



Structural Analysis Report

Prepared for:

Vertical Bridge
750 Park of Commerce Drive, Suite 200
Boca Raton, FL 33487

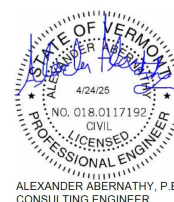
ATTN: Mr. Aaron Gooden

Structure : 139 ft Monopole
Site ID : US-VT-5036
Site Name : Richford
Proposed Carrier : AT&T Wireless
Carrier Site Name : Richford Hardwood
Site Location : 254 Hardwood Hill Road
 Richford, VT
 44.969806, -72.669997
County : Franklin
Date : April 24, 2025
Max Structure Usage : 28%
Max Foundation Usage : 35%
Result : Pass

Prepared By:
 Jung Hyun Hong, E.I.T. (NE)
 Structural Engineer

A handwritten signature in black ink, appearing to read 'JH Hong', is written over a light blue grid background.

Approved by:
 Alexander Abernathy, P.E.
 Consulting Engineer



Engineering Review and Certification Cover Sheet

The attached structural analysis completed by Semaan Engineering Solutions, LLC has been prepared under my direct supervision and found to be in conformance with the local building codes and governing EIA 222 standard listed on Page 2. The reviewing professional credentials are listed as follows:

Engineer's Name: Cliff Alexander Abernathy, P.E.

Engineer's Company: Cliff Alexander Abernathy, Consulting Engineer, sole proprietor

State of Licensure: VT

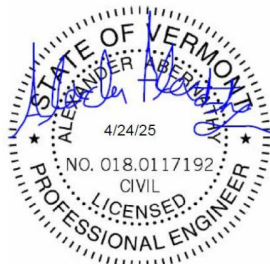
Engineer's License Number: 018.0117192

Site ID: US-VT-5036 Richford

Site Location: Richford, VT

Engineer Signature:

Date: 4/24/25



ALEXANDER ABERNATHY, P.E.
CONSULTING ENGINEER



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Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 139 ft Monopole to reflect the change in loading by AT&T Wireless.

Supporting Documents

Tower Drawing	Sabre Job # 18-4244-RAM-R2, dated April 5, 2019
Foundation Drawing	Sabre Job # 18-4244-RAM-R2, dated April 5, 2019
Geotechnical Report	ATL Report # CD7344E-01-10-17, dated October 26, 2017
Mount Analysis	B+T Project # 174472.001.01.0003, dated April 2, 2025
Tower Inventory	Vertical Bridge Collocation Application Site # US-VT-5036, dated March 5, 2025
Proposed Loading	Vertical Bridge Collocation Application # P-069101, dated April 3, 2025
Modifications	SES Site # 27374, dated September 24, 2019
Post Modification	HighTower Site # 27374, dated July 29, 2020

Analysis

The tower was analyzed using TNX tower analysis software. This program considers an elastic three-dimensional model and second-order effects per ANSI/TIA-222.

Basic Wind Speed	107 mph (3-Second Gust) Vult
Basic Wind Speed w/Ice	40 mph (3-Second Gust) w/ 1-1/2" radial ice concurrent
Code	ANSI/TIA-222-H / 2018 IBC / 2015 Vermont Fire & Building Safety Code
Risk Category	II
Exposure Category	B
Topographic Category	5 (Hill)
Crest Height	690 ft
Spectral Response	$S_s = 0.264$, $S_1 = 0.08$
Site Class	B - Competent Rock
Ground Elevation	1114.33 ft
Annex S Considered	Yes

Conclusion

Based on the analysis results, the structure meets the requirements per the applicable codes listed above. The structure and foundation can support the equipment as described in this report.

If you have any questions or require additional information, please contact Semaan Engineering Solutions at 402-289-1888.

Existing and Reserved Equipment

This loading is included in the analysis.

Centerline Elevation (ft)		Qty.	Antenna	Mount Type	Coax (in)	Carrier
Mount	Equip.					
136.0	136.0	3	4415 B30 RRU	(3) Sabre C10857001C 12ft HD V-Booms	(1) 0.5" Fiber (3) 2" Conduit	AT&T
		3	4478 B14 RRU			
		3	8843 B2/B66A RRU			
		3	DMP65R-BU8DA			
		3	TPA65R-BU8D			
		1	DC9-48-60-24-8C-EV			
118.0	118.0	12	NHH-65B-R2B (CFD)	(1) 12' HD Platform w/ Rail w/Kickers	(1) 1 5/8" Hybrid Cable	Verizon*
		2	B2/B66A RRH-BR049			
		1	B5/B13 RRH BR04C			
		1	RHSDC-6627-PF-48			

(CFD) = Computational fluid dynamics derived equivalent wind area provided by manufacturer.

* A total of 40,000 sq. in. reserved rights for Verizon has been included in this analysis.

Equipment to be Removed

This loading is not included in the analysis.

Centerline Elevation (ft)		Qty.	Antenna	Mount Type	Coax (in)	Carrier
Mount	Equip.					
136.0	136.0	1	DC6-48-60-0-8C-EV	-	(1) 1" DC	AT&T
		3	RRUS 4478 B5			

Proposed Equipment

This loading is included in the analysis.

Centerline Elevation (ft)		Qty.	Antenna	Mount Type	Coax (in)	Carrier
Mount	Equip.					
136.0	138.5	3	AIR 6472 B77G B77M	(3) Existing Sabre C10857001C 12ft HD V-Booms	(1) 0.5" Fiber (5) 0.82" DC (1) 0.92" DC (1) 2" Conduit	AT&T
	136.0	3	4490 B5/B12A RRU			
		1	DC9-48-60-24-8C-EV			

Install proposed coax inside the pole shaft.

Structure Usages

Structural Component	Controlling Usage	Pass/Fail
Shaft	28%	Pass
Anchor Bolts	25%	Pass
Baseplate	25%	Pass
Flange	22%	Pass

Foundations

Reaction Component	Analysis Reactions	% of Usage
Moment (Kips-Ft)	2,866.1	22%
Axial (Kips)	57.4	11%
Shear (Kips)	29.4	8%
Reinf. Conc. Fnd. Capacity	N/A	35%

The structure base reactions resulting from this analysis were found to be acceptable through analysis based on geotechnical and foundation information, therefore no modification or reinforcement of the foundation will be required.

Deflection, Twist, and Sway*

Limit State Deformations	Deflection (in)	Twist (°)	Sway (°)
Structure Displacement	8.638	0.000	0.640
% of Allowable	17%	0%	16%

*Deflection, Twist, and Sway was evaluated considering a design wind speed of 60 mph (3-Second Gust) per ANSI/TIA-222-H Limit State Deformations per Section 2.8.2



Standard Conditions

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessary limited, to:

- Information supplied by the client regarding the structure itself, antenna, mounts and feed line loading on the structure and its components, or other relevant information.
- Information from drawings in the possession of Semaan Engineering Solutions, or generated by field inspections or measurements of the structure.

It is the responsibility of the client to ensure that the information provided to Semaan Engineering Solutions Holdings and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and that their capacity has not significantly changed from the "as new" condition.

Unless explicitly agreed by both the client and Semaan Engineering Solutions, all services will be performed in accordance with the current revision of ANSI/TIA -222. The design basic wind speed will be determined based on the minimum basic wind speed as prescribed in ANSI/TIA-222. Although every effort is taken to ensure that the loading considered is adequate to meet the requirements of all applicable regulatory entities, we can provide no assurance to meet any other local and state codes or requirements. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement.

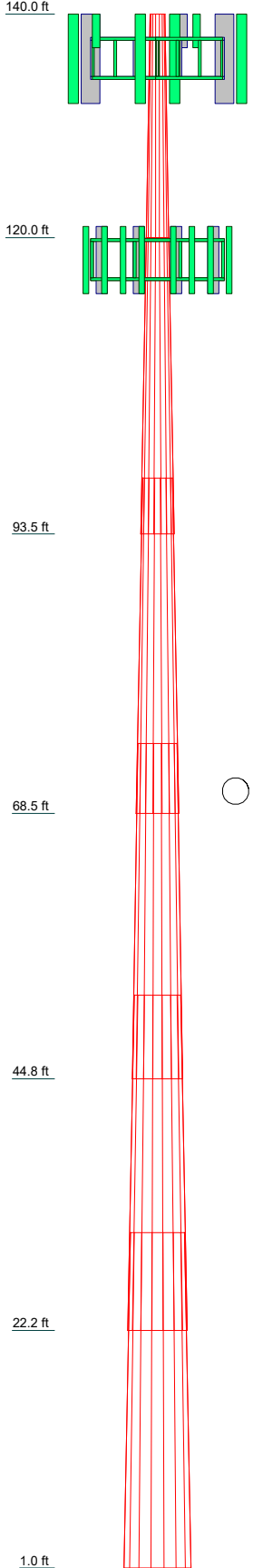
All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. Semaan Engineering Solutions Holdings is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.



Site ID US-VT-5036
April 24, 2025

Attachment 1:
Calculations

Section	6	5	4	3	2	1
Length (ft)	30.00	30.00	30.00	30.00	26.50	20.00
Number of Sides	18	18	18	18	18	18
Thickness (in)	0.50	0.50	0.50	0.44	0.38	0.25
Socket Length (ft)		8.75	7.50	6.25	5.00	
Top Dia (in)	58.39	50.42	41.92	32.77	24.44	16.00
Bot Dia (in)	71.06	63.09	54.59	45.44	35.63	24.44
Grade				A572-65		
Weight (K)	10.4	9.1	7.7	5.5	3.2	1.1



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Collar Mount w/Mount Pipe (ATT)	136	4415 B30 RRU (ATT)	136
Sabre C10857001C 12ft HD V-Boom w/o Mount Pipe (SES) (ATT)	136	4415 B30 RRU (ATT)	136
Sabre C10857001C 12ft HD V-Boom w/o Mount Pipe (SES) (ATT)	136	4415 B30 RRU (ATT)	136
Sabre C10857001C 12ft HD V-Boom w/o Mount Pipe (SES) (ATT)	136	4490 B5/B12A RRU w/10' Mount Pipe (ATT)	136
Sabre C10857001C 12ft HD V-Boom w/o Mount Pipe (SES) (ATT)	136	4490 B5/B12A RRU w/10' Mount Pipe (ATT)	136
DMP65R-BU8DA w/8' Mount Pipe (ATT)	136	4490 B5/B12A RRU w/10' Mount Pipe (ATT)	136
DMP65R-BU8DA w/8' Mount Pipe (ATT)	136	DC9-48-60-24-8C-EV (ATT)	136
DMP65R-BU8DA w/8' Mount Pipe (ATT)	136	DC9-48-60-24-8C-EV (ATT)	136
8'x2 1/2" Pipe Mount (ATT)	136	12' HD Platform w/ Rail w/Kickers w/o Mount Pipe (SES) (Verizon)	118
8'x2 1/2" Pipe Mount (ATT)	136	(4) NHH-65B-R2B (CFD) (Verizon)	118
8'x2 1/2" Pipe Mount (ATT)	136	(4) NHH-65B-R2B (CFD) (Verizon)	118
AIR 6472 B77G B77M w/10' Mount Pipe (ATT)	136	(4) NHH-65B-R2B (CFD) (Verizon)	118
AIR 6472 B77G B77M w/10' Mount Pipe (ATT)	136	(2) Side By Side w/8' Mount Pipe (SES) (Verizon)	118
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AIR 6472 B77G B77M w/10' Mount Pipe (ATT)	136	(2) Side By Side w/8' Mount Pipe (SES) (Verizon)	118
TPA65R-BU8D w/8' Mount Pipe (ATT)	136	(2) Side By Side w/8' Mount Pipe (SES) (Verizon)	118
TPA65R-BU8D w/8' Mount Pipe (ATT)	136	B2/B66A RRH-BR049 (Verizon)	118
TPA65R-BU8D w/8' Mount Pipe (ATT)	136	B2/B66A RRH-BR049 (Verizon)	118
8843 B2/B66A RRU (ATT)	136	B5/B13 RRH BR04C (Verizon)	118
8843 B2/B66A RRU (ATT)	136	RHSDC-6627-PF-48 (Verizon)	118
8843 B2/B66A RRU (ATT)	136	1/3 Remaining Reserved Rights (40,000 sq in) (Verizon)	118
4478 B14 RRU w/10' Mount Pipe (ATT)	136	1/3 Remaining Reserved Rights (40,000 sq in) (Verizon)	118
4478 B14 RRU w/10' Mount Pipe (ATT)	136	1/3 Remaining Reserved Rights (40,000 sq in) (Verizon)	118
4478 B14 RRU w/10' Mount Pipe (ATT)	136	1/3 Remaining Reserved Rights (40,000 sq in) (Verizon)	118

MATERIAL STRENGTH

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



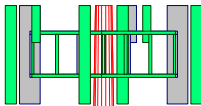
Semaan Engineering Solutions
 1047 N 205th Street
 Elkhorn, NE 68022
 Phone: 402.289.1888
 FAX:

Job: **US-VT-5036_Richford**

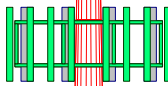
Project: REV05	Drawn by: JungH	App'd:
Client: Vertical Bridge	Date: 04/22/25	Scale: NTS
Code: TIA-222-H		Dwg No. E-1
Path: \\192.168.1.12\Common\TNX files\US-VT-5036\US-VT-5036_REV05\US-VT-5036_REV05.dwg		

Section	1	2	3	4	5	6	
Length (ft)	20.00	26.50	30.00	30.00	30.00	30.00	
Number of Sides	18	18	18	18	18	18	
Thickness (in)	0.25	0.38	0.44	0.50	0.50	0.50	
Socket Length (ft)		5.00	6.25	7.50	8.75		
Top Dia (in)	16.00	24.44	32.77	41.92	50.42	58.39	
Bot Dia (in)	24.44	35.63	45.44	54.59	63.09	71.06	
Grade			A572-65				
Weight (K)	1.1	3.2	5.5	7.7	9.1	10.4	37.0

140.0 ft



120.0 ft



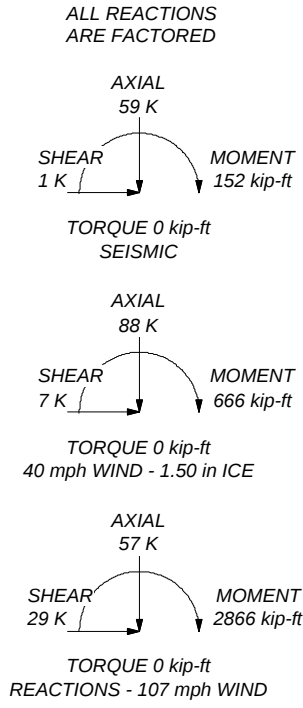
93.5 ft

68.5 ft

44.8 ft

22.2 ft

1.0 ft



MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Franklin County, Vermont.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 107 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 40 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 5 with Crest Height of 690.000 ft
8. Leg A azimuth is -30° from North.
9. CCISeismic Note: Seismic loads generated by CCISeismic 3.4.0
10. CCISeismic Note: Seismic calculations are in accordance with TIA-222-H-1
11. TOWER RATING: 27.7%



Semaan Engineering Solutions

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Phone: 402.289.1888

FAX:

Job: **US-VT-5036_Richford**

Project: **REV05**

Client: Vertical Bridge

Drawn by: JungH

App'd:

Code: TIA-222-H

Date: 04/22/25

Scale: NTS

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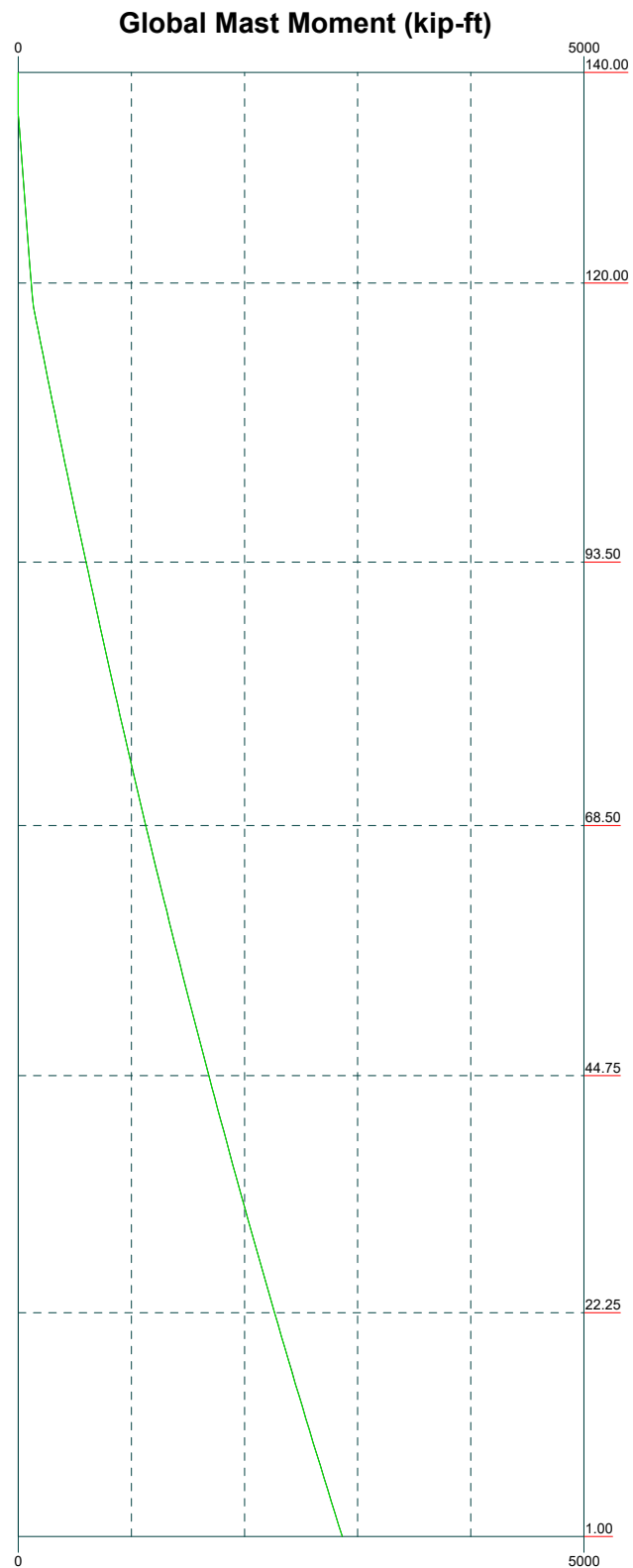
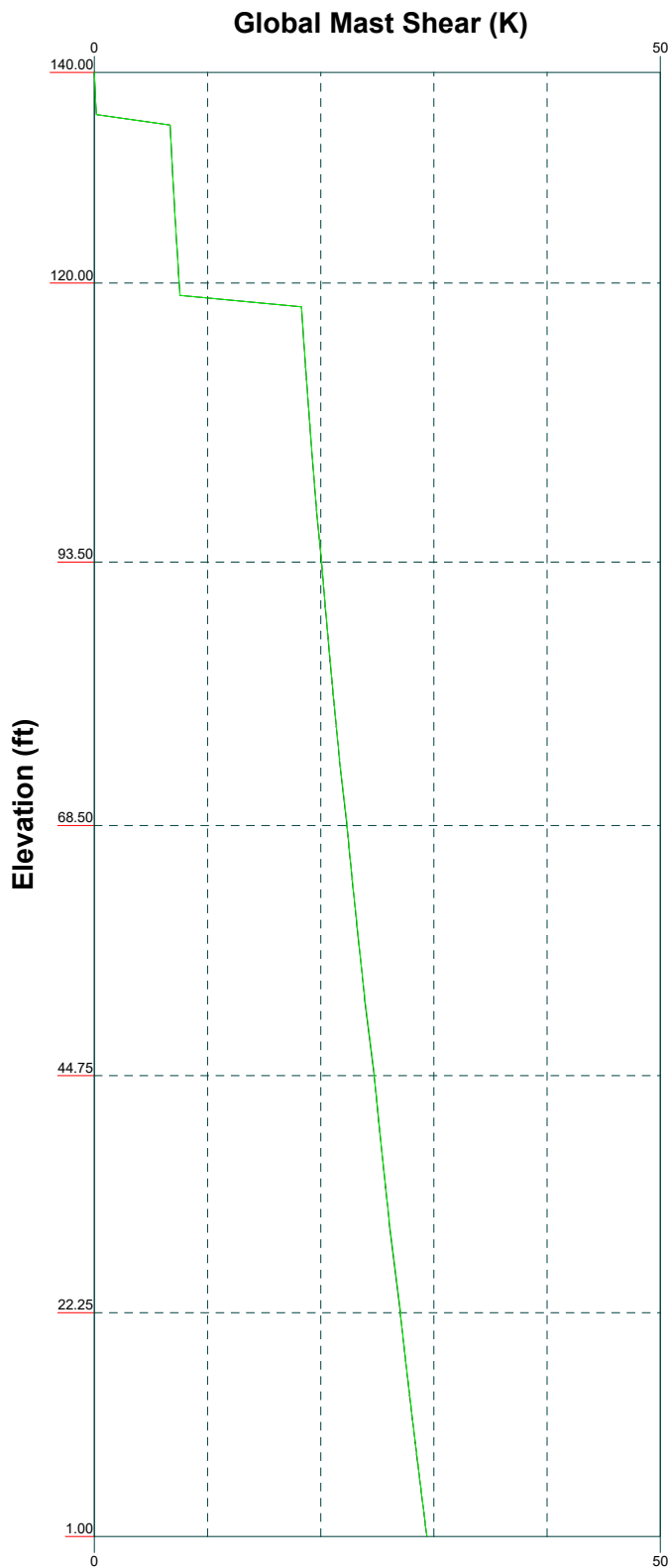
Dwg No. E-1

Vx

Vz

Mx

Mz



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FAX:

Job: **US-VT-5036_Richford**

Project: **REV05**

Client: Vertical Bridge

Drawn by: JungH

App'd:

