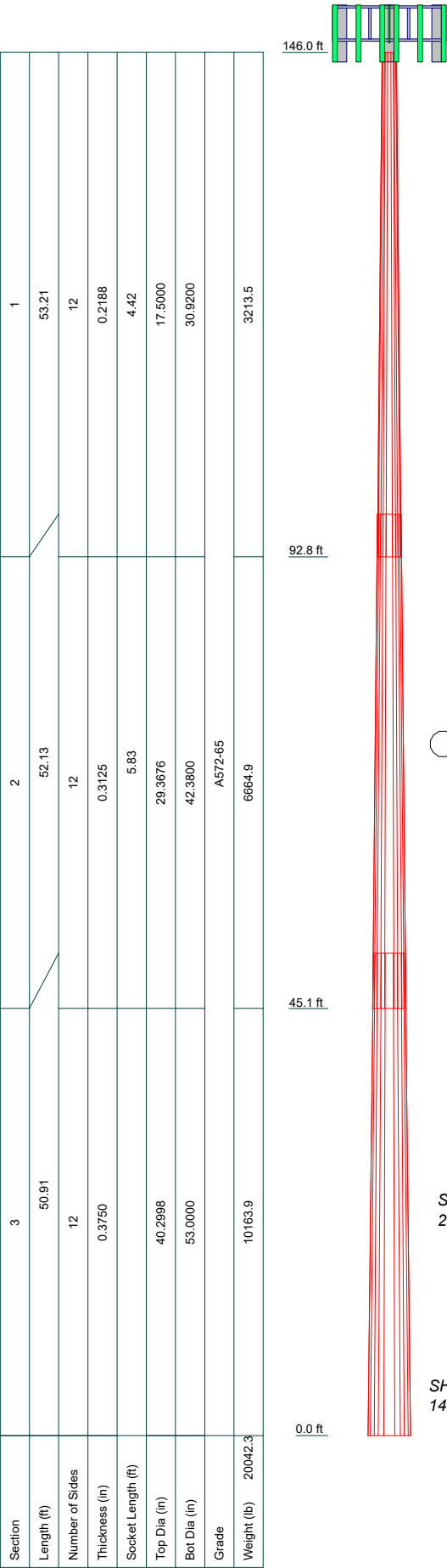
1. Strengths listed were assumed for this analysis and are based upon ASTM, AISC, RCSC, AWS and ACI preferred specification values. Values and materials are consistent with industry standards. Material strengths were taken from original design documents when available.

4.3 Analysis Notes & Assumptions

Core One Consulting USA does not take responsibility for the appurtenances or equipment loading of other carriers, as these fall outside the scope of this analysis. Our assessment is based only on the information provided, and we have not independently verified the existing structural conditions. If any of the reported conditions (such as appurtenance loading, member sizes, etc.) are inaccurate, please contact our office immediately to request an amended report, as any discrepancies will render this evaluation inaccurate. This analysis confirms the adequacy of the primary components of the structure. However, it's important to note that not all connections, welds, bolts, plates, etc., were individually detailed and analyzed. In instances where specific analysis was not conducted, it was assumed that the existing connection plates, welds, bolts, etc., were sufficient to develop the full capacity of the main structural members.

Furthermore, this analysis does not account for unusual or extreme wind events, rime/in-cloud ice loadings, harmonic or nodal vibration, vortex shedding, or similar conditions. Therefore, it is the owner's responsibility to determine the appropriate design wind speed and the amount of ice accumulation beyond code minimum values that should be considered in the analysis.

This report solely evaluates the proposed carrier's structure outline in the appendix. It does not assess the adequacy of other mounts, tower or coaxial mounting attachments, which are assumed to be adequate and installed per manufacturer requirements for the purposes of this analysis.



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod	149	4471 B30	148
Top Beacon	149	4471 B30	148
C10855721C w/ Handrail	149	4471 B30	148
DC6-48-60-18-8C	149	4890 B25/66	148
DC6-48-60-18-8C	149	4890 B25/66	148
DC6-48-60-0-8C	149	4890 B25/66	148
AIR6472	148	4494 B14/B29	148
AIR6472	148	4494 B14/B29	148
AIR6472	148	4494 B14/B29	148
4490 B5/B12A	148	(2) NNH4-65C-R6-V4	148
4490 B5/B12A	148	(2) NNH4-65C-R6-V4	148
4490 B5/B12A	148	(2) NNH4-65C-R6-V4	148

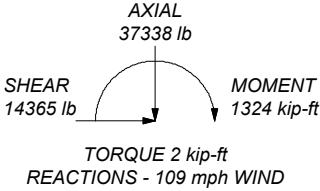
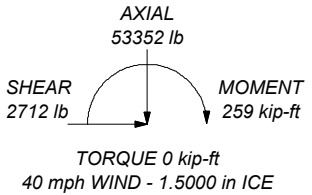
MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower designed for Exposure B to the TIA-222-H Standard.
2. Tower designed for a 109 mph basic wind in accordance with the TIA-222-H Standard.
3. Tower is also designed for a 40 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Risk Category II.
6. Topographic Category 1 with Crest Height of 0.00 ft
7. TOWER RATING: 36.5%

ALL REACTIONS
ARE FACTORED



Core One Consulting
4515 S. McClintock Drive Suite 220
Tempe, AZ
Phone:
FAX:

Job:	HTMO01589		
Project:			
Client:	Horvath Communications	Drawn by:	Alexander Bazeley
Code:	TIA-222-H	Date:	05/26/25
Path:			Scale: NT
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	Client	Horvath Communications	Designed by	Alexander Bazeley

Tower Input Data

The tower is a monopole.

This tower is designed using the TIA-222-H standard.

The following design criteria apply:

Tower base elevation above sea level: 1023.00 ft.

Basic wind speed of 109 mph.

Risk Category II.

Exposure Category B.

Simplified Topographic Factor Procedure for wind speed-up calculations is used.

Topographic Category: 1.

Crest Height: 0.00 ft.

Nominal ice thickness of 1.5000 in.

Ice thickness is considered to increase with height.

Ice density of 56 pcf.

A wind speed of 40 mph is used in combination with ice.

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 60 mph.

Non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

Stress ratio used in pole design is 1.

Tower analysis based on target reliabilities in accordance with Annex S.

Load Modification Factors used: $K_{cs}(F_w) = 0.95$, $K_{cs}(t_i) = 0.85$.

Maximum demand-capacity ratio is: 1.05.

Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs	Assume Legs Pinned	Calculate Redundant Bracing Forces
Consider Moments - Horizontals	✓ Assume Rigid Index Plate	Ignore Redundant Members in FEA
Consider Moments - Diagonals	✓ Use Clear Spans For Wind Area	SR Leg Bolts Resist Compression
Use Moment Magnification	Use Clear Spans For KL/r	All Leg Panels Have Same Allowable
✓ Use Code Stress Ratios	Retension Guys To Initial Tension	Offset Girt At Foundation
✓ Use Code Safety Factors - Guys	✓ Bypass Mast Stability Checks	✓ Consider Feed Line Torque
Escalate Ice	✓ Use Azimuth Dish Coefficients	Include Angle Block Shear Check
Always Use Max Kz	✓ Project Wind Area of Appurtenances	Use TIA-222-H Bracing Resist. Exemption
Kz In Exposure D Hurricane Region	Alternative Appurt. EPA Calculation	Use TIA-222-H Tension Splice Exemption
Include Bolts In Member Capacity	Autocalc Torque Arm Areas	Poles
Leg Bolts Are At Top Of Section	Add IBC .6D+W Combination	Include Shear-Torsion Interaction
Secondary Horizontal Braces Leg	✓ Sort Capacity Reports By Component	Always Use Sub-Critical Flow
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Use Top Mounted Sockets
SR Members Have Cut Ends	Treat Feed Line Bundles As Cylinder	Pole Without Linear Attachments
SR Members Are Concentric	Ignore KL/ry For 60 Deg. Angle Legs	Pole With Shroud Or No Appurtenances
Distribute Leg Loads As Uniform	Use ASCE 10 X-Brace Ly Rules	Outside and Inside Corner Radii Are Known
Use Special Wind Profile		

Tapered Pole Section Geometry

Section	Elevation	Section Length	Splice Length	Number of Sides	Top Diameter	Bottom Diameter	Wall Thickness	Bend Radius	Pole Grade
	ft	ft	ft		in	in	in	in	

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	Client	Horvath Communications	Designed by	Alexander Bazeley

