

Date: **May 18, 2021**



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

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

**Carrier Designation:** **DISH Network Co-Locate**  
**Site Number:** BOBDL00038A  
**Site Name:** CT-CCI-T-803175

**Crown Castle Designation:** **BU Number:** 803175  
**Site Name:** CT NEW BRITAIN 3 CAC 803175  
**JDE Job Number:** 650036  
**Work Order Number:** 1962722  
**Order Number:** 556644 Rev. 0

**Engineering Firm Designation:** **Crown Castle Project Number:** 1962722

**Site Data:** **167 Cocco, New Britain, Hartford County, CT**  
**Latitude 41° 41' 11.8", Longitude -72° 45' 27.8"**  
**188 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:

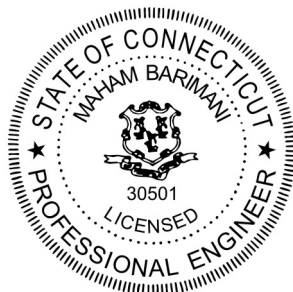
LC7: Proposed Equipment Configuration **Sufficient Capacity - 99.4%**

This analysis utilizes an ultimate 3-second gust wind speed of 125 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - "Analysis Criteria".

Structural analysis prepared by: Nicholas Cvetic, E.I.T.

Respectfully submitted by:

Maham Barimani, P.E.  
Senior Project Engineer



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## 1) INTRODUCTION

This tower is a 188 ft monopole tower designed by Summit.

## 2) ANALYSIS CRITERIA

<b>TIA-222 Revision:</b>	TIA-222-H
<b>Risk Category:</b>	II
<b>Wind Speed:</b>	125 mph
<b>Exposure Category:</b>	C
<b>Topographic Factor:</b>	1
<b>Ice Thickness:</b>	2 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)
173.0	173.0	3	fujitsu	TA08025-B604	1	1-3/4
		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		

**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)
188.0	190.0	1	cci antennas	DMP65R-BU4D w/ Mount Pipe	6	1-5/8
		2	cci antennas	DMP65R-BU6D w/ Mount Pipe		
		1	cci antennas	OPA-65R-LCUU-H4 w/ Mount Pipe		
		2	cci antennas	OPA-65R-LCUU-H6 w/ Mount Pipe		
		1	cci antennas	OPA65R-BU4D w/ Mount Pipe		
		2	cci antennas	OPA65R-BU6D w/ Mount Pipe		
		6	ericsson	RRUS 32 B2		
		3	ericsson	RRUS 4449 B5/B12		
		3	ericsson	RRUS 4478 B14		
		3	ericsson	RRUS E2 B29		
	1	quintel technology	QS46512-2 w/ Mount Pipe			
	2	quintel technology	QS66512-2 w/ Mount Pipe			
	1	raycap	DC6-48-60-18-8C	8	3/4	
	1	raycap	DC6-48-60-0-8F	2	3/8	
	189.0	3	ericsson	RRUS 32 B30	2	3/8
3		ericsson	RRUS 32 B66			
1		raycap	DC6-48-60-0-8F			
2		raycap	DC6-48-60-18-8F			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
	188.0	1	tower mounts	Platform Mount [LP 1201-1_KCKR-HR-1]		
161.0	161.0	3	ericsson	AIR -32 B2A/B66AA w/ Mount Pipe	2 1	1-5/8 1-1/2
		3	ericsson	AIR6449 B41_T-MOBILE w/ Mount Pipe		
		3	ericsson	RADIO 4449 B71 B85A_T-MOBILE		
		3	ericsson	RRUS 4415 B25_CCIV2		
		3	rfs celwave	APXVAARR24_43-U-NA20 w/ Mount Pipe		
		1	tower mounts	Platform Mount [LP 602-1_KCKR]		
146.0	149.0	3	samsung telecommunications	RFV01U-D1A	8	1-5/8
		3	samsung telecommunications	RFV01U-D2A		
	147.0	3	samsung telecommunications	MT6407-77A w/ Mount Pipe		
	146.0	1	tower mounts	Platform Mount [LP 712-1]		
	145.0	3	amphenol	BXA-80063-6BF-EDIN-4 w/ Mount Pipe		
		6	andrew	SBNHH-1D65B w/ Mount Pipe		
		1	raycap	RHSDC-3315-PF-48		
143.0	3	samsung telecommunications	CBRS w/ Mount Pipe			

### 3) ANALYSIS PROCEDURE

**Table 3 - Documents Provided**

Document	Reference	Source
4-GEOTECHNICAL REPORTS	679661	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	679660	CCISITES
4-TOWER MANUFACTURER DRAWINGS	679659	CCISITES