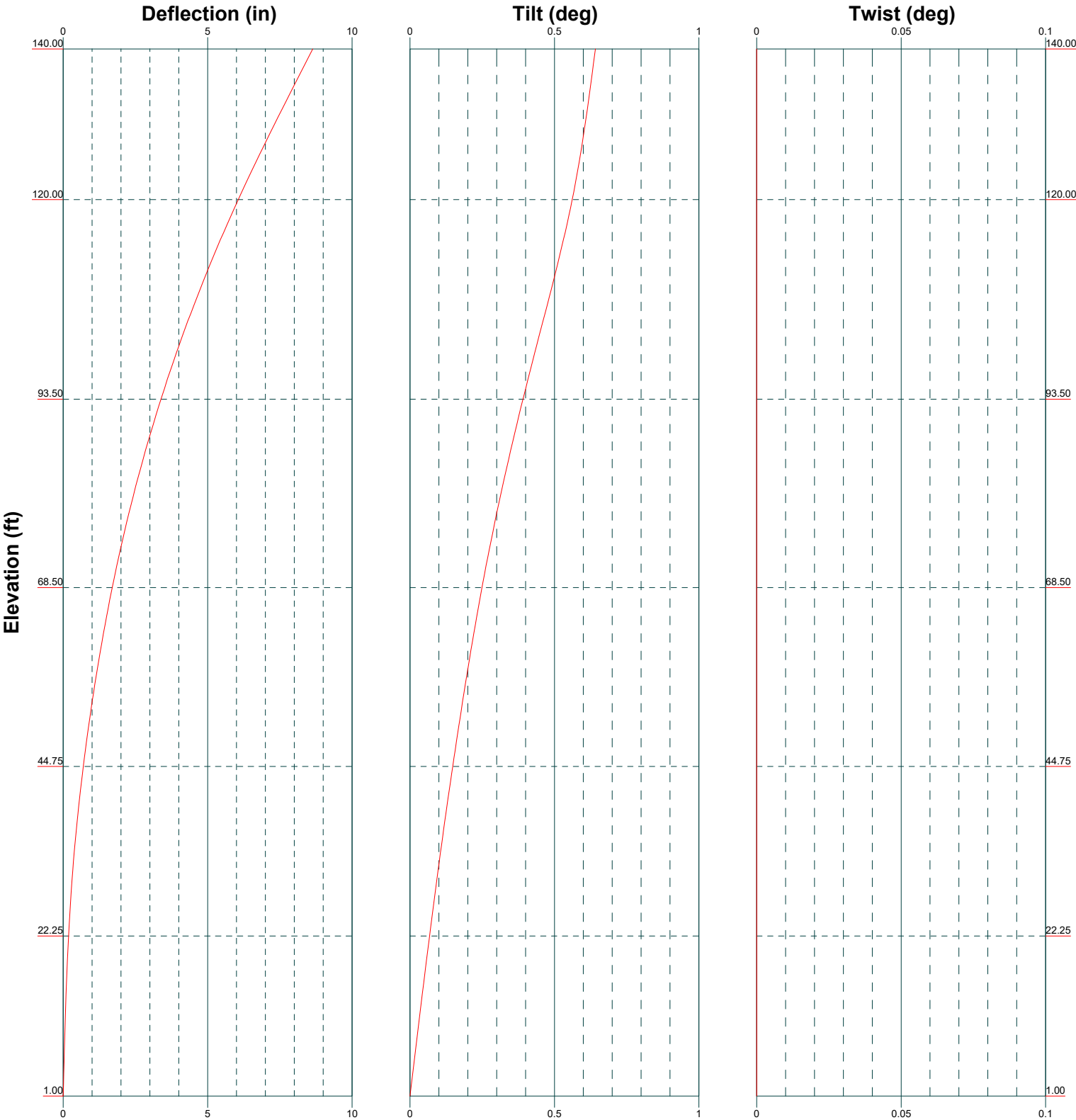
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Date: 04/22/25

Scale: NTS

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Dwg No. E-4



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Phone: 402.289.1888
FAX:

Job: **US-VT-5036_Richford**

Project: **REV05**

Client: **Vertical Bridge**

Drawn by: **JungH**

App'd:

Code: **TIA-222-H**

Date: **04/22/25**

Scale: **NTS**

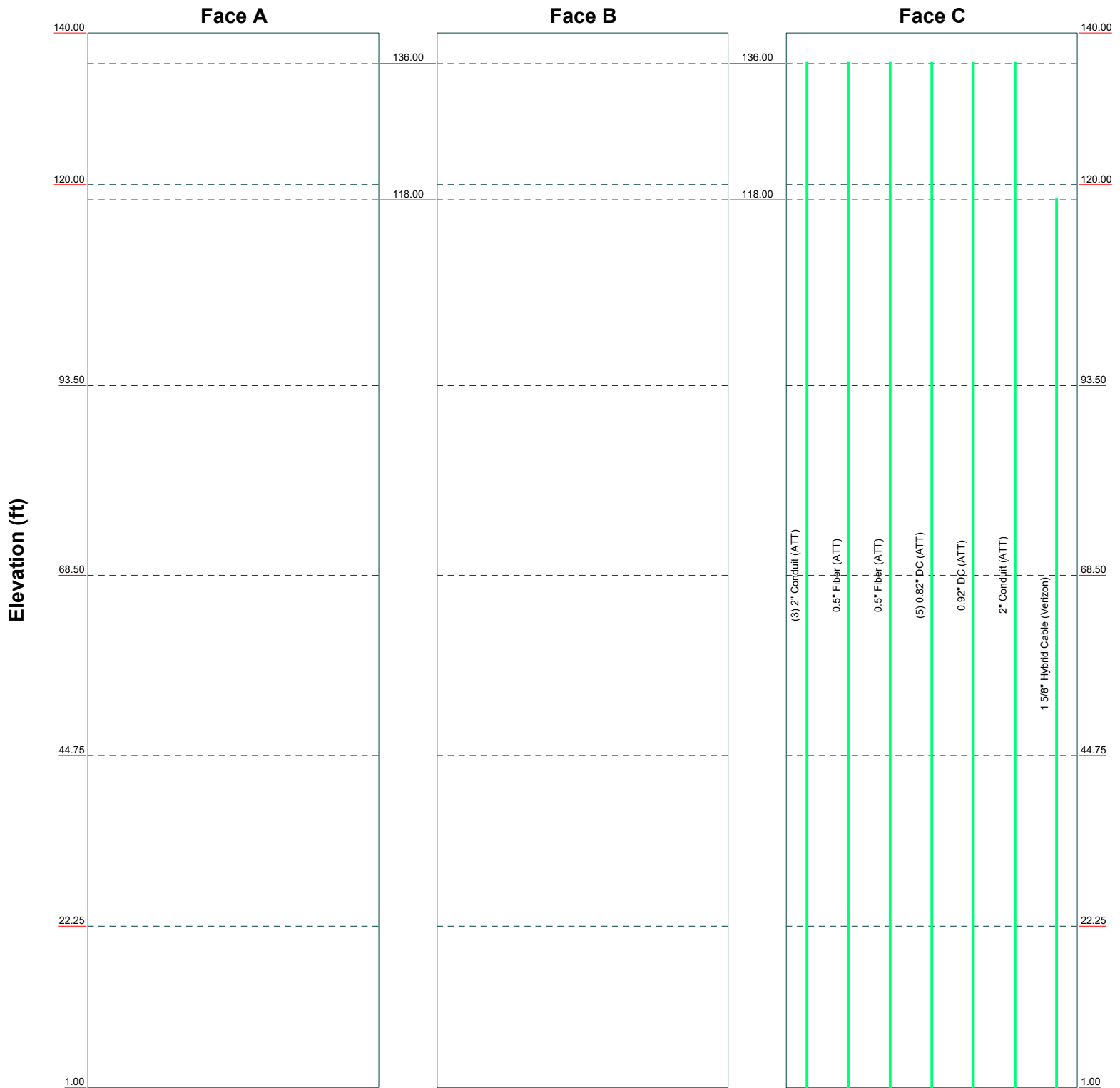
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Dwg No. **E-5**

Feed Line Distribution Chart

1' - 140'

Round Flat App In Face App Out Face Truss Leg



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FAX:

Job: **US-VT-5036_Richford**

Project: **REV05**

Client: Vertical Bridge

Drawn by: JungH

App'd:

Code: TIA-222-H

Date: 04/22/25

Scale: NTS

Path: \\192.168.1.12\\Common\\TNX files\\US-VT-5036\\US-VT-5036_REV05\\US-VT-5036_REV05.dwg

Dwg No. E-7

tnxTower Semaan Engineering Solutions 1047 N 205th Street Elkhorn, NE 68022 Phone: 402.289.1888 FAX:	Job	US-VT-5036_Richford	Page	1 of 31
	Project	REV05	Date	11:32:35 04/22/25
	Client	Vertical Bridge	Designed by	JungH

Tower Input Data

The tower is a monopole.

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

The following design criteria apply:

Tower is located in Franklin County, Vermont.

Tower base elevation above sea level: 1115.330 ft.

Basic wind speed of 107 mph.

Risk Category II.

Exposure Category B.

Crest Height: 690.000 ft.

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

Topographic Feature: Hill.

Slope Distance L: 3707.000 ft.

Distance from Crest x: 202.800 ft.

Horizontal Distance Downwind: No.

Nominal ice thickness of 1.50 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.

Leg A azimuth is -30° from North..

CCISEismic Note: Seismic loads generated by CCISEismic 3.4.0.

CCISEismic Note: Seismic calculations are in accordance with TIA-222-H-1.

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: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$, $K_{es}(E_v \text{ and } E_h) = 1.0$.

Maximum demand-capacity ratio is: 1.

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

tnxTower Semaan Engineering Solutions 1047 N 205th Street Elkhorn, NE 68022 Phone: 402.289.1888 FAX:	Job	US-VT-5036_Richford	Page	2 of 31
	Project	REV05	Date	11:32:35 04/22/25
	Client	Vertical Bridge	Designed by	JungH

Distribute Leg Loads As Uniform
Use Special Wind Profile

Use ASCE 10 X-Brace Ly Rules

Outside and Inside Corner Radii Are Known

Tapered Pole Section Geometry

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	140.00-120.00	20.00	0.00	18	16.00	24.44	0.25	1.00	A572-65 (65 ksi)
L2	120.00-93.50	26.50	5.00	18	24.44	35.63	0.38	1.50	A572-65 (65 ksi)
L3	93.50-68.50	30.00	6.25	18	32.77	45.44	0.44	1.75	A572-65 (65 ksi)
L4	68.50-44.75	30.00	7.50	18	41.92	54.59	0.50	2.00	A572-65 (65 ksi)
L5	44.75-22.25	30.00	8.75	18	50.42	63.09	0.50	2.00	A572-65 (65 ksi)
L6	22.25-1.00	30.00		18	58.39	71.06	0.50	2.00	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	16.21	12.50	391.68	5.59	8.13	48.19	783.87	6.25	2.38	9.504
	24.78	19.20	1419.72	8.59	12.42	114.33	2841.30	9.60	3.86	15.448
L2	24.76	28.65	2096.74	8.54	12.42	168.85	4196.23	14.33	3.64	9.712
	36.12	41.96	6590.42	12.52	18.10	364.09	13189.51	20.99	5.61	14.963
L3	35.35	44.90	5930.39	11.48	16.65	356.23	11868.58	22.45	5.00	11.423
	46.07	62.49	15986.09	15.97	23.08	692.58	31993.22	31.25	7.23	16.519
L4	45.17	65.74	14250.97	14.71	21.30	669.15	28520.70	32.88	6.50	12.997
	55.35	85.84	31727.90	19.20	27.73	1144.12	63497.54	42.93	8.73	17.455
L5	54.34	79.23	24946.21	17.72	25.61	973.90	49925.24	39.62	7.99	15.989
	63.98	99.33	49158.13	22.22	32.05	1533.85	98380.95	49.67	10.22	20.447
L6	62.97	91.88	38906.21	20.55	29.66	1311.55	77863.62	45.95	9.40	18.795
	72.08	111.98	70435.26	25.05	36.10	1951.20	140963.20	56.00	11.63	23.253

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 140.00-120.00				1	1	1			
L2 120.00-93.50				1	1	1			
L3 93.50-68.50				1	1	1			
L4 68.50-44.75				1	1	1			
L5 44.75-22.25				1	1	1			
L6 22.25-1.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Area

tnxTower Semaan Engineering Solutions 1047 N 205th Street Elkhorn, NE 68022 Phone: 402.289.1888 FAX:	Job	US-VT-5036_Richford	Page	3 of 31
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	Client	Vertical Bridge	Designed by	JungH

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
2" Conduit (ATT)	C	No	No	Inside Pole	136.00 - 1.00	3	No Ice	0.00	2.000
							1/2" Ice	0.00	2.000
							1" Ice	0.00	2.000
							2" Ice	0.00	2.000
0.5" Fiber (ATT)	C	No	No	Inside Pole	136.00 - 1.00	1	No Ice	0.00	0.060
							1/2" Ice	0.00	0.060
							1" Ice	0.00	0.060
							2" Ice	0.00	0.060
0.5" Fiber (ATT)	C	No	No	Inside Pole	136.00 - 1.00	1	No Ice	0.00	0.060
							1/2" Ice	0.00	0.060
							1" Ice	0.00	0.060
							2" Ice	0.00	0.060
0.82" DC (ATT)	C	No	No	Inside Pole	136.00 - 1.00	5	No Ice	0.00	0.700
							1/2" Ice	0.00	0.700
							1" Ice	0.00	0.700
							2" Ice	0.00	0.700
0.92" DC (ATT)	C	No	No	Inside Pole	136.00 - 1.00	1	No Ice	0.00	0.500
							1/2" Ice	0.00	0.500
							1" Ice	0.00	0.500
							2" Ice	0.00	0.500
2" Conduit (ATT)	C	No	No	Inside Pole	136.00 - 1.00	1	No Ice	0.00	2.000
							1/2" Ice	0.00	2.000
							1" Ice	0.00	2.000
							2" Ice	0.00	2.000
1 5/8" Hybrid Cable (Verizon)	C	No	No	Inside Pole	118.00 - 1.00	1	No Ice	0.00	1.780
							1/2" Ice	0.00	1.780
							1" Ice	0.00	1.780
							2" Ice	0.00	1.780

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 K
L1	140.00-120.00	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	0.000	0.19
L2	120.00-93.50	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	0.000	0.36
L3	93.50-68.50	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	0.000	0.35
L4	68.50-44.75	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	0.000	0.33
L5	44.75-22.25	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	0.000	0.31
L6	22.25-1.00	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	0.000	0.30

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	Client	Vertical Bridge	Designed by	JungH

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 K
L1	140.00-120.00	A	1.709	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	0.000	0.19
L2	120.00-93.50	A	1.688	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	0.000	0.36
L3	93.50-68.50	A	1.655	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	0.000	0.35
L4	68.50-44.75	A	1.610	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	0.000	0.33
L5	44.75-22.25	A	1.540	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	0.000	0.31
L6	22.25-1.00	A	1.395	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	0.000	0.30

Feed Line Center of Pressure

Section	Elevation ft	CP_x in	CP_z in	CP_x Ice in	CP_z Ice in
L1	140.00-120.00	0.00	0.00	0.00	0.00
L2	120.00-93.50	0.00	0.00	0.00	0.00
L3	93.50-68.50	0.00	0.00	0.00	0.00
L4	68.50-44.75	0.00	0.00	0.00	0.00
L5	44.75-22.25	0.00	0.00	0.00	0.00
L6	22.25-1.00	0.00	0.00	0.00	0.00

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

User Defined Loads - Seismic

Description	Elevation ft	Offset From Centroid ft	Azimuth Angle °	E_v K	E_{hx} K	E_{hz} K	E_h K
CCISeismic Tower Section 1 - 1	135.00	0.000	0.000	0.02	0.00	0.00	0.04
CCISeismic Tower Section 1 - 2	125.00	0.000	0.000	0.02	0.00	0.00	0.04
CCISeismic Tower Section 2 - 1	116.75	0.000	0.000	0.02	0.00	0.00	0.04
CCISeismic Tower Section 2 - 2	108.50	0.000	0.000	0.04	0.00	0.00	0.07
CCISeismic Tower Section 2 - 3	98.50	0.000	0.000	0.04	0.00	0.00	0.06
CCISeismic Tower Section 3 - 1	93.50	0.000	0.000	0.05	0.00	0.00	0.07
CCISeismic Tower Section 3 - 2	83.50	0.000	0.000	0.06	0.00	0.00	0.07

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Description	Elevation	Offset From Centroid	Azimuth Angle	E_v	E_{hx}	E_{hz}	E_h
	ft	ft	°	K	K	K	K
CCISeismic Tower Section 3 - 3	73.50	0.000	0.000	0.06	0.00	0.00	0.06
CCISeismic Tower Section 4 - 1	69.75	0.000	0.000	0.07	0.00	0.00	0.06
CCISeismic Tower Section 4 - 2	59.75	0.000	0.000	0.08	0.00	0.00	0.05
CCISeismic Tower Section 4 - 3	49.75	0.000	0.000	0.09	0.00	0.00	0.04
CCISeismic Tower Section 5 - 1	47.25	0.000	0.000	0.09	0.00	0.00	0.04
CCISeismic Tower Section 5 - 2	37.25	0.000	0.000	0.10	0.00	0.00	0.02
CCISeismic Tower Section 5 - 3	27.25	0.000	0.000	0.10	0.00	0.00	0.01
CCISeismic Tower Section 6 - 1	26.00	0.000	0.000	0.10	0.00	0.00	0.01
CCISeismic Tower Section 6 - 2	16.00	0.000	0.000	0.11	0.00	0.00	0.01
CCISeismic Tower Section 6 - 3	6.00	0.000	0.000	0.12	0.00	0.00	0.00
CCISeismic pole mounts Collar Mount w/Mount Pipe	136.00	0.000	0.000	0.01	0.00	0.00	0.04
CCISeismic tower mounts Sabre C10857001C 12ft HD V-Boom w/o Mount Pipe (SES)	136.00	0.000	0.000	0.01	0.00	0.00	0.04
CCISeismic tower mounts Sabre C10857001C 12ft HD V-Boom w/o Mount Pipe (SES)	136.00	0.000	0.000	0.01	0.00	0.00	0.04
CCISeismic tower mounts Sabre C10857001C 12ft HD V-Boom w/o Mount Pipe (SES)	136.00	0.000	0.000	0.00	0.00	0.00	0.01
CCISeismic cci DMP65R-BU8DA w/8' Mount Pipe	136.00	0.000	0.000	0.00	0.00	0.00	0.01
CCISeismic cci DMP65R-BU8DA w/8' Mount Pipe	136.00	0.000	0.000	0.00	0.00	0.00	0.01
CCISeismic cci DMP65R-BU8DA w/8' Mount Pipe	136.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic tower mounts 8'x2 1/2" Pipe Mount	136.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic tower mounts 8'x2 1/2" Pipe Mount	136.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic tower mounts 8'x2 1/2" Pipe Mount	136.00	0.000	0.000	0.00	0.00	0.00	0.01
CCISeismic ericsson AIR 6472 B77G B77M w/10' Mount Pipe	136.00	0.000	0.000	0.00	0.00	0.00	0.01
CCISeismic ericsson AIR 6472 B77G B77M w/10' Mount Pipe	136.00	0.000	0.000	0.00	0.00	0.00	0.01
CCISeismic ericsson AIR 6472 B77G B77M w/10' Mount Pipe	136.00	0.000	0.000	0.00	0.00	0.00	0.01
CCISeismic cci TPA65R-BU8D w/8' Mount Pipe	136.00	0.000	0.000	0.00	0.00	0.00	0.01
CCISeismic cci TPA65R-BU8D w/8' Mount Pipe	136.00	0.000	0.000	0.00	0.00	0.00	0.01
CCISeismic cci TPA65R-BU8D w/8' Mount Pipe	136.00	0.000	0.000	0.00	0.00	0.00	0.01
CCISeismic ericsson 8843 B2/B66A RRU	136.00	0.000	0.000	0.00	0.00	0.00	0.01
CCISeismic ericsson 8843 B2/B66A RRU	136.00	0.000	0.000	0.00	0.00	0.00	0.01
CCISeismic ericsson 8843 B2/B66A RRU	136.00	0.000	0.000	0.00	0.00	0.00	0.01
CCISeismic ericsson 4478 B14 RRU w/10' Mount Pipe	136.00	0.000	0.000	0.00	0.00	0.00	0.01
CCISeismic ericsson 4478 B14 RRU w/10' Mount Pipe	136.00	0.000	0.000	0.00	0.00	0.00	0.01
CCISeismic ericsson 4478 B14 RRU w/10' Mount Pipe	136.00	0.000	0.000	0.00	0.00	0.00	0.01

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Description	Elevation	Offset From Centroid	Azimuth Angle	E_v	E_{hx}	E_{hz}	E_h
	ft	ft	°	K	K	K	K
CCISeismic ericsson 4415 B30 RRU	136.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic ericsson 4415 B30 RRU	136.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic ericsson 4415 B30 RRU	136.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic ericsson 4490 B5/B12A RRU w/10' Mount Pipe	136.00	0.000	0.000	0.00	0.00	0.00	0.01
CCISeismic ericsson 4490 B5/B12A RRU w/10' Mount Pipe	136.00	0.000	0.000	0.00	0.00	0.00	0.01
CCISeismic ericsson 4490 B5/B12A RRU w/10' Mount Pipe	136.00	0.000	0.000	0.00	0.00	0.00	0.01
CCISeismic raycap DC9-48-60-24-8C-EV	136.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic raycap DC9-48-60-24-8C-EV	136.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic pole mounts Sabre C10855665C 12' HD Platform w/ Rail w/Kickers w/o Mount Pipe (SES)	118.00	0.000	0.000	0.06	0.00	0.00	0.12
CCISeismic (4) commscope NHH-65B-R2B (CFD)	118.00	0.000	0.000	0.01	0.00	0.00	0.01
CCISeismic (4) commscope NHH-65B-R2B (CFD)	118.00	0.000	0.000	0.01	0.00	0.00	0.01
CCISeismic (4) commscope NHH-65B-R2B (CFD)	118.00	0.000	0.000	0.01	0.00	0.00	0.01
CCISeismic (2) tower mounts Side By Side w/8' Mount Pipe (SES)	118.00	0.000	0.000	0.00	0.00	0.00	0.01
CCISeismic (2) tower mounts Side By Side w/8' Mount Pipe (SES)	118.00	0.000	0.000	0.00	0.00	0.00	0.01
CCISeismic (2) tower mounts Side By Side w/8' Mount Pipe (SES)	118.00	0.000	0.000	0.00	0.00	0.00	0.01
CCISeismic samsung B2/B66A RRH-BR049	118.00	0.000	0.000	0.00	0.00	0.00	0.01
CCISeismic samsung B2/B66A RRH-BR049	118.00	0.000	0.000	0.00	0.00	0.00	0.01
CCISeismic samsung B5/B13 RRH BR04C	118.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic raycap RHSDC-6627-PF-48	118.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic 1/3 Remaining Reserved Rights (40,000 sq in)	118.00	0.000	0.000	0.02	0.00	0.00	0.04
CCISeismic 1/3 Remaining Reserved Rights (40,000 sq in)	118.00	0.000	0.000	0.02	0.00	0.00	0.04
CCISeismic 1/3 Remaining Reserved Rights (40,000 sq in)	118.00	0.000	0.000	0.02	0.00	0.00	0.04
CCISeismic (3) 2" Conduit From 0 to 135 (129ft to 135ft)	133.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic (3) 2" Conduit From 0 to 135 (119ft to 129ft)	125.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic (3) 2" Conduit From 0 to 135 (109ft to 119ft)	115.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic (3) 2" Conduit From 0 to 135 (99ft to 109ft)	105.00	0.000	0.000	0.00	0.00	0.00	0.00