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	146.00-92.79	53.21	4.42	12	17.5000	30.9200	0.2188	0.8752	A572-65 (65 ksi)
L2	92.79-45.08	52.13	5.83	12	29.3676	42.3800	0.3125	1.2500	A572-65 (65 ksi)
L3	45.08-0.00	50.91		12	40.2998	53.0000	0.3750	1.5000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	It/Q in ²	w in	w/t
L1	18.0401	12.1752	464.0992	6.1867	9.0650	51.1968	940.3908	5.9923	4.1036	18.755
	31.9336	21.6301	2602.2870	10.9910	16.0166	162.4748	5272.9390	10.6457	7.7002	35.193
L2	31.4356	29.2367	3150.3641	10.4017	15.2124	207.0913	6383.4917	14.3894	7.0330	22.506
	43.7648	42.3304	9561.6304	15.0602	21.9528	435.5532	19374.4555	20.8337	10.5203	33.665
L3	43.0948	48.2091	9808.4364	14.2931	20.8753	469.8591	19874.5514	23.7271	9.7953	26.121
	54.7374	63.5447	22462.0514	18.8397	27.4540	818.1704	45514.2058	31.2748	13.1990	35.197

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A _f	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
ft	ft ²	in							
L1 146.00-92.79				1	1	1.05			
L2 92.79-45.08				1	1	1.05			
L3 45.08-0.00				1	1	1.05			

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C _A A _A ft ² /ft	Weight plf
AT&T								
3/8" Power Cable	C	No	No	Inside Pole	146.00 - 8.00	2	No Ice 0.00 1/2" Ice 0.00 1" Ice 0.00 2" Ice 0.00	0.05 0.05 0.05 0.05
3/4" DC Power	C	No	No	Inside Pole	146.00 - 8.00	6	No Ice 0.00 1/2" Ice 0.00 1" Ice 0.00 2" Ice 0.00	5.00 5.00 5.00 5.00
2" Conduit	C	No	No	Inside Pole	146.00 - 8.00	2	No Ice 0.00 1/2" Ice 0.00 1" Ice 0.00 2" Ice 0.00	3.65 3.65 3.65 3.65
1-5/8" Hybird	C	No	No	Inside Pole	146.00 - 8.00	12	No Ice 0.00 1/2" Ice 0.00 1" Ice 0.00 2" Ice 0.00	1.00 1.00 1.00 1.00
3/8" Power Cable	C	No	No	Inside Pole	146.00 - 8.00	1	No Ice 0.00	0.05

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Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C _A A _A ft ² /ft	Weight plf
Safety Line 3/8	C	No	No	CaAa (Out Of Face)	146.00 - 8.00	1	1/2" Ice	0.00
							1" Ice	0.00
							2" Ice	0.00
							No Ice	0.04
							1/2" Ice	0.14
							1" Ice	0.24
							2" Ice	0.44
								0.05
								0.05
								0.05
								0.22
								0.75
								1.28
								2.34

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight lb
L1	146.00-92.79	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.995	2642.94
L2	92.79-45.08	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.789	2369.76
L3	45.08-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.391	1841.76

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight lb
L1	146.00-92.79	A	1.447	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	17.399	2724.58
L2	92.79-45.08	A	1.371	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	15.601	2442.96
L3	45.08-0.00	A	1.223	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	11.558	1895.65

Feed Line Center of Pressure

Section	Elevation ft	CP _X in	CP _Z in	CP _X Ice in	CP _Z Ice in
L1	146.00-92.79	-0.1950	0.1126	-1.1004	0.6353
L2	92.79-45.08	-0.1962	0.1133	-1.1826	0.6828
L3	45.08-0.00	-0.1587	0.0916	-0.9548	0.5513

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	Client	Horvath Communications	Designed by	Alexander Bazeley

Note: For pole sections, center of pressure calculations do not consider feed line shielding.

Discrete Tower Loads

<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment °</i>	<i>Placement ft</i>	<i>C_AA_A Front ft²</i>	<i>C_AA_A Side ft²</i>	<i>Weight lb</i>
Tower Top								
_ Lightning Rod	C	None		0.0000	149.00	No Ice 0.52 1/2" Ice 1.05 1" Ice 1.49 2" Ice 2.15	No Ice 0.52 1/2" Ice 1.05 1" Ice 1.49 2" Ice 2.15	25.00 29.84 38.08 65.42
_ Top Beacon	C	None		0.0000	149.00	No Ice 1.75 1/2" Ice 2.68 1" Ice 2.92 2" Ice 3.44	No Ice 1.75 1/2" Ice 2.68 1" Ice 2.92 2" Ice 3.44	68.00 102.19 139.76 225.68
AT&T								
C10855721C w/ Handrail	A	From Leg	0.00 0.00 0.00	0.0000	149.00	No Ice 35.85 1/2" Ice 40.46 1" Ice 45.07 2" Ice 54.29	No Ice 35.85 1/2" Ice 40.46 1" Ice 45.07 2" Ice 54.29	2500.00 3500.00 4500.00 6500.00

(2) NNH4-65C-R6-V4	A	From Leg	3.00 0.00 0.00	0.0000	148.00	No Ice 17.07 1/2" Ice 17.70 1" Ice 18.33 2" Ice 19.62	No Ice 7.66 1/2" Ice 8.25 1" Ice 8.84 2" Ice 10.06	93.70 185.29 285.02 509.70
(2) NNH4-65C-R6-V4	B	From Leg	3.00 0.00 0.00	0.0000	148.00	No Ice 17.07 1/2" Ice 17.70 1" Ice 18.33 2" Ice 19.62	No Ice 7.66 1/2" Ice 8.25 1" Ice 8.84 2" Ice 10.06	93.70 185.29 285.02 509.70
(2) NNH4-65C-R6-V4	C	From Leg	3.00 0.00 0.00	0.0000	148.00	No Ice 17.07 1/2" Ice 17.70 1" Ice 18.33 2" Ice 19.62	No Ice 7.66 1/2" Ice 8.25 1" Ice 8.84 2" Ice 10.06	93.70 185.29 285.02 509.70
AIR6472	A	From Leg	3.00 0.00 0.00	0.0000	148.00	No Ice 4.78 1/2" Ice 5.07 1" Ice 5.37 2" Ice 6.00	No Ice 2.44 1/2" Ice 2.68 1" Ice 2.92 2" Ice 3.43	100.00 133.04 170.13 257.25
AIR6472	B	From Leg	3.00 0.00 0.00	0.0000	148.00	No Ice 4.78 1/2" Ice 5.07 1" Ice 5.37 2" Ice 6.00	No Ice 2.44 1/2" Ice 2.68 1" Ice 2.92 2" Ice 3.43	100.00 133.04 170.13 257.25
AIR6472	C	From Leg	3.00 0.00 0.00	0.0000	148.00	No Ice 4.78 1/2" Ice 5.07 1" Ice 5.37 2" Ice 6.00	No Ice 2.44 1/2" Ice 2.68 1" Ice 2.92 2" Ice 3.43	100.00 133.04 170.13 257.25
4490 B5/B12A	A	From Leg	3.00 0.00 0.00	0.0000	148.00	No Ice 2.68 1/2" Ice 2.88 1" Ice 3.10 2" Ice 3.54	No Ice 1.22 1/2" Ice 1.37 1" Ice 1.53 2" Ice 1.87	65.00 85.06 108.11 163.98
4490 B5/B12A	B	From Leg	3.00 0.00 0.00	0.0000	148.00	No Ice 2.68 1/2" Ice 2.88 1" Ice 3.10 2" Ice 3.54	No Ice 1.22 1/2" Ice 1.37 1" Ice 1.53 2" Ice 1.87	65.00 85.06 108.11 163.98

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	Client		Designed by
			Alexander Bazeley

