



STATE OF CONNECTICUT  
*CONNECTICUT SITING COUNCIL*

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**VIA ELECTRONIC MAIL**

May 6, 2024

Jeffrey Barbadora  
Permitting Specialist  
Crown Castle  
1800 West Park Drive  
Westborough, MA 01581  
[Jeff.Barbadora@crowncastle.com](mailto:Jeff.Barbadora@crowncastle.com)

RE: **EM-VER-019-230920** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 116 Grant Hill Road, Brooklyn, Connecticut.  
**Request for Project Change.**

Dear Jeffrey Barbadora:

The Connecticut Siting Council (Council) is in receipt of the correspondence dated May 3, 2024 and the associated Structural Analysis dated October 24, 2023, regarding a project change for the above-referenced exempt modification request acknowledged by the Council on October 16, 2023.

Pursuant to Condition No. 1 of the Council's October 16, 2023 exempt modification approval, the request to increase the number of Kaelus interference mitigation filters to be installed from three to six is hereby approved.

This approval applies only to the project change in the correspondence dated May 3, 2024.

Thank you for your attention and cooperation.

Sincerely,

Melanie A. Bachman  
Executive Director

MAB/ANM/laf

c: The Honorable Austin Tanner, First Selectperson, Town of Brooklyn ([a.tanner@brooklynct.org](mailto:a.tanner@brooklynct.org))

**From:** Barbadora, Jeff <Jeff.Barbadora@crowncastle.com>  
**Sent:** Friday, May 3, 2024 6:00 AM  
**To:** CSC-DL Siting Council <Siting.Council@ct.gov>  
**Subject:** EM-VER-019-230920 - 116 Grant Hill Road Brooklyn CT - 876390

Good morning,

Would the CSC please update the approval for EM-VER-085-230920 to include a total of 6 filters?

The original SA submitted with the application and dated 7/28/2023 stated only 3 filters and should have stated 6 filters.

Please see updated SA stating a total of 6 filters and let me know if you have any questions.

Thanks,

**Jeffrey Barbadora**  
Permitting Specialist  
781-970-0053

**Crown Castle**  
1800 W. Park Drive, Suite 250  
Westborough, MA 01581

Date: **October 24, 2023**



Crown Castle  
2000 Corporate Drive  
Canonsburg, PA 15317  
(724) 416-2000

**Subject:** **Structural Analysis Report**

**Carrier Designation:** **Verizon Wireless Co-Locate**  
**Site Number:** 5000397339  
**Site Name:** BROOKLYN WEST CT

**Crown Castle Designation:** **BU Number:** 876390  
**Site Name:** HAMPTON / BERNIER  
**JDE Job Number:** 2103502  
**Work Order Number:** 2265058  
**Order Number:** 658803 Rev. 0

**Engineering Firm Designation:** **Crown Castle Project Number:** 2265058

**Site Data:** **116 Grant Hill Rd., Brooklyn, Windham County, CT**  
**Latitude 41° 47' 29.64", Longitude -72° 0' 54.04"**  
**150 Foot - Monopole Tower**

Crown Castle is pleased to submit this “**Structural Analysis Report**” to determine the structural integrity of the above-mentioned tower.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC7: Proposed Equipment Configuration

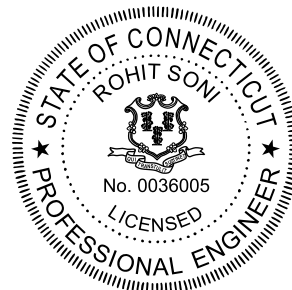
**Sufficient Capacity - 95.5%**

This analysis has been performed in accordance with the 2022 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 121 mph. Applicable Standard references and design criteria are listed in Section 2 - "Analysis Criteria".

Structural analysis prepared by: Emma McCarty

Respectfully submitted by:

Rohit Soni, P.E.  
Senior Project Engineer



## TABLE OF CONTENTS

### 1) INTRODUCTION

### 2) ANALYSIS CRITERIA

Table 1 - Proposed Equipment Configuration

Table 2 - Other Considered Equipment

### 3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

3.1) Analysis Method

3.2) Assumptions

### 4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Table 5 - Tower Component Stresses vs. Capacity - LC7

4.1) Recommendations

### 5) APPENDIX A

tnxTower Output

### 6) APPENDIX B

Base Level Drawing

### 7) APPENDIX C

Additional Calculations

## 1) INTRODUCTION

This tower is a 150 ft Monopole tower designed by Engineered Endeavors, Inc.. The tower has been modified to accommodate additional loading.

## 2) ANALYSIS CRITERIA

<b>TIA-222 Revision:</b>	TIA-222-H
<b>Risk Category:</b>	II
<b>Wind Speed:</b>	121 mph
<b>Exposure Category:</b>	B
<b>Base Topographic Factor (Kzt):</b>	1.512
<b>Ice Thickness:</b>	1 in
<b>Wind Speed with Ice:</b>	50 mph
<b>Service Wind Speed:</b>	60 mph

**Table 1 - Proposed Equipment Configuration**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
115.0	119.0	6	antel	LPA-80080/4CF w/ Mount Pipe	17	1-5/8
		6	commscope	NHH-65B-R2B w/ Mount Pipe		
		6	kaelus	BSF0020F3V1		
		1	raycap	RVZDC-6627-PF-48_CCIV2		
		3	samsung telecommunications	MT6407-77A w/ Mount Pipe		
		3	samsung telecommunications	RF4439D-25A		
	3	samsung telecommunications	RF4440D-13A			
115.0	1	tower mounts	Platform Mount [LP 303-1_HR-1]			

**Table 2 - Other Considered Equipment**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
149.0	150.0	3	alcatel lucent	PCS 1900MHz 4x45W-65MHz	4	1-1/4
		6	alcatel lucent	RRH2X50-800		
		3	alcatel lucent	TD-RRH8x20-25		
		3	commscope	NNVV-65B-R4 w/ Mount Pipe		
		3	rfs celwave	APXVTM14-ALU-I20 w/ Mount Pipe		
	1	tower mounts	Platform Mount [LP 303-1_HR-1]			
149.0	1	tower mounts	Platform Mount [LP 712-1]			
137.0	137.0	3	ericsson	AIR 6419 B41_TMO w/ Mount Pipe	4	1-5/8
		3	ericsson	RADIO 4449 B71 B85A_T-MOBILE		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
		3	ericsson	RADIO 4460 B2/B25 B66_TMO		
		3	rfs celwave	APX16DWV-16DWV-S-E-A20 w/ Mount Pipe		
		3	rfs celwave	APXVAALL24_43-U-NA20_TMO w/ Mount Pipe		
		1	tower mounts	Platform Mount [LP 1201-1_KCKR-HR-1]		
129.0	129.0	1	tower mounts	Side Arm Mount [SO 104-3]	-	-
	127.0	3	ericsson	TME-RRUS-11		
127.0	129.0	3	kmw communications	AM-X-CD-17-65-00T-RET w/ Mount Pipe	3 12 1	3/8 1-1/4 Conduit
		6	powerwave technologies	7770.00 w/ Mount Pipe		
	127.0	6	powerwave technologies	LGP 17201		
		6	powerwave technologies	LGP13519		
		1	raycap	DC6-48-60-18-8F		
		1	tower mounts	Sector Mount [SM 901-3]		
90.0	100.0	1	dbspectra	DS9A09F36D-N	1 2	1/2 1-1/4
	90.0	1	bird technologies group	TTA-429-94C-08179		
		1	tower mounts	Side Arm Mount [SO 307-1]		
76.0	77.0	1	lucent	KS24019-L112A	1	1/2
	76.0	1	tower mounts	Side Arm Mount [SO 701-1]		
70.0	70.0	3	fujitsu	TA08025-B604	1	1-3/8
		3	fujitsu	TA08025-B605		
		3	jma wireless	MX08FRO665-21 w/ Mount Pipe		
		1	raycap	RDIDC-9181-PF-48		
		1	tower mounts	Commscope MC-PK8-DSH		

### 3) ANALYSIS PROCEDURE

**Table 3 - Documents Provided**

Document	Reference	Source
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	2255030	CCISITES
4-GEOTECHNICAL REPORTS	1615347	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	1615410	CCISITES
4-TOWER MANUFACTURER DRAWINGS	1533003	CCISITES
4-POST-MODIFICATION INSPECTION	2383064	CCISITES

### 3.1) Analysis Method

tnxTower (version 8.1.4.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A. When applicable, Crown Castle has calculated and provided the effective area for panel antennas using approved methods following the intent of the TIA-222 standard.

### 3.2) Assumptions

- 1) Tower and structures were maintained in accordance with the TIA-222 Standard.
- 2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.

This analysis may be affected if any assumptions are not valid or have been made in error. Crown Castle should be notified to determine the effect on the structural integrity of the tower.