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Description	Elevation	Offset From Centroid	Azimuth Angle	E_v	E_{hx}	E_{hz}	E_h
	ft	ft	°	K	K	K	K
CCISeismic (3) 2" Conduit From 0 to 135 (89ft to99ft)	95.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic (3) 2" Conduit From 0 to 135 (79ft to89ft)	85.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic (3) 2" Conduit From 0 to 135 (69ft to79ft)	75.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic (3) 2" Conduit From 0 to 135 (59ft to69ft)	65.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic (3) 2" Conduit From 0 to 135 (49ft to59ft)	55.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic (3) 2" Conduit From 0 to 135 (39ft to49ft)	45.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic (3) 2" Conduit From 0 to 135 (29ft to39ft)	35.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic (3) 2" Conduit From 0 to 135 (19ft to29ft)	25.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic (3) 2" Conduit From 0 to 135 (9ft to19ft)	15.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic (3) 2" Conduit From 0 to 135 (0ft to9ft)	5.50	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic (5) general cable 0.82" DC From 0 to 135 (129ft to135ft)	133.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic (5) general cable 0.82" DC From 0 to 135 (119ft to129ft)	125.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic (5) general cable 0.82" DC From 0 to 135 (109ft to119ft)	115.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic (5) general cable 0.82" DC From 0 to 135 (99ft to109ft)	105.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic (5) general cable 0.82" DC From 0 to 135 (89ft to99ft)	95.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic (5) general cable 0.82" DC From 0 to 135 (79ft to89ft)	85.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic (5) general cable 0.82" DC From 0 to 135 (69ft to79ft)	75.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic (5) general cable 0.82" DC From 0 to 135 (59ft to69ft)	65.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic (5) general cable 0.82" DC From 0 to 135 (49ft to59ft)	55.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic (5) general cable 0.82" DC From 0 to 135 (39ft to49ft)	45.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic (5) general cable 0.82" DC From 0 to 135 (29ft to39ft)	35.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic (5) general cable 0.82" DC From 0 to 135 (19ft to29ft)	25.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic (5) general cable 0.82" DC From 0 to 135 (9ft to19ft)	15.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic (5) general cable	5.50	0.000	0.000	0.00	0.00	0.00	0.00

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Description	Elevation	Offset From Centroid	Azimuth Angle	E_v	E_{hx}	E_{hz}	E_h
	ft	ft	°	K	K	K	K
0.82" DC From 0 to 135 (0ft to 9ft)							
CCISeismic 0.92" DC From 0 to 135 (129ft to 135ft)	133.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic 0.92" DC From 0 to 135 (119ft to 129ft)	125.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic 0.92" DC From 0 to 135 (109ft to 119ft)	115.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic 0.92" DC From 0 to 135 (99ft to 109ft)	105.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic 0.92" DC From 0 to 135 (89ft to 99ft)	95.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic 0.92" DC From 0 to 135 (79ft to 89ft)	85.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic 0.92" DC From 0 to 135 (69ft to 79ft)	75.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic 0.92" DC From 0 to 135 (59ft to 69ft)	65.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic 0.92" DC From 0 to 135 (49ft to 59ft)	55.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic 0.92" DC From 0 to 135 (39ft to 49ft)	45.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic 0.92" DC From 0 to 135 (29ft to 39ft)	35.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic 0.92" DC From 0 to 135 (19ft to 29ft)	25.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic 0.92" DC From 0 to 135 (9ft to 19ft)	15.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic 0.92" DC From 0 to 135 (0ft to 9ft)	5.50	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic 2" Conduit From 0 to 135 (129ft to 135ft)	133.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic 2" Conduit From 0 to 135 (119ft to 129ft)	125.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic 2" Conduit From 0 to 135 (109ft to 119ft)	115.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic 2" Conduit From 0 to 135 (99ft to 109ft)	105.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic 2" Conduit From 0 to 135 (89ft to 99ft)	95.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic 2" Conduit From 0 to 135 (79ft to 89ft)	85.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic 2" Conduit From 0 to 135 (69ft to 79ft)	75.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic 2" Conduit From 0 to 135 (59ft to 69ft)	65.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic 2" Conduit From 0 to 135 (49ft to 59ft)	55.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic 2" Conduit From 0 to 135 (39ft to 49ft)	45.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic 2" Conduit From 0 to 135 (29ft to 39ft)	35.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic 2" Conduit From 0 to 135 (19ft to 29ft)	25.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic 2" Conduit From 0 to 135 (9ft to 19ft)	15.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic 2" Conduit From 0 to 135 (0ft to 9ft)	5.50	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic general cable 1 5/8" Hybrid Cable From 0 to 117	114.00	0.000	0.000	0.00	0.00	0.00	0.00

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Description	Elevation	Offset From Centroid	Azimuth Angle	E_v	E_{hx}	E_{hz}	E_h
	ft	ft	°	K	K	K	K
(109ft to 117ft)							
CCISeismic general cable 1 5/8" Hybrid Cable From 0 to 117 (99ft to 109ft)	105.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic general cable 1 5/8" Hybrid Cable From 0 to 117 (89ft to 99ft)	95.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic general cable 1 5/8" Hybrid Cable From 0 to 117 (79ft to 89ft)	85.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic general cable 1 5/8" Hybrid Cable From 0 to 117 (69ft to 79ft)	75.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic general cable 1 5/8" Hybrid Cable From 0 to 117 (59ft to 69ft)	65.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic general cable 1 5/8" Hybrid Cable From 0 to 117 (49ft to 59ft)	55.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic general cable 1 5/8" Hybrid Cable From 0 to 117 (39ft to 49ft)	45.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic general cable 1 5/8" Hybrid Cable From 0 to 117 (29ft to 39ft)	35.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic general cable 1 5/8" Hybrid Cable From 0 to 117 (19ft to 29ft)	25.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic general cable 1 5/8" Hybrid Cable From 0 to 117 (9ft to 19ft)	15.00	0.000	0.000	0.00	0.00	0.00	0.00
CCISeismic general cable 1 5/8" Hybrid Cable From 0 to 117 (0ft to 9ft)	5.50	0.000	0.000	0.00	0.00	0.00	0.00

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment	Placement	$C_A A_A$ Front	$C_A A_A$ Side	Weight
				°	ft	ft ²	ft ²	K
Collar Mount w/Mount Pipe (ATT)	C	None		0.000	136.00	No Ice 4.80 1/2" Ice 6.00 1" Ice 7.20 2" Ice 9.60	4.80 6.00 7.20 9.60	0.45 0.60 0.75 1.05
Sabre C10857001C 12ft HD V-Boom w/o Mount Pipe (SES) (ATT)	A	From Leg	2.50 0.000 0.000	0.000	136.00	No Ice 9.12 1/2" Ice 11.86 1" Ice 14.59 2" Ice 20.06	4.97 6.46 7.95 10.93	0.46 0.60 0.74 1.02
Sabre C10857001C 12ft HD V-Boom w/o Mount Pipe (SES)	B	From Leg	2.50 0.000 0.000	0.000	136.00	No Ice 9.12 1/2" Ice 11.86 1" Ice 14.59	4.97 6.46 7.95	0.46 0.60 0.74

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
(ATT)						2" Ice	20.06	10.93	1.02
Sabre C10857001C 12ft HD	C	From Leg	2.50	0.000	136.00	No Ice	9.12	4.97	0.46
V-Boom w/o Mount Pipe			0.000			1/2" Ice	11.86	6.46	0.60
(SES)			0.000			1" Ice	14.59	7.95	0.74
(ATT)						2" Ice	20.06	10.93	1.02
DMP65R-BU8DA w/8'	A	From Leg	4.50	0.000	136.00	No Ice	17.87	10.02	0.12
Mount Pipe			-6.000			1/2" Ice	18.50	11.44	0.24
(ATT)			0.000			1" Ice	19.14	12.72	0.37
						2" Ice	20.44	14.94	0.67
DMP65R-BU8DA w/8'	B	From Leg	4.50	0.000	136.00	No Ice	17.87	10.02	0.12
Mount Pipe			-6.000			1/2" Ice	18.50	11.44	0.24
(ATT)			0.000			1" Ice	19.14	12.72	0.37
						2" Ice	20.44	14.94	0.67
DMP65R-BU8DA w/8'	C	From Leg	4.50	0.000	136.00	No Ice	17.87	10.02	0.12
Mount Pipe			-6.000			1/2" Ice	18.50	11.44	0.24
(ATT)			0.000			1" Ice	19.14	12.72	0.37
						2" Ice	20.44	14.94	0.67
8'x2 1/2" Pipe Mount	A	From Leg	4.50	0.000	136.00	No Ice	2.30	2.30	0.05
(ATT)			-2.000			1/2" Ice	3.13	3.13	0.06
			0.000			1" Ice	3.62	3.62	0.09
						2" Ice	4.62	4.62	0.15
8'x2 1/2" Pipe Mount	B	From Leg	4.50	0.000	136.00	No Ice	2.30	2.30	0.05
(ATT)			-2.000			1/2" Ice	3.13	3.13	0.06
			0.000			1" Ice	3.62	3.62	0.09
						2" Ice	4.62	4.62	0.15
8'x2 1/2" Pipe Mount	C	From Leg	4.50	0.000	136.00	No Ice	2.30	2.30	0.05
(ATT)			-2.000			1/2" Ice	3.13	3.13	0.06
			0.000			1" Ice	3.62	3.62	0.09
						2" Ice	4.62	4.62	0.15
AIR 6472 B77G B77M w/10'	A	From Leg	4.50	0.000	136.00	No Ice	6.89	5.35	0.14
Mount Pipe			2.000			1/2" Ice	7.90	6.62	0.20
(ATT)			2.500			1" Ice	8.93	7.92	0.27
						2" Ice	10.42	9.66	0.44
AIR 6472 B77G B77M w/10'	B	From Leg	4.50	0.000	136.00	No Ice	6.89	5.35	0.14
Mount Pipe			2.000			1/2" Ice	7.90	6.62	0.20
(ATT)			2.500			1" Ice	8.93	7.92	0.27
						2" Ice	10.42	9.66	0.44
AIR 6472 B77G B77M w/10'	C	From Leg	4.50	0.000	136.00	No Ice	6.89	5.35	0.14
Mount Pipe			2.000			1/2" Ice	7.90	6.62	0.20
(ATT)			2.500			1" Ice	8.93	7.92	0.27
						2" Ice	10.42	9.66	0.44
TPA65R-BU8D w/8' Mount	A	From Leg	4.50	0.000	136.00	No Ice	17.87	10.42	0.13
Pipe			6.000			1/2" Ice	18.50	11.85	0.26
(ATT)			0.000			1" Ice	19.14	12.94	0.39
						2" Ice	20.44	15.16	0.69
TPA65R-BU8D w/8' Mount	B	From Leg	4.50	0.000	136.00	No Ice	17.87	10.42	0.13
Pipe			6.000			1/2" Ice	18.50	11.85	0.26
(ATT)			0.000			1" Ice	19.14	12.94	0.39
						2" Ice	20.44	15.16	0.69
TPA65R-BU8D w/8' Mount	C	From Leg	4.50	0.000	136.00	No Ice	17.87	10.42	0.13
Pipe			6.000			1/2" Ice	18.50	11.85	0.26
(ATT)			0.000			1" Ice	19.14	12.94	0.39
						2" Ice	20.44	15.16	0.69
8843 B2/B66A RRU	A	From Leg	2.50	0.000	136.00	No Ice	1.64	1.35	0.07
(ATT)			0.000			1/2" Ice	1.80	1.50	0.09
			0.000			1" Ice	1.97	1.65	0.11
						2" Ice	2.32	1.99	0.16

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
8843 B2/B66A RRU (ATT)	B	From Leg	2.50 0.000 0.000	0.000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.64 1.80 1.97 2.32	1.35 1.50 1.65 1.99	0.07 0.09 0.11 0.16
8843 B2/B66A RRU (ATT)	C	From Leg	2.50 0.000 0.000	0.000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.64 1.80 1.97 2.32	1.35 1.50 1.65 1.99	0.07 0.09 0.11 0.16
4478 B14 RRU w/10' Mount Pipe (ATT)	A	From Leg	2.50 0.000 0.000	0.000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.04 5.09 6.16 7.80	3.62 4.80 6.00 7.80	0.10 0.14 0.19 0.31
4478 B14 RRU w/10' Mount Pipe (ATT)	B	From Leg	2.50 0.000 0.000	0.000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.04 5.09 6.16 7.80	3.62 4.80 6.00 7.80	0.10 0.14 0.19 0.31
4478 B14 RRU w/10' Mount Pipe (ATT)	C	From Leg	2.50 0.000 0.000	0.000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.04 5.09 6.16 7.80	3.62 4.80 6.00 7.80	0.10 0.14 0.19 0.31
4415 B30 RRU (ATT)	A	From Leg	2.50 0.000 0.000	0.000	136.00	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	0.05 0.06 0.08 0.12
4415 B30 RRU (ATT)	B	From Leg	2.50 0.000 0.000	0.000	136.00	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	0.05 0.06 0.08 0.12
4415 B30 RRU (ATT)	C	From Leg	2.50 0.000 0.000	0.000	136.00	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	0.05 0.06 0.08 0.12
4490 B5/B12A RRU w/10' Mount Pipe (ATT)	A	From Leg	2.50 0.000 0.000	0.000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.66 5.72 6.80 8.46	3.60 4.78 5.98 7.78	0.10 0.15 0.20 0.33
4490 B5/B12A RRU w/10' Mount Pipe (ATT)	B	From Leg	2.50 0.000 0.000	0.000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.66 5.72 6.80 8.46	3.60 4.78 5.98 7.78	0.10 0.15 0.20 0.33
4490 B5/B12A RRU w/10' Mount Pipe (ATT)	C	From Leg	2.50 0.000 0.000	0.000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.66 5.72 6.80 8.46	3.60 4.78 5.98 7.78	0.10 0.15 0.20 0.33
DC9-48-60-24-8C-EV (ATT)	A	From Leg	2.50 0.000 0.000	0.000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.15 1.79 2.00 2.45	1.15 1.79 2.00 2.45	0.03 0.05 0.07 0.13
DC9-48-60-24-8C-EV (ATT)	B	From Leg	2.50 0.000 0.000	0.000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.15 1.79 2.00 2.45	1.15 1.79 2.00 2.45	0.03 0.05 0.07 0.13
*** 12' HD Platform w/ Rail w/Kickers w/o Mount Pipe (SES) (Verizon)	C	None		0.000	118.00	No Ice 1/2" Ice 1" Ice 2" Ice	24.40 27.54 30.68 36.96	24.40 27.54 30.68 36.96	1.80 2.34 2.88 3.96

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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 140.00-120.00	129.30	1.064	0.042	34.159	A	0.000	34.159	34.159	100.00	0.000	0.000
					B	0.000	34.159		100.00	0.000	0.000
					C	0.000	34.159		100.00	0.000	0.000
L2 120.00-93.50	105.93	1.005	0.041	67.229	A	0.000	67.229	67.229	100.00	0.000	0.000
					B	0.000	67.229		100.00	0.000	0.000
					C	0.000	67.229		100.00	0.000	0.000
L3 93.50-68.50	80.45	0.929	0.039	84.816	A	0.000	84.816	84.816	100.00	0.000	0.000
					B	0.000	84.816		100.00	0.000	0.000
					C	0.000	84.816		100.00	0.000	0.000
L4 68.50-44.75	56.22	0.838	0.036	99.479	A	0.000	99.479	99.479	100.00	0.000	0.000
					B	0.000	99.479		100.00	0.000	0.000
					C	0.000	99.479		100.00	0.000	0.000
L5 44.75-22.25	33.19	0.721	0.031	110.928	A	0.000	110.928	110.928	100.00	0.000	0.000
					B	0.000	110.928		100.00	0.000	0.000
					C	0.000	110.928		100.00	0.000	0.000
L6 22.25-1.00	11.39	0.700	0.031	119.574	A	0.000	119.574	119.574	100.00	0.000	0.000
					B	0.000	119.574		100.00	0.000	0.000
					C	0.000	119.574		100.00	0.000	0.000

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 140.00-120.00	129.30	1.064	0.006	1.71	39.856	A	0.000	39.856	39.856	100.00	0.000	0.000
						B	0.000	39.856		100.00	0.000	0.000
						C	0.000	39.856		100.00	0.000	0.000
L2 120.00-93.50	105.93	1.005	0.006	1.69	74.683	A	0.000	74.683	74.683	100.00	0.000	0.000
						B	0.000	74.683		100.00	0.000	0.000
						C	0.000	74.683		100.00	0.000	0.000
L3 93.50-68.50	80.45	0.929	0.005	1.66	91.848	A	0.000	91.848	91.848	100.00	0.000	0.000
						B	0.000	91.848		100.00	0.000	0.000
						C	0.000	91.848		100.00	0.000	0.000
L4 68.50-44.75	56.22	0.838	0.005	1.61	106.032	A	0.000	106.032	106.032	100.00	0.000	0.000
						B	0.000	106.032		100.00	0.000	0.000
						C	0.000	106.032		100.00	0.000	0.000
L5 44.75-22.25	33.19	0.721	0.004	1.54	116.966	A	0.000	116.966	116.966	100.00	0.000	0.000
						B	0.000	116.966		100.00	0.000	0.000
						C	0.000	116.966		100.00	0.000	0.000
L6 22.25-1.00	11.39	0.700	0.004	1.39	125.028	A	0.000	125.028	125.028	100.00	0.000	0.000
						B	0.000	125.028		100.00	0.000	0.000
						C	0.000	125.028		100.00	0.000	0.000

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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 140.00-120.00	129.30	1.064	0.013	34.159	A	0.000	34.159	34.159	100.00	0.000	0.000
					B	0.000	34.159		100.00	0.000	0.000
					C	0.000	34.159		100.00	0.000	0.000
L2 120.00-93.50	105.93	1.005	0.012	67.229	A	0.000	67.229	67.229	100.00	0.000	0.000
					B	0.000	67.229		100.00	0.000	0.000
					C	0.000	67.229		100.00	0.000	0.000
L3 93.50-68.50	80.45	0.929	0.011	84.816	A	0.000	84.816	84.816	100.00	0.000	0.000
					B	0.000	84.816		100.00	0.000	0.000
					C	0.000	84.816		100.00	0.000	0.000
L4 68.50-44.75	56.22	0.838	0.011	99.479	A	0.000	99.479	99.479	100.00	0.000	0.000
					B	0.000	99.479		100.00	0.000	0.000
					C	0.000	99.479		100.00	0.000	0.000
L5 44.75-22.25	33.19	0.721	0.009	110.928	A	0.000	110.928	110.928	100.00	0.000	0.000
					B	0.000	110.928		100.00	0.000	0.000
					C	0.000	110.928		100.00	0.000	0.000
L6 22.25-1.00	11.39	0.700	0.009	119.574	A	0.000	119.574	119.574	100.00	0.000	0.000
					B	0.000	119.574		100.00	0.000	0.000
					C	0.000	119.574		100.00	0.000	0.000

Tower Forces - No Ice - Wind Normal 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	K	K				ksf			ft ²	K	plf	
L1 140.00-120.00	0.19	1.08	A	1	0.63	0.042	1	1	34.159	1.00	50.021	C
			B	1	0.63		1	1	34.159			
			C	1	0.63		1	1	34.159			
L2 120.00-93.50	0.36	3.18	A	1	0.63	0.041	1	1	67.229	1.90	71.649	C
			B	1	0.63		1	1	67.229			
			C	1	0.63		1	1	67.229			
L3 93.50-68.50	0.35	5.48	A	1	0.63	0.039	1	1	84.816	2.27	90.673	C
			B	1	0.63		1	1	84.816			
			C	1	0.63		1	1	84.816			
L4 68.50-44.75	0.33	7.74	A	1	0.63	0.036	1	1	99.479	2.46	103.430	C
			B	1	0.63		1	1	99.479			
			C	1	0.63		1	1	99.479			
L5 44.75-22.25	0.31	9.11	A	1	0.63	0.031	1	1	110.928	2.41	107.160	C
			B	1	0.63		1	1	110.928			
			C	1	0.63		1	1	110.928			
L6 22.25-1.00	0.30	10.41	A	1	0.63	0.031	1	1	119.574	2.58	121.434	C
			B	1	0.63		1	1	119.574			
			C	1	0.63		1	1	119.574			
Sum Weight:	1.84	37.00						OTM	747.77 kip-ft	12.61		

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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	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
L1 140.00-120.00	0.19	1.08	A	1	0.63	0.042	1	1	34.159	1.00	50.021	C
			B	1	0.63		1	1	34.159			
			C	1	0.63		1	1	34.159			
L2 120.00-93.50	0.36	3.18	A	1	0.63	0.041	1	1	67.229	1.90	71.649	C
			B	1	0.63		1	1	67.229			
			C	1	0.63		1	1	67.229			
L3 93.50-68.50	0.35	5.48	A	1	0.63	0.039	1	1	84.816	2.27	90.673	C
			B	1	0.63		1	1	84.816			
			C	1	0.63		1	1	84.816			
L4 68.50-44.75	0.33	7.74	A	1	0.63	0.036	1	1	99.479	2.46	103.430	C
			B	1	0.63		1	1	99.479			
			C	1	0.63		1	1	99.479			
L5 44.75-22.25	0.31	9.11	A	1	0.63	0.031	1	1	110.928	2.41	107.160	C
			B	1	0.63		1	1	110.928			
			C	1	0.63		1	1	110.928			
L6 22.25-1.00	0.30	10.41	A	1	0.63	0.031	1	1	119.574	2.58	121.434	C
			B	1	0.63		1	1	119.574			
			C	1	0.63		1	1	119.574			
Sum Weight:	1.84	37.00						OTM	747.77 kip-ft	12.61		