<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment °</i>	<i>Placement ft</i>		<i>C_{AA} Front ft²</i>	<i>C_{AA} Side ft²</i>	<i>Weight lb</i>
4490 B5/B12A	C	From Leg	3.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.68 2.88 3.10 3.54	1.22 1.37 1.53 1.87	65.00 85.06 108.11 163.98
4471 B30	A	From Leg	3.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.84 2.01 2.19 2.57	0.82 0.94 1.07 1.37	46.00 60.07 76.66 118.17
4471 B30	B	From Leg	3.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.84 2.01 2.19 2.57	0.82 0.94 1.07 1.37	46.00 60.07 76.66 118.17
4471 B30	C	From Leg	3.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.84 2.01 2.19 2.57	0.82 0.94 1.07 1.37	46.00 60.07 76.66 118.17
4890 B25/66	A	From Leg	3.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.22 2.40 2.59 3.00	1.01 1.15 1.29 1.61	68.00 85.25 105.26 154.34
4890 B25/66	B	From Leg	3.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.22 2.40 2.59 3.00	1.01 1.15 1.29 1.61	68.00 85.25 105.26 154.34
4890 B25/66	C	From Leg	3.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.22 2.40 2.59 3.00	1.01 1.15 1.29 1.61	68.00 85.25 105.26 154.34
4494 B14/B29	A	From Leg	3.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.65 1.81 1.98 2.34	0.91 1.04 1.18 1.47	59.40 73.67 90.44 132.23
4494 B14/B29	B	From Leg	3.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.65 1.81 1.98 2.34	0.91 1.04 1.18 1.47	59.40 73.67 90.44 132.23
4494 B14/B29	C	From Leg	3.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.65 1.81 1.98 2.34	0.91 1.04 1.18 1.47	59.40 73.67 90.44 132.23
DC6-48-60-18-8C	A	From Leg	0.00 0.00 0.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.05 3.26 3.49 3.96	0.98 1.12 1.26 1.58	16.00 37.28 61.65 120.45
DC6-48-60-18-8C	B	From Leg	0.00 0.00 0.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.05 3.26 3.49 3.96	0.98 1.12 1.26 1.58	16.00 37.28 61.65 120.45
DC6-48-60-0-8C	C	From Leg	0.00 0.00 0.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.05 3.26 3.49 3.96	0.98 1.12 1.26 1.58	16.00 37.28 61.65 120.45

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Tower Pressures - No Ice

$$G_H = 1.100$$

Section Elevation	z	K_Z	q_z	A_G	F a c e	A_F	A_R	A_{leg}	Leg %	$C_A A_A$ In Face ft^2	$C_A A_A$ Out Face ft^2
ft	ft		ksf	ft^2		ft^2	ft^2	ft^2			
L1 146.00-92.79	117.34	1.034	0	110.796	A	0.000	110.796	110.796	100.00	0.000	0.000
					B	0.000	110.796		100.00	0.000	0.000
					C	0.000	110.796		100.00	0.000	1.995
L2 92.79-45.08	68.23	0.886	0	149.492	A	0.000	149.492	149.492	100.00	0.000	0.000
					B	0.000	149.492		100.00	0.000	0.000
					C	0.000	149.492		100.00	0.000	1.789
L3 45.08-0.00	21.83	0.700	0	183.761	A	0.000	183.761	183.761	100.00	0.000	0.000
					B	0.000	183.761		100.00	0.000	0.000
					C	0.000	183.761		100.00	0.000	1.391

Tower Pressure - With Ice

$$G_H = 1.100$$

Section Elevation	z	K_Z	q_z	t_z	A_G	F a c e	A_F	A_R	A_{leg}	Leg %	$C_A A_A$ In Face ft^2	$C_A A_A$ Out Face ft^2
ft	ft		ksf	in	ft^2		ft^2	ft^2	ft^2			
L1 146.00-92.79	117.34	1.034	0	1.4475	123.632	A	0.000	123.632	123.632	100.00	0.000	0.000
						B	0.000	123.632		100.00	0.000	0.000
						C	0.000	123.632		100.00	0.000	17.399
L2 92.79-45.08	68.23	0.886	0	1.3710	161.002	A	0.000	161.002	161.002	100.00	0.000	0.000
						B	0.000	161.002		100.00	0.000	0.000
						C	0.000	161.002		100.00	0.000	15.601
L3 45.08-0.00	21.83	0.700	0	1.2234	194.062	A	0.000	194.062	194.062	100.00	0.000	0.000
						B	0.000	194.062		100.00	0.000	0.000
						C	0.000	194.062		100.00	0.000	11.558

Tower Pressure - Service

$$G_H = 1.100$$

Section Elevation	z	K_Z	q_z	A_G	F a c e	A_F	A_R	A_{leg}	Leg %	$C_A A_A$ In Face ft^2	$C_A A_A$ Out Face ft^2
ft	ft		ksf	ft^2		ft^2	ft^2	ft^2			
L1 146.00-92.79	117.34	1.034	0	110.796	A	0.000	110.796	110.796	100.00	0.000	0.000
					B	0.000	110.796		100.00	0.000	0.000
					C	0.000	110.796		100.00	0.000	1.995
L2 92.79-45.08	68.23	0.886	0	149.492	A	0.000	149.492	149.492	100.00	0.000	0.000
					B	0.000	149.492		100.00	0.000	0.000
					C	0.000	149.492		100.00	0.000	1.789
L3 45.08-0.00	21.83	0.700	0	183.761	A	0.000	183.761	183.761	100.00	0.000	0.000
					B	0.000	183.761		100.00	0.000	0.000
					C	0.000	183.761		100.00	0.000	1.391

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Tower Forces - No Ice - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z ksf	D _F	D _R	A _E ft ²	F lb	w plf	Ctrl. Face
L1 146.00-92.79	2642.94	3213.46	A	1	0.95	0	1	1	110.796	3220.85	60.53	C
			B	1	0.95		1	1	110.796			
			C	1	0.95		1	1	110.796			
L2 92.79-45.08	2369.76	6664.94	A	1	0.95	0	1	1	149.492	3686.37	77.27	C
			B	1	0.95		1	1	149.492			
			C	1	0.95		1	1	149.492			
L3 45.08-0.00	1841.76	10163.90	A	1	0.95	0	1	1	183.761	3640.55	80.76	C
			B	1	0.95		1	1	183.761			
			C	1	0.95		1	1	183.761			
Sum Weight:	6854.46	20042.30						OTM	708.93 kip-ft	10547.77		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z ksf	D _F	D _R	A _E ft ²	F lb	w plf	Ctrl. Face
L1 146.00-92.79	2642.94	3213.46	A	1	0.95	0	1	1	110.796	3220.85	60.53	C
			B	1	0.95		1	1	110.796			
			C	1	0.95		1	1	110.796			
L2 92.79-45.08	2369.76	6664.94	A	1	0.95	0	1	1	149.492	3686.37	77.27	C
			B	1	0.95		1	1	149.492			
			C	1	0.95		1	1	149.492			
L3 45.08-0.00	1841.76	10163.90	A	1	0.95	0	1	1	183.761	3640.55	80.76	C
			B	1	0.95		1	1	183.761			
			C	1	0.95		1	1	183.761			
Sum Weight:	6854.46	20042.30						OTM	708.93 kip-ft	10547.77		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z ksf	D _F	D _R	A _E ft ²	F lb	w plf	Ctrl. Face
L1 146.00-92.79	2642.94	3213.46	A	1	0.95	0	1	1	110.796	3220.85	60.53	C
			B	1	0.95		1	1	110.796			
			C	1	0.95		1	1	110.796			
L2 92.79-45.08	2369.76	6664.94	A	1	0.95	0	1	1	149.492	3686.37	77.27	C
			B	1	0.95		1	1	149.492			
			C	1	0.95		1	1	149.492			
L3 45.08-0.00	1841.76	10163.90	A	1	0.95	0	1	1	183.761	3640.55	80.76	C

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Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z ksf	D _F	D _R	A _E	F	w	Ctrl. Face
ft	lb	lb							ft ²	lb	plf	
Sum Weight:	6854.46	20042.30	B C	1 1	0.95 0.95		1 1	1 1 OTM	183.761 183.761 708.93 kip-ft	10547.77		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z ksf	D _F	D _R	A _E	F	w	Ctrl. Face
ft	lb	lb							ft ²	lb	plf	
L1 146.00-92.79	2724.58	5688.00	A B C	1 1 1	1.2 1.2 1.2	0	1 1 1	1 1 1	123.632 123.632 123.632	670.36	12.60	C
L2 92.79-45.08	2442.96	9760.90	A B C	1 1 1	1.2 1.2 1.2	0	1 1 1	1 1 1	160.394 160.394 160.394	718.30	15.06	C
L3 45.08-0.00	1895.65	13520.28	A B C	1 1 1	1.2 1.2 1.2	0	1 1 1	1 1 1	192.953 192.953 192.953	677.33	15.03	C
Sum Weight:	7063.19	28969.18						OTM	142.46 kip-ft	2065.99		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z ksf	D _F	D _R	A _E	F	w	Ctrl. Face
ft	lb	lb							ft ²	lb	plf	
L1 146.00-92.79	2724.58	5688.00	A B C	1 1 1	1.2 1.2 1.2	0	1 1 1	1 1 1	123.632 123.632 123.632	670.36	12.60	C
L2 92.79-45.08	2442.96	9760.90	A B C	1 1 1	1.2 1.2 1.2	0	1 1 1	1 1 1	160.394 160.394 160.394	718.30	15.06	C
L3 45.08-0.00	1895.65	13520.28	A B C	1 1 1	1.2 1.2 1.2	0	1 1 1	1 1 1	192.953 192.953 192.953	677.33	15.03	C
Sum Weight:	7063.19	28969.18						OTM	142.46 kip-ft	2065.99		