## 4) ANALYSIS RESULTS

**Table 4 - Section Capacity (Summary)**

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	150 - 123.29	Pole	TP22.9x17x0.1875	1	-12.76	802.65	52.3	Pass
L2	123.29 - 88.88	Pole	TP30x21.7696x0.3125	2	-21.30	1752.41	71.5	Pass
L3	88.88 - 43.8	Pole	TP39.2x28.4504x0.375	3	-35.22	2752.19	83.6	Pass
L4	43.8 - 0	Pole	TP48x37.2689x0.4375	4	-52.39	4056.91	84.2	Pass
							Summary	
						Pole (L4)	84.2	Pass
						Rating =	84.2	Pass

**Table 5 - Tower Component Stresses vs. Capacity - LC7**

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	81.4	Pass
1	Base Plate	0	75.2	Pass
1	Base Foundation (Structure)	0	95.5	Pass
1	Base Foundation (Soil Interaction)	0	79.4	Pass

<b>Structure Rating (max from all components) =</b>	<b>95.5%</b>
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Notes:

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

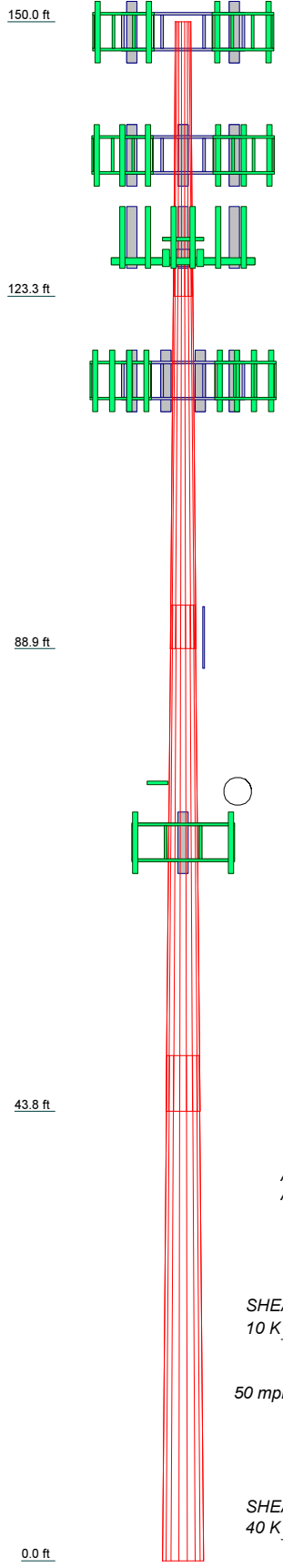
### 4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the proposed load configuration. No modifications are required at this time.

**APPENDIX A**  
**TNXTOWER OUTPUT**



Section	1	2	3	4
Length (ft)	28.71	37.83	49.33	49.22
Number of Sides	18	18	18	18
Thickness (in)	0.1875	0.3125	0.3750	0.4375
Socket Length (ft)	3.42	4.25	5.42	37.2688
Top Dia (in)	17.0000	21.7686	28.4504	37.2688
Bot Dia (in)	22.9000	30.0000	39.2000	48.0000
Grade			A572-65	
Weight (K)	1.1	3.3	6.7	9.8



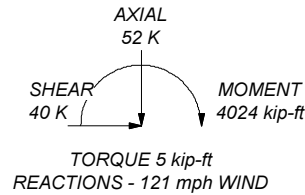
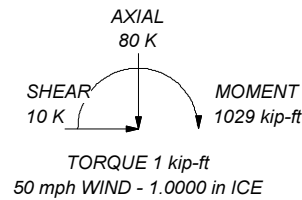
**MATERIAL STRENGTH**

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

**TOWER DESIGN NOTES**

1. Tower is located in Windham County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 121 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 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 110.00 ft
8. TOWER RATING: 84.2%

ALL REACTIONS ARE FACTORED



**Crown Castle**  

**CROWN CASTLE**  
 2000 Corporate Drive  
 Canonsburg, PA 15317  
 The Pathway to Possible Phone: (724) 416-2000  
 FAX:

Job:	<b>BU# 876390</b>		
Project:			
Client:	Crown Castle	Drawn by:	EMcCarty
Code:	TIA-222-H	Date:	10/24/23
Path:	C:\WORK AREA\876390\WO 2265058 - SA\Prod\876390.er		App'd:
			Scale: NTS
			Dwg No. E-1

## 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 Windham County, Connecticut.
- Tower base elevation above sea level: 721.00 ft.
- Basic wind speed of 121 mph.
- Risk Category II.
- Exposure Category B.
- Crest Height: 110.00 ft.
- Rigorous Topographic Factor Procedure for wind speed-up calculations is used.
  - Topographic Feature: Continuous Ridge.
  - Slope Distance L: 920.00 ft.
  - Distance from Crest x: 0.00 ft.
  - Horizontal Distance Downwind: No.
- Nominal ice thickness of 1.0000 in.
- Ice thickness is considered to increase with height.
- Ice density of 56 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50 °F.
- Deflections calculated using a wind speed of 60 mph.
- A 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:  $K_{es}(F_w) = 0.95$ ,  $K_{es}(t_i) = 0.85$ .
- Maximum demand-capacity ratio is: 1.05.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

## Options

Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification ✓ Use Code Stress Ratios ✓ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile  Include Bolts In Member Capacity  Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) SR Members Have Cut Ends SR Members Are Concentric	Distribute Leg Loads As Uniform Assume Legs Pinned ✓ Assume Rigid Index Plate ✓ Use Clear Spans For Wind Area Use Clear Spans For KL/r Retension Guys To Initial Tension ✓ Bypass Mast Stability Checks ✓ Use Azimuth Dish Coefficients ✓ Project Wind Area of Appurt.  Autocalc Torque Arm Areas  Add IBC .6D+W Combination ✓ Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Treat Feed Line Bundles As Cylinder Ignore KL/ry For 60 Deg. Angle Legs	Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation ✓ Consider Feed Line Torque Include Angle Block Shear Check Use TIA-222-H Bracing Resist. Exemption Use TIA-222-H Tension Splice Exemption  <div style="text-align: center; background-color: #e0e0e0; padding: 2px;"><b>Poles</b></div> ✓ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets Pole Without Linear Attachments Pole With Shroud Or No Appurtenances Outside and Inside Corner Radii Are Known
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### 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	150.00-123.29	26.71	3.42	18	17.0000	22.9000	0.1875	0.7500	A572-65 (65 ksi)
L2	123.29-88.88	37.83	4.25	18	21.7696	30.0000	0.3125	1.2500	A572-65 (65 ksi)
L3	88.88-43.80	49.33	5.42	18	28.4504	39.2000	0.3750	1.5000	A572-65 (65 ksi)
L4	43.80-0.00	49.22		18	37.2689	48.0000	0.4375	1.7500	A572-65 (65 ksi)

### Tapered Pole Properties

Section	Tip Dia. in	Area in <sup>2</sup>	I in <sup>4</sup>	r in	C in	I/C in <sup>3</sup>	J in <sup>4</sup>	I/Q in <sup>2</sup>	w in	w/t
L1	17.2333	10.0055	357.3078	5.9684	8.6360	41.3742	715.0858	5.0037	2.6620	14.197
	23.2243	13.5168	880.9281	8.0629	11.6332	75.7253	1763.0154	6.7597	3.7004	19.735
L2	22.8127	21.2827	1237.9543	7.6173	11.0589	111.9416	2477.5376	10.6434	3.2814	10.501
	30.4146	29.4463	3278.8026	10.5391	15.2400	215.1445	6561.9196	14.7259	4.7300	15.136
L3	29.7718	33.4167	3327.7548	9.9668	14.4528	230.2502	6659.8883	16.7115	4.3473	11.593
	39.7469	46.2115	8800.5544	13.7829	19.9136	441.9369	17612.6889	23.1101	6.2392	16.638
L4	38.9763	51.1450	8765.5170	13.0752	18.9326	462.9852	17542.5679	25.5774	5.7893	13.233
	48.6730	66.0465	18876.2818	16.8847	24.3840	774.1257	37777.4015	33.0295	7.6780	17.55

Tower Elevation ft	Gusset Area (per face) ft <sup>2</sup>	Gusset Thickness in	Gusset Grade	Adjust. Factor A <sub>r</sub>	Adjust. Factor A <sub>r</sub>	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 150.00-123.29				1	1	1			
L2 123.29-88.88				1	1	1			
L3 88.88-43.80				1	1	1			
L4 43.80-0.00				1	1	1			

### Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter r in	Perimeter r in	Weight plf
***** Safety Line 3/8"	C	No	Surface Ar (CaAa)	150.00 - 0.00	1	1	-0.050 -0.050	0.3750		0.22
Climbing Pegs	C	No	Surface Ar (CaAa)	150.00 - 0.00	1	1	-0.100 0.000	0.7050		1.80
*** HCS 6X12 4AWG(1-5/8)	A	No	Surface Ar (CaAa)	137.00 - 0.00	1	1	0.030 0.060	1.6600		2.40
LDF7-50A(1-5/8)	B	No	Surface Ar (CaAa)	115.00 - 0.00	17	9	-0.410 -0.100	1.9800		0.82
*** LDF4-50A(1/2)	B	No	Surface Ar (CaAa)	90.00 - 0.00	1	1	-0.030 -0.010	0.6300		0.15

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
LDF6-50A(1-1/4)	B	No	Surface Ar (CaAa)	90.00 - 0.00	2	1	-0.010 0.050	1.5500		0.60
***										
CU12PSM9P8XXX(1-3/8)	A	No	Surface Ar (CaAa)	70.00 - 0.00	1	1	0.410 0.440	1.4110		1.66
***										