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	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
L1 140.00-120.00	0.19	1.08	A	1	0.63	0.042	1	1	34.159	1.00	50.021	C
			B	1	0.63		1	1	34.159			
			C	1	0.63		1	1	34.159			
L2 120.00-93.50	0.36	3.18	A	1	0.63	0.041	1	1	67.229	1.90	71.649	C
			B	1	0.63		1	1	67.229			
			C	1	0.63		1	1	67.229			
L3 93.50-68.50	0.35	5.48	A	1	0.63	0.039	1	1	84.816	2.27	90.673	C
			B	1	0.63		1	1	84.816			
			C	1	0.63		1	1	84.816			
L4 68.50-44.75	0.33	7.74	A	1	0.63	0.036	1	1	99.479	2.46	103.430	C
			B	1	0.63		1	1	99.479			
			C	1	0.63		1	1	99.479			
L5 44.75-22.25	0.31	9.11	A	1	0.63	0.031	1	1	110.928	2.41	107.160	C
			B	1	0.63		1	1	110.928			
			C	1	0.63		1	1	110.928			
L6 22.25-1.00	0.30	10.41	A	1	0.63	0.031	1	1	119.574	2.58	121.434	C
			B	1	0.63		1	1	119.574			
			C	1	0.63		1	1	119.574			
Sum Weight:	1.84	37.00						OTM	747.77 kip-ft	12.61		

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Tower Forces - With Ice - Wind Normal 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	K	K				ksf			ft ²	K	plf	
L1 140.00-120.00	0.19	2.00	A	1	1.1	0.006	1	1	39.856	0.28	14.241	C
			B	1	1.1		1	1	39.856			
			C	1	1.1		1	1	39.856			
L2 120.00-93.50	0.36	4.94	A	1	1.1	0.006	1	1	74.683	0.51	19.421	C
			B	1	1.1		1	1	74.683			
			C	1	1.1		1	1	74.683			
L3 93.50-68.50	0.35	7.62	A	1	1.1	0.005	1	1	91.713	0.60	23.924	C
			B	1	1.1		1	1	91.713			
			C	1	1.1		1	1	91.713			
L4 68.50-44.75	0.33	10.15	A	1	1.1	0.005	1	1	105.853	0.64	26.855	C
			B	1	1.1		1	1	105.853			
			C	1	1.1		1	1	105.853			
L5 44.75-22.25	0.31	11.67	A	1	1.1	0.004	1	1	116.702	0.62	27.509	C
			B	1	1.1		1	1	116.702			
			C	1	1.1		1	1	116.702			
L6 22.25-1.00	0.30	12.89	A	1	1.1	0.004	1	1	124.513	0.66	30.855	C
			B	1	1.1		1	1	124.513			
			C	1	1.1		1	1	124.513			
Sum Weight:	1.84	49.28						OTM	200.03 kip-ft	3.31		

Tower Forces - With Ice - Wind 60 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	K	K				ksf			ft ²	K	plf	
L1 140.00-120.00	0.19	2.00	A	1	1.1	0.006	1	1	39.856	0.28	14.241	C
			B	1	1.1		1	1	39.856			
			C	1	1.1		1	1	39.856			
L2 120.00-93.50	0.36	4.94	A	1	1.1	0.006	1	1	74.683	0.51	19.421	C
			B	1	1.1		1	1	74.683			
			C	1	1.1		1	1	74.683			
L3 93.50-68.50	0.35	7.62	A	1	1.1	0.005	1	1	91.713	0.60	23.924	C
			B	1	1.1		1	1	91.713			
			C	1	1.1		1	1	91.713			
L4 68.50-44.75	0.33	10.15	A	1	1.1	0.005	1	1	105.853	0.64	26.855	C
			B	1	1.1		1	1	105.853			
			C	1	1.1		1	1	105.853			
L5 44.75-22.25	0.31	11.67	A	1	1.1	0.004	1	1	116.702	0.62	27.509	C
			B	1	1.1		1	1	116.702			
			C	1	1.1		1	1	116.702			
L6 22.25-1.00	0.30	12.89	A	1	1.1	0.004	1	1	124.513	0.66	30.855	C
			B	1	1.1		1	1	124.513			
			C	1	1.1		1	1	124.513			
Sum Weight:	1.84	49.28						OTM	200.03 kip-ft	3.31		

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Tower Forces - With Ice - 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	K	K				ksf			ft ²	K	plf	
L1 140.00-120.00	0.19	2.00	A	1	1.1	0.006	1	1	39.856	0.28	14.241	C
			B	1	1.1		1	1	39.856			
			C	1	1.1		1	1	39.856			
L2 120.00-93.50	0.36	4.94	A	1	1.1	0.006	1	1	74.683	0.51	19.421	C
			B	1	1.1		1	1	74.683			
			C	1	1.1		1	1	74.683			
L3 93.50-68.50	0.35	7.62	A	1	1.1	0.005	1	1	91.713	0.60	23.924	C
			B	1	1.1		1	1	91.713			
			C	1	1.1		1	1	91.713			
L4 68.50-44.75	0.33	10.15	A	1	1.1	0.005	1	1	105.853	0.64	26.855	C
			B	1	1.1		1	1	105.853			
			C	1	1.1		1	1	105.853			
L5 44.75-22.25	0.31	11.67	A	1	1.1	0.004	1	1	116.702	0.62	27.509	C
			B	1	1.1		1	1	116.702			
			C	1	1.1		1	1	116.702			
L6 22.25-1.00	0.30	12.89	A	1	1.1	0.004	1	1	124.513	0.66	30.855	C
			B	1	1.1		1	1	124.513			
			C	1	1.1		1	1	124.513			
Sum Weight:	1.84	49.28						OTM	200.03 kip-ft	3.31		

Tower Forces - Service - Wind Normal 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	K	K				ksf			ft ²	K	plf	
L1 140.00-120.00	0.19	1.08	A	1	0.63	0.013	1	1	34.159	0.30	14.814	C
			B	1	0.63		1	1	34.159			
			C	1	0.63		1	1	34.159			
L2 120.00-93.50	0.36	3.18	A	1	0.63	0.012	1	1	67.229	0.56	21.219	C
			B	1	0.63		1	1	67.229			
			C	1	0.63		1	1	67.229			
L3 93.50-68.50	0.35	5.48	A	1	0.63	0.011	1	1	84.816	0.67	26.853	C
			B	1	0.63		1	1	84.816			
			C	1	0.63		1	1	84.816			
L4 68.50-44.75	0.33	7.74	A	1	0.63	0.011	1	1	99.479	0.73	30.630	C
			B	1	0.63		1	1	99.479			
			C	1	0.63		1	1	99.479			
L5 44.75-22.25	0.31	9.11	A	1	0.63	0.009	1	1	110.928	0.71	31.735	C
			B	1	0.63		1	1	110.928			
			C	1	0.63		1	1	110.928			
L6 22.25-1.00	0.30	10.41	A	1	0.63	0.009	1	1	119.574	0.76	35.962	C
			B	1	0.63		1	1	119.574			
			C	1	0.63		1	1	119.574			
Sum Weight:	1.84	37.00						OTM	221.45 kip-ft	3.74		

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Tower Forces - Service - Wind 60 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	K	K				ksf			ft ²	K	plf	
L1 140.00-120.00	0.19	1.08	A	1	0.63	0.013	1	1	34.159	0.30	14.814	C
			B	1	0.63		1	1	34.159			
			C	1	0.63		1	1	34.159			
L2 120.00-93.50	0.36	3.18	A	1	0.63	0.012	1	1	67.229	0.56	21.219	C
			B	1	0.63		1	1	67.229			
			C	1	0.63		1	1	67.229			
L3 93.50-68.50	0.35	5.48	A	1	0.63	0.011	1	1	84.816	0.67	26.853	C
			B	1	0.63		1	1	84.816			
			C	1	0.63		1	1	84.816			
L4 68.50-44.75	0.33	7.74	A	1	0.63	0.011	1	1	99.479	0.73	30.630	C
			B	1	0.63		1	1	99.479			
			C	1	0.63		1	1	99.479			
L5 44.75-22.25	0.31	9.11	A	1	0.63	0.009	1	1	110.928	0.71	31.735	C
			B	1	0.63		1	1	110.928			
			C	1	0.63		1	1	110.928			
L6 22.25-1.00	0.30	10.41	A	1	0.63	0.009	1	1	119.574	0.76	35.962	C
			B	1	0.63		1	1	119.574			
			C	1	0.63		1	1	119.574			
Sum Weight:	1.84	37.00						OTM	221.45 kip-ft	3.74		

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	K	K				ksf			ft ²	K	plf	
L1 140.00-120.00	0.19	1.08	A	1	0.63	0.013	1	1	34.159	0.30	14.814	C
			B	1	0.63		1	1	34.159			
			C	1	0.63		1	1	34.159			
L2 120.00-93.50	0.36	3.18	A	1	0.63	0.012	1	1	67.229	0.56	21.219	C
			B	1	0.63		1	1	67.229			
			C	1	0.63		1	1	67.229			
L3 93.50-68.50	0.35	5.48	A	1	0.63	0.011	1	1	84.816	0.67	26.853	C
			B	1	0.63		1	1	84.816			
			C	1	0.63		1	1	84.816			
L4 68.50-44.75	0.33	7.74	A	1	0.63	0.011	1	1	99.479	0.73	30.630	C
			B	1	0.63		1	1	99.479			
			C	1	0.63		1	1	99.479			
L5 44.75-22.25	0.31	9.11	A	1	0.63	0.009	1	1	110.928	0.71	31.735	C
			B	1	0.63		1	1	110.928			
			C	1	0.63		1	1	110.928			
L6 22.25-1.00	0.30	10.41	A	1	0.63	0.009	1	1	119.574	0.76	35.962	C
			B	1	0.63		1	1	119.574			
			C	1	0.63		1	1	119.574			
Sum Weight:	1.84	37.00						OTM	221.45 kip-ft	3.74		

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Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	37.00					
Bracing Weight	0.00					
Total Member Self-Weight	37.00			-0.01	-0.18	
Total Weight	47.80			-0.01	-0.18	
Wind 0 deg - No Ice		-0.02	-29.39	-2825.00	1.85	0.18
Wind 30 deg - No Ice		14.67	-25.44	-2445.51	-1410.21	0.26
Wind 60 deg - No Ice		25.43	-14.68	-1410.76	-2444.44	0.27
Wind 90 deg - No Ice		29.37	0.02	2.01	-2823.74	0.21
Wind 120 deg - No Ice		25.45	14.71	1414.24	-2446.47	0.09
Wind 150 deg - No Ice		14.70	25.46	2447.52	-1413.71	-0.06
Wind 180 deg - No Ice		0.02	29.39	2824.98	-2.20	-0.18
Wind 210 deg - No Ice		-14.67	25.44	2445.50	1409.86	-0.26
Wind 240 deg - No Ice		-25.43	14.68	1410.74	2444.09	-0.27
Wind 270 deg - No Ice		-29.37	-0.02	-2.03	2823.39	-0.21
Wind 300 deg - No Ice		-25.45	-14.71	-1414.26	2446.12	-0.09
Wind 330 deg - No Ice		-14.70	-25.46	-2447.54	1413.36	0.06
Member Ice	12.28					
Total Weight Ice	75.56			0.30	-0.41	
Wind 0 deg - Ice		-0.00	-6.92	-646.80	-0.19	0.04
Wind 30 deg - Ice		3.46	-5.99	-559.99	-323.61	0.05
Wind 60 deg - Ice		5.99	-3.46	-323.06	-560.44	0.05
Wind 90 deg - Ice		6.92	0.00	0.52	-647.20	0.03
Wind 120 deg - Ice		5.99	3.46	324.04	-560.66	0.01
Wind 150 deg - Ice		3.46	6.00	560.81	-324.00	-0.02
Wind 180 deg - Ice		0.00	6.92	647.39	-0.63	-0.04
Wind 210 deg - Ice		-3.46	5.99	560.59	322.79	-0.05
Wind 240 deg - Ice		-5.99	3.46	323.65	559.62	-0.05
Wind 270 deg - Ice		-6.92	-0.00	0.08	646.38	-0.03
Wind 300 deg - Ice		-5.99	-3.46	-323.44	559.84	-0.01
Wind 330 deg - Ice		-3.46	-6.00	-560.21	323.18	0.02
Total Weight	47.80			-0.01	-0.18	
Wind 0 deg - Service		-0.01	-8.71	-836.94	0.42	0.06
Wind 30 deg - Service		4.35	-7.54	-724.51	-417.91	0.08
Wind 60 deg - Service		7.53	-4.35	-417.95	-724.31	0.08
Wind 90 deg - Service		8.70	0.01	0.59	-836.68	0.06
Wind 120 deg - Service		7.54	4.36	418.97	-724.91	0.02
Wind 150 deg - Service		4.36	7.54	725.09	-418.95	-0.02
Wind 180 deg - Service		0.01	8.71	836.92	-0.77	-0.06
Wind 210 deg - Service		-4.35	7.54	724.49	417.56	-0.08
Wind 240 deg - Service		-7.53	4.35	417.94	723.96	-0.08
Wind 270 deg - Service		-8.70	-0.01	-0.61	836.33	-0.06
Wind 300 deg - Service		-7.54	-4.36	-418.99	724.56	-0.02
Wind 330 deg - Service		-4.36	-7.54	-725.11	418.60	0.02
Seismic Vertical	1.51					
Seismic Horizontal 0 deg		0.00	-1.43	-149.27	0.00	0.00
Seismic Horizontal 30 deg		0.72	-1.24	-129.27	-74.64	0.00
Seismic Horizontal 60 deg		1.24	-0.72	-74.64	-129.27	0.00
Seismic Horizontal 90 deg		1.43	0.00	0.00	-149.27	0.00
Seismic Horizontal 120 deg		1.24	0.72	74.64	-129.27	0.00
Seismic Horizontal 150 deg		0.72	1.24	129.27	-74.64	0.00
Seismic Horizontal 180 deg		0.00	1.43	149.27	0.00	0.00
Seismic Horizontal 210 deg		-0.72	1.24	129.27	74.64	0.00

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Load Case	Vertical Forces	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Seismic Horizontal 240 deg		-1.24	0.72	74.64	129.27	0.00
Seismic Horizontal 270 deg		-1.43	0.00	0.00	149.27	0.00
Seismic Horizontal 300 deg		-1.24	-0.72	-74.64	129.27	0.00
Seismic Horizontal 330 deg		-0.72	-1.24	-129.27	74.64	0.00

Load Combinations

Comb. No.	Description
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
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

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Comb. No.	Description
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service
51	1.2 Dead+1.0 Ev+1.0 Eh 0 deg
52	0.9 Dead-1.0 Ev+1.0 Eh 0 deg
53	1.2 Dead+1.0 Ev+1.0 Eh 30 deg
54	0.9 Dead-1.0 Ev+1.0 Eh 30 deg
55	1.2 Dead+1.0 Ev+1.0 Eh 60 deg
56	0.9 Dead-1.0 Ev+1.0 Eh 60 deg
57	1.2 Dead+1.0 Ev+1.0 Eh 90 deg
58	0.9 Dead-1.0 Ev+1.0 Eh 90 deg
59	1.2 Dead+1.0 Ev+1.0 Eh 120 deg
60	0.9 Dead-1.0 Ev+1.0 Eh 120 deg
61	1.2 Dead+1.0 Ev+1.0 Eh 150 deg
62	0.9 Dead-1.0 Ev+1.0 Eh 150 deg
63	1.2 Dead+1.0 Ev+1.0 Eh 180 deg
64	0.9 Dead-1.0 Ev+1.0 Eh 180 deg
65	1.2 Dead+1.0 Ev+1.0 Eh 210 deg
66	0.9 Dead-1.0 Ev+1.0 Eh 210 deg
67	1.2 Dead+1.0 Ev+1.0 Eh 240 deg
68	0.9 Dead-1.0 Ev+1.0 Eh 240 deg
69	1.2 Dead+1.0 Ev+1.0 Eh 270 deg
70	0.9 Dead-1.0 Ev+1.0 Eh 270 deg
71	1.2 Dead+1.0 Ev+1.0 Eh 300 deg
72	0.9 Dead-1.0 Ev+1.0 Eh 300 deg
73	1.2 Dead+1.0 Ev+1.0 Eh 330 deg
74	0.9 Dead-1.0 Ev+1.0 Eh 330 deg

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	140 - 120	Pole	Max Tension	30	0.00	0.00	-0.00
			Max. Compression	26	-14.87	-0.32	0.19
			Max. Mx	8	-6.29	-114.98	0.05
			Max. My	2	-6.29	-0.10	114.94
			Max. Vy	8	7.50	-114.98	0.05
			Max. Vx	2	-7.50	-0.10	114.94
			Max. Torque	24			-0.14
			Max Tension	1	0.00	0.00	0.00
L2	120 - 93.5	Pole	Max. Compression	26	-33.45	-0.45	-0.30
			Max. Mx	8	-15.13	-499.32	-0.33
			Max. My	2	-15.13	0.13	499.36
			Max. Vy	8	19.63	-499.32	-0.33
			Max. Vx	2	-19.65	0.13	499.36
			Max. Torque	19			0.27
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-42.06	-0.45	-0.30
L3	93.5 - 68.5	Pole	Max. Mx	8	-21.52	-989.30	-0.75
			Max. My	2	-21.52	0.55	989.63
			Max. Vy	8	21.66	-989.30	-0.75
			Max. Vx	2	-21.68	0.55	989.63
			Max. Torque	19			0.27
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-53.54	-0.45	-0.30
			Max. Mx	8	-30.28	-1501.63	-1.14
L4	68.5 - 44.75	Pole	Max. My	2	-30.28	0.94	1502.24
			Max. Vy	8	23.87	-1501.63	-1.14

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L5	44.75 - 22.25	Pole	Max. Vx	2	-23.89	0.94	1502.24
			Max. Torque	19			0.27
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-67.12	-0.45	-0.30
			Max. Mx	8	-40.78	-2032.62	-1.52
			Max. My	2	-40.78	1.31	2033.50
			Max. Vy	8	26.05	-2032.62	-1.52
L6	22.25 - 1	Pole	Max. Vx	2	-26.06	1.31	2033.50
			Max. Torque	19			0.27
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-88.06	-0.45	-0.30
			Max. Mx	8	-57.36	-2863.37	-2.04
			Max. My	2	-57.36	1.83	2864.61
			Max. Vy	8	29.38	-2863.37	-2.04
			Max. Vx	2	-29.39	1.83	2864.61
			Max. Torque	19			0.27

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	88.06	0.00	0.00
	Max. H _x	20	57.36	29.37	0.02
	Max. H _z	2	57.36	0.02	29.39
	Max. M _x	2	2864.61	0.02	29.39
	Max. M _z	8	2863.37	-29.37	-0.02
	Max. Torsion	19	0.27	25.43	-14.68
	Min. Vert	56	41.51	-1.24	0.72
	Min. H _x	8	57.36	-29.37	-0.02
	Min. H _z	14	57.36	-0.02	-29.39
	Min. M _x	14	-2864.59	-0.02	-29.39
	Min. M _z	20	-2862.94	29.37	0.02
	Min. Torsion	7	-0.27	-25.43	14.68

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead Only	47.80	0.00	-0.05	-0.04	-0.18	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	57.36	-0.02	-29.39	-2864.61	1.83	0.19
0.9 Dead+1.0 Wind 0 deg - No Ice	43.02	-0.02	-29.39	-2854.47	1.88	0.19
1.2 Dead+1.0 Wind 30 deg - No Ice	57.36	14.67	-25.44	-2479.81	-1430.02	0.26
0.9 Dead+1.0 Wind 30 deg - No Ice	43.02	14.67	-25.44	-2471.02	-1424.90	0.26
1.2 Dead+1.0 Wind 60 deg - No Ice	57.36	25.43	-14.68	-1430.54	-2478.76	0.27
0.9 Dead+1.0 Wind 60 deg - No Ice	43.02	25.43	-14.68	-1425.47	-2469.93	0.27

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Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
1.2 Dead+1.0 Wind 90 deg - No Ice	57.36	29.37	0.02	2.04	-2863.37	0.20
0.9 Dead+1.0 Wind 90 deg - No Ice	43.02	29.37	0.02	2.03	-2853.18	0.20
1.2 Dead+1.0 Wind 120 deg - No Ice	57.36	25.45	14.71	1434.06	-2480.81	0.08
0.9 Dead+1.0 Wind 120 deg - No Ice	43.02	25.45	14.71	1428.99	-2471.97	0.08
1.2 Dead+1.0 Wind 150 deg - No Ice	57.36	14.70	25.46	2481.83	-1433.57	-0.06
0.9 Dead+1.0 Wind 150 deg - No Ice	43.02	14.70	25.46	2473.05	-1428.44	-0.06
1.2 Dead+1.0 Wind 180 deg - No Ice	57.36	0.02	29.39	2864.59	-2.27	-0.19
0.9 Dead+1.0 Wind 180 deg - No Ice	43.02	0.02	29.39	2854.45	-2.20	-0.19
1.2 Dead+1.0 Wind 210 deg - No Ice	57.36	-14.67	25.44	2479.78	1429.59	-0.26
0.9 Dead+1.0 Wind 210 deg - No Ice	43.02	-14.67	25.44	2471.01	1424.58	-0.26
1.2 Dead+1.0 Wind 240 deg - No Ice	57.36	-25.43	14.68	1430.51	2478.32	-0.27
0.9 Dead+1.0 Wind 240 deg - No Ice	43.02	-25.43	14.68	1425.45	2469.61	-0.27
1.2 Dead+1.0 Wind 270 deg - No Ice	57.36	-29.37	-0.02	-2.06	2862.94	-0.20
0.9 Dead+1.0 Wind 270 deg - No Ice	43.02	-29.37	-0.02	-2.05	2852.86	-0.20
1.2 Dead+1.0 Wind 300 deg - No Ice	57.36	-25.45	-14.71	-1434.09	2480.37	-0.08
0.9 Dead+1.0 Wind 300 deg - No Ice	43.02	-25.45	-14.71	-1429.01	2471.65	-0.08
1.2 Dead+1.0 Wind 330 deg - No Ice	57.36	-14.70	-25.46	-2481.85	1433.14	0.06
0.9 Dead+1.0 Wind 330 deg - No Ice	43.02	-14.70	-25.46	-2473.07	1428.12	0.06
1.2 Dead+1.0 Ice+1.0 Temp	88.06	0.00	0.00	0.30	-0.45	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	88.06	-0.00	-6.92	-664.75	-0.25	0.04
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	88.06	3.46	-5.99	-575.53	-332.65	0.05
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	88.06	5.99	-3.46	-332.02	-576.05	0.05
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	88.06	6.92	0.00	0.54	-665.22	0.03
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	88.06	5.99	3.46	333.04	-576.28	0.00
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	88.06	3.46	6.00	576.38	-333.05	-0.02
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	88.06	0.00	6.92	665.37	-0.70	-0.04
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	88.06	-3.46	5.99	576.16	331.70	-0.05
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	88.06	-5.99	3.46	332.65	575.10	-0.05
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	88.06	-6.92	-0.00	0.09	664.27	-0.03
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	88.06	-5.99	-3.46	-332.41	575.32	-0.00
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	88.06	-3.46	-6.00	-575.76	332.09	0.02