Tower Forces - With Ice - Wind 90 To Face

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Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z ksf	D _F	D _R	A _E	F	w	Ctrl. Face
ft	lb	lb							ft ²	lb	plf	
L1 146.00-92.79	2724.58	5688.00	A	1	1.2	0	1	1	123.632	670.36	12.60	C
			B	1	1.2		1	1	123.632			
			C	1	1.2		1	1	123.632			
L2 92.79-45.08	2442.96	9760.90	A	1	1.2	0	1	1	160.394	718.30	15.06	C
			B	1	1.2		1	1	160.394			
			C	1	1.2		1	1	160.394			
L3 45.08-0.00	1895.65	13520.28	A	1	1.2	0	1	1	192.953	677.33	15.03	C
			B	1	1.2		1	1	192.953			
			C	1	1.2		1	1	192.953			
Sum Weight:	7063.19	28969.18						OTM	142.46 kip-ft	2065.99		

Tower Forces - Service - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z ksf	D _F	D _R	A _E	F	w	Ctrl. Face
ft	lb	lb							ft ²	lb	plf	
L1 146.00-92.79	2642.94	3213.46	A	1	0.95	0	1	1	110.796	919.16	17.27	C
			B	1	0.95		1	1	110.796			
			C	1	0.95		1	1	110.796			
L2 92.79-45.08	2369.76	6664.94	A	1	0.95	0	1	1	149.492	1052.01	22.05	C
			B	1	0.95		1	1	149.492			
			C	1	0.95		1	1	149.492			
L3 45.08-0.00	1841.76	10163.90	A	1	0.95	0	1	1	183.761	1038.93	23.05	C
			B	1	0.95		1	1	183.761			
			C	1	0.95		1	1	183.761			
Sum Weight:	6854.46	20042.30						OTM	202.31 kip-ft	3010.11		

Tower Forces - Service - Wind 60 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z ksf	D _F	D _R	A _E	F	w	Ctrl. Face
ft	lb	lb							ft ²	lb	plf	
L1 146.00-92.79	2642.94	3213.46	A	1	0.95	0	1	1	110.796	919.16	17.27	C
			B	1	0.95		1	1	110.796			
			C	1	0.95		1	1	110.796			
L2 92.79-45.08	2369.76	6664.94	A	1	0.95	0	1	1	149.492	1052.01	22.05	C
			B	1	0.95		1	1	149.492			
			C	1	0.95		1	1	149.492			
L3 45.08-0.00	1841.76	10163.90	A	1	0.95	0	1	1	183.761	1038.93	23.05	C
			B	1	0.95		1	1	183.761			
			C	1	0.95		1	1	183.761			
Sum Weight:	6854.46	20042.30						OTM	202.31 kip-ft	3010.11		

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Tower Forces - Service - Wind 90 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z	D _F	D _R	A _E	F	w	Ctrl. Face
ft	lb	lb				ksf			ft ²	lb	plf	
L1 146.00-92.79	2642.94	3213.46	A	1	0.95	0	1	1	110.796	919.16	17.27	C
			B	1	0.95		1	1	110.796			
			C	1	0.95		1	1	110.796			
L2 92.79-45.08	2369.76	6664.94	A	1	0.95	0	1	1	149.492	1052.01	22.05	C
			B	1	0.95		1	1	149.492			
			C	1	0.95		1	1	149.492			
L3 45.08-0.00	1841.76	10163.90	A	1	0.95	0	1	1	183.761	1038.93	23.05	C
			B	1	0.95		1	1	183.761			
			C	1	0.95		1	1	183.761			
Sum Weight:	6854.46	20042.30						OTM	202.31 kip-ft	3010.11		

Force Totals

Load Case	Vertical Forces	Sum of Forces X	Sum of Forces Z	Sum of Overturning Moments, M _x	Sum of Overturning Moments, M _z	Sum of Torques
	lb	lb	lb	kip-ft	kip-ft	kip-ft
Leg Weight	20042.30					
Bracing Weight	0.00					
Total Member Self-Weight	20042.30			-1.80	0.04	
Total Weight	31115.16			-1.80	0.04	
Wind 0 deg - No Ice		0.00	-14364.79	-1276.80	0.04	-0.16
Wind 30 deg - No Ice		7182.39	-12440.27	-1105.98	-637.46	-2.30
Wind 60 deg - No Ice		12440.27	-7182.39	-639.30	-1104.15	-0.58
Wind 90 deg - No Ice		14364.79	0.00	-1.80	-1274.96	1.29
Wind 120 deg - No Ice		12440.27	7182.39	635.70	-1104.15	-0.42
Wind 150 deg - No Ice		7182.39	12440.27	1102.38	-637.46	-2.02
Wind 180 deg - No Ice		0.00	14364.79	1273.20	0.04	0.16
Wind 210 deg - No Ice		-7182.39	12440.27	1102.38	637.54	2.30
Wind 240 deg - No Ice		-12440.27	7182.39	635.70	1104.22	0.58
Wind 270 deg - No Ice		-14364.79	0.00	-1.80	1275.04	-1.29
Wind 300 deg - No Ice		-12440.27	-7182.39	-639.30	1104.22	0.42
Wind 330 deg - No Ice		-7182.39	-12440.27	-1105.98	637.54	2.02
Member Ice	8926.88					
Total Weight Ice	46408.46			-3.81	0.30	
Wind 0 deg - Ice		0.00	-2711.89	-242.08	0.30	-0.19
Wind 30 deg - Ice		1355.94	-2348.56	-210.16	-118.84	-0.43
Wind 60 deg - Ice		2348.56	-1355.94	-122.95	-206.05	-0.11
Wind 90 deg - Ice		2711.89	0.00	-3.81	-237.97	0.24
Wind 120 deg - Ice		2348.56	1355.94	115.32	-206.05	0.08
Wind 150 deg - Ice		1355.94	2348.56	202.53	-118.84	-0.11
Wind 180 deg - Ice		0.00	2711.89	234.46	0.30	0.19
Wind 210 deg - Ice		-1355.94	2348.56	202.53	119.43	0.43
Wind 240 deg - Ice		-2348.56	1355.94	115.32	206.04	0.11
Wind 270 deg - Ice		-2711.89	0.00	-3.81	238.56	-0.24
Wind 300 deg - Ice		-2348.56	-1355.94	-122.95	206.04	-0.08
Wind 330 deg - Ice		-1355.94	-2348.56	-210.16	119.43	0.11

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<i>Load Case</i>	<i>Vertical Forces</i> <i>lb</i>	<i>Sum of Forces X</i> <i>lb</i>	<i>Sum of Forces Z</i> <i>lb</i>	<i>Sum of Overturning Moments, M_x</i> <i>kip-ft</i>	<i>Sum of Overturning Moments, M_z</i> <i>kip-ft</i>	<i>Sum of Torques</i> <i>kip-ft</i>
Total Weight	31115.16			-1.80	0.04	
Wind 0 deg - Service		0.00	-4099.40	-365.68	0.00	-0.05
Wind 30 deg - Service		2049.70	-3550.19	-316.93	-181.93	-0.66
Wind 60 deg - Service		3550.19	-2049.70	-183.75	-315.11	-0.17
Wind 90 deg - Service		4099.40	0.00	-1.82	-363.86	0.37
Wind 120 deg - Service		3550.19	2049.70	180.11	-315.11	-0.12
Wind 150 deg - Service		2049.70	3550.19	313.29	-181.93	-0.58
Wind 180 deg - Service		0.00	4099.40	362.04	0.00	0.05
Wind 210 deg - Service		-2049.70	3550.19	313.29	181.93	0.66
Wind 240 deg - Service		-3550.19	2049.70	180.11	315.11	0.17
Wind 270 deg - Service		-4099.40	0.00	-1.82	363.86	-0.37
Wind 300 deg - Service		-3550.19	-2049.70	-183.75	315.11	0.12
Wind 330 deg - Service		-2049.70	-3550.19	-316.93	181.93	0.58

Load Combinations

<i>Comb. No.</i>	<i>Description</i>
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp

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<i>Comb. No.</i>	<i>Description</i>
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