#### 3.1) Analysis Method

tnxTower (version 8.0.9.0), 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	188 - 137	Pole	TP32.711x22x0.25	1	-18.0680	1538.6699	77.0	Pass
L2	137 - 90.25	Pole	TP42.03x31.3184x0.3125	2	-27.9058	2474.4929	99.4	Pass
L3	90.25 - 44.5	Pole	TP51.014x40.3023x0.375	3	-41.3424	3602.4658	95.3	Pass
L4	44.5 - 0	Pole	TP59.61x48.8988x0.5	4	-63.6626	5762.1267	73.1	Pass
							Summary	
						Pole (L2)	99.4	Pass
						Rating =	99.4	Pass

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

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	83.0	Pass
1	Base Plate	0	78.3	Pass
1	Base Foundation (Structure)	0	59.8	Pass
1	Base Foundation (Soil Interaction)	0	96.0	Pass

<b>Structure Rating (max from all components) =</b>	<b>99.4%</b>
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Notes:

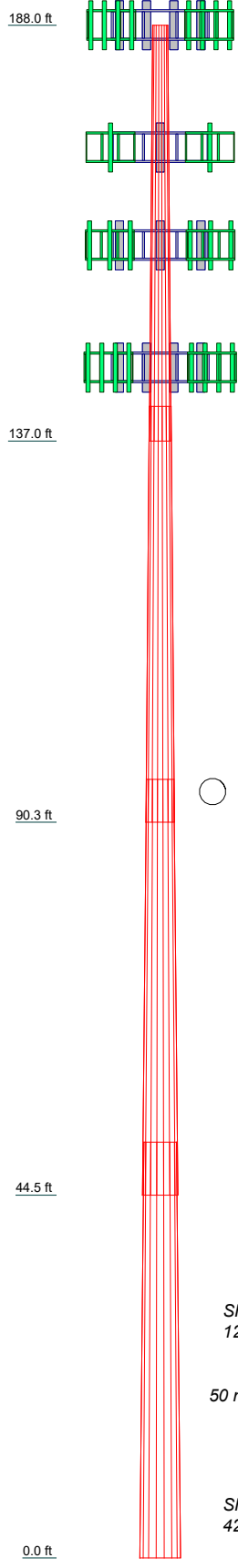
- 1) See additional documentation in "Appendix C - Additional Calculations" for calculations supporting the % capacity consumed.

### 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)	51.0000	51.0000	51.0000	51.0000	
Number of Sides	18	18	18	18	
Thickness (in)	0.2500	0.3125	0.3750	0.5000	
Socket Length (ft)	4.2500	5.2500	6.5000		
Top Dia (in)	22.0000	31.3184	40.3023	48.8988	
Bot Dia (in)	32.7110	42.0300	51.0140	59.6100	
Grade		A607-65			
Weight (K)	3.7	6.3	9.4	14.8	34.1



**MATERIAL STRENGTH**

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-65	65 ksi	80 ksi			

**TOWER DESIGN NOTES**

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 125 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 2.00 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 1 with Crest Height of 0.0000 ft
8. TOWER RATING: 99.4%

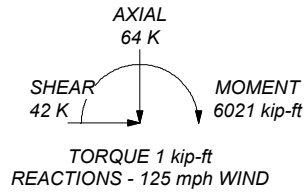
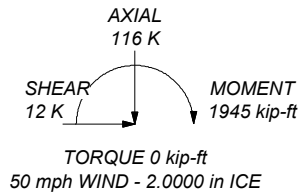
137.0 ft

90.3 ft

44.5 ft

0.0 ft

ALL REACTIONS ARE FACTORED



**CROWN CASTLE**  
 The Pathway to Possible

**Crown Castle**  
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 Canonsburg, PA 15317  
 Phone: (724) 416-2000  
 FAX:

Job: <b>BU# 803175</b>		
Project:		
Client: Crown Castle	Drawn by: NCvetic	App'd:
Code: TIA-222-H	Date: 05/18/21	Scale: NTS
Path:	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 Hartford County, Connecticut.
- Tower base elevation above sea level: 88.0000 ft.
- Basic wind speed of 125 mph.
- Risk Category II.
- Exposure Category C.
- Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- Topographic Category: 1.
- Crest Height: 0.0000 ft.
- Nominal ice thickness of 2.0000 in.
- Ice thickness is considered to increase with height.
- Ice density of 56.0000 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50.0000 °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	188.0000- 137.0000	51.0000	4.2500	18	22.0000	32.7110	0.2500	1.0000	A607-65 (65 ksi)
L2	137.0000- 90.2500	51.0000	5.2500	18	31.3184	42.0300	0.3125	1.2500	A607-65 (65 ksi)
L3	90.2500- 44.5000	51.0000	6.5000	18	40.3023	51.0140	0.3750	1.5000	A607-65 (65 ksi)
L4	44.5000- 0.0000	51.0000		18	48.8988	59.6100	0.5000	2.0000	A607-65 (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>	It/Q in <sup>2</sup>	w in	w/t
L1	22.3008	17.2586	1031.4832	7.7212	11.1760	92.2945	2064.3237	8.6310	3.4320	13.728
	33.1771	25.7578	3429.0204	11.5237	16.6172	206.3538	6862.5527	12.8813	5.3171	21.269
L2	32.6597	30.7540	3735.3226	11.0071	15.9098	234.7819	7475.5603	15.3799	4.9620	15.879
	42.6302	41.3785	9098.0688	14.8097	21.3512	426.1143	18208.109	20.6932	6.8473	21.911
L3	41.9859	47.5235	9571.6471	14.1742	20.4736	467.5120	19155.888	23.7663	6.4332	17.155
	51.7431	60.2731	19526.796	17.9768	25.9151	753.4907	39079.287	30.1423	8.3185	22.183
L4	50.9622	76.8089	22730.963	17.1816	24.8406	915.0736	45491.836	38.4117	7.7262	15.452
	60.4524	93.8076	41409.239	20.9841	30.2819	1367.4593	82872.966	46.9127	9.6114	19.223

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 188.0000- 137.0000				1	1	1			
L2 137.0000- 90.2500				1	1	1			
L3 90.2500- 44.5000				1	1	1			
L4 44.5000- 0.0000				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
3/8-in Detuner Wire	A	No	Surface Ar	133.0000 - 0.0000	1	1	0.000 0.000	0.3750		0.0959
3/8-in Detuner Wire	B	No	Surface Ar	133.0000 - 0.0000	1	1	0.000 0.000	0.3750		0.0959
3/8-in Detuner Wire	C	No	Surface Ar	133.0000 - 0.0000	1	1	0.000 0.000	0.3750		0.0959

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### 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>AA</sub> ft <sup>2</sup> /ft	Weight plf
**									
LDF7-50A(1-5/8)	C	No	No	Inside Pole	188.0000 - 5.0000	6	No Ice	0.0000	0.8200
							1/2" Ice	0.0000	0.8200
							1" Ice	0.0000	0.8200
							2" Ice	0.0000	0.8200
FB-L98B-002-75000(3/8)	C	No	No	Inside Pole	188.0000 - 5.0000	2	No Ice	0.0000	0.0586
							1/2" Ice	0.0000	0.0586
							1" Ice	0.0000	0.0586
							2" Ice	0.0000	0.0586
WR-VG86ST-BRD(3/4)	C	No	No	Inside Pole	188.0000 - 5.0000	2	No Ice	0.0000	0.5840
							1/2" Ice	0.0000	0.5840
							1" Ice	0.0000	0.5840
							2" Ice	0.0000	0.5840
WR-VG86ST-BRD(3/4)	C	No	No	Inside Pole	188.0000 - 5.0000	4	No Ice	0.0000	0.5840
							1/2" Ice	0.0000	0.5840
							1" Ice	0.0000	0.5840
							2" Ice	0.0000	0.5840
WR-VG86ST-BRD(3/4)	C	No	No	Inside Pole	188.0000 - 5.0000	2	No Ice	0.0000	0.5840
							1/2" Ice	0.0000	0.5840
							1" Ice	0.0000	0.5840
							2" Ice	0.0000	0.5840
**									
CU12PSM6P4XXX (1-3/4)	C	No	No	Inside Pole	173.0000 - 0.0000	1	No Ice	0.0000	2.7200
							1/2" Ice	0.0000	2.7200
							1" Ice	0.0000	2.7200
							2" Ice	0.0000	2.7200
**									
33-597(1-1/2)	C	No	No	Inside Pole	161.0000 - 6.0000	1	No Ice	0.0000	1.6100
							1/2" Ice	0.0000	1.6100
							1" Ice	0.0000	1.6100
							2" Ice	0.0000	1.6100
HCS 6X12 4AWG(1-5/8)	C	No	No	Inside Pole	161.0000 - 6.0000	1	No Ice	0.0000	2.4000
							1/2" Ice	0.0000	2.4000
							1" Ice	0.0000	2.4000
							2" Ice	0.0000	2.4000
HB158-21U6S24-xxM_TMO(1-5/8)	C	No	No	Inside Pole	161.0000 - 6.0000	1	No Ice	0.0000	2.5000
							1/2" Ice	0.0000	2.5000
							1" Ice	0.0000	2.5000
							2" Ice	0.0000	2.5000
**									
HB158-1-08U8-S8J18(1-5/8)	C	No	No	Inside Pole	146.0000 - 5.0000	2	No Ice	0.0000	1.3000
							1/2" Ice	0.0000	1.3000
							1" Ice	0.0000	1.3000
							2" Ice	0.0000	1.3000
LCF158-50J(1-5/8)	C	No	No	Inside Pole	146.0000 - 5.0000	6	No Ice	0.0000	0.9200
							1/2" Ice	0.0000	0.9200
							1" Ice	0.0000	0.9200
							2" Ice	0.0000	0.9200
**									

### Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight K
L1	188.0000-137.0000	A	0.000	0.000	0.000	0.000	0.0000
		B	0.000	0.000	0.000	0.000	0.0000
		C	0.000	0.000	0.000	0.000	0.8224
L2	137.0000-90.2500	A	0.000	0.000	1.603	0.000	0.0041
		B	0.000	0.000	1.603	0.000	0.0041
		C	0.000	0.000	1.603	0.000	1.2691
L3	90.2500-44.5000	A	0.000	0.000	1.716	0.000	0.0044

Tower Sectio n	Tower Elevation ft	Face	$A_R$ 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
L4	44.5000-0.0000	B	0.000	0.000	1.716	0.000	0.0044
		C	0.000	0.000	1.716	0.000	1.2423
		A	0.000	0.000	1.669	0.000	0.0043
		B	0.000	0.000	1.669	0.000	0.0043
		C	0.000	0.000	1.669	0.000	1.0802

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

Tower Sectio n	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	188.0000- 137.0000	A	1.992	0.000	0.000	0.000	0.000	0.0000
		B		0.000	0.000	0.000	0.000	0.0000
		C		0.000	0.000	0.000	0.000	0.8224
L2	137.0000- 90.2500	A	1.922	0.000	0.000	18.635	0.000	0.2504
		B		0.000	0.000	18.635	0.000	0.2504
		C		0.000	0.000	18.635	0.000	1.5154
L3	90.2500-44.5000	A	1.825	0.000	0.000	19.306	0.000	0.2512
		B		0.000	0.000	19.306	0.000	0.2512
		C		0.000	0.000	19.306	0.000	1.4892
L4	44.5000-0.0000	A	1.636	0.000	0.000	17.909	0.000	0.2225
		B		0.000	0.000	17.909	0.000	0.2225
		C		0.000	0.000	17.909	0.000	1.2984

### Feed Line Center of Pressure

Section	Elevation ft	$CP_x$ in	$CP_z$ in	$CP_x$ Ice in	$CP_z$ Ice in
L1	188.0000- 137.0000	0.0000	0.0000	0.0000	0.0000
L2	137.0000-90.2500	0.0000	0.0000	0.0000	0.0000
L3	90.2500-44.5000	0.0000	0.0000	0.0000	0.0000
L4	44.5000-0.0000	0.0000	0.0000	0.0000	0.0000

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
L2	1	3/8-in Detuner Wire	90.25 - 133.00	1.0000	1.0000
L2	2	3/8-in Detuner Wire	90.25 - 133.00	1.0000	1.0000
L2	3	3/8-in Detuner Wire	90.25 - 133.00	1.0000	1.0000
L3	1	3/8-in Detuner Wire	44.50 - 90.25	1.0000	1.0000
L3	2	3/8-in Detuner Wire	44.50 - 90.25	1.0000	1.0000
L3	3	3/8-in Detuner Wire	44.50 - 90.25	1.0000	1.0000
L4	1	3/8-in Detuner Wire	0.00 - 44.50	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
L4	2	3/8-in Detuner Wire	0.00 - 44.50	1.0000	1.0000
L4	3	3/8-in Detuner Wire	0.00 - 44.50	1.0000	1.0000

### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement ft		C <sub>A</sub> A <sub>A</sub> Front ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Side ft <sup>2</sup>	Weight K
Lighting Rod 3/4" x 8'	C	From Leg	0.0000	0.0000	188.0000	No Ice	0.6000	0.6000	0.0300
			0.0000			1/2"	1.4146	1.4146	0.0362
			4.0000			Ice	2.2458	2.2458	0.0475
						1" Ice	3.6690	3.6690	0.0861
						2" Ice			
**									
1" Dia x 3.5-ft	A	From Leg	1.5000	0.0000	100.0000	No Ice	0.0000	0.3675	0.0040
			0.0000			1/2"	0.0000	0.6798	0.0074
			0.0000			Ice	0.0000	0.8994	0.0132
						1" Ice	0.0000	1.3662	0.0326
						2" Ice			
1" Dia x 3.5-ft	B	From Leg	1.5000	0.0000	100.0000	No Ice	0