**Feed Line/Linear Appurtenances - Entered As Area**

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C <sub>A</sub> A <sub>A</sub> ft <sup>2</sup> /ft	Weight plf
*****									
HB114-1-0813U4-M5J(1-1/4)	C	No	No	Inside Pole	149.00 - 0.00	3	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	1.20 1.20 1.20
HB114-13U3M12-XXXF(1-1/4)	C	No	No	Inside Pole	149.00 - 0.00	1	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.99 0.99 0.99
HB158-21U6S24-xxM_TMO(1-5/8)	A	No	No	Inside Pole	137.00 - 0.00	3	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	2.50 2.50 2.50
***									
LDF6-50A(1-1/4)	C	No	No	Inside Pole	127.00 - 0.00	12	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.60 0.60 0.60
FB-L98B-002-75000(3/8)	C	No	No	Inside Pole	127.00 - 0.00	3	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.06 0.06 0.06
2" Rigid Conduit	C	No	No	Inside Pole	127.00 - 0.00	1	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	2.80 2.80 2.80
***									
***									
LDF4-50A(1/2)	A	No	No	Inside Pole	76.00 - 0.00	1	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.15 0.15 0.15
***									

**Feed Line/Linear Appurtenances Section Areas**

Tower Section n	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> In Face ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Out Face ft <sup>2</sup>	Weight K
L1	150.00-123.29	A	0.000	0.000	2.276	0.000	0.14
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	2.885	0.000	0.21
L2	123.29-88.88	A	0.000	0.000	5.712	0.000	0.34
		B	0.000	0.000	46.790	0.000	0.37
		C	0.000	0.000	3.716	0.000	0.58
L3	88.88-43.80	A	0.000	0.000	11.180	0.000	0.49
		B	0.000	0.000	90.160	0.000	0.69
		C	0.000	0.000	4.869	0.000	0.76
L4	43.80-0.00	A	0.000	0.000	13.451	0.000	0.51
		B	0.000	0.000	87.600	0.000	0.67
		C	0.000	0.000	4.730	0.000	0.74

### Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	$A_R$ ft <sup>2</sup>	$A_F$ ft <sup>2</sup>	$C_A A_A$ In Face ft <sup>2</sup>	$C_A A_A$ Out Face ft <sup>2</sup>	Weight K
L1	150.00-123.29	A	1.065	0.000	0.000	5.197	0.000	0.18
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	14.268	0.000	0.32
L2	123.29-88.88	A	1.057	0.000	0.000	13.045	0.000	0.46
		B		0.000	0.000	65.861	0.000	0.99
		C		0.000	0.000	18.382	0.000	0.72
L3	88.88-43.80	A	1.036	0.000	0.000	26.246	0.000	0.74
		B		0.000	0.000	141.210	0.000	2.15
		C		0.000	0.000	23.925	0.000	0.94
L4	43.80-0.00	A	0.961	0.000	0.000	31.601	0.000	0.80
		B		0.000	0.000	136.606	0.000	2.06
		C		0.000	0.000	22.880	0.000	0.91

### Feed Line Center of Pressure

Section	Elevation ft	$CP_x$ in	$CP_z$ in	$CP_x$ Ice in	$CP_z$ Ice in
L1	150.00-123.29	-0.4807	0.3753	-0.4234	1.3987
L2	123.29-88.88	2.6731	-5.6235	1.8366	-3.5748
L3	88.88-43.80	3.9702	-7.3831	3.3576	-5.4275
L4	43.80-0.00	4.2716	-8.2554	3.6412	-6.2821

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

### Shielding Factor $K_a$

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	$K_a$ No Ice	$K_a$ Ice
L1	2	Safety Line 3/8"	123.29 - 150.00	1.0000	1.0000
L1	3	Climbing Pegs	123.29 - 150.00	1.0000	1.0000
L1	8	HCS 6X12 4AWG(1-5/8)	123.29 - 137.00	1.0000	1.0000
L2	2	Safety Line 3/8"	88.88 - 123.29	1.0000	1.0000
L2	3	Climbing Pegs	88.88 - 123.29	1.0000	1.0000
L2	8	HCS 6X12 4AWG(1-5/8)	88.88 - 123.29	1.0000	1.0000
L2	16	LDF7-50A(1-5/8)	88.88 - 115.00	1.0000	1.0000
L2	20	LDF4-50A(1/2)	88.88 - 90.00	1.0000	1.0000
L2	21	LDF6-50A(1-1/4)	88.88 - 90.00	1.0000	1.0000
L3	2	Safety Line 3/8"	43.80 - 88.88	1.0000	1.0000
L3	3	Climbing Pegs	43.80 - 88.88	1.0000	1.0000
L3	8	HCS 6X12 4AWG(1-5/8)	43.80 - 88.88	1.0000	1.0000
L3	16	LDF7-50A(1-5/8)	43.80 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
L3	20	LDF4-50A(1/2)	88.88 43.80 - 88.88	1.0000	1.0000
L3	21	LDF6-50A(1-1/4)	88.88 43.80 - 88.88	1.0000	1.0000
L3	25	CU12PSM9P8XXX(1-3/8)	88.88 43.80 - 70.00	1.0000	1.0000
L4	2	Safety Line 3/8"	0.00 - 43.80	1.0000	1.0000
L4	3	Climbing Pegs	0.00 - 43.80	1.0000	1.0000
L4	8	HCS 6X12 4AWG(1-5/8)	0.00 - 43.80	1.0000	1.0000
L4	16	LDF7-50A(1-5/8)	0.00 - 43.80	1.0000	1.0000
L4	20	LDF4-50A(1/2)	0.00 - 43.80	1.0000	1.0000
L4	21	LDF6-50A(1-1/4)	0.00 - 43.80	1.0000	1.0000
L4	25	CU12PSM9P8XXX(1-3/8)	0.00 - 43.80	1.0000	1.0000

**Discrete Tower Loads**

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment	Placement ft
***149***					
NNVV-65B-R4 w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	149.00
NNVV-65B-R4 w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	149.00
NNVV-65B-R4 w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	149.00
APXVTM14-ALU-I20 w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	149.00
APXVTM14-ALU-I20 w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	149.00
APXVTM14-ALU-I20 w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	149.00
(2) RRH2X50-800	A	From Leg	4.00 0.00 1.00	0.0000	149.00
(4) RRH2X50-800	B	From Leg	4.00 0.00 1.00	0.0000	149.00
PCS 1900MHz 4x45W-65MHz	A	From Leg	4.00 0.00 1.00	0.0000	149.00
(2) PCS 1900MHz 4x45W-65MHz	B	From Leg	4.00 0.00 1.00	0.0000	149.00
TD-RRH8x20-25	A	From Leg	4.00 0.00 1.00	0.0000	149.00
(2) TD-RRH8x20-25	B	From Leg	4.00 0.00 1.00	0.0000	149.00
(2) 6' x 2" Mount Pipe	A	From Leg	4.00	0.0000	149.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
			0.00		
(2) 6' x 2" Mount Pipe	B	From Leg	1.00 4.00	0.0000	149.00
			0.00		
(2) 6' x 2" Mount Pipe	C	From Leg	1.00 4.00	0.0000	149.00
			0.00		
Transition Ladder	C	From Leg	1.00 2.00	0.0000	149.00
			0.00		
Platform Mount [LP 303-1_HR-1]	C	None	-4.00	0.0000	149.00
Platform Mount [LP 712-1]	C	None		0.0000	149.00
***137***					
AIR 6419 B41_TMO w/ Mount Pipe	A	From Leg	4.00	0.0000	137.00
			0.00		
AIR 6419 B41_TMO w/ Mount Pipe	B	From Leg	0.00 4.00	0.0000	137.00
			0.00		
AIR 6419 B41_TMO w/ Mount Pipe	C	From Leg	0.00 4.00	0.0000	137.00
			0.00		
APX16DWW-16DWW-S-E-A20 w/ Mount Pipe	A	From Leg	0.00 4.00	0.0000	137.00
			0.00		
APX16DWW-16DWW-S-E-A20 w/ Mount Pipe	B	From Leg	0.00 4.00	0.0000	137.00
			0.00		
APX16DWW-16DWW-S-E-A20 w/ Mount Pipe	C	From Leg	0.00 4.00	0.0000	137.00
			0.00		
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	A	From Leg	0.00 4.00	0.0000	137.00
			0.00		
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	B	From Leg	0.00 4.00	0.0000	137.00
			0.00		
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	C	From Leg	0.00 4.00	0.0000	137.00
			0.00		
RADIO 4449 B71 B85A_T-MOBILE	A	From Leg	0.00 4.00	0.0000	137.00
			0.00		
RADIO 4449 B71 B85A_T-MOBILE	B	From Leg	0.00 4.00	0.0000	137.00
			0.00		
RADIO 4449 B71 B85A_T-MOBILE	C	From Leg	0.00 4.00	0.0000	137.00
			0.00		
RADIO 4460 B2/B25 B66_TMO	A	From Leg	0.00 4.00	0.0000	137.00
			0.00		
RADIO 4460 B2/B25 B66_TMO	B	From Leg	0.00 4.00	0.0000	137.00
			0.00		
RADIO 4460 B2/B25 B66_TMO	C	From Leg	0.00 4.00	0.0000	137.00
			0.00		
9' Mount pipe [#P2STD]	A	From Leg	0.00 4.00	0.0000	137.00
			0.00		
9' Mount pipe [#P2STD]	B	From Leg	0.00 4.00	0.0000	137.00
			0.00		
			0.00		