<i>Section No.</i>	<i>Elevation ft</i>	<i>Component Type</i>	<i>Condition</i>	<i>Gov. Load Comb.</i>	<i>Axial lb</i>	<i>Major Axis Moment kip-ft</i>	<i>Minor Axis Moment kip-ft</i>
L1	146 - 92.79	Pole	Max Tension	27	0.02	-0.00	-0.00
			Max. Compression	26	-19925.38	0.09	4.79
			Max. Mx	20	-11183.59	278.39	2.32
			Max. My	2	-11182.59	0.01	280.67
			Max. Vy	20	-7106.69	278.39	2.32
			Max. Vx	2	-7108.25	0.01	280.67
			Max. Torque	16			-2.29
L2	92.79 - 45.08	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-33326.69	0.20	4.91
			Max. Mx	20	-21379.92	686.89	2.36
			Max. My	2	-21379.51	0.03	689.21
			Max. Vy	20	-10577.16	686.89	2.36
			Max. Vx	2	-10577.98	0.03	689.21
			Max. Torque	16			-2.32
L3	45.08 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-53352.38	0.32	4.84
			Max. Mx	20	-37333.17	1321.73	2.37
			Max. My	2	-37333.16	0.05	1324.04
			Max. Vy	20	-14377.84	1321.73	2.37
			Max. Vx	2	-14377.86	0.05	1324.04
			Max. Torque	16			-2.35

Maximum Reactions

<i>Location</i>	<i>Condition</i>	<i>Gov. Load Comb.</i>	<i>Vertical lb</i>	<i>Horizontal, X lb</i>	<i>Horizontal, Z lb</i>
Pole	Max. Vert	26	53352.38	0.00	0.01
	Max. H _x	20	37338.19	14364.79	-0.00
	Max. H _z	2	37338.19	0.00	14364.79
	Max. M _x	2	1324.04	0.00	14364.79
	Max. M _z	8	1321.63	-14364.79	-0.00
	Max. Torsion	4	2.35	-7182.39	12440.27
	Min. Vert	13	28003.64	-7182.39	-12440.27
	Min. H _x	8	37338.19	-14364.79	-0.00
	Min. H _z	14	37338.19	0.00	-14364.79
	Min. M _x	14	-1319.32	0.00	-14364.79

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Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
	Min. M _z	20	-1321.73	14364.79	-0.00
	Min. Torsion	16	-2.35	7182.39	-12440.27

Tower Mast Reaction Summary

Load Combination	Vertical lb	Shear _x lb	Shear _z lb	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead Only	31115.16	-0.00	-0.00	-1.89	0.04	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	37338.19	-0.00	-14364.79	-1324.04	0.05	-0.16
0.9 Dead+1.0 Wind 0 deg - No Ice	28003.64	-0.00	-14364.79	-1311.19	0.03	-0.16
1.2 Dead+1.0 Wind 30 deg - No Ice	37338.19	7182.39	-12440.27	-1146.97	-660.81	-2.35
0.9 Dead+1.0 Wind 30 deg - No Ice	28003.64	7182.39	-12440.27	-1135.75	-654.70	-2.34
1.2 Dead+1.0 Wind 60 deg - No Ice	37338.19	12440.27	-7182.39	-663.20	-1144.57	-0.68
0.9 Dead+1.0 Wind 60 deg - No Ice	28003.64	12440.27	-7182.39	-656.46	-1133.99	-0.66
1.2 Dead+1.0 Wind 90 deg - No Ice	37338.19	14364.79	0.00	-2.37	-1321.63	1.17
0.9 Dead+1.0 Wind 90 deg - No Ice	28003.64	14364.79	0.00	-1.74	-1309.43	1.20
1.2 Dead+1.0 Wind 120 deg - No Ice	37338.19	12440.27	7182.39	658.49	-1144.57	-0.52
0.9 Dead+1.0 Wind 120 deg - No Ice	28003.64	12440.27	7182.39	653.00	-1133.99	-0.50
1.2 Dead+1.0 Wind 150 deg - No Ice	37338.19	7182.39	12440.27	1142.26	-660.79	-2.07
0.9 Dead+1.0 Wind 150 deg - No Ice	28003.64	7182.39	12440.27	1132.30	-654.69	-2.06
1.2 Dead+1.0 Wind 180 deg - No Ice	37338.19	-0.00	14364.79	1319.32	0.05	0.16
0.9 Dead+1.0 Wind 180 deg - No Ice	28003.64	-0.00	14364.79	1307.73	0.03	0.16
1.2 Dead+1.0 Wind 210 deg - No Ice	37338.19	-7182.39	12440.27	1142.26	660.88	2.35
0.9 Dead+1.0 Wind 210 deg - No Ice	28003.64	-7182.39	12440.27	1132.30	654.76	2.34
1.2 Dead+1.0 Wind 240 deg - No Ice	37338.19	-12440.27	7182.39	658.49	1144.66	0.68
0.9 Dead+1.0 Wind 240 deg - No Ice	28003.64	-12440.27	7182.39	653.00	1134.06	0.66
1.2 Dead+1.0 Wind 270 deg - No Ice	37338.19	-14364.79	0.00	-2.37	1321.73	-1.17
0.9 Dead+1.0 Wind 270 deg - No Ice	28003.64	-14364.79	0.00	-1.74	1309.50	-1.20
1.2 Dead+1.0 Wind 300 deg - No Ice	37338.19	-12440.27	-7182.39	-663.20	1144.66	0.52
0.9 Dead+1.0 Wind 300 deg - No Ice	28003.64	-12440.27	-7182.39	-656.46	1134.06	0.50
1.2 Dead+1.0 Wind 330 deg - No Ice	37338.19	-7182.39	-12440.27	-1146.97	660.90	2.07
0.9 Dead+1.0 Wind 330 deg - No Ice	28003.64	-7182.39	-12440.27	-1135.75	654.77	2.06

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Load Combination	Vertical lb	Shear _x lb	Shear _z lb	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
1.2 Dead+1.0 Ice+1.0 Temp	53352.38	-0.00	-0.01	-4.84	0.32	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	53352.38	-0.00	-2712.00	-258.71	0.33	-0.19
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	53352.38	1356.00	-2348.67	-224.71	-126.56	-0.45
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	53352.38	2348.66	-1356.01	-131.82	-219.45	-0.15
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	53352.38	2712.00	-0.01	-4.93	-253.45	0.20
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	53352.38	2348.66	1355.99	121.95	-219.45	0.04
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	53352.38	1356.00	2348.65	214.84	-126.56	-0.13
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	53352.38	-0.00	2711.99	248.84	0.33	0.19
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	53352.38	-1356.00	2348.65	214.84	127.21	0.45
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	53352.38	-2348.66	1355.99	121.95	220.10	0.15
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	53352.38	-2712.00	-0.01	-4.93	254.10	-0.20
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	53352.38	-2348.66	-1356.01	-131.82	220.10	-0.04
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	53352.38	-1356.00	-2348.67	-224.71	127.21	0.13
Dead+Wind 0 deg - Service	31115.16	-0.00	-4099.40	-376.89	0.04	-0.05
Dead+Wind 30 deg - Service	31115.16	2049.70	-3550.19	-326.66	-187.44	-0.67
Dead+Wind 60 deg - Service	31115.16	3550.19	-2049.70	-189.42	-324.68	-0.19
Dead+Wind 90 deg - Service	31115.16	4099.40	-0.00	-1.94	-374.91	0.34
Dead+Wind 120 deg - Service	31115.16	3550.19	2049.70	185.54	-324.68	-0.15
Dead+Wind 150 deg - Service	31115.16	2049.70	3550.19	322.78	-187.44	-0.59
Dead+Wind 180 deg - Service	31115.16	-0.00	4099.40	373.01	0.04	0.05
Dead+Wind 210 deg - Service	31115.16	-2049.70	3550.19	322.78	187.51	0.67
Dead+Wind 240 deg - Service	31115.16	-3550.19	2049.70	185.54	324.76	0.19
Dead+Wind 270 deg - Service	31115.16	-4099.40	-0.00	-1.94	374.99	-0.34
Dead+Wind 300 deg - Service	31115.16	-3550.19	-2049.70	-189.42	324.76	0.15
Dead+Wind 330 deg - Service	31115.16	-2049.70	-3550.19	-326.66	187.52	0.59

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	
1	0.00	-31115.16	0.00	0.00	31115.16	0.00	0.000%
2	0.00	-37338.19	-14364.79	0.00	37338.19	14364.79	0.000%
3	0.00	-28003.64	-14364.79	0.00	28003.64	14364.79	0.000%
4	7182.39	-37338.19	-12440.27	-7182.39	37338.19	12440.27	0.000%
5	7182.39	-28003.64	-12440.27	-7182.39	28003.64	12440.27	0.000%
6	12440.27	-37338.19	-7182.39	-12440.27	37338.19	7182.39	0.000%
7	12440.27	-28003.64	-7182.39	-12440.27	28003.64	7182.39	0.000%
8	14364.79	-37338.19	0.00	-14364.79	37338.19	-0.00	0.000%
9	14364.79	-28003.64	0.00	-14364.79	28003.64	-0.00	0.000%
10	12440.27	-37338.19	7182.39	-12440.27	37338.19	-7182.39	0.000%
11	12440.27	-28003.64	7182.39	-12440.27	28003.64	-7182.39	0.000%
12	7182.39	-37338.19	12440.27	-7182.39	37338.19	-12440.27	0.000%
13	7182.39	-28003.64	12440.27	-7182.39	28003.64	-12440.27	0.000%
14	0.00	-37338.19	14364.79	0.00	37338.19	-14364.79	0.000%
15	0.00	-28003.64	14364.79	0.00	28003.64	-14364.79	0.000%