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Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead+Wind 0 deg - Service	47.80	-0.01	-8.71	-846.78	0.43	0.06
Dead+Wind 30 deg - Service	47.80	4.35	-7.54	-733.03	-422.82	0.08
Dead+Wind 60 deg - Service	47.80	7.53	-4.35	-422.87	-732.83	0.08
Dead+Wind 90 deg - Service	47.80	8.70	0.01	0.60	-846.52	0.06
Dead+Wind 120 deg - Service	47.80	7.54	4.36	423.90	-733.43	0.02
Dead+Wind 150 deg - Service	47.80	4.36	7.54	733.61	-423.87	-0.02
Dead+Wind 180 deg - Service	47.80	0.01	8.71	846.76	-0.79	-0.06
Dead+Wind 210 deg - Service	47.80	-4.35	7.54	733.01	422.47	-0.08
Dead+Wind 240 deg - Service	47.80	-7.53	4.35	422.85	732.47	-0.08
Dead+Wind 270 deg - Service	47.80	-8.70	-0.01	-0.62	846.16	-0.06
Dead+Wind 300 deg - Service	47.80	-7.54	-4.36	-423.92	733.07	-0.02
Dead+Wind 330 deg - Service	47.80	-4.36	-7.54	-733.63	423.51	0.02
1.2 Dead+1.0 Ev+1.0 Eh 0 deg	58.87	0.00	-1.43	-151.42	-0.22	0.00
0.9 Dead-1.0 Ev+1.0 Eh 0 deg	41.51	0.00	-1.43	-150.78	-0.16	0.00
1.2 Dead+1.0 Ev+1.0 Eh 30 deg	58.87	0.72	-1.24	-131.14	-75.92	0.00
0.9 Dead-1.0 Ev+1.0 Eh 30 deg	41.51	0.72	-1.24	-130.58	-75.55	0.00
1.2 Dead+1.0 Ev+1.0 Eh 60 deg	58.87	1.24	-0.72	-75.72	-131.34	-0.00
0.9 Dead-1.0 Ev+1.0 Eh 60 deg	41.51	1.24	-0.72	-75.39	-130.73	-0.00
1.2 Dead+1.0 Ev+1.0 Eh 90 deg	58.87	1.43	-0.06	-0.05	-151.63	-0.00
0.9 Dead-1.0 Ev+1.0 Eh 90 deg	41.51	1.43	0.05	0.02	-150.93	-0.00
1.2 Dead+1.0 Ev+1.0 Eh 120 deg	58.87	1.24	0.72	75.69	-131.34	-0.00
0.9 Dead-1.0 Ev+1.0 Eh 120 deg	41.51	1.24	0.72	75.38	-130.73	-0.00
1.2 Dead+1.0 Ev+1.0 Eh 150 deg	58.87	0.72	1.24	131.11	-75.92	-0.00
0.9 Dead-1.0 Ev+1.0 Eh 150 deg	41.51	0.72	1.24	130.56	-75.55	-0.00
1.2 Dead+1.0 Ev+1.0 Eh 180 deg	58.87	0.00	1.43	151.40	-0.22	-0.00
0.9 Dead-1.0 Ev+1.0 Eh 180 deg	41.51	0.00	1.43	150.76	-0.16	-0.00
1.2 Dead+1.0 Ev+1.0 Eh 210 deg	58.87	-0.72	1.24	131.11	75.49	-0.00
0.9 Dead-1.0 Ev+1.0 Eh 210 deg	41.51	-0.72	1.24	130.56	75.22	-0.00
1.2 Dead+1.0 Ev+1.0 Eh 240 deg	58.87	-1.24	0.72	75.69	130.91	0.00
0.9 Dead-1.0 Ev+1.0 Eh 240 deg	41.51	-1.24	0.72	75.38	130.41	0.00
1.2 Dead+1.0 Ev+1.0 Eh 270 deg	58.87	-1.43	-0.06	-0.05	151.19	0.00
0.9 Dead-1.0 Ev+1.0 Eh 270 deg	41.51	-1.43	0.05	0.02	150.61	0.00
1.2 Dead+1.0 Ev+1.0 Eh 300 deg	58.87	-1.24	-0.72	-75.72	130.91	0.00
0.9 Dead-1.0 Ev+1.0 Eh 300 deg	41.51	-1.24	-0.72	-75.39	130.41	0.00
1.2 Dead+1.0 Ev+1.0 Eh 330 deg	58.87	-0.72	-1.24	-131.14	75.49	0.00
0.9 Dead-1.0 Ev+1.0 Eh 330 deg	41.51	-0.72	-1.24	-130.58	75.22	0.00

Solution Summary

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Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-47.80	0.00	0.00	47.80	0.05	0.106%
2	-0.02	-57.36	-29.39	0.02	57.36	29.39	0.000%
3	-0.02	-43.02	-29.39	0.02	43.02	29.39	0.000%
4	14.67	-57.36	-25.44	-14.67	57.36	25.44	0.000%
5	14.67	-43.02	-25.44	-14.67	43.02	25.44	0.000%
6	25.43	-57.36	-14.68	-25.43	57.36	14.68	0.000%
7	25.43	-43.02	-14.68	-25.43	43.02	14.68	0.000%
8	29.37	-57.36	0.02	-29.37	57.36	-0.02	0.000%
9	29.37	-43.02	0.02	-29.37	43.02	-0.02	0.000%
10	25.45	-57.36	14.71	-25.45	57.36	-14.71	0.000%
11	25.45	-43.02	14.71	-25.45	43.02	-14.71	0.000%
12	14.70	-57.36	25.46	-14.70	57.36	-25.46	0.000%
13	14.70	-43.02	25.46	-14.70	43.02	-25.46	0.000%
14	0.02	-57.36	29.39	-0.02	57.36	-29.39	0.000%
15	0.02	-43.02	29.39	-0.02	43.02	-29.39	0.000%
16	-14.67	-57.36	25.44	14.67	57.36	-25.44	0.000%
17	-14.67	-43.02	25.44	14.67	43.02	-25.44	0.000%
18	-25.43	-57.36	14.68	25.43	57.36	-14.68	0.000%
19	-25.43	-43.02	14.68	25.43	43.02	-14.68	0.000%
20	-29.37	-57.36	-0.02	29.37	57.36	0.02	0.000%
21	-29.37	-43.02	-0.02	29.37	43.02	0.02	0.000%
22	-25.45	-57.36	-14.71	25.45	57.36	14.71	0.000%
23	-25.45	-43.02	-14.71	25.45	43.02	14.71	0.000%
24	-14.70	-57.36	-25.46	14.70	57.36	25.46	0.000%
25	-14.70	-43.02	-25.46	14.70	43.02	25.46	0.000%
26	0.00	-88.06	0.00	0.00	88.06	0.00	0.000%
27	-0.00	-88.06	-6.92	0.00	88.06	6.92	0.000%
28	3.46	-88.06	-5.99	-3.46	88.06	5.99	0.000%
29	5.99	-88.06	-3.46	-5.99	88.06	3.46	0.000%
30	6.92	-88.06	0.00	-6.92	88.06	-0.00	0.000%
31	5.99	-88.06	3.46	-5.99	88.06	-3.46	0.000%
32	3.46	-88.06	6.00	-3.46	88.06	-6.00	0.000%
33	0.00	-88.06	6.92	-0.00	88.06	-6.92	0.000%
34	-3.46	-88.06	5.99	3.46	88.06	-5.99	0.000%
35	-5.99	-88.06	3.46	5.99	88.06	-3.46	0.000%
36	-6.92	-88.06	-0.00	6.92	88.06	0.00	0.000%
37	-5.99	-88.06	-3.46	5.99	88.06	3.46	0.000%
38	-3.46	-88.06	-6.00	3.46	88.06	6.00	0.000%
39	-0.01	-47.80	-8.71	0.01	47.80	8.71	0.000%
40	4.35	-47.80	-7.54	-4.35	47.80	7.54	0.000%
41	7.53	-47.80	-4.35	-7.53	47.80	4.35	0.000%
42	8.70	-47.80	0.01	-8.70	47.80	-0.01	0.000%
43	7.54	-47.80	4.36	-7.54	47.80	-4.36	0.000%
44	4.36	-47.80	7.54	-4.36	47.80	-7.54	0.000%
45	0.01	-47.80	8.71	-0.01	47.80	-8.71	0.000%
46	-4.35	-47.80	7.54	4.35	47.80	-7.54	0.000%
47	-7.53	-47.80	4.35	7.53	47.80	-4.35	0.000%
48	-8.70	-47.80	-0.01	8.70	47.80	0.01	0.000%
49	-7.54	-47.80	-4.36	7.54	47.80	4.36	0.000%
50	-4.36	-47.80	-7.54	4.36	47.80	7.54	0.000%
51	0.00	-58.87	-1.43	0.00	58.87	1.43	0.000%
52	0.00	-41.51	-1.43	0.00	41.51	1.43	0.000%
53	0.72	-58.87	-1.24	-0.72	58.87	1.24	0.000%
54	0.72	-41.51	-1.24	-0.72	41.51	1.24	0.000%
55	1.24	-58.87	-0.72	-1.24	58.87	0.72	0.000%
56	1.24	-41.51	-0.72	-1.24	41.51	0.72	0.000%
57	1.43	-58.87	0.00	-1.43	58.87	0.06	0.109%
58	1.43	-41.51	0.00	-1.43	41.51	-0.05	0.114%
59	1.24	-58.87	0.72	-1.24	58.87	-0.72	0.000%
60	1.24	-41.51	0.72	-1.24	41.51	-0.72	0.000%
61	0.72	-58.87	1.24	-0.72	58.87	-1.24	0.000%

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Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
62	0.72	-41.51	1.24	-0.72	41.51	-1.24	0.000%
63	0.00	-58.87	1.43	0.00	58.87	-1.43	0.000%
64	0.00	-41.51	1.43	0.00	41.51	-1.43	0.000%
65	-0.72	-58.87	1.24	0.72	58.87	-1.24	0.000%
66	-0.72	-41.51	1.24	0.72	41.51	-1.24	0.000%
67	-1.24	-58.87	0.72	1.24	58.87	-0.72	0.000%
68	-1.24	-41.51	0.72	1.24	41.51	-0.72	0.000%
69	-1.43	-58.87	0.00	1.43	58.87	0.06	0.109%
70	-1.43	-41.51	0.00	1.43	41.51	-0.05	0.114%
71	-1.24	-58.87	-0.72	1.24	58.87	0.72	0.000%
72	-1.24	-41.51	-0.72	1.24	41.51	0.72	0.000%
73	-0.72	-58.87	-1.24	0.72	58.87	1.24	0.000%
74	-0.72	-41.51	-1.24	0.72	41.51	1.24	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00039037
2	Yes	4	0.00000001	0.00004297
3	Yes	4	0.00000001	0.00002196
4	Yes	4	0.00000001	0.00051597
5	Yes	4	0.00000001	0.00033417
6	Yes	4	0.00000001	0.00050134
7	Yes	4	0.00000001	0.00032427
8	Yes	4	0.00000001	0.00004318
9	Yes	4	0.00000001	0.00002217
10	Yes	4	0.00000001	0.00051215
11	Yes	4	0.00000001	0.00033151
12	Yes	4	0.00000001	0.00051255
13	Yes	4	0.00000001	0.00033172
14	Yes	4	0.00000001	0.00004341
15	Yes	4	0.00000001	0.00002234
16	Yes	4	0.00000001	0.00050079
17	Yes	4	0.00000001	0.00032400
18	Yes	4	0.00000001	0.00051529
19	Yes	4	0.00000001	0.00033383
20	Yes	4	0.00000001	0.00004274
21	Yes	4	0.00000001	0.00002180
22	Yes	4	0.00000001	0.00050816
23	Yes	4	0.00000001	0.00032885
24	Yes	4	0.00000001	0.00050790
25	Yes	4	0.00000001	0.00032870
26	Yes	4	0.00000001	0.00000001
27	Yes	4	0.00000001	0.00078506
28	Yes	4	0.00000001	0.00079771
29	Yes	4	0.00000001	0.00079837
30	Yes	4	0.00000001	0.00078735
31	Yes	4	0.00000001	0.00079984
32	Yes	4	0.00000001	0.00079972
33	Yes	4	0.00000001	0.00078678
34	Yes	4	0.00000001	0.00079721
35	Yes	4	0.00000001	0.00079617
36	Yes	4	0.00000001	0.00078374
37	Yes	4	0.00000001	0.00079570
38	Yes	4	0.00000001	0.00079620

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39	Yes	4	0.00000001	0.00001059
40	Yes	4	0.00000001	0.00002134
41	Yes	4	0.00000001	0.00002048
42	Yes	4	0.00000001	0.00001058
43	Yes	4	0.00000001	0.00002101
44	Yes	4	0.00000001	0.00002107
45	Yes	4	0.00000001	0.00001059
46	Yes	4	0.00000001	0.00002043
47	Yes	4	0.00000001	0.00002127
48	Yes	4	0.00000001	0.00001056
49	Yes	4	0.00000001	0.00002081
50	Yes	4	0.00000001	0.00002075
51	Yes	4	0.00000001	0.00000290
52	Yes	4	0.00000001	0.00000001
53	Yes	4	0.00000001	0.00000296
54	Yes	4	0.00000001	0.00000001
55	Yes	4	0.00000001	0.00000297
56	Yes	4	0.00000001	0.00000001
57	Yes	4	0.00000001	0.00040025
58	Yes	4	0.00000001	0.00062103
59	Yes	4	0.00000001	0.00000297
60	Yes	4	0.00000001	0.00000001
61	Yes	4	0.00000001	0.00000296
62	Yes	4	0.00000001	0.00000001
63	Yes	4	0.00000001	0.00000290
64	Yes	4	0.00000001	0.00000001
65	Yes	4	0.00000001	0.00000295
66	Yes	4	0.00000001	0.00000001
67	Yes	4	0.00000001	0.00000294
68	Yes	4	0.00000001	0.00000001
69	Yes	4	0.00000001	0.00040025
70	Yes	4	0.00000001	0.00062103
71	Yes	4	0.00000001	0.00000295
72	Yes	4	0.00000001	0.00000001
73	Yes	4	0.00000001	0.00000295
74	Yes	4	0.00000001	0.00000001

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	140 - 120	8.638	43	0.640	0.000
L2	120 - 93.5	6.060	44	0.564	0.000
L3	98.5 - 68.5	3.816	44	0.421	0.000
L4	74.75 - 44.75	2.052	44	0.278	0.000
L5	52.25 - 22.25	0.962	44	0.176	0.000
L6	31 - 1	0.333	44	0.097	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
136.00	Collar Mount w/Mount Pipe	43	8.104	0.627	0.000	33756
135.00	CCISeismic Tower Section 1 - 1	43	7.971	0.624	0.000	33756

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<i>Elevation</i>	<i>Appurtenance</i>	<i>Gov. Load Comb.</i>	<i>Deflection</i>	<i>Tilt</i>	<i>Twist</i>	<i>Radius of Curvature</i>
<i>ft</i>			<i>in</i>	<i>°</i>	<i>°</i>	<i>ft</i>
133.00	CCISeismic (3) 2" Conduit From 0 to 135 (129ft to 135ft)	43	7.707	0.618	0.000	24111
125.00	CCISeismic Tower Section 1 - 2	44	6.674	0.587	0.000	11252
118.00	12' HD Platform w/ Rail w/Kickers w/o Mount Pipe (SES)	44	5.824	0.553	0.000	8554
116.75	CCISeismic Tower Section 2 - 1	44	5.680	0.545	0.000	8511
115.00	CCISeismic (3) 2" Conduit From 0 to 135 (109ft to 119ft)	44	5.481	0.535	0.000	8526
114.00	CCISeismic general cable 1 5/8" Hybrid Cable From 0 to 117 (109ft to 117ft)	44	5.369	0.528	0.000	8543
108.50	CCISeismic Tower Section 2 - 2	44	4.780	0.492	0.000	8640
105.00	CCISeismic (3) 2" Conduit From 0 to 135 (99ft to 109ft)	44	4.427	0.467	0.000	8701
98.50	CCISeismic Tower Section 2 - 3	44	3.816	0.421	0.000	8849
95.00	CCISeismic (3) 2" Conduit From 0 to 135 (89ft to 99ft)	44	3.511	0.398	0.000	9033
93.50	CCISeismic Tower Section 3 - 1	44	3.385	0.388	0.000	9129
85.00	CCISeismic (3) 2" Conduit From 0 to 135 (79ft to 89ft)	44	2.727	0.335	0.000	9725
83.50	CCISeismic Tower Section 3 - 2	44	2.621	0.326	0.000	9838
75.00	CCISeismic (3) 2" Conduit From 0 to 135 (69ft to 79ft)	44	2.067	0.279	0.000	10577
73.50	CCISeismic Tower Section 3 - 3	44	1.978	0.271	0.000	10768
69.75	CCISeismic Tower Section 4 - 1	44	1.767	0.253	0.000	11358
65.00	CCISeismic (3) 2" Conduit From 0 to 135 (59ft to 69ft)	44	1.520	0.230	0.000	12242
59.75	CCISeismic Tower Section 4 - 2	44	1.273	0.207	0.000	13394
55.00	CCISeismic (3) 2" Conduit From 0 to 135 (49ft to 59ft)	44	1.071	0.187	0.000	14609
49.75	CCISeismic Tower Section 4 - 3	44	0.869	0.166	0.000	15093
47.25	CCISeismic Tower Section 5 - 1	44	0.780	0.156	0.000	14817
45.00	CCISeismic (3) 2" Conduit From 0 to 135 (39ft to 49ft)	44	0.705	0.148	0.000	14539
37.25	CCISeismic Tower Section 5 - 2	44	0.478	0.119	0.000	13657
35.00	CCISeismic (3) 2" Conduit From 0 to 135 (29ft to 39ft)	44	0.422	0.111	0.000	13424
27.25	CCISeismic Tower Section 5 - 3	44	0.263	0.084	0.000	14889
26.00	CCISeismic Tower Section 6 - 1	44	0.243	0.080	0.000	15624
25.00	CCISeismic (3) 2" Conduit From 0 to 135 (19ft to 29ft)	44	0.227	0.077	0.000	16275
16.00	CCISeismic Tower Section 6 - 2	44	0.115	0.047	0.000	26040
15.00	CCISeismic (3) 2" Conduit From 0 to 135 (9ft to 19ft)	44	0.105	0.044	0.000	27900
6.00	CCISeismic Tower Section 6 - 3	44	0.033	0.016	0.000	78120
5.50	CCISeismic (3) 2" Conduit From 0 to 135 (0ft to 9ft)	44	0.030	0.014	0.000	78120

Maximum Tower Deflections - Design Wind

<i>Section No.</i>	<i>Elevation</i>	<i>Horz. Deflection</i>	<i>Gov. Load Comb.</i>	<i>Tilt</i>	<i>Twist</i>
	<i>ft</i>	<i>in</i>		<i>°</i>	<i>°</i>
L1	140 - 120	29.231	12	2.164	0.002
L2	120 - 93.5	20.509	12	1.908	0.001
L3	98.5 - 68.5	12.914	12	1.426	0.000

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Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L4	74.75 - 44.75	6.945	12	0.941	0.000
L5	52.25 - 22.25	3.257	12	0.596	0.000
L6	31 - 1	1.128	12	0.329	0.000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
136.00	Collar Mount w/Mount Pipe	12	27.426	2.122	0.001	10017
135.00	CCISeismic Tower Section 1 - 1	12	26.976	2.112	0.001	10017
133.00	CCISeismic (3) 2" Conduit From 0 to 135 (129ft to135ft)	12	26.080	2.090	0.001	7155
125.00	CCISeismic Tower Section 1 - 2	12	22.585	1.988	0.001	3338
118.00	12' HD Platform w/ Rail w/Kickers w/o Mount Pipe (SES)	12	19.711	1.870	0.001	2537
116.75	CCISeismic Tower Section 2 - 1	12	19.221	1.846	0.001	2523
115.00	CCISeismic (3) 2" Conduit From 0 to 135 (109ft to119ft)	12	18.549	1.810	0.001	2527
114.00	CCISeismic general cable 1 5/8" Hybrid Cable From 0 to 117 (109ft to117ft)	12	18.171	1.788	0.001	2532
108.50	CCISeismic Tower Section 2 - 2	12	16.177	1.664	0.001	2559
105.00	CCISeismic (3) 2" Conduit From 0 to 135 (99ft to109ft)	12	14.982	1.581	0.001	2576
98.50	CCISeismic Tower Section 2 - 3	12	12.914	1.426	0.000	2618
95.00	CCISeismic (3) 2" Conduit From 0 to 135 (89ft to99ft)	12	11.882	1.346	0.000	2672
93.50	CCISeismic Tower Section 3 - 1	12	11.456	1.312	0.000	2700
85.00	CCISeismic (3) 2" Conduit From 0 to 135 (79ft to89ft)	12	9.230	1.133	0.000	2875
83.50	CCISeismic Tower Section 3 - 2	12	8.869	1.103	0.000	2909
75.00	CCISeismic (3) 2" Conduit From 0 to 135 (69ft to79ft)	12	6.996	0.945	0.000	3126
73.50	CCISeismic Tower Section 3 - 3	12	6.695	0.919	0.000	3182
69.75	CCISeismic Tower Section 4 - 1	12	5.979	0.856	0.000	3356
65.00	CCISeismic (3) 2" Conduit From 0 to 135 (59ft to69ft)	12	5.144	0.780	0.000	3617
59.75	CCISeismic Tower Section 4 - 2	12	4.308	0.701	0.000	3958
55.00	CCISeismic (3) 2" Conduit From 0 to 135 (49ft to59ft)	12	3.624	0.634	0.000	4317
49.75	CCISeismic Tower Section 4 - 3	12	2.940	0.562	0.000	4460
47.25	CCISeismic Tower Section 5 - 1	12	2.641	0.529	0.000	4378
45.00	CCISeismic (3) 2" Conduit From 0 to 135 (39ft to49ft)	12	2.386	0.500	0.000	4296
37.25	CCISeismic Tower Section 5 - 2	12	1.618	0.403	0.000	4036
35.00	CCISeismic (3) 2" Conduit From 0 to 135 (29ft to39ft)	12	1.428	0.376	0.000	3967
27.25	CCISeismic Tower Section 5 - 3	12	0.891	0.286	0.000	4400
26.00	CCISeismic Tower Section 6 - 1	12	0.821	0.272	0.000	4617
25.00	CCISeismic (3) 2" Conduit From 0 to 135 (19ft to29ft)	12	0.768	0.260	0.000	4809
16.00	CCISeismic Tower Section 6 - 2	12	0.388	0.161	0.000	7695
15.00	CCISeismic (3) 2" Conduit From 0 to 135 (9ft to19ft)	12	0.356	0.150	0.000	8245
6.00	CCISeismic Tower Section 6 - 3	12	0.112	0.053	0.000	23085
5.50	CCISeismic (3) 2" Conduit From 0	12	0.101	0.048	0.000	23085