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
9' Mount pipe [#P2STD]	C	From Leg	4.00 0.00 0.00	0.0000	137.00
Platform Mount [LP 1201-1_KCKR-HR-1] *****	C	None		0.0000	137.00
TME-RRUS-11	A	From Leg	1.00 0.00 -2.00	0.0000	129.00
TME-RRUS-11	B	From Leg	1.00 0.00 -2.00	0.0000	129.00
TME-RRUS-11	C	From Leg	1.00 0.00 -2.00	0.0000	129.00
4' x 2" Horizontal Leg Mount Pipe	A	From Leg	1.00 0.00 0.00	0.0000	129.00
4' x 2" Horizontal Leg Mount Pipe	B	From Leg	1.00 0.00 0.00	0.0000	129.00
4' x 2" Horizontal Leg Mount Pipe	C	From Leg	1.00 0.00 0.00	0.0000	129.00
Side Arm Mount [SO 104-3] *****	C	None		0.0000	129.00
(2) 7770.00 w/ Mount Pipe	A	From Leg	3.00 0.00 2.00	0.0000	127.00
(2) 7770.00 w/ Mount Pipe	B	From Leg	3.00 0.00 2.00	0.0000	127.00
(2) 7770.00 w/ Mount Pipe	C	From Leg	3.00 0.00 2.00	0.0000	127.00
AM-X-CD-17-65-00T-RET w/ Mount Pipe	A	From Leg	3.00 0.00 2.00	0.0000	127.00
AM-X-CD-17-65-00T-RET w/ Mount Pipe	B	From Leg	3.00 0.00 2.00	0.0000	127.00
AM-X-CD-17-65-00T-RET w/ Mount Pipe	C	From Leg	3.00 0.00 2.00	0.0000	127.00
(2) LGP 17201	A	From Leg	3.00 0.00 0.00	0.0000	127.00
(2) LGP 17201	B	From Leg	3.00 0.00 0.00	0.0000	127.00
(2) LGP 17201	C	From Leg	3.00 0.00 0.00	0.0000	127.00
(2) LGP13519	A	From Leg	3.00 0.00 0.00	0.0000	127.00
(2) LGP13519	B	From Leg	3.00 0.00 0.00	0.0000	127.00
(2) LGP13519	C	From Leg	3.00 0.00 0.00	0.0000	127.00
DC6-48-60-18-8F	B	From Leg	3.00 0.00 0.00	0.0000	127.00
Sector Mount [SM 901-3]	C	None		0.0000	127.00



Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
***					
(2) NHH-65B-R2B w/ Mount Pipe	A	From Leg	4.00 0.00 4.00	0.0000	115.00
(2) NHH-65B-R2B w/ Mount Pipe	B	From Leg	4.00 0.00 4.00	0.0000	115.00
(2) NHH-65B-R2B w/ Mount Pipe	C	From Leg	4.00 0.00 4.00	0.0000	115.00
MT6407-77A w/ Mount Pipe	A	From Leg	4.00 0.00 4.00	0.0000	115.00
MT6407-77A w/ Mount Pipe	B	From Leg	4.00 0.00 4.00	0.0000	115.00
MT6407-77A w/ Mount Pipe	C	From Leg	4.00 0.00 4.00	0.0000	115.00
(3) BSF0020F3V1	A	From Leg	4.00 0.00 4.00	0.0000	115.00
(2) BSF0020F3V1	B	From Leg	4.00 0.00 4.00	0.0000	115.00
BSF0020F3V1	C	From Leg	4.00 0.00 4.00	0.0000	115.00
RVZDC-6627-PF-48_CCIV2	A	From Leg	4.00 0.00 4.00	0.0000	115.00
RF4439D-25A	A	From Leg	4.00 0.00 4.00	0.0000	115.00
RF4439D-25A	B	From Leg	4.00 0.00 4.00	0.0000	115.00
RF4439D-25A	C	From Leg	4.00 0.00 4.00	0.0000	115.00
RF4440D-13A	A	From Leg	4.00 0.00 4.00	0.0000	115.00
RF4440D-13A	B	From Leg	4.00 0.00 4.00	0.0000	115.00
RF4440D-13A	C	From Leg	4.00 0.00 4.00	0.0000	115.00
(2) LPA-80080/4CF w/ Mount Pipe	A	From Leg	4.00 0.00 4.00	0.0000	115.00
(2) LPA-80080/4CF w/ Mount Pipe	B	From Leg	4.00 0.00 4.00	0.0000	115.00
(2) LPA-80080/4CF w/ Mount Pipe	C	From Leg	4.00 0.00 4.00	0.0000	115.00
Platform Mount [LP 303-1_HR-1] *****	C	None		0.0000	115.00
DS9A09F36D-N	A	From Leg	4.00 0.00 10.00	0.0000	90.00
TTA-429-94C-08179	A	From Leg	4.00 0.00	0.0000	90.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
6' x 2" Horizontal Mount Pipe	A	From Leg	0.00 2.50 0.00	0.0000	90.00
Pipe Mount [PM 601-1]	A	From Leg	0.00 0.50 0.00	0.0000	90.00
Side Arm Mount [SO 307-1]	A	From Leg	0.00 2.50 0.00	0.0000	90.00
***** KS24019-L112A	C	From Leg	0.00 3.00 0.00	0.0000	76.00
Side Arm Mount [SO 701-1]	C	From Leg	1.00 1.50 0.00	0.0000	76.00
***** MX08FRO665-21 w/ Mount Pipe	A	From Leg	0.00 4.00 0.00	0.0000	70.00
MX08FRO665-21 w/ Mount Pipe	B	From Leg	0.00 4.00 0.00	0.0000	70.00
MX08FRO665-21 w/ Mount Pipe	C	From Leg	0.00 4.00 0.00	0.0000	70.00
TA08025-B604	A	From Leg	0.00 4.00 0.00	0.0000	70.00
(2) TA08025-B604	C	From Leg	0.00 4.00 0.00	0.0000	70.00
TA08025-B605	A	From Leg	0.00 4.00 0.00	0.0000	70.00
(2) TA08025-B605	B	From Leg	0.00 4.00 0.00	0.0000	70.00
RDIDC-9181-PF-48	A	From Leg	0.00 4.00 0.00	0.0000	70.00
(2) 8' x 2" Mount Pipe	A	From Leg	0.00 4.00 0.00	0.0000	70.00
(2) 8' x 2" Mount Pipe	B	From Leg	0.00 4.00 0.00	0.0000	70.00
(2) 8' x 2" Mount Pipe	C	From Leg	0.00 4.00 0.00	0.0000	70.00
Commscope MC-PK8-DSH ***** *** ** *	C	None	0.00	0.0000	70.00

**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
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

**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	150 - 123.29	Pole	Max Tension	48	0.00	-0.00	-0.00	
			Max. Compression	26	-26.40	-3.46	-0.63	
			Max. Mx	8	-12.84	-215.34	-3.50	
			Max. My	14	-12.88	-5.02	-213.52	
			Max. Vy	8	16.33	-215.34	-3.50	
			Max. Vx	2	-16.31	1.54	212.87	
			Max. Torque	16				1.68
			Max Tension	1	0.00	0.00	0.00	
L2	123.29 - 88.88	Pole	Max. Compression	26	-40.25	-5.13	1.07	
			Max. Mx	8	-21.37	-912.77	-8.19	

Sectio n No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L3	88.88 - 43.8	Pole	Max. My	2	-21.43	6.17	907.56
			Max. Vy	8	23.24	-912.77	-8.19
			Max. Vx	2	-23.02	6.17	907.56
			Max. Torque	22			-2.22
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-59.53	-8.01	5.06
			Max. Mx	8	-35.49	-2117.46	-14.18
			Max. My	2	-35.57	12.41	2088.60
			Max. Vy	8	31.12	-2117.46	-14.18
			Max. Vx	2	-30.25	12.41	2088.60
L4	43.8 - 0	Pole	Max. Torque	24			-4.43
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-79.79	-11.42	7.49
			Max. Mx	8	-52.40	-3752.18	-21.19
			Max. My	2	-52.40	19.13	3667.13
			Max. Vy	8	35.26	-3752.18	-21.19
			Max. Vx	24	-34.29	2014.34	3483.35
			Max. Torque	24			-4.70

### Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	32	79.79	-4.79	-8.26
	Max. H <sub>x</sub>	20	52.44	35.20	0.15
	Max. H <sub>z</sub>	25	39.33	19.82	34.23
	Max. M <sub>x</sub>	2	3667.13	0.15	33.81
	Max. M <sub>z</sub>	8	3752.18	-35.20	-0.15
	Max. Torsion	12	4.67	-19.82	-34.23
	Min. Vert	7	39.33	-29.14	16.77
	Min. H <sub>x</sub>	8	52.44	-35.20	-0.15
	Min. H <sub>z</sub>	13	39.33	-19.82	-34.23
	Min. M <sub>x</sub>	14	-3661.78	-0.15	-33.81
	Min. M <sub>z</sub>	20	-3742.77	35.20	0.15
	Min. Torsion	24	-4.69	19.82	34.23