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Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	
16	-7182.39	-37338.19	12440.27	7182.39	37338.19	-12440.27	0.000%
17	-7182.39	-28003.64	12440.27	7182.39	28003.64	-12440.27	0.000%
18	-12440.27	-37338.19	7182.39	12440.27	37338.19	-7182.39	0.000%
19	-12440.27	-28003.64	7182.39	12440.27	28003.64	-7182.39	0.000%
20	-14364.79	-37338.19	0.00	14364.79	37338.19	-0.00	0.000%
21	-14364.79	-28003.64	0.00	14364.79	28003.64	-0.00	0.000%
22	-12440.27	-37338.19	-7182.39	12440.27	37338.19	7182.39	0.000%
23	-12440.27	-28003.64	-7182.39	12440.27	28003.64	7182.39	0.000%
24	-7182.39	-37338.19	-12440.27	7182.39	37338.19	12440.27	0.000%
25	-7182.39	-28003.64	-12440.27	7182.39	28003.64	12440.27	0.000%
26	0.00	-53352.38	0.00	0.00	53352.38	0.01	0.000%
27	0.00	-53352.38	-2711.89	0.00	53352.38	2712.00	0.000%
28	1355.94	-53352.38	-2348.56	-1356.00	53352.38	2348.67	0.000%
29	2348.56	-53352.38	-1355.94	-2348.66	53352.38	1356.01	0.000%
30	2711.89	-53352.38	0.00	-2712.00	53352.38	0.01	0.000%
31	2348.56	-53352.38	1355.94	-2348.66	53352.38	-1355.99	0.000%
32	1355.94	-53352.38	2348.56	-1356.00	53352.38	-2348.65	0.000%
33	0.00	-53352.38	2711.89	0.00	53352.38	-2711.99	0.000%
34	-1355.94	-53352.38	2348.56	1356.00	53352.38	-2348.65	0.000%
35	-2348.56	-53352.38	1355.94	2348.66	53352.38	-1355.99	0.000%
36	-2711.89	-53352.38	0.00	2712.00	53352.38	0.01	0.000%
37	-2348.56	-53352.38	-1355.94	2348.66	53352.38	1356.01	0.000%
38	-1355.94	-53352.38	-2348.56	1356.00	53352.38	2348.67	0.000%
39	0.00	-31115.16	-4099.40	0.00	31115.16	4099.40	0.000%
40	2049.70	-31115.16	-3550.19	-2049.70	31115.16	3550.19	0.000%
41	3550.19	-31115.16	-2049.70	-3550.19	31115.16	2049.70	0.000%
42	4099.40	-31115.16	0.00	-4099.40	31115.16	0.00	0.000%
43	3550.19	-31115.16	2049.70	-3550.19	31115.16	-2049.70	0.000%
44	2049.70	-31115.16	3550.19	-2049.70	31115.16	-3550.19	0.000%
45	0.00	-31115.16	4099.40	0.00	31115.16	-4099.40	0.000%
46	-2049.70	-31115.16	3550.19	2049.70	31115.16	-3550.19	0.000%
47	-3550.19	-31115.16	2049.70	3550.19	31115.16	-2049.70	0.000%
48	-4099.40	-31115.16	0.00	4099.40	31115.16	0.00	0.000%
49	-3550.19	-31115.16	-2049.70	3550.19	31115.16	2049.70	0.000%
50	-2049.70	-31115.16	-3550.19	2049.70	31115.16	3550.19	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00010925
3	Yes	4	0.00000001	0.00004162
4	Yes	5	0.00000001	0.00006976
5	Yes	4	0.00000001	0.00092391
6	Yes	5	0.00000001	0.00008485
7	Yes	5	0.00000001	0.00004299
8	Yes	4	0.00000001	0.00030331
9	Yes	4	0.00000001	0.00021354
10	Yes	5	0.00000001	0.00007395
11	Yes	4	0.00000001	0.00098537
12	Yes	5	0.00000001	0.00009694
13	Yes	5	0.00000001	0.00004985
14	Yes	4	0.00000001	0.00010688
15	Yes	4	0.00000001	0.00004100
16	Yes	5	0.00000001	0.00009816

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17	Yes	5	0.00000001	0.00005051
18	Yes	5	0.00000001	0.00007356
19	Yes	4	0.00000001	0.00098002
20	Yes	4	0.00000001	0.00030333
21	Yes	4	0.00000001	0.00021355
22	Yes	5	0.00000001	0.00008431
23	Yes	5	0.00000001	0.00004270
24	Yes	5	0.00000001	0.00006998
25	Yes	4	0.00000001	0.00092655
26	Yes	4	0.00000001	0.00003674
27	Yes	4	0.00000001	0.00060909
28	Yes	4	0.00000001	0.00062104
29	Yes	4	0.00000001	0.00061000
30	Yes	4	0.00000001	0.00057430
31	Yes	4	0.00000001	0.00056838
32	Yes	4	0.00000001	0.00055805
33	Yes	4	0.00000001	0.00053850
34	Yes	4	0.00000001	0.00056028
35	Yes	4	0.00000001	0.00056997
36	Yes	4	0.00000001	0.00057606
37	Yes	4	0.00000001	0.00061122
38	Yes	4	0.00000001	0.00062144
39	Yes	4	0.00000001	0.00001072
40	Yes	4	0.00000001	0.00004505
41	Yes	4	0.00000001	0.00004521
42	Yes	4	0.00000001	0.00002458
43	Yes	4	0.00000001	0.00003177
44	Yes	4	0.00000001	0.00006685
45	Yes	4	0.00000001	0.00001029
46	Yes	4	0.00000001	0.00006893
47	Yes	4	0.00000001	0.00003158
48	Yes	4	0.00000001	0.00002458
49	Yes	4	0.00000001	0.00004434
50	Yes	4	0.00000001	0.00004356

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	146 - 92.79	13.318	39	0.9615	0.0141
L2	97.21 - 45.08	5.312	39	0.5575	0.0028
L3	50.91 - 0	1.366	39	0.2503	0.0008

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
149.00	Lightning Rod	39	13.318	0.9615	0.0141	53859
148.00	(2) NNH4-65C-R6-V4	39	13.318	0.9615	0.0141	53859

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Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	146 - 92.79	46.575	2	3.3258	0.0493
L2	97.21 - 45.08	18.653	2	1.9557	0.0098
L3	50.91 - 0	4.798	2	0.8794	0.0027

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
149.00	Lightning Rod	2	46.575	3.3258	0.0493	15657
148.00	(2) NNH4-65C-R6-V4	2	46.575	3.3258	0.0493	15657

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	KL/r	A in ²	P _u lb	φP _n lb	Ratio $\frac{P_u}{\phi P_n}$
L1	146 - 92.79 (1)	TP30.92x17.5x0.2188	53.21	0.00	0.0	20.8447	-11182.60	1219420.00	0.009
L2	92.79 - 45.08 (2)	TP42.38x29.3676x0.3125	52.13	0.00	0.0	40.8661	-21379.50	2390670.00	0.009
L3	45.08 - 0 (3)	TP53x40.2998x0.375	50.91	0.00	0.0	63.5447	-37333.20	3709660.00	0.010

Pole Bending Design Data

Section No.	Elevation ft	Size	M _{ux} kip-ft	φM _{ux} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{ux}}$	M _{uy} kip-ft	φM _{uy} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{uy}}$
L1	146 - 92.79 (1)	TP30.92x17.5x0.2188	280.67	750.77	0.374	0.00	750.77	0.000
L2	92.79 - 45.08 (2)	TP42.38x29.3676x0.3125	689.21	2066.62	0.333	0.00	2066.62	0.000
L3	45.08 - 0 (3)	TP53x40.2998x0.375	1324.04	3980.31	0.333	0.00	3980.31	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V _u lb	φV _n lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T _u kip-ft	φT _n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
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tnxTower Core One Consulting 4515 S. McClintock Drive Suite 220 Tempe, AZ Phone: FAX:	Job	HTMO01589	Page	18 of 18
	Project		Date	19:36:24 05/26/25
	Client	Horvath Communications	Designed by	Alexander Bazeley