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<i>Elevation</i>	<i>Appurtenance</i>	<i>Gov. Load Comb.</i>	<i>Deflection</i>	<i>Tilt</i>	<i>Twist</i>	<i>Radius of Curvature</i>
<i>ft</i>			<i>in</i>	<i>°</i>	<i>°</i>	<i>ft</i>
to 135 (0ft to9ft)						

Compression Checks

Pole Design Data

Section No.	Elevation	Size	L	L _u	Kl/r	A	P _u	φP _n	Ratio
	<i>ft</i>		<i>ft</i>	<i>ft</i>		<i>in²</i>	<i>K</i>	<i>K</i>	$\frac{P_u}{\phi P_n}$
L1	140 - 120 (1)	TP24.44x16x0.25	20.00	0.00	0.0	19.20	-6.29	1123.07	0.006
L2	120 - 93.5 (2)	TP35.63x24.44x0.38	26.50	0.00	0.0	39.45	-15.13	2307.95	0.007
L3	93.5 - 68.5 (3)	TP45.44x32.77x0.44	30.00	0.00	0.0	58.82	-21.52	3441.15	0.006
L4	68.5 - 44.75 (4)	TP54.59x41.92x0.5	30.00	0.00	0.0	80.81	-30.28	4727.62	0.006
L5	44.75 - 22.25 (5)	TP63.09x50.42x0.5	30.00	0.00	0.0	93.46	-40.78	5467.71	0.007
L6	22.25 - 1 (6)	TP71.06x58.39x0.5	30.00	0.00	0.0	111.98	-57.36	6550.76	0.009

Pole Bending Design Data

Section No.	Elevation	Size	M _{ux}	φM _{nx}	Ratio	M _{uy}	φM _{ny}	Ratio
	<i>ft</i>		<i>kip-ft</i>	<i>kip-ft</i>	$\frac{M_{ux}}{\phi M_{nx}}$	<i>kip-ft</i>	<i>kip-ft</i>	$\frac{M_{uy}}{\phi M_{ny}}$
L1	140 - 120 (1)	TP24.44x16x0.25	115.00	704.82	0.163	0.00	704.82	0.000
L2	120 - 93.5 (2)	TP35.63x24.44x0.38	499.68	1990.98	0.251	0.00	1990.98	0.000
L3	93.5 - 68.5 (3)	TP45.44x32.77x0.44	990.24	3780.74	0.262	0.00	3780.74	0.000
L4	68.5 - 44.75 (4)	TP54.59x41.92x0.5	1503.12	6168.15	0.244	0.00	6168.15	0.000
L5	44.75 - 22.25 (5)	TP63.09x50.42x0.5	2034.63	7925.36	0.257	0.00	7925.36	0.000
L6	22.25 - 1 (6)	TP71.06x58.39x0.5	2866.12	10685.17	0.268	0.00	10685.17	0.000

Pole Shear Design Data

Section No.	Elevation	Size	Actual V _u	φV _n	Ratio	Actual T _u	φT _n	Ratio
	<i>ft</i>		<i>K</i>	<i>K</i>	$\frac{V_u}{\phi V_n}$	<i>kip-ft</i>	<i>kip-ft</i>	$\frac{T_u}{\phi T_n}$
L1	140 - 120 (1)	TP24.44x16x0.25	7.50	336.92	0.022	0.00	713.86	0.000
L2	120 - 93.5 (2)	TP35.63x24.44x0.38	19.66	692.38	0.028	0.06	2009.83	0.000
L3	93.5 - 68.5 (3)	TP45.44x32.77x0.44	21.69	1032.35	0.021	0.06	3829.72	0.000
L4	68.5 - 44.75 (4)	TP54.59x41.92x0.5	23.90	1418.29	0.017	0.06	6324.91	0.000
L5	44.75 - 22.25 (5)	TP63.09x50.42x0.5	26.07	1640.31	0.016	0.06	8460.17	0.000
L6	22.25 - 1 (6)	TP71.06x58.39x0.5	29.41	1965.23	0.015	0.06	12143.67	0.000

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Pole Interaction Design Data

Section No.	Elevation ft	Ratio P_u	Ratio M_{ux}	Ratio M_{uy}	Ratio V_u	Ratio T_u	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	140 - 120 (1)	0.006	0.163	0.000	0.022	0.000	0.169	1.000	✓
L2	120 - 93.5 (2)	0.007	0.251	0.000	0.028	0.000	0.258	1.000	✓
L3	93.5 - 68.5 (3)	0.006	0.262	0.000	0.021	0.000	0.269	1.000	✓
L4	68.5 - 44.75 (4)	0.006	0.244	0.000	0.017	0.000	0.250	1.000	✓
L5	44.75 - 22.25 (5)	0.007	0.257	0.000	0.016	0.000	0.264	1.000	✓
L6	22.25 - 1 (6)	0.009	0.268	0.000	0.015	0.000	0.277	1.000	✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	140 - 120	Pole	TP24.44x16x0.25	1	-6.29	1123.07	16.9	Pass
L2	120 - 93.5	Pole	TP35.63x24.44x0.38	2	-15.13	2307.95	25.8	Pass
L3	93.5 - 68.5	Pole	TP45.44x32.77x0.44	3	-21.52	3441.15	26.9	Pass
L4	68.5 - 44.75	Pole	TP54.59x41.92x0.5	4	-30.28	4727.62	25.0	Pass
L5	44.75 - 22.25	Pole	TP63.09x50.42x0.5	5	-40.78	5467.71	26.4	Pass
L6	22.25 - 1	Pole	TP71.06x58.39x0.5	6	-57.36	6550.76	27.7	Pass
							Summary	
							Pole (L6)	27.7
							RATING =	27.7
								Pass

Seismic Analysis

Site Number:	US-VT-5036
Order Number:	REV05
Date:	4/22/2025

Location				
	Decimal Degrees	Deg	Min	Sec
Lat:	44.969806	+	44	58
Long:	-72.669997	-	72	40
				11.30
				11.99
Code and Site Parameters				
Seismic Design Code:		TIA-222-H-1		
Site Soil:		B		
Risk Category:		II		
USGS Seismic Reference		S _s :	0.2640	g
		S ₁ :	0.0800	g
		T _L :	6	s
Seismic Design Category Determination				
Importance Factor, I _e :		1		
Acceleration-based site coefficient, F _a :		0.9000		
Velocity-based site coefficient, F _v :		0.8000		
Design spectral response acceleration short period, S _{DS} :		0.1584		
Design spectral response acceleration 1 s period, S _{D1} :		0.0427		
		T _s :	0.2694	
Seismic Design Category Based on S _{DS} :		A		
Seismic Design Category Based on S _{D1} :		A		
Seismic Design Category Based on S ₁ :		N/A		
Controlling Seismic Design Category:		A		

Seismic Analysis

Site Number:	US-VT-5036
Order Number:	REV05
Date:	4/22/2025

Tower Details			
Tower Type:	Tapered Monopole		
Height, h:	139	ft	
Effective Seismic Weight, W:	47.80	kips	
Amplification Factor, A _s :	1.0		2.7.8.1
Seismic Base Shear			
Response Modification Factor, R:	1.5		
Discrete Appurtenance Weight in Top 1/3 of Structure, W _u :	8.953452	kips	
W _L :	38.84224803	kips	
E:	29000.0	ksi	
g:	386.088	in/s ²	
Average Moment of Inertia, I _{avg} :	22870.82507	in ⁴	
F _a :	0.481047534	hz	
Approximate Fundamental Period Monopole, T _a :	2.0788	s	2.7.7.1.3.3
Seismic Response Coefficient, C _s	0.1056		2.7.7.1.1
Seismic Response Coefficient Max 1, C _{smax}	0.0137		2.7.7.1.1
Seismic Response Coefficient Max 2, C _{smax}	N/A		2.7.7.1.1
	0.01368313		
Seismic Response Coefficient Min 1, C _{smin}	0.0300		2.7.7.1.1
Seismic Response Coefficient Min 2, C _{smin}	N/A		2.7.7.1.1
	0.0300		
Controlling Seismic Response Coefficient, C _{sc}	0.0300		
Seismic Base Shear, V	1.434	kips	2.7.7.1.1
Vertical Distribution Factors			
Period Related Exponent, k:	1.789		
Sum of w _i h _i ^k	107954.97		

Tower Section Loads								
Section Number	Length	Top Height	Mid Height, h_x	Section Weight, w_x	$w_x h_x^k$	C_{vx}	F_{xh}	F_{xv}
1 - 1	10.00	139.00	134.00	0.4822	3086.79	0.0286	0.0410	0.0153
1 - 2	10.00	129.00	124.00	0.5962	3321.90	0.0308	0.0441	0.0189
2 - 1	6.50	119.00	115.75	0.6697	3298.87	0.0306	0.0438	0.0212
2 - 2	10.00	112.50	107.50	1.1714	5054.93	0.0468	0.0671	0.0371
2 - 3	10.00	102.50	97.50	1.3424	4864.18	0.0451	0.0646	0.0425
3 - 1	10.00	97.50	92.50	1.6275	5367.03	0.0497	0.0713	0.0516
3 - 2	10.00	87.50	82.50	1.8270	4909.50	0.0455	0.0652	0.0579
3 - 3	10.00	77.50	72.50	2.0265	4321.44	0.0400	0.0574	0.0642
4 - 1	10.00	73.75	68.75	2.3508	4558.66	0.0422	0.0605	0.0745
4 - 2	10.00	63.75	58.75	2.5788	3774.71	0.0350	0.0501	0.0817
4 - 3	10.00	53.75	48.75	2.8068	2942.21	0.0273	0.0391	0.0889
5 - 1	10.00	51.25	46.25	2.8098	2680.56	0.0248	0.0356	0.0890
5 - 2	10.00	41.25	36.25	3.0378	1874.06	0.0174	0.0249	0.0962
5 - 3	10.00	31.25	26.25	3.2658	1130.77	0.0105	0.0150	0.1035
6 - 1	10.00	30.00	25.00	3.2403	1028.15	0.0095	0.0137	0.1027
6 - 2	10.00	20.00	15.00	3.4683	441.17	0.0041	0.0059	0.1099
6 - 3	10.00	10.00	5.00	3.6963	65.84	0.0006	0.0009	0.1171
Sum				36.9978	52720.78			

Discrete Loads						
Name	h_x	w_x	$w_x h_x^k$	C_{vx}	F_{xh}	F_{xv}
pole mounts Collar Mount w/Mount Pipe	135.00	0.4500	2918.96	0.0270	0.0388	0.0143
tower mounts Sabre C10857001C 12ft HD V-Boom w/o Mount Pipe (SES)	135.00	0.4620	2996.80	0.0278	0.0398	0.0146
tower mounts Sabre C10857001C 12ft HD V-Boom w/o Mount Pipe (SES)	135.00	0.4620	2996.80	0.0278	0.0398	0.0146
tower mounts Sabre C10857001C 12ft HD V-Boom w/o Mount Pipe (SES)	135.00	0.4620	2996.80	0.0278	0.0398	0.0146
cci DMP65R-BU8DA w/8' Mount Pipe	135.00	0.1249	810.17	0.0075	0.0108	0.0040
cci DMP65R-BU8DA w/8' Mount Pipe	135.00	0.1249	810.17	0.0075	0.0108	0.0040
cci DMP65R-BU8DA w/8' Mount Pipe	135.00	0.1249	810.17	0.0075	0.0108	0.0040
tower mounts 8'x2 1/2" Pipe Mount	135.00	0.0463	300.59	0.0028	0.0040	0.0015
tower mounts 8'x2 1/2" Pipe Mount	135.00	0.0463	300.59	0.0028	0.0040	0.0015
tower mounts 8'x2 1/2" Pipe Mount	135.00	0.0463	300.59	0.0028	0.0040	0.0015
ericsson AIR 6472 B77G B77M w/10' Mount Pipe	135.00	0.1351	876.34	0.0081	0.0116	0.0043
ericsson AIR 6472 B77G B77M w/10' Mount Pipe	135.00	0.1351	876.34	0.0081	0.0116	0.0043
ericsson AIR 6472 B77G B77M w/10' Mount Pipe	135.00	0.1351	876.34	0.0081	0.0116	0.0043
cci TPA65R-BU8D w/8' Mount Pipe	135.00	0.1334	865.44	0.0080	0.0115	0.0042
cci TPA65R-BU8D w/8' Mount Pipe	135.00	0.1334	865.44	0.0080	0.0115	0.0042
cci TPA65R-BU8D w/8' Mount Pipe	135.00	0.1334	865.44	0.0080	0.0115	0.0042
ericsson 8843 B2/B66A RRU	135.00	0.0720	467.03	0.0043	0.0062	0.0023
ericsson 8843 B2/B66A RRU	135.00	0.0720	467.03	0.0043	0.0062	0.0023
ericsson 8843 B2/B66A RRU	135.00	0.0720	467.03	0.0043	0.0062	0.0023
ericsson 4478 B14 RRU w/10' Mount Pipe	135.00	0.0959	622.06	0.0058	0.0083	0.0030
ericsson 4478 B14 RRU w/10' Mount Pipe	135.00	0.0959	622.06	0.0058	0.0083	0.0030
ericsson 4478 B14 RRU w/10' Mount Pipe	135.00	0.0959	622.06	0.0058	0.0083	0.0030
ericsson 4415 B30 RRU	135.00	0.0460	298.38	0.0028	0.0040	0.0015
ericsson 4415 B30 RRU	135.00	0.0460	298.38	0.0028	0.0040	0.0015
ericsson 4415 B30 RRU	135.00	0.0460	298.38	0.0028	0.0040	0.0015
ericsson 4490 B5/B12A RRU w/10' Mount Pipe	135.00	0.1049	680.44	0.0063	0.0090	0.0033
ericsson 4490 B5/B12A RRU w/10' Mount Pipe	135.00	0.1049	680.44	0.0063	0.0090	0.0033
ericsson 4490 B5/B12A RRU w/10' Mount Pipe	135.00	0.1049	680.44	0.0063	0.0090	0.0033
raycap DC9-48-60-24-8C-EV	135.00	0.0262	169.95	0.0016	0.0023	0.0008
raycap DC9-48-60-24-8C-EV	135.00	0.0262	169.95	0.0016	0.0023	0.0008
pole mounts Sabre C10855665C 12' HD Platform w/ Rail w/Kickers w/o Mov	117.00	1.8010	9043.20	0.0838	0.1201	0.0571
(4) commscope NHH-65B-R2B (CFD)	117.00	0.1746	876.72	0.0081	0.0116	0.0055
(4) commscope NHH-65B-R2B (CFD)	117.00	0.1746	876.72	0.0081	0.0116	0.0055
(4) commscope NHH-65B-R2B (CFD)	117.00	0.1746	876.72	0.0081	0.0116	0.0055
(2) tower mounts Side By Side w/8' Mount Pipe (SES)	117.00	0.1438	721.95	0.0067	0.0096	0.0046
(2) tower mounts Side By Side w/8' Mount Pipe (SES)	117.00	0.1438	721.95	0.0067	0.0096	0.0046
(2) tower mounts Side By Side w/8' Mount Pipe (SES)	117.00	0.1438	721.95	0.0067	0.0096	0.0046
samsung B2/B66A RRH-BR049	117.00	0.0975	489.57	0.0045	0.0065	0.0031
samsung B2/B66A RRH-BR049	117.00	0.0975	489.57	0.0045	0.0065	0.0031
samsung B5/B13 RRH BR04C	117.00	0.0703	353.14	0.0033	0.0047	0.0022
raycap RHSDC-6627-PF-48	117.00	0.0320	160.68	0.0015	0.0021	0.0010
1/3 Remaining Reserved Rights (40,000 sq in)	117.00	0.5786	2905.42	0.0269	0.0386	0.0183
1/3 Remaining Reserved Rights (40,000 sq in)	117.00	0.5786	2905.42	0.0269	0.0386	0.0183
1/3 Remaining Reserved Rights (40,000 sq in)	117.00	0.5786	2905.42	0.0269	0.0386	0.0183
Sum		8.9535	51059.07			

Linear Loads								
Name	Start Height	End Height	h_x	w_x	$w_x h_x^k$	C_{vx}	F_{xh}	F_{xv}
(3) 2" Conduit From 0 to 135	129.00	135.00	132.00	0.0360	224.31	0.0021	0.0030	0.0011
(3) 2" Conduit From 0 to 135	119.00	129.00	124.00	0.0600	334.28	0.0031	0.0044	0.0019
(3) 2" Conduit From 0 to 135	109.00	119.00	114.00	0.0600	287.59	0.0027	0.0038	0.0019
(3) 2" Conduit From 0 to 135	99.00	109.00	104.00	0.0600	244.02	0.0023	0.0032	0.0019
(3) 2" Conduit From 0 to 135	89.00	99.00	94.00	0.0600	203.64	0.0019	0.0027	0.0019
(3) 2" Conduit From 0 to 135	79.00	89.00	84.00	0.0600	166.52	0.0015	0.0022	0.0019
(3) 2" Conduit From 0 to 135	69.00	79.00	74.00	0.0600	132.72	0.0012	0.0018	0.0019
(3) 2" Conduit From 0 to 135	59.00	69.00	64.00	0.0600	102.36	0.0009	0.0014	0.0019
(3) 2" Conduit From 0 to 135	49.00	59.00	54.00	0.0600	75.53	0.0007	0.0010	0.0019
(3) 2" Conduit From 0 to 135	39.00	49.00	44.00	0.0600	52.35	0.0005	0.0007	0.0019
(3) 2" Conduit From 0 to 135	29.00	39.00	34.00	0.0600	33.00	0.0003	0.0004	0.0019
(3) 2" Conduit From 0 to 135	19.00	29.00	24.00	0.0600	17.70	0.0002	0.0002	0.0019
(3) 2" Conduit From 0 to 135	9.00	19.00	14.00	0.0600	6.75	0.0001	0.0001	0.0019
(3) 2" Conduit From 0 to 135	0.00	9.00	4.50	0.0540	0.80	0.0000	0.0000	0.0017
0.5" Fiber From 0 to 135	129.00	135.00	132.00	0.0004	2.24	0.0000	0.0000	0.0000
0.5" Fiber From 0 to 135	119.00	129.00	124.00	0.0006	3.34	0.0000	0.0000	0.0000
0.5" Fiber From 0 to 135	109.00	119.00	114.00	0.0006	2.88	0.0000	0.0000	0.0000
0.5" Fiber From 0 to 135	99.00	109.00	104.00	0.0006	2.44	0.0000	0.0000	0.0000
0.5" Fiber From 0 to 135	89.00	99.00	94.00	0.0006	2.04	0.0000	0.0000	0.0000
0.5" Fiber From 0 to 135	79.00	89.00	84.00	0.0006	1.67	0.0000	0.0000	0.0000
0.5" Fiber From 0 to 135	69.00	79.00	74.00	0.0006	1.33	0.0000	0.0000	0.0000
0.5" Fiber From 0 to 135	59.00	69.00	64.00	0.0006	1.02	0.0000	0.0000	0.0000
0.5" Fiber From 0 to 135	49.00	59.00	54.00	0.0006	0.76	0.0000	0.0000	0.0000
0.5" Fiber From 0 to 135	39.00	49.00	44.00	0.0006	0.52	0.0000	0.0000	0.0000
0.5" Fiber From 0 to 135	29.00	39.00	34.00	0.0006	0.33	0.0000	0.0000	0.0000
0.5" Fiber From 0 to 135	19.00	29.00	24.00	0.0006	0.18	0.0000	0.0000	0.0000
0.5" Fiber From 0 to 135	9.00	19.00	14.00	0.0006	0.07	0.0000	0.0000	0.0000
0.5" Fiber From 0 to 135	0.00	9.00	4.50	0.0005	0.01	0.0000	0.0000	0.0000
0.5" Fiber From 0 to 135	129.00	135.00	132.00	0.0004	2.24	0.0000	0.0000	0.0000
0.5" Fiber From 0 to 135	119.00	129.00	124.00	0.0006	3.34	0.0000	0.0000	0.0000
0.5" Fiber From 0 to 135	109.00	119.00	114.00	0.0006	2.88	0.0000	0.0000	0.0000
0.5" Fiber From 0 to 135	99.00	109.00	104.00	0.0006	2.44	0.0000	0.0000	0.0000
0.5" Fiber From 0 to 135	89.00	99.00	94.00	0.0006	2.04	0.0000	0.0000	0.0000
0.5" Fiber From 0 to 135	79.00	89.00	84.00	0.0006	1.67	0.0000	0.0000	0.0000
0.5" Fiber From 0 to 135	69.00	79.00	74.00	0.0006	1.33	0.0000	0.0000	0.0000
0.5" Fiber From 0 to 135	59.00	69.00	64.00	0.0006	1.02	0.0000	0.0000	0.0000
0.5" Fiber From 0 to 135	49.00	59.00	54.00	0.0006	0.76	0.0000	0.0000	0.0000
0.5" Fiber From 0 to 135	39.00	49.00	44.00	0.0006	0.52	0.0000	0.0000	0.0000
0.5" Fiber From 0 to 135	29.00	39.00	34.00	0.0006	0.33	0.0000	0.0000	0.0000
0.5" Fiber From 0 to 135	19.00	29.00	24.00	0.0006	0.18	0.0000	0.0000	0.0000
0.5" Fiber From 0 to 135	9.00	19.00	14.00	0.0006	0.07	0.0000	0.0000	0.0000
0.5" Fiber From 0 to 135	0.00	9.00	4.50	0.0005	0.01	0.0000	0.0000	0.0000
(5) general cable 0.82" DC From 0 to 135	129.00	135.00	132.00	0.0210	130.85	0.0012	0.0017	0.0007
(5) general cable 0.82" DC From 0 to 135	119.00	129.00	124.00	0.0350	195.00	0.0018	0.0026	0.0011
(5) general cable 0.82" DC From 0 to 135	109.00	119.00	114.00	0.0350	167.76	0.0016	0.0022	0.0011
(5) general cable 0.82" DC From 0 to 135	99.00	109.00	104.00	0.0350	142.35	0.0013	0.0019	0.0011
(5) general cable 0.82" DC From 0 to 135	89.00	99.00	94.00	0.0350	118.79	0.0011	0.0016	0.0011
(5) general cable 0.82" DC From 0 to 135	79.00	89.00	84.00	0.0350	97.13	0.0009	0.0013	0.0011
(5) general cable 0.82" DC From 0 to 135	69.00	79.00	74.00	0.0350	77.42	0.0007	0.0010	0.0011
(5) general cable 0.82" DC From 0 to 135	59.00	69.00	64.00	0.0350	59.71	0.0006	0.0008	0.0011
(5) general cable 0.82" DC From 0 to 135	49.00	59.00	54.00	0.0350	44.06	0.0004	0.0006	0.0011
(5) general cable 0.82" DC From 0 to 135	39.00	49.00	44.00	0.0350	30.54	0.0003	0.0004	0.0011
(5) general cable 0.82" DC From 0 to 135	29.00	39.00	34.00	0.0350	19.25	0.0002	0.0003	0.0011
(5) general cable 0.82" DC From 0 to 135	19.00	29.00	24.00	0.0350	10.32	0.0001	0.0001	0.0011
(5) general cable 0.82" DC From 0 to 135	9.00	19.00	14.00	0.0350	3.94	0.0000	0.0001	0.0011
(5) general cable 0.82" DC From 0 to 135	0.00	9.00	4.50	0.0315	0.46	0.0000	0.0000	0.0010
0.92" DC From 0 to 135	129.00	135.00	132.00	0.0030	18.69	0.0002	0.0002	0.0001
0.92" DC From 0 to 135	119.00	129.00	124.00	0.0050	27.86	0.0003	0.0004	0.0002
0.92" DC From 0 to 135	109.00	119.00	114.00	0.0050	23.97	0.0002	0.0003	0.0002
0.92" DC From 0 to 135	99.00	109.00	104.00	0.0050	20.34	0.0002	0.0003	0.0002
0.92" DC From 0 to 135	89.00	99.00	94.00	0.0050	16.97	0.0002	0.0002	0.0002
0.92" DC From 0 to 135	79.00	89.00	84.00	0.0050	13.88	0.0001	0.0002	0.0002
0.92" DC From 0 to 135	69.00	79.00	74.00	0.0050	11.06	0.0001	0.0001	0.0002
0.92" DC From 0 to 135	59.00	69.00	64.00	0.0050	8.53	0.0001	0.0001	0.0002
0.92" DC From 0 to 135	49.00	59.00	54.00	0.0050	6.29	0.0001	0.0001	0.0002
0.92" DC From 0 to 135	39.00	49.00	44.00	0.0050	4.36	0.0000	0.0001	0.0002
0.92" DC From 0 to 135	29.00	39.00	34.00	0.0050	2.75	0.0000	0.0000	0.0002
0.92" DC From 0 to 135	19.00	29.00	24.00	0.0050	1.47	0.0000	0.0000	0.0002
0.92" DC From 0 to 135	9.00	19.00	14.00	0.0050	0.56	0.0000	0.0000	0.0002
0.92" DC From 0 to 135	0.00	9.00	4.50	0.0045	0.07	0.0000	0.0000	0.0001
2" Conduit From 0 to 135	129.00	135.00	132.00	0.0120	74.77	0.0007	0.0010	0.0004
2" Conduit From 0 to 135	119.00	129.00	124.00	0.0200	111.43	0.0010	0.0015	0.0006
2" Conduit From 0 to 135	109.00	119.00	114.00	0.0200	95.86	0.0009	0.0013	0.0006
2" Conduit From 0 to 135	99.00	109.00	104.00	0.0200	81.34	0.0008	0.0011	0.0006
2" Conduit From 0 to 135	89.00	99.00	94.00	0.0200	67.88	0.0006	0.0009	0.0006
2" Conduit From 0 to 135	79.00	89.00	84.00	0.0200	55.51	0.0005	0.0007	0.0006
2" Conduit From 0 to 135	69.00	79.00	74.00	0.0200	44.24	0.0004	0.0006	0.0006
2" Conduit From 0 to 135	59.00	69.00	64.00	0.0200	34.12	0.0003	0.0005	0.0006
2" Conduit From 0 to 135	49.00	59.00	54.00	0.0200	25.18	0.0002	0.0003	0.0006
2" Conduit From 0 to 135	39.00	49.00	44.00	0.0200	17.45	0.0002	0.0002	0.0006
2" Conduit From 0 to 135	29.00	39.00	34.00	0.0200	11.00	0.0001	0.0001	0.0006

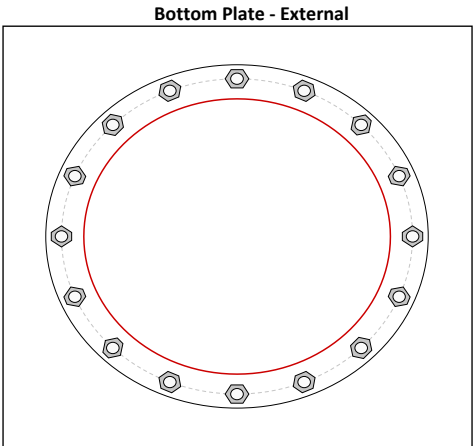
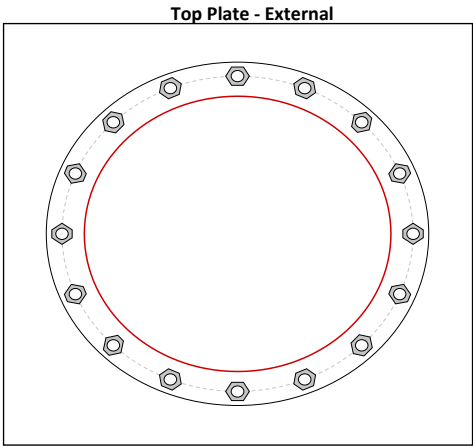
2" Conduit From 0 to 135	19.00	29.00	24.00	0.0200	5.90	0.0001	0.0001	0.0006
2" Conduit From 0 to 135	9.00	19.00	14.00	0.0200	2.25	0.0000	0.0000	0.0006
2" Conduit From 0 to 135	0.00	9.00	4.50	0.0180	0.27	0.0000	0.0000	0.0006
general cable 1 5/8" Hybrid Cable From 0 to 117	109.00	117.00	113.00	0.0142	67.19	0.0006	0.0009	0.0005
general cable 1 5/8" Hybrid Cable From 0 to 117	99.00	109.00	104.00	0.0178	72.39	0.0007	0.0010	0.0006
general cable 1 5/8" Hybrid Cable From 0 to 117	89.00	99.00	94.00	0.0178	60.41	0.0006	0.0008	0.0006
general cable 1 5/8" Hybrid Cable From 0 to 117	79.00	89.00	84.00	0.0178	49.40	0.0005	0.0007	0.0006
general cable 1 5/8" Hybrid Cable From 0 to 117	69.00	79.00	74.00	0.0178	39.37	0.0004	0.0005	0.0006
general cable 1 5/8" Hybrid Cable From 0 to 117	59.00	69.00	64.00	0.0178	30.37	0.0003	0.0004	0.0006
general cable 1 5/8" Hybrid Cable From 0 to 117	49.00	59.00	54.00	0.0178	22.41	0.0002	0.0003	0.0006
general cable 1 5/8" Hybrid Cable From 0 to 117	39.00	49.00	44.00	0.0178	15.53	0.0001	0.0002	0.0006
general cable 1 5/8" Hybrid Cable From 0 to 117	29.00	39.00	34.00	0.0178	9.79	0.0001	0.0001	0.0006
general cable 1 5/8" Hybrid Cable From 0 to 117	19.00	29.00	24.00	0.0178	5.25	0.0000	0.0001	0.0006
general cable 1 5/8" Hybrid Cable From 0 to 117	9.00	19.00	14.00	0.0178	2.00	0.0000	0.0000	0.0006
general cable 1 5/8" Hybrid Cable From 0 to 117	0.00	9.00	4.50	0.0160	0.24	0.0000	0.0000	0.0005
Sum				1.8445	4175.12			

Monopole Flange Plate Connection

Elevation = 120 ft.

Site Number:	US-VT-5036
Order Number:	REV05
Date:	4/22/2025
TIA-222 Revision	H

Applied Loads	
Moment (kip-ft)	115.0
Axial Force (kips)	6.3
Shear Force (kips)	7.5



Connection Properties	
Bolt Data	

(16) 1" $\varnothing$ bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 28" BC

Top Plate Data	
30.5" OD x 1.5" Plate (A572-50; Fy=50 ksi, Fu=65 ksi)	

Top Stiffener Data	
N/A	

Top Pole Data	
24.443885" x 0.25" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)	

Bottom Plate Data	
30.5" OD x 1.5" Plate (A572-50; Fy=50 ksi, Fu=65 ksi)	

Bottom Stiffener Data	
N/A	

Bottom Pole Data	
24.443885" x 0.375" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)	

Analysis Results	
Bolt Capacity	

Max Load (kips)	11.92
Allowable (kips)	54.54
Stress Rating:	21.9% Pass

Top Plate Capacity		
Max Stress (ksi):	5.12	(Flexural)
Allowable Stress (ksi):	45.00	
Stress Rating:	11.4%	Pass
Tension Side Stress Rating:	5.4%	Pass

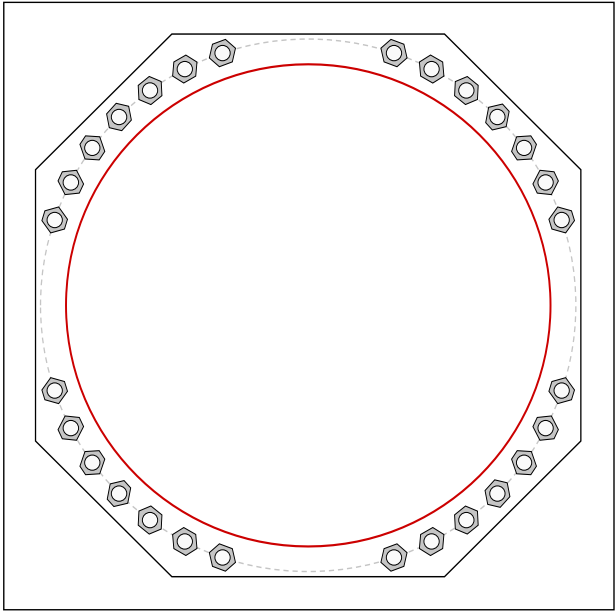
Bottom Plate Capacity		
Max Stress (ksi):	5.12	(Flexural)
Allowable Stress (ksi):	45.00	
Stress Rating:	11.4%	Pass
Tension Side Stress Rating:	5.4%	Pass

Monopole Base Plate Connection

Site Info	
Site Number:	US-VT-5036
Order Number:	REV05
Date:	4/22/2025

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
I_{ar} (in)	1

Applied Loads	
Moment (kip-ft)	2866.1
Axial Force (kips)	57.4
Shear Force (kips)	29.4



Connection Properties		Analysis Results	
Anchor Rod Data		Anchor Rod Summary (units of kips, kip-in)	
(28) 2-1/4" $\varnothing$ bolts (A615-75 N; F_y =75 ksi, F_u =100 ksi) on 78.5" BC		Pu_t = 60.52	ϕPn_t = 243.75
Anchor Spacing: 6 in		Vu = 1.05	ϕVn = 149.1
		Mu = n/a	ϕMn = n/a
			Stress Rating
			24.8%
			Pass
Base Plate Data		Base Plate Summary	
80" W x 2.75" Plate (A572-50; F_y =50 ksi, F_u =65 ksi); Clip: 20 in		Max Stress (ksi):	11.2 (Flexural)
		Allowable Stress (ksi):	45
		Stress Rating:	24.9%
			Pass
Stiffener Data			
N/A			
Pole Data			
71.06" x 0.5" 18-sided pole (A572-65; F_y =65 ksi, F_u =80 ksi)			

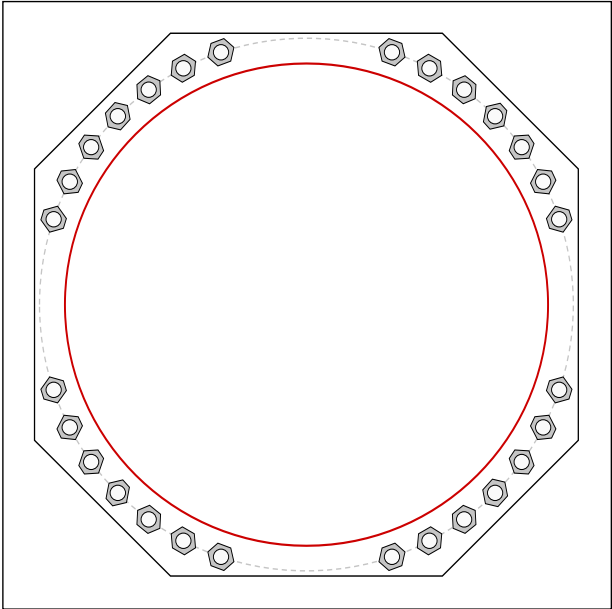
Monopole Base Plate Connection - Seismic

Site Info	
Site Number:	US-VT-5036
Order Number:	REV05
Date:	4/22/2025

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
I_{ar} (in)	1

Applied Loads	
Moment (kip-ft)	151.6
Axial Force (kips)	58.9
Shear Force (kips)	1.4

*1.5 Overstrength Factor Applied



Connection Properties		Analysis Results	
Anchor Rod Data		Anchor Rod Summary (units of kips, kip-in)	
(28) 2-1/4" ϕ bolts (A615-75 N; F_y =75 ksi, F_u =100 ksi) on 78.5" BC		Pu_c = 7.07	ϕPn_c = 268.39
Anchor Spacing: 6 in		Vu = 0.08	ϕVn = 120.77
		Mu = n/a	ϕMn = n/a
			Stress Rating
			2.6%
			Pass
Base Plate Data		Base Plate Summary	
80" W x 2.75" Plate (A572-50; F_y =50 ksi, F_u =65 ksi); Clip: 20 in		Max Stress (ksi):	0.94 (Flexural)
		Allowable Stress (ksi):	45
		Stress Rating:	2.1%
			Pass
Stiffener Data			
N/A			
Pole Data			
71.06" x 0.5" 18-sided pole (A572-65; F_y =65 ksi, F_u =80 ksi)			

Pier and Pad Foundation

Site Number:	US-VT-5036
Order Number:	REV05
Date:	4/24/2025

TIA-222 Revision:	H
Tower Type:	Monopole
Mapped Foundation?:	N

Top & Bot. Pad Rein. Different?:	☐
Block Foundation?:	☐
Rectangular Pad?:	☐

Superstructure Analysis Reactions		
Compression, P_{comp} :	57.4	kips
Base Shear, V_{u_comp} :	29.4	kips
Moment, M_u :	2866.1	ft-kips
Tower Height, H :	140	ft
BP Dist. Above Fdn, bp_{dist} :	4.5	in

Pier Properties		
Pier Shape:	Square	
Pier Diameter, dpier :	9	ft
Ext. Above Grade, E :	0.5	ft
Pier Rebar Size, Sc :	9	
Pier Rebar Quantity, mc :	52	
Pier Tie/Spiral Size, St :	5	
Pier Tie/Spiral Spacing:	12.00	in
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier} :	3	in

Pad Properties		
Depth, D :	6	ft
Pad Width, W₁ :	33.5	ft
Pad Thickness, T :	2.0	ft
Pad Rebar Size (Bottom dir. 2), Sp₂ :	9	
Pad Rebar Quantity (Bottom dir. 2), mp₂ :	70	
Pad Clear Cover, cc_{pad} :	3	in

Material Properties		
Rebar Grade, Fy :	60	ksi
Concrete Compressive Strength, F'c :	4.5	ksi
Dry Concrete Density, δc :	150	pcf

Soil Properties		
Total Soil Unit Weight, γ :	130	pcf
Ultimate Net Bearing, Q_{net} :	20.000	ksf
Cohesion, Cu :	0.000	ksf
Friction Angle, φ :	32	degrees
SPT Blow Count, N_{blows} :		
Base Friction, μ :	0.44	
Neglected Depth, N :	5.00	ft
Foundation Bearing on Rock?	Yes	
Groundwater Depth, gw :	N/A	ft

Foundation Analysis Checks				
	Capacity	Demand	Rating	Check
Lateral (Sliding) (kips)	349.70	29.40	8.4%	Pass
Bearing Pressure (ksf)	15.59	1.74	11.2%	Pass
Overturning (kip*ft)	13798.69	3068.24	22.2%	Pass
Pier Flexure (Comp.) (kip*ft)	11109.83	2998.41	27.0%	Pass
Pier Compression (kip)	54777.06	122.97	0.2%	Pass
Pad Flexure (kip*ft)	5651.82	1092.98	19.3%	Pass
Pad Shear - 1-way (kips)	781.02	142.11	18.2%	Pass
Pad Shear - 2-way (Comp) (ksi)	0.201	0.045	22.4%	Pass
Flexural 2-way (Comp) (kip*ft)	5077.73	1799.05	35.4%	Pass

Structural Rating:	35.4%
Soil Rating:	22.2%

<--Toggle between Gross and Net

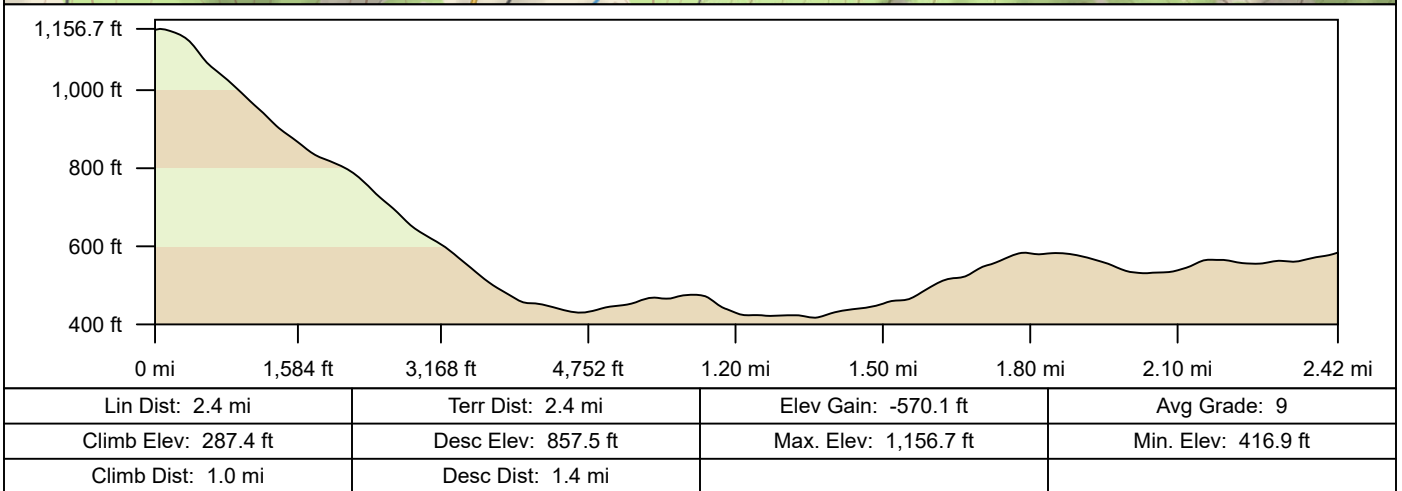
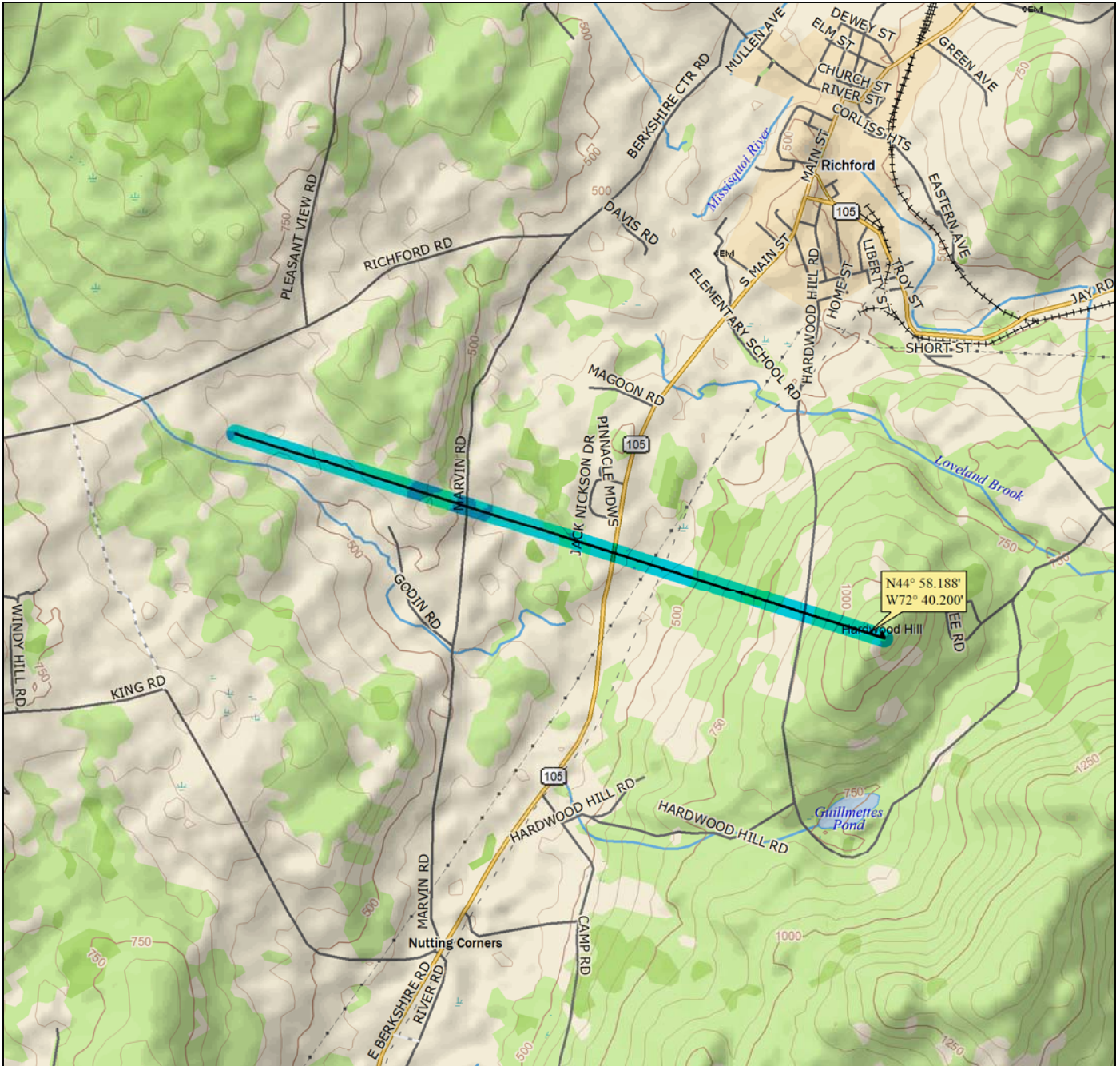
Verizon Reserved Loading Calculation

Mount
Total EPA _a (ft ²)
24.4

Reserved Rights
Square Inches (in ²)
40,000

Equipment					
Model Number	(H)eight (in)	(W)idth (in)	(D)epth (in)	QTY	EPA (in ²)
					H x W x QTY
Antenna					
NHH-65B-R2B	71.97	11.85	7.09	12	10234.13
8' Mount Pipe	96	2.875	2.875	6	1656.00
TME					
B2/B66A RRH-BR049	15	15	10	2	450.00
B5/B13 RRH BR04C	15	15	8.15	1	225.00
RHSDC-6627-PF-48	29.5	16.5	12.6	1	486.75
				Total	13051.88

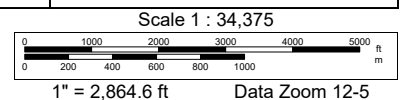
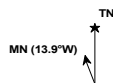
Loading Calculator			1/3 Remaining Reserved Rights (40,000 sq in)			
Total Equipment EPA (in ²)	Total EPA (in ²)	Remaining EPA (in ²)	Remaining (ft ² /per sector)		Weight (lbs/per sector)	
			0" Ice	1/2" Ice	0" Ice	1/2" Ice
13051.88	16565.48	23434.52	54.25	63.65	578.63	867.95



Data use subject to license.

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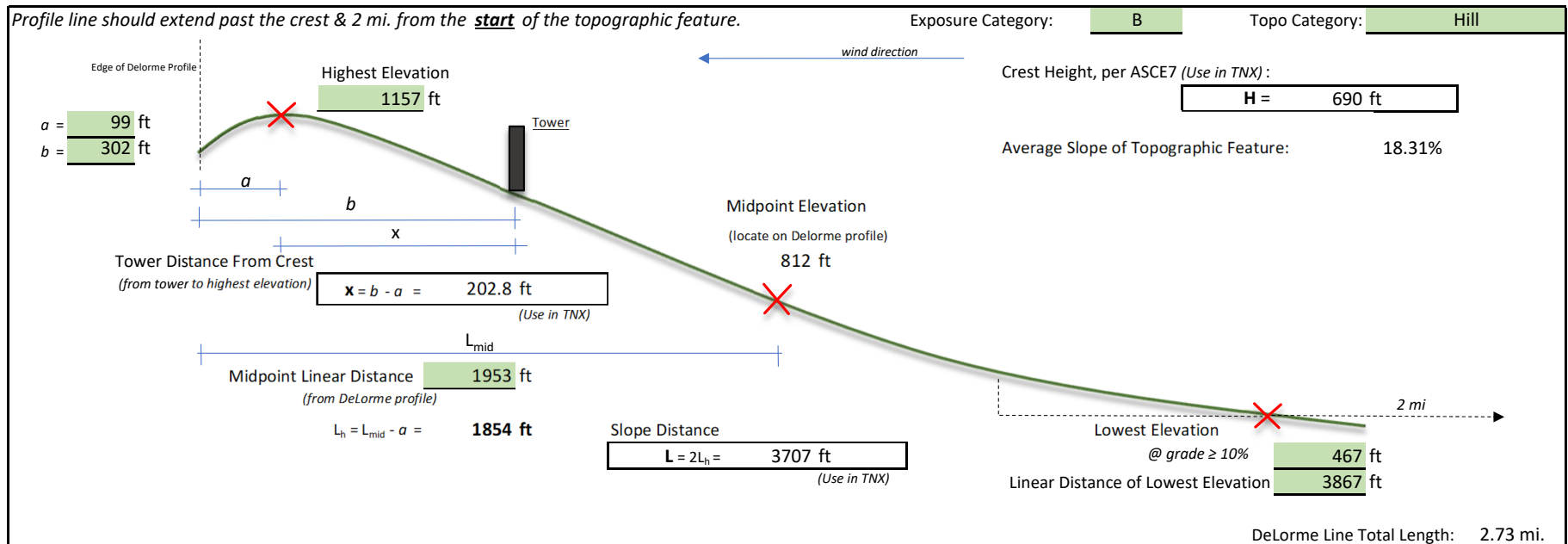
www.delorme.com



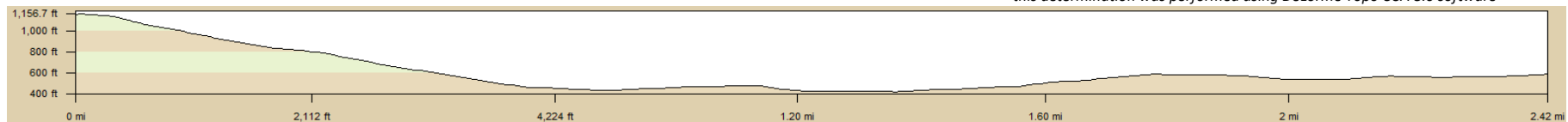
Site ID:	US-VT-5036
Site Name:	Richford
Engineer:	JHH
Date:	4/22/2025
TIA-222 Code Revision:	H

Crest Height Determination for Use in tnxTower

Analysis per TIA-222-H Standards (Section 2.6.6)



* this determination was performed using DeLorme Topo USA 8.0 software



US-VT-5036_Richford

Exposure B

Legend

-  44.969806, -72.669997
-  500'/1500'/2800'

 44.969806, -72.669997

ASCE Hazards Report

Address:

No Address at This Location

Standard:

ASCE/SEI 7-16

Risk Category: II**Soil Class:**

B - Rock

Latitude:

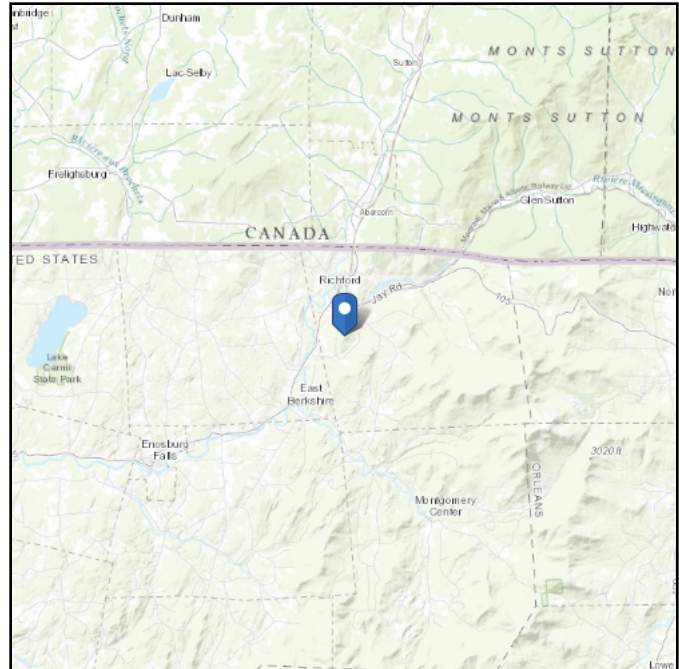
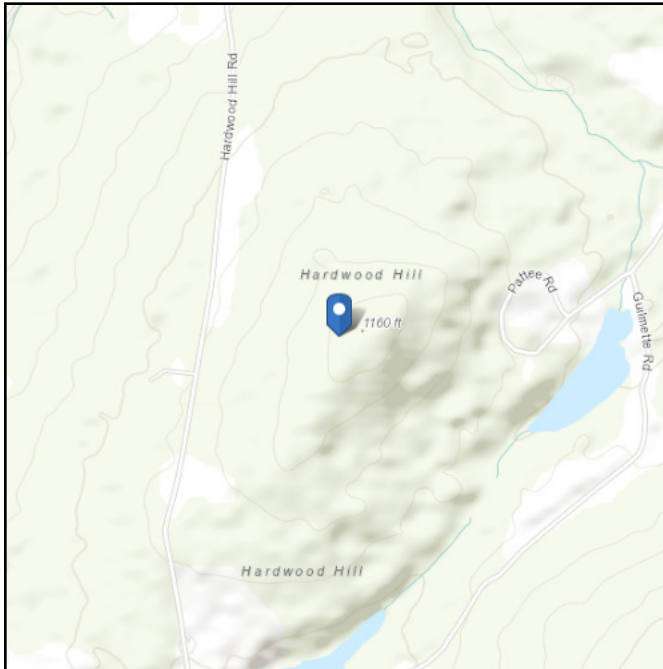
44.969806

Longitude:

-72.669997

Elevation:

1114.3303774695946 ft
(NAVD 88)



Wind

Results:

Wind Speed	107 Vmph
10-year MRI	73 Vmph
25-year MRI	80 Vmph
50-year MRI	84 Vmph
100-year MRI	89 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:

Fri Apr 04 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).

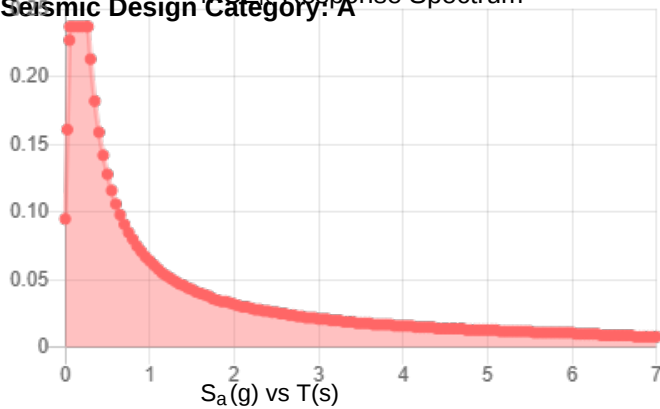
Site is not in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2.

Site Soil Class: B - Rock

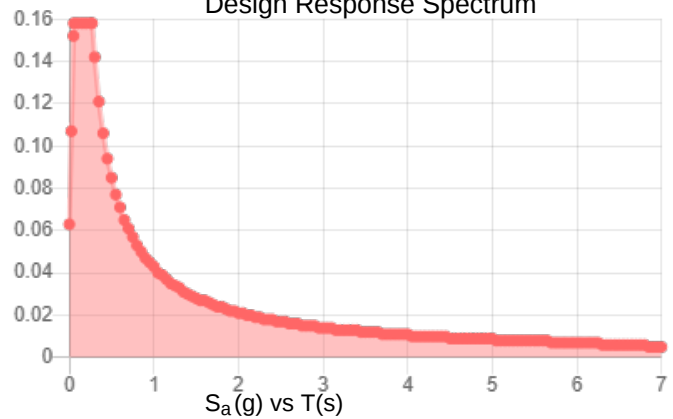
Results:

S_S :	0.264	S_{D1} :	0.043
S_1 :	0.08	T_L :	6
F_a :	0.9	PGA :	0.147
F_v :	0.8	PGA _M :	0.132
S_{MS} :	0.237	F_{PGA} :	0.9
S_{M1} :	0.064	I_e :	1
S_{DS} :	0.158	C_v :	0.764

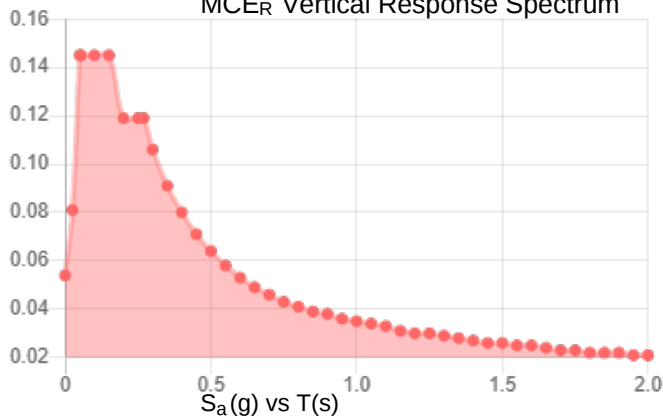
Seismic Design Category: A MCE_R Response Spectrum



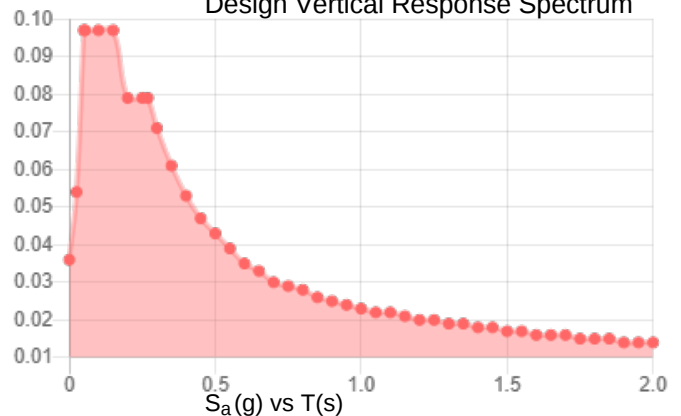
Design Response Spectrum



MCE_R Vertical Response Spectrum



Design Vertical Response Spectrum



Data Accessed: Fri Apr 04 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: Fri Apr 04 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.

In the Appalachian Mountains, ice thicknesses may vary significantly over short distances.

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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Site ID US-VT-5036
April 24, 2025

Attachment 2:
Collocation Application



COLOCATION APPLICATION - P-069101
US-VT-5036
Version 2
New Cingular Wireless PCS, LLC

Vertical Bridge REIT, LLC.
750 Park of Commerce Dr, ste 200
Boca Raton, FL 33487

SUMMARY

PRIMARY INFO

Application #: P-069101
Application Version: 2 (Submitted: 4/3/2025 2:14:00 PM)
Application Type: Broadband
Application Name: CBAND NE
Lease Type: Amendment
ASR Number:
Description: Adding (3) antennas, replacing (3) RRHs, adding (1) fiber cable, adding (1) DC cable.

VERTICAL BRIDGE SITE INFO

VB Site #: US-VT-5036
VB Site Name: Richford
Latitude: 44.96980555
Longitude: -72.66999722
Structure Type: Monopole
Structure Height: 120.0000
Site Address: 320 Hardwood Hill Road - Richford, VT 05476

VERTICAL BRIDGE DEAL TEAM

RLM: Mason Minnich
Mason.Minnich@verticalbridge.com
(419) 631-8900
LPM: Alison Skipper
Alison.Skipper@verticalbridge.com
ROM: Braden Hill
Braden.Hill@verticalbridge.com
(754) 223-6326

TENANT LEGAL INFO

Tenant Legal Name: New Cingular Wireless PCS, LLC
State of Registration: Delaware
Type of Entity: LLC
Carrier NOC #: 8772315447
AT&T FA Code: VT1035
Tenant Site Name: Richford Hardwood

APPLICANT

Name: Allison Hebel
Address: 750 W. Center St. STE 301
W. Bridgewater, MA 02379
Phone Number: (215) 588-7035
Email Address: ahebel@clinellc.com
AT&T IWM #:

FINAL LEASED RIGHTS CONFIGURATION TOTALS

This is a summary of your remaining existing equipment plus the new equipment.

FINAL EQUIPMENT

QTY	Equipment Type
2	Surge Arrestor/Raycap/Squid
9	Panel
12	RRU

FINAL LINES

QTY	Line Type
2	Fiber
4	Flex Conduit
6	DC Power

FREQUENCY & TECHNOLOGY INFO



COLOCATION APPLICATION - P-069101
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Type of Tehnology: Broadband Wireless
Is TX Frequency Licensed: Yes
TX Frequency: 734-746, 880-894, 1930-1990, 3450-3550,3860-3940
Is RX Frequency Licensed: Yes
RX Frequency: 704-716, 835-849, 1850-1910, 3450-3550,3860-3940

MOUNT & STRUCTURAL ANALYSIS

MOUNT ANALYSIS

Provided by Tenant: Yes
To Be Run by VB:
Include Mount Mapping:

STRUCTURAL HARD COPIES

Required: No
Number of Hard Copies:

CONTACTS

INVOICE CONTACT

Attention To	Name	Address	Phone Number 1	Phone Number 2	Email 1	Email 2
	Allison Conwell	750 W. Center St. Ste 301 W. Bridgewater, MA 02379	(215) 588-7035		aconwell@clinellc.com	

PO CONTACT

Name	Phone	Email
Allison Conwell	(215) 588-7035	aconwell@clinellc.com

LEASING CONTACT

Name	Phone	Email
Ryan Lynch	(774) 359-6119	rl099y@att.com

LINE & EQUIPMENT

EXISTING LINE(S)

Qty	Line Type	Line Diameter(In.)	Line Location	Comments	Remain
3	Flex Conduit	2	Interior		Yes
1	DC Power	1	Interior		No
1	Fiber	0.5	Interior		Yes

NEW LINE(S)



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Boca Raton, FL 33487

Qty	Line Type	Line Diameter(In.)	Line Location	Comments
1	Fiber	0.5	Interior	
5	DC Power	0.82	Interior	
1	DC Power	0.92	Interior	
1	Flex Conduit	2	Interior	

EXISTING EQUIPMENT											
Qty	Equipment Type	Mount RAD Height	Equipment RAD Height (H')	Mount Type	Manufacturer	Model Number	Dimensions (H"xW"xD")	Weight (Lbs.)	Azimuth	Comments	Remain
1	Surge Arrestor/ Raycap/ Squid	136.00	136.00	Sector Frames	Raycap	DC6- 48- 60- 0- 8C- EV	18.30 x 10.20 x 31.40	26.20	90, 210, 330		No
3	RRU	136.00	136.00	Sector Frames	Ericsson	8843 B2/B66A	15.00 x 13.20 x 11.10	75.00	90, 210, 330		Yes
3	Panel	136.00	136.00	Sector Frames	CCI	DMP65R- BU8DA	96.00 x 20.70 x 7.70	105.60	90, 210, 330		Yes
3	RRU	136.00	136.00	Sector Frames	Ericsson	RRUS 4478 B14	18.10 x 13.40 x 8.30	59.40	90, 210, 330		Yes
3	RRU	136.00	136.00	Sector Frames	Ericsson	RRUS 4415 B30	15.00 x 13.20 x 5.00	43.00	90, 210, 330		Yes
3	RRU	136.00	136.00	Sector Frames	Ericsson	RRUS 4478 B5	16.50 x 13.40 x 7.70	59.90	90, 210, 330		No
1	Surge Arrestor/ Raycap/ Squid	136.00	136.00	Sector Frames	Raycap	DC9- 48- 60- 24- 8C- EV	18.30 x 10.20 x 31.40	28.70	90, 210, 330		Yes
3	Panel	136.00	136.00	Sector Frames	CCI	TPA65R- BU8D	96.00 x 20.70 x 7.70	87.10	90, 210, 330		Yes

NEW EQUIPMENT										
Qty	Equipment Type	Mount RAD Height	Equipment RAD Height (H')	Mount Type	Manufacturer	Model Number	Dimensions (H"xW"xD")	Weight (Lbs.)	Azimuth	Comments
3	Panel	136.00	138.50	Sector Frames	Ericsson	AIR 6472 B77G B77M	36.40 x 16.10 x 7.50	98.00	90, 210, 330	
3	RRU	136.00	136.00	Sector Frames	Ericsson	RRU 4490 B5/B12A	20.60 x 15.60 x 7.00	65.00	90, 210, 330	
1	Surge Arrestor/ Raycap/ Squid	136.00	136.00	Sector Frames	Raycap	DC9- 48- 60- 24- 8C- EV	18.30 x 10.20 x 31.40	28.70	90, 210, 330	

ADDITIONAL SITE REQUIREMENTS

GROUND & INTERIOR SPACE REQUIREMENTS

Requirement Type	Total Lease Area (L x W)	Cabinet Required	Cabinet Area (L x W)	Shelter Required	Shelter Pad (L x W)	Comments
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COLOCATION APPLICATION - P-069101
US-VT-5036
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Vertical Bridge REIT, LLC.
750 Park of Commerce Dr, ste 200
Boca Raton, FL 33487

No Changes						20' x 12.5' - 250 sq ft & 314 sq ft (11' x 4" for 500 gallon propane tank)
------------	--	--	--	--	--	--

GENERATOR REQUIREMENTS

Requirement Type	Fuel Type	Kilowatt Size	Pad Dimensions (L x D)	Generator Manufacturer	Fuel Tank Manufacturer	Comments
No Changes						24 KW Propane Generator

AC POWER REQUIREMENTS

Meter Type	Additional Details	Comments
Existing Tenant Meter		

BACKHAUL REQUIREMENTS

Requirement Type	Cable Type	Number of Points of Entry	Riser Size (Inches)	Comments
No Changes				