### Tower Mast Reaction Summary

Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>z</sub> K	Overturing Moment, M <sub>x</sub> kip-ft	Overturing Moment, M <sub>z</sub> kip-ft	Torque kip-ft
Dead Only	43.70	0.00	-0.00	-2.18	-3.83	-0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	52.44	-0.15	-33.81	-3667.13	19.13	1.52
0.9 Dead+1.0 Wind 0 deg - No Ice	39.33	-0.15	-33.81	-3594.08	19.84	1.51
1.2 Dead+1.0 Wind 30 deg - No Ice	52.44	16.73	-29.20	-3164.45	-1812.08	0.00
0.9 Dead+1.0 Wind 30 deg - No Ice	39.33	16.73	-29.20	-3101.34	-1775.18	0.00
1.2 Dead+1.0 Wind 60 deg - No Ice	52.44	29.14	-16.77	-1814.36	-3159.03	-1.50
0.9 Dead+1.0 Wind 60 deg - No Ice	39.33	29.14	-16.77	-1777.95	-3095.49	-1.51
1.2 Dead+1.0 Wind 90 deg - No Ice	52.44	35.20	0.15	21.19	-3752.18	-2.60
0.9 Dead+1.0 Wind 90 deg - No Ice	39.33	35.20	0.15	21.33	-3677.56	-2.60
1.2 Dead+1.0 Wind 120 deg - No Ice	52.44	29.64	17.24	1866.36	-3210.58	-3.00

Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>z</sub> K	Overturning Moment, M <sub>x</sub> kip-ft	Overturning Moment, M <sub>z</sub> kip-ft	Torque kip-ft
0.9 Dead+1.0 Wind 120 deg - No Ice	39.33	29.64	17.24	1830.19	-3146.15	-3.00
1.2 Dead+1.0 Wind 150 deg - No Ice	52.44	19.82	34.23	3478.04	-2023.67	-4.67
0.9 Dead+1.0 Wind 150 deg - No Ice	39.33	19.82	34.23	3412.67	-1984.02	-4.67
1.2 Dead+1.0 Wind 180 deg - No Ice	52.44	0.15	33.81	3661.78	-28.55	-1.52
0.9 Dead+1.0 Wind 180 deg - No Ice	39.33	0.15	33.81	3590.14	-26.71	-1.52
1.2 Dead+1.0 Wind 210 deg - No Ice	52.44	-16.73	29.20	3159.10	1802.63	-0.03
0.9 Dead+1.0 Wind 210 deg - No Ice	39.33	-16.73	29.20	3097.41	1768.30	-0.02
1.2 Dead+1.0 Wind 240 deg - No Ice	52.44	-29.14	16.77	1809.05	3149.57	1.48
0.9 Dead+1.0 Wind 240 deg - No Ice	39.33	-29.14	16.77	1774.05	3088.60	1.49
1.2 Dead+1.0 Wind 270 deg - No Ice	52.44	-35.20	-0.15	-26.48	3742.77	2.60
0.9 Dead+1.0 Wind 270 deg - No Ice	39.33	-35.20	-0.15	-25.22	3670.70	2.60
1.2 Dead+1.0 Wind 300 deg - No Ice	52.44	-29.64	-17.24	-1871.67	3201.20	3.02
0.9 Dead+1.0 Wind 300 deg - No Ice	39.33	-29.64	-17.24	-1834.09	3139.31	3.02
1.2 Dead+1.0 Wind 330 deg - No Ice	52.44	-19.82	-34.23	-3483.35	2014.35	4.69
0.9 Dead+1.0 Wind 330 deg - No Ice	39.33	-19.82	-34.23	-3416.57	1977.22	4.69
1.2 Dead+1.0 Ice+1.0 Temp	79.79	0.00	-0.00	-7.49	-11.42	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	79.79	-0.03	-9.07	-999.32	-6.57	0.27
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	79.79	4.51	-7.84	-863.98	-502.95	-0.13
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	79.79	7.84	-4.51	-499.16	-867.64	-0.50
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	79.79	9.07	0.03	-2.61	-1002.93	-0.74
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	79.79	7.87	4.56	492.62	-872.56	-0.77
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	79.79	4.79	8.26	881.71	-527.57	-0.98
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	79.79	0.03	9.07	984.25	-16.42	-0.27
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	79.79	-4.51	7.84	848.92	479.95	0.13
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	79.79	-7.84	4.51	484.10	844.65	0.50
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	79.79	-9.07	-0.03	-12.46	979.94	0.74
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	79.79	-7.87	-4.56	-507.69	849.57	0.77
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	79.79	-4.79	-8.26	-896.78	504.58	0.98
Dead+Wind 0 deg - Service	43.70	-0.04	-7.83	-842.38	1.54	0.36
Dead+Wind 30 deg - Service	43.70	3.88	-6.76	-727.12	-418.29	0.01
Dead+Wind 60 deg - Service	43.70	6.75	-3.88	-417.59	-727.10	-0.35
Dead+Wind 90 deg - Service	43.70	8.15	0.04	3.23	-863.24	-0.61
Dead+Wind 120 deg - Service	43.70	6.87	3.99	426.34	-739.03	-0.71
Dead+Wind 150 deg - Service	43.70	4.59	7.93	796.32	-467.11	-1.11
Dead+Wind 180 deg - Service	43.70	0.04	7.83	837.93	-9.37	-0.36
Dead+Wind 210 deg - Service	43.70	-3.88	6.76	722.67	410.46	-0.01
Dead+Wind 240 deg - Service	43.70	-6.75	3.88	413.15	719.26	0.35

Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>z</sub> K	Overturning Moment, M <sub>x</sub> kip-ft	Overturning Moment, M <sub>z</sub> kip-ft	Torque kip-ft
Dead+Wind 270 deg - Service	43.70	-8.15	-0.04	-7.68	855.40	0.61
Dead+Wind 300 deg - Service	43.70	-6.87	-3.99	-430.78	731.19	0.71
Dead+Wind 330 deg - Service	43.70	-4.59	-7.93	-800.77	459.28	1.11

## Solution Summary

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	-43.70	0.00	-0.00	43.70	0.00	0.000%
2	-0.15	-52.44	-33.81	0.15	52.44	33.81	0.000%
3	-0.15	-39.33	-33.81	0.15	39.33	33.81	0.000%
4	16.73	-52.44	-29.20	-16.73	52.44	29.20	0.000%
5	16.73	-39.33	-29.20	-16.73	39.33	29.20	0.000%
6	29.14	-52.44	-16.77	-29.14	52.44	16.77	0.000%
7	29.14	-39.33	-16.77	-29.14	39.33	16.77	0.000%
8	35.20	-52.44	0.15	-35.20	52.44	-0.15	0.000%
9	35.20	-39.33	0.15	-35.20	39.33	-0.15	0.000%
10	29.64	-52.44	17.24	-29.64	52.44	-17.24	0.000%
11	29.64	-39.33	17.24	-29.64	39.33	-17.24	0.000%
12	19.82	-52.44	34.23	-19.82	52.44	-34.23	0.000%
13	19.82	-39.33	34.23	-19.82	39.33	-34.23	0.000%
14	0.15	-52.44	33.81	-0.15	52.44	-33.81	0.000%
15	0.15	-39.33	33.81	-0.15	39.33	-33.81	0.000%
16	-16.73	-52.44	29.20	16.73	52.44	-29.20	0.000%
17	-16.73	-39.33	29.20	16.73	39.33	-29.20	0.000%
18	-29.14	-52.44	16.77	29.14	52.44	-16.77	0.000%
19	-29.14	-39.33	16.77	29.14	39.33	-16.77	0.000%
20	-35.20	-52.44	-0.15	35.20	52.44	0.15	0.000%
21	-35.20	-39.33	-0.15	35.20	39.33	0.15	0.000%
22	-29.64	-52.44	-17.24	29.64	52.44	17.24	0.000%
23	-29.64	-39.33	-17.24	29.64	39.33	17.24	0.000%
24	-19.82	-52.44	-34.23	19.82	52.44	34.23	0.000%
25	-19.82	-39.33	-34.23	19.82	39.33	34.23	0.000%
26	0.00	-79.79	0.00	-0.00	79.79	0.00	0.000%
27	-0.03	-79.79	-9.07	0.03	79.79	9.07	0.000%
28	4.51	-79.79	-7.84	-4.51	79.79	7.84	0.000%
29	7.84	-79.79	-4.51	-7.84	79.79	4.51	0.000%
30	9.07	-79.79	0.03	-9.07	79.79	-0.03	0.000%
31	7.87	-79.79	4.56	-7.87	79.79	-4.56	0.000%
32	4.79	-79.79	8.26	-4.79	79.79	-8.26	0.000%
33	0.03	-79.79	9.07	-0.03	79.79	-9.07	0.000%
34	-4.51	-79.79	7.84	4.51	79.79	-7.84	0.000%
35	-7.84	-79.79	4.51	7.84	79.79	-4.51	0.000%
36	-9.07	-79.79	-0.03	9.07	79.79	0.03	0.000%
37	-7.87	-79.79	-4.56	7.87	79.79	4.56	0.000%
38	-4.79	-79.79	-8.26	4.79	79.79	8.26	0.000%
39	-0.04	-43.70	-7.83	0.04	43.70	7.83	0.000%
40	3.88	-43.70	-6.76	-3.88	43.70	6.76	0.000%
41	6.75	-43.70	-3.88	-6.75	43.70	3.88	0.000%
42	8.15	-43.70	0.04	-8.15	43.70	-0.04	0.000%
43	6.87	-43.70	3.99	-6.87	43.70	-3.99	0.000%
44	4.59	-43.70	7.93	-4.59	43.70	-7.93	0.000%
45	0.04	-43.70	7.83	-0.04	43.70	-7.83	0.000%
46	-3.88	-43.70	6.76	3.88	43.70	-6.76	0.000%
47	-6.75	-43.70	3.88	6.75	43.70	-3.88	0.000%
48	-8.15	-43.70	-0.04	8.15	43.70	0.04	0.000%
49	-6.87	-43.70	-3.99	6.87	43.70	3.99	0.000%
50	-4.59	-43.70	-7.93	4.59	43.70	7.93	0.000%

### Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00053024
3	Yes	5	0.00000001	0.00024541
4	Yes	7	0.00000001	0.00016087
5	Yes	6	0.00000001	0.00055171
6	Yes	7	0.00000001	0.00015869
7	Yes	6	0.00000001	0.00054346
8	Yes	5	0.00000001	0.00026185
9	Yes	5	0.00000001	0.00012248
10	Yes	7	0.00000001	0.00015755
11	Yes	6	0.00000001	0.00053629
12	Yes	7	0.00000001	0.00017262
13	Yes	6	0.00000001	0.00058370
14	Yes	6	0.00000001	0.00012227
15	Yes	5	0.00000001	0.00059436
16	Yes	7	0.00000001	0.00015501
17	Yes	6	0.00000001	0.00053091
18	Yes	7	0.00000001	0.00015717
19	Yes	6	0.00000001	0.00053917
20	Yes	5	0.00000001	0.00094711
21	Yes	5	0.00000001	0.00042866
22	Yes	7	0.00000001	0.00016626
23	Yes	6	0.00000001	0.00056942
24	Yes	7	0.00000001	0.00015928
25	Yes	6	0.00000001	0.00053469
26	Yes	4	0.00000001	0.00014063
27	Yes	6	0.00000001	0.00023586
28	Yes	6	0.00000001	0.00054147
29	Yes	6	0.00000001	0.00053867
30	Yes	6	0.00000001	0.00023656
31	Yes	6	0.00000001	0.00052560
32	Yes	6	0.00000001	0.00057499
33	Yes	6	0.00000001	0.00023445
34	Yes	6	0.00000001	0.00048853
35	Yes	6	0.00000001	0.00049144
36	Yes	6	0.00000001	0.00023014
37	Yes	6	0.00000001	0.00053451
38	Yes	6	0.00000001	0.00052036
39	Yes	4	0.00000001	0.00071183
40	Yes	5	0.00000001	0.00032401
41	Yes	5	0.00000001	0.00031035
42	Yes	4	0.00000001	0.00055764
43	Yes	5	0.00000001	0.00030522
44	Yes	5	0.00000001	0.00039664
45	Yes	4	0.00000001	0.00080485
46	Yes	5	0.00000001	0.00028257
47	Yes	5	0.00000001	0.00029449
48	Yes	4	0.00000001	0.00061717
49	Yes	5	0.00000001	0.00034365
50	Yes	5	0.00000001	0.00031698

### Maximum Tower Deflections - Service Wind

Section No.	Elevation  ft	Horz. Deflection in	Gov. Load Comb.	Tilt  °	Twist  °
L1	150 - 123.29	36.754	44	2.2287	0.0093
L2	126.71 - 88.88	26.245	44	2.0143	0.0057
L3	93.13 - 43.8	13.814	44	1.4590	0.0037
L4	49.22 - 0	3.725	44	0.7047	0.0015

### Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
149.00	NNVV-65B-R4 w/ Mount Pipe	44	36.290	2.2210	0.0092	17277
137.00	AIR 6419 B41_TMO w/ Mount Pipe	44	30.776	2.1228	0.0071	6644
129.00	TME-RRUS-11	44	27.229	2.0414	0.0060	4136
127.00	(2) 7770.00 w/ Mount Pipe	44	26.369	2.0178	0.0057	3863
115.00	(2) NHH-65B-R2B w/ Mount Pipe	44	21.477	1.8465	0.0047	3568
90.00	DS9A09F36D-N	44	12.854	1.4018	0.0036	3310
76.00	KS24019-L112A	44	9.000	1.1512	0.0029	3172
70.00	MX08FRO665-21 w/ Mount Pipe	44	7.574	1.0470	0.0025	3110

### Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 123.29	159.771	12	9.6989	0.0411
L2	126.71 - 88.88	114.288	12	8.7968	0.0248
L3	93.13 - 43.8	60.244	12	6.3784	0.0159
L4	49.22 - 0	16.250	12	3.0773	0.0062

### Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
149.00	NNVV-65B-R4 w/ Mount Pipe	12	157.765	9.6671	0.0403	4298
137.00	AIR 6419 B41_TMO w/ Mount Pipe	12	133.913	9.2580	0.0311	1650
129.00	TME-RRUS-11	12	118.554	8.9130	0.0260	1024
127.00	(2) 7770.00 w/ Mount Pipe	12	114.825	8.8120	0.0249	955
115.00	(2) NHH-65B-R2B w/ Mount Pipe	12	93.595	8.0712	0.0202	866
90.00	DS9A09F36D-N	12	56.062	6.1280	0.0153	776
76.00	KS24019-L112A	12	39.263	5.0312	0.0122	738
70.00	MX08FRO665-21 w/ Mount Pipe	12	33.041	4.5750	0.0108	721

### Compression Checks

### Pole Design Data

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	KI/r	A in <sup>2</sup>	P <sub>u</sub> K	φP <sub>n</sub> K	Ratio P <sub>u</sub> / φP <sub>n</sub>
L1	150 - 123.29	TP22.9x17x0.1875	26.71	0.00	0.0	13.067	-12.76	764.43	0.017
	(1)					2			
L2	123.29 - 88.88	TP30x21.7696x0.3125	37.83	0.00	0.0	28.529	-21.30	1668.96	0.013
	(2)					2			
L3	88.88 - 43.8	TP39.2x28.4504x0.375	49.33	0.00	0.0	44.805	-35.22	2621.13	0.013
	(3)					7			
L4	43.8 - 0 (4)	TP48x37.2689x0.4375	49.22	0.00	0.0	66.046	-52.39	3863.72	0.014
						5			



Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	A in <sup>2</sup>	P <sub>u</sub> K	φP <sub>n</sub> K	Ratio $\frac{P_u}{\phi P_n}$
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### Pole Bending Design Data

Section No.	Elevation ft	Size	M <sub>ux</sub> kip-ft	φM <sub>nx</sub> kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M <sub>uy</sub> kip-ft	φM <sub>ny</sub> kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	150 - 123.29 (1)	TP22.9x17x0.1875	217.99	413.83	0.527	0.00	413.83	0.000
L2	123.29 - 88.88 (2)	TP30x21.7696x0.3125	918.92	1249.92	0.735	0.00	1249.92	0.000
L3	88.88 - 43.8 (3)	TP39.2x28.4504x0.375	2187.56	2537.12	0.862	0.00	2537.12	0.000
L4	43.8 - 0 (4)	TP48x37.2689x0.4375	4023.93	4628.73	0.869	0.00	4628.73	0.000

### Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V <sub>u</sub> K	φV <sub>n</sub> K	Ratio $\frac{V_u}{\phi V_n}$	Actual T <sub>u</sub> kip-ft	φT <sub>n</sub> kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	150 - 123.29 (1)	TP22.9x17x0.1875	16.50	229.33	0.072	1.20	440.97	0.003
L2	123.29 - 88.88 (2)	TP30x21.7696x0.3125	23.26	500.69	0.046	1.58	1261.18	0.001
L3	88.88 - 43.8 (3)	TP39.2x28.4504x0.375	34.58	786.34	0.044	4.41	2592.30	0.002
L4	43.8 - 0 (4)	TP48x37.2689x0.4375	39.62	1159.12	0.034	4.67	4828.05	0.001

### Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	150 - 123.29 (1)	0.017	0.527	0.000	0.072	0.003	0.549	1.050	4.8.2
L2	123.29 - 88.88 (2)	0.013	0.735	0.000	0.046	0.001	0.750	1.050	4.8.2
L3	88.88 - 43.8 (3)	0.013	0.862	0.000	0.044	0.002	0.878	1.050	4.8.2
L4	43.8 - 0 (4)	0.014	0.869	0.000	0.034	0.001	0.884	1.050	4.8.2

### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	φP <sub>allow</sub> K	% Capacity	Pass Fail
L1	150 - 123.29	Pole	TP22.9x17x0.1875	1	-12.76	802.65	52.3	Pass
L2	123.29 - 88.88	Pole	TP30x21.7696x0.3125	2	-21.30	1752.41	71.5	Pass
L3	88.88 - 43.8	Pole	TP39.2x28.4504x0.375	3	-35.22	2752.19	83.6	Pass
L4	43.8 - 0	Pole	TP48x37.2689x0.4375	4	-52.39	4056.91	84.2	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$\phi P_{allow}$ K	% Capacity	Pass Fail
						Summary		
						Pole (L4)	84.2	Pass
						<b>RATING =</b>	<b>84.2</b>	<b>Pass</b>

**APPENDIX B**  
**BASE LEVEL DRAWING**



(OTHER CONSIDERED EQUIPMENT)  
(1) 1/2" TO 90 FT LEVEL  
(2) 1-1/4" TO 90 FT LEVEL

(PROPOSED EQUIPMENT CONFIGURATION)  
(17) 1-5/8" TO 115 FT LEVEL

(OTHER CONSIDERED EQUIPMENT)  
(1) 1/2" TO 76 FT LEVEL

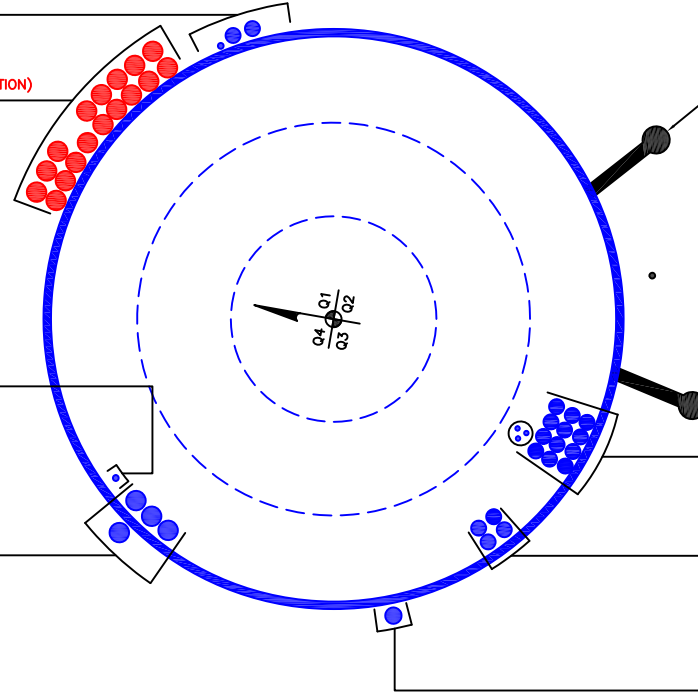
(OTHER CONSIDERED EQUIPMENT)  
(4) 1-5/8" TO 137 FT LEVEL

CLIMBING PEGS  
W/ SAFETY CLIMB

(OTHER CONSIDERED EQUIPMENT—IN CONDUIT)  
(3) 3/8" TO 127 FT LEVEL  
(OTHER CONSIDERED EQUIPMENT)  
(12) 1-1/4" TO 127 FT LEVEL

(OTHER CONSIDERED EQUIPMENT)  
(4) 1-1/4" TO 149 FT LEVEL

(OTHER CONSIDERED EQUIPMENT)  
(1) 1-3/8" TO 70 FT LEVEL



**APPENDIX C**  
**ADDITIONAL CALCULATIONS**

# Monopole Base Plate Connection

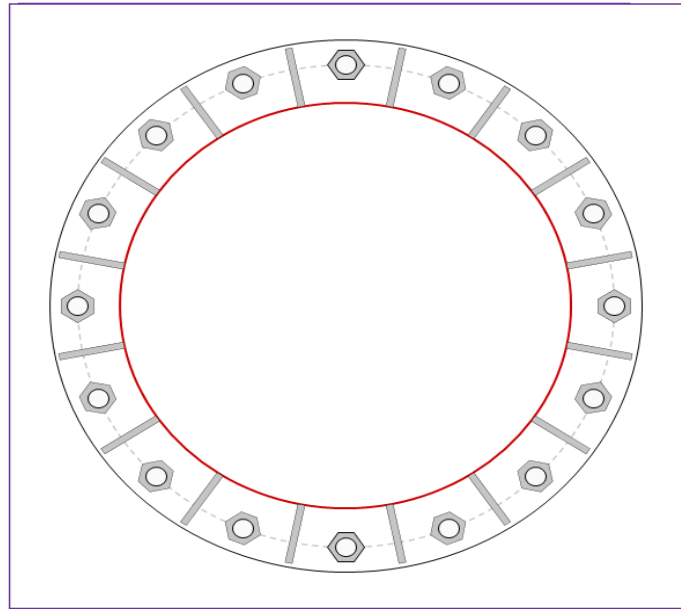


Site Info	
BU #	876390
Site Name	Hampton / Bernier
Order #	658803 Rev. 0

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

Applied Loads	
Moment (kip-ft)	4023.93
Axial Force (kips)	52.39
Shear Force (kips)	39.62

\*TIA-222-H Section 15.5 Applied



Connection Properties	Analysis Results
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**Anchor Rod Data**  
 (16) 2-1/4"  $\phi$  bolts (A615-75 N;  $F_y=75$  ksi,  $F_u=100$  ksi) on 57" BC

**Base Plate Data**  
 63" OD x 2" Plate (A871 Gr. 60;  $F_y=60$  ksi,  $F_u=75$  ksi)

**Stiffener Data**  
 (16) 18"H x 7"W x 0.75"T, Notch: 0.75"  
 plate:  $F_y= 50$  ksi ; weld:  $F_y= 70$  ksi  
 horiz. weld: 0.375" groove, 45° dbl bevel FALSE  
 vert. weld: 0.375" fillet

**Pole Data**  
 48" x 0.4375" 18-sided pole (A572-65;  $F_y=65$  ksi,  $F_u=80$  ksi)

Anchor Rod Summary		<i>(units of kips, kip-in)</i>	
$Pu\_t = 208.38$	$\phi Pn\_t = 243.75$	<b>Stress Rating</b>	
$Vu = 2.48$	$\phi Vn = 149.1$	<b>81.4%</b>	
$Mu = n/a$	$\phi Mn = n/a$	<b>Pass</b>	

Base Plate Summary		
Max Stress (ksi):	37.14	(Roark's Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	<b>65.5%</b>	<b>Pass</b>

Stiffener Summary		
Horizontal Weld:	<b>68.0%</b>	<b>Pass</b>
Vertical Weld:	<b>51.6%</b>	<b>Pass</b>
Plate Flexure+Shear:	<b>24.6%</b>	<b>Pass</b>
Plate Tension+Shear:	<b>68.8%</b>	<b>Pass</b>
Plate Compression:	<b>75.2%</b>	<b>Pass</b>

Pole Summary		
Punching Shear:	<b>13.3%</b>	<b>Pass</b>

# Pier and Pad Foundation



**BU #:** 876390  
**Site Name:** Hampton / Bernier  
**App. Number:** 658803 Rev. 0

**TIA-222 Revision:** H  
**Tower Type:** Monopole

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

Superstructure Analysis Reactions		
Compression, $P_{comp}$ :	52.44	kips
Base Shear, $V_{u\_comp}$ :	39.55	kips
Moment, $M_u$ :	4023.93	ft-kips
Tower Height, $H$ :	150	ft
BP Dist. Above Fdn, $bp_{dist}$ :	3.25	in

Foundation Analysis Checks				
	Capacity	Demand	Rating*	Check
<i>Lateral (Sliding) (kips)</i>	217.62	39.55	17.3%	Pass
<i>Bearing Pressure (ksf)</i>	9.47	3.06	32.3%	Pass
<i>Overtuning (kip*ft)</i>	5382.22	4271.94	79.4%	Pass
<i>Pier Flexure (Comp.) (kip*ft)</i>	4131.99	4142.58	95.5%	Pass
<i>Pier Compression (kip)</i>	26891.28	75.26	0.3%	Pass
<i>Pad Flexure (kip*ft)</i>	4770.48	2114.93	42.2%	Pass
<i>Pad Shear - 1-way (kips)</i>	899.95	307.54	32.5%	Pass
<i>Pad Shear - 2-way (Comp) (ksi)</i>	0.190	0.000	0.0%	Pass
<i>Flexural 2-way (Comp) (kip*ft)</i>	4566.12	2485.55	51.8%	Pass

Pier Properties		
Pier Shape:	Square	
Pier Diameter, $dpier$ :	6.5	ft
Ext. Above Grade, $E$ :	1	ft
Pier Rebar Size, $Sc$ :	9	
Pier Rebar Quantity, $mc$ :	27	
Pier Tie/Spiral Size, $St$ :	4	
Pier Tie/Spiral Quantity, $mt$ :	4	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, $cc_{pier}$ :	3	in

\*Rating per TIA-222-H Section 15.5

Structural Rating*:	95.5%
Soil Rating*:	79.4%

Pad Properties		
Depth, $D$ :	5	ft
Pad Width, $W_1$ :	25.25	ft
Pad Thickness, $T$ :	3	ft
Pad Rebar Size (Top dir. 2), $Sp_{top2}$ :	9	
Pad Rebar Quantity (Top dir. 2), $mp_{top2}$ :	20	
Pad Rebar Size (Bottom dir. 2), $Sp_2$ :	9	
Pad Rebar Quantity (Bottom dir. 2), $mp_2$ :	35	
Pad Clear Cover, $cc_{pad}$ :	3	in