Section No.	Elevation <i>ft</i>	Size	Actual V_u <i>lb</i>	ϕV_n <i>lb</i>	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u <i>kip-ft</i>	ϕT_n <i>kip-ft</i>	Ratio $\frac{T_u}{\phi T_n}$
L1	146 - 92.79 (1)	TP30.92x17.5x0.2188	7108.25	365825.00	0.019	0.05	952.07	0.000
L2	92.79 - 45.08 (2)	TP42.38x29.3676x0.3125	10578.00	717200.00	0.015	0.10	2562.11	0.000
L3	45.08 - 0 (3)	TP53x40.2998x0.375	14377.90	1115210.00	0.013	0.16	5162.36	0.000

Pole Interaction Design Data

Section No.	Elevation <i>ft</i>	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	146 - 92.79 (1)	0.009	0.374	0.000	0.019	0.000	0.383	1.050	✓
L2	92.79 - 45.08 (2)	0.009	0.333	0.000	0.015	0.000	0.343	1.050	✓
L3	45.08 - 0 (3)	0.010	0.333	0.000	0.013	0.000	0.343	1.050	✓

Section Capacity Table

Section No.	Elevation <i>ft</i>	Component Type	Size	Critical Element	P <i>lb</i>	ϕP_{allow} <i>lb</i>	% Capacity	Pass Fail
L1	146 - 92.79	Pole	TP30.92x17.5x0.2188	1	-11182.60	1280391.00	36.5	Pass
L2	92.79 - 45.08	Pole	TP42.38x29.3676x0.3125	2	-21379.50	2510203.50	32.6	Pass
L3	45.08 - 0	Pole	TP53x40.2998x0.375	3	-37333.20	3895142.75	32.7	Pass
							Summary	
							Pole (L1)	36.5 Pass
							RATING =	36.5 Pass

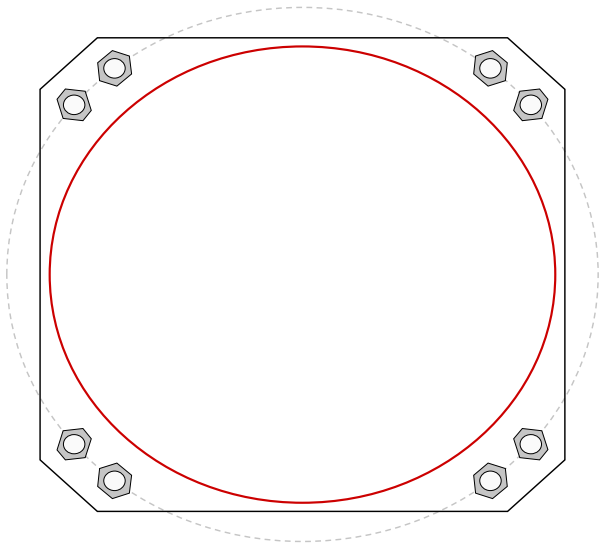
Monopole Base Plate Connection

Site Info	
BU #	HTMO1589
Site Name	Green
Order #	

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
I _{gr} (in)	0

Applied Loads	
Moment (kip-ft)	1324.04
Axial Force (kips)	37.33
Shear Force (kips)	14.38

*TIA-222-H Section 15.5 Applied



Connection Properties		Analysis Results	
Anchor Rod Data		Anchor Rod Summary (units of kips, kip-in)	
(8) 2-1/4" ϕ bolts (A615-75 X; F _y =75 ksi, F _u =100 ksi) on 62" BC Anchor Spacing: 6 in		Pu_c = 132.73	ϕ Pn_c = 268.39 Stress Rating
		Vu = 1.8	ϕ Vn = 120.77 47.1%
		Mu = n/a	ϕ Mn = n/a Pass
Base Plate Data		Base Plate Summary	
55" OD x 2.75" Plate (A572-60; F _y =60 ksi, F _u =75 ksi)		Max Stress (ksi):	24.56 (Flexural)
Stiffener Data		Allowable Stress (ksi):	54
N/A		Stress Rating:	43.3% Pass
Pole Data			
53" x 0.375" 12-sided pole (A572-65; F _y =65 ksi, F _u =80 ksi)			

Drilled Pier Foundation

BU #: HTMO1589
 Site Name: Green
 Order Number:

Report File: Z:\Clients\Horvath Communications\HTMO1589_Green_Monopole\Calcs\HTMO1589_Green_M

TIA-222 Revision: H
 Tower Type: Monopole

Applied Loads		
	Comp.	Uplift
Moment (kip-ft)	1324.04	
Axial Force (kips)	37.34	
Shear Force (kips)	14.36	

Material Properties		
Concrete Strength, f _c :	4	ksi
Rebar Strength, F _y :	60	ksi
Tie Yield Strength, F _y t:	60	ksi

Pier Design Data		
Depth	25	ft
Ext. Above Grade	1	ft
Pier Section 1		
From 1' above grade to 25' below grade		
Pier Diameter	7	ft
Rebar Quantity	21	
Rebar Size	11	
Clear Cover to Ties	3	in
Tie Size	5	
Tie Spacing	12	in

[Rebar & Pier Options](#)

[Embedded Pole Inputs](#)

[Belled Pier Inputs](#)

Analysis Results		
Soil Lateral Check		
	Compression	Uplift
D _{v=0} (ft from TOC)	9.48	-
Soil Safety Factor	5.76	-
Max Moment (kip-ft)	1481.82	-
Rating	23.1%	-
Soil Vertical Check		
	Compression	Uplift
Skin Friction (kips)	360.59	-
End Bearing (kips)	649.43	-
Weight of Concrete (kips)	180.11	-
Total Capacity (kips)	1010.01	-
Axial (kips)	217.45	-
Rating	21.5%	-
Reinforced Concrete Flexure		
	Compression	Uplift
Critical Depth (ft from TOC)	9.37	-
Critical Moment (kip-ft)	1481.75	-
Critical Moment Capacity	5429.50	-
Rating	27.3%	-
Reinforced Concrete Shear		
	Compression	Uplift
Critical Depth (ft from TOC)	19.46	-
Critical Shear (kip)	181.61	-
Critical Shear Capacity	765.56	-
Rating	23.7%	-
Soil Interaction Rating		23.1%
Structural Foundation Rating		27.3%

Check Limitation	
Apply TIA-222-H Section 15.5:	☐
N/A	☐
Shear Design Options	
Check Shear along Depth of Pier:	☒
Utilize Shear-Friction Methodology:	☐
Override Critical Depth:	☐

[Go to Soil Calculations](#)

Soil Profile														
Groundwater Depth		N/A		# of Layers		4								
Layer	Top (ft)	Bottom (ft)	Thickness (ft)	Y _{soil} (pcf)	Y _{concrete} (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Net Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	7.5	7.5	100	150	0	0	0.000	0.000					Cohesionless
2	7.5	10	2.5	100	150	1.5		0.825	0.825					Cohesive
3	10	18	8	100	150	1.875		1.031	1.031					Cohesive
4	18	25	7	100	150	3		1.650	1.650			20		Cohesive

Address:
No Address at This Location

ASCE Hazards Report

Standard: ASCE/SEI 7-16

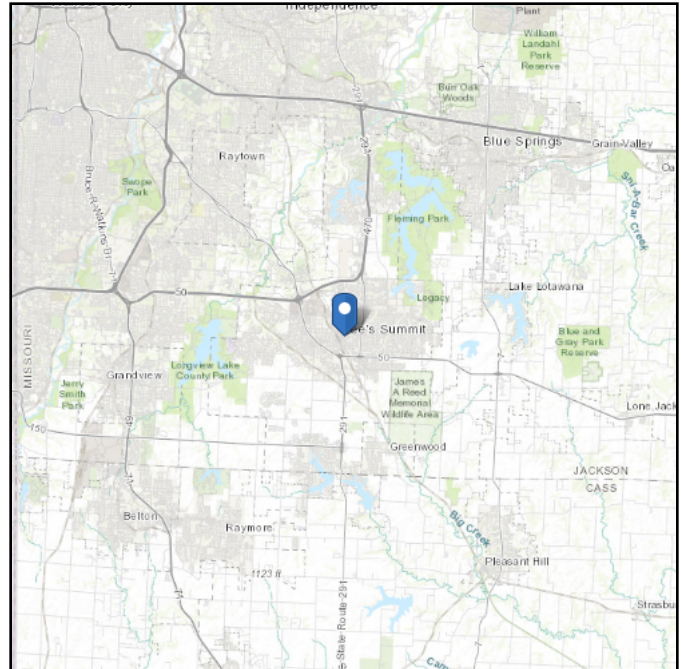
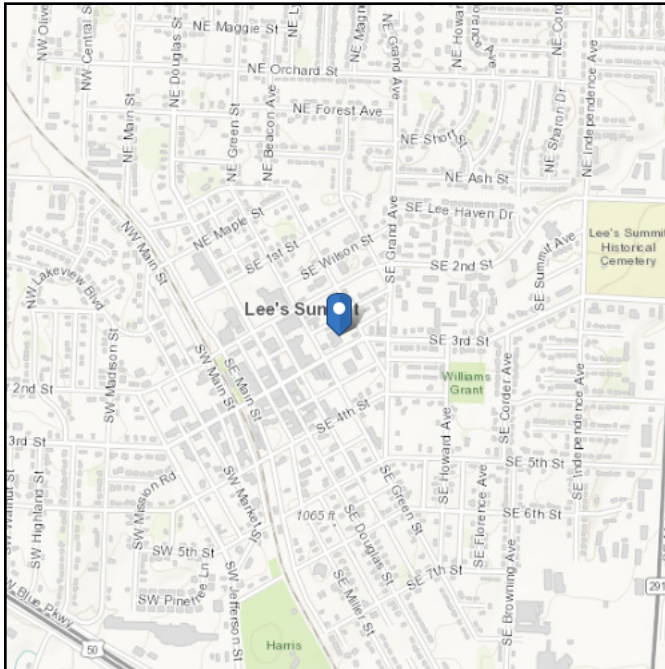
Latitude: 38.91389

Risk Category: II

Longitude: -94.37417

Soil Class: D - Default (see Section 11.4.3)

Elevation: 1023.60926421875 ft (NAVD 88)



Wind

Results:

Wind Speed	109 Vmph
10-year MRI	76 Vmph
25-year MRI	83 Vmph
50-year MRI	88 Vmph
100-year MRI	94 Vmph

Data Source: ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2

Date Accessed: Mon May 26 2025

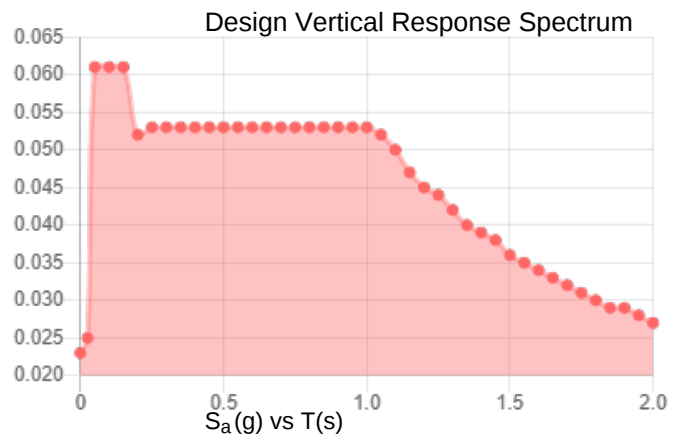
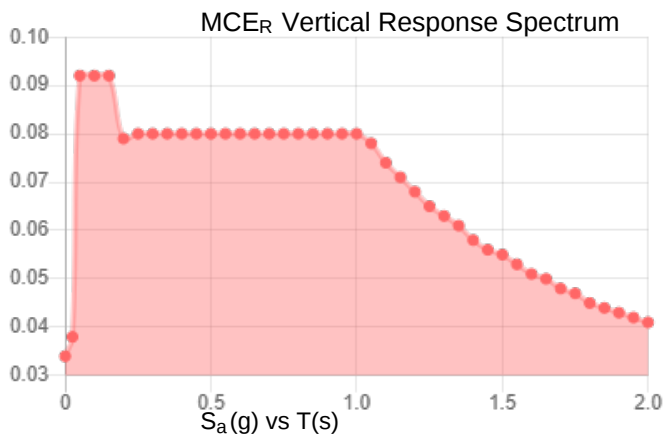
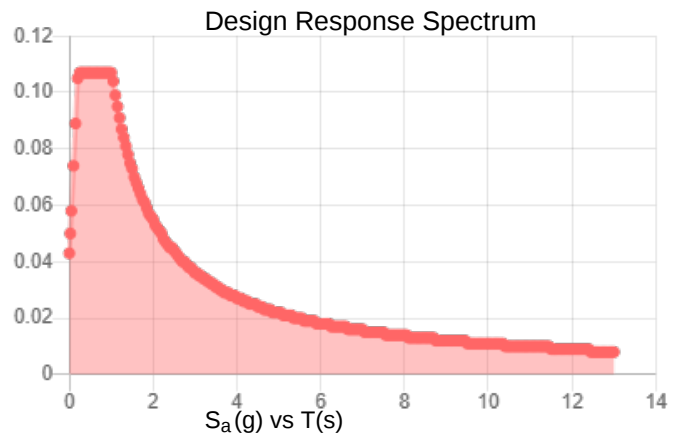
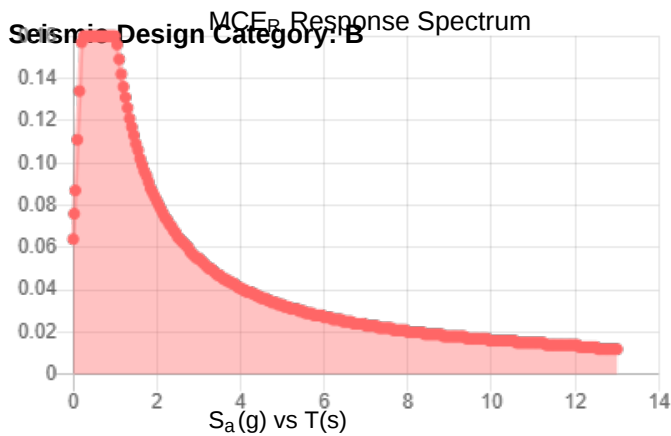
Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

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

Site Soil Class: D - Default (see Section 11.4.3)

Results:

S_S :	0.1	S_{D1} :	0.109
S_1 :	0.068	T_L :	12
F_a :	1.6	PGA :	0.047
F_v :	2.4	PGA _M :	0.076
S_{MS} :	0.16	F_{PGA} :	1.6
S_{M1} :	0.164	I_e :	1
S_{DS} :	0.107	C_v :	0.7



Data Accessed: Mon May 26 2025

Date Source:

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

Ice

Results:

Ice Thickness: 1.50 in.
Concurrent Temperature: 5 F
Gust Speed 40 mph

Data Source: Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8

Date Accessed: Mon May 26 2025

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

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

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EPA Calculator (in^2)

Mount Height (ft)	Antenna Height (ft)	Quantity	Equipment	Weight (lb)	Length (in)	Width (in)	Depth (in)	Carrier	Retained Proposed Removed
149	149	6	Quintel QS86512-2	127.5	96	12	9.6	AT&T	Removed
		3	Airscale AEQK	99.2	29.5	17.7	9.5		Removed
		3	Commscope SBNHH1D-65C	49.6	96	11.9	7.1		Removed
	148	6	Commscope NNH4-65C-R6-V4	93.7	96	19.6	7.1		Proposed
		3	Ericsson AIR 6472 B77G B77M	67.2	36.3	15.8	7.4		Proposed
	149	3	Nokia AHLBBA	94.8	24	14.9	12.7		Removed
		3	Nokia B25-RRH4x30-4R	53	21.2	12	7.2		Removed
		3	Nokia RRH4x45-4R	56.8	25.8	11.8	7.2		Removed
		3	AHCA	36.8	13.3	11.6	6.5		Removed
		3	Powerwave TT08-19DB111-001	22	14.2	6.7	5.4		Removed
		3	Alcatel Lucent RRH4x25-WCS-4R	70	29.5	11.8	7.9		Removed
	148	3	Ericsson 4490 B5/B12A	65	17.5	15.1	6.8		Proposed
		3	Ericsson 4471 B30	28.4	13.9	10.3	5.1		Proposed
		3	Ericsson 4890 B25/B66	67.2	17.5	15.1	6.9		Proposed
		3	Ericsson 4494 B14/B29	57.3	17.5	15.1	5.9		Proposed
	149	2	Raycap DC6-48-60-18-8C	26.2	20.6	18.17	6.37		Retained
		1	Raycap DC6-48-60-0-8C	26.2	20.06	18.17	6.37		Retained

Total Square Inches Retained	738.7922
Total Square Inches Removed	4330.51
Total Square Inches Proposed	3391.06

Existing Configuration	5069.3022	in^2
Final Configuration	4129.8522	in^2

EPA Increase	-939.45	in^2
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*Negative increase means the total proposed EPA has decreased