Material Properties		
Rebar Grade, $F_y$ :	60	ksi
Concrete Compressive Strength, $F'_c$ :	4	ksi
Dry Concrete Density, $\delta_c$ :	150	pcf

Soil Properties		
Total Soil Unit Weight, $\gamma$ :	125	pcf
Ultimate Net Bearing, $Q_{net}$ :	12.000	ksf
Cohesion, $C_u$ :	0.000	ksf
Friction Angle, $\phi$ :	30	degrees
SPT Blow Count, $N_{blows}$ :	6	
Base Friction, $\mu$ :	0.5	
Neglected Depth, $N$ :	3.33	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, $gw$ :	13	ft

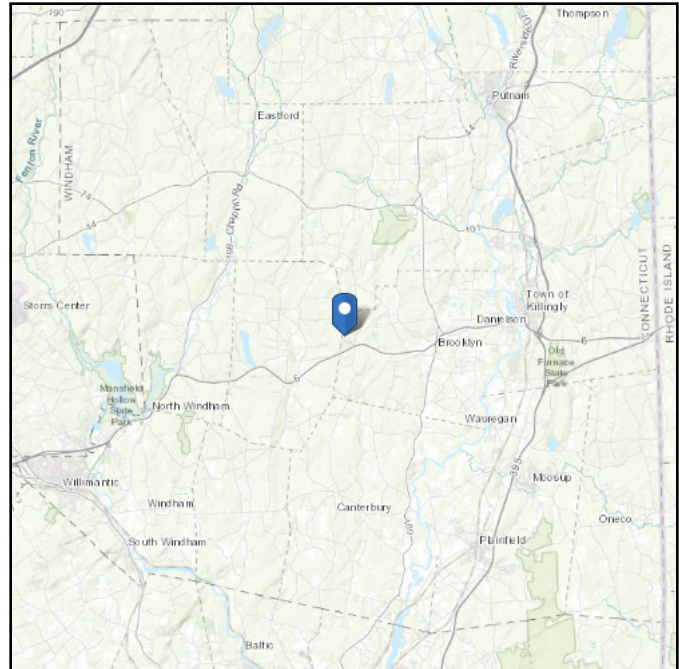
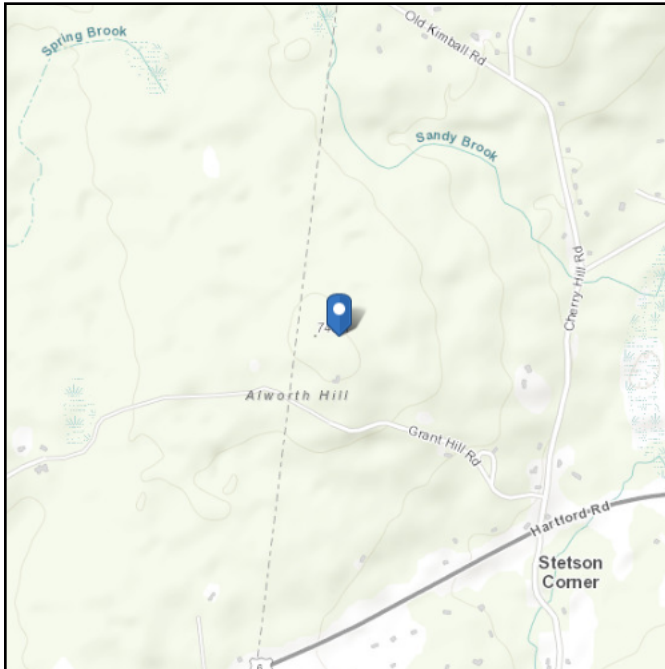
--Toggle between Gross and Net

# ASCE 7 Hazards Report

**Address:**  
No Address at This Location

**Standard:** ASCE/SEI 7-16  
**Risk Category:** II  
**Soil Class:** D - Default (see Section 11.4.3)

**Latitude:** 41.791567  
**Longitude:** -72.015011  
**Elevation:** 720.9157298343945 ft (NAVD 88)



## Wind

### Results:

Wind Speed	121 Vmph
10-year MRI	75 Vmph
25-year MRI	85 Vmph
50-year MRI	94 Vmph
100-year MRI	100 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: Thu Sep 21 2023

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 in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

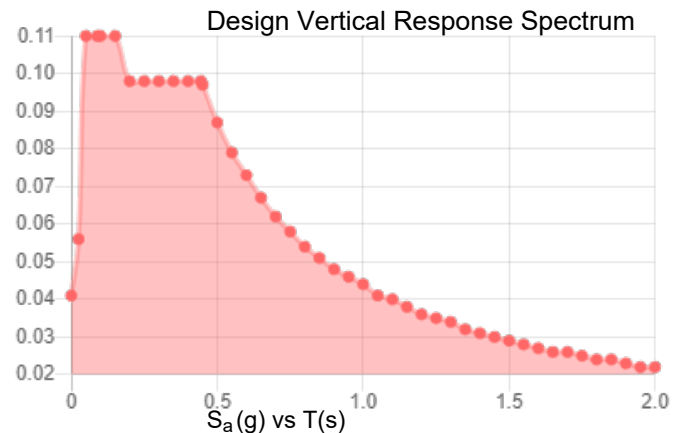
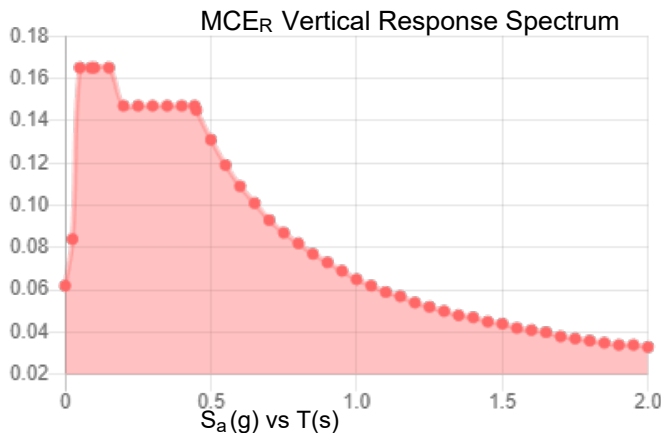
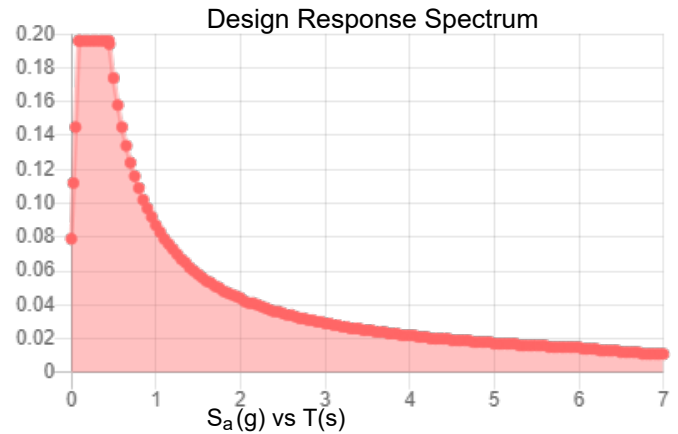
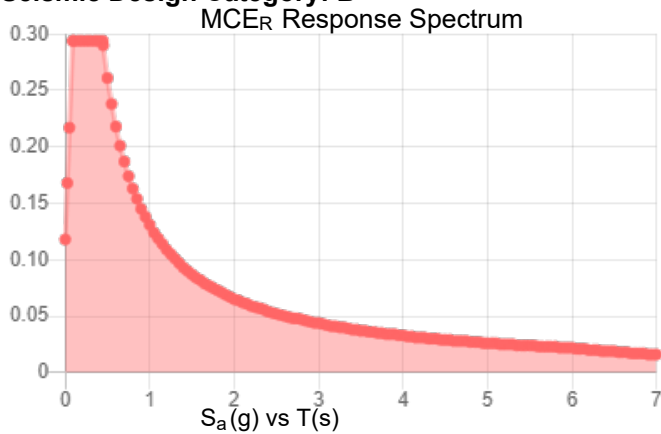


**Site Soil Class:**

**Results:**

$S_s$ :	0.184	$S_{D1}$ :	0.087
$S_1$ :	0.054	$T_L$ :	6
$F_a$ :	1.6	PGA :	0.099
$F_v$ :	2.4	PGA <sub>M</sub> :	0.159
$S_{MS}$ :	0.294	$F_{PGA}$ :	1.6
$S_{M1}$ :	0.131	$I_e$ :	1
$S_{DS}$ :	0.196	$C_v$ :	0.7

**Seismic Design Category: B**



**Data Accessed:**

**Thu Sep 21 2023**

**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

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**Results:**

Ice Thickness: 1.00 in.  
Concurrent Temperature: 15 F  
Gust Speed 50 mph

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

**Date Accessed:** Thu Sep 21 2023

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

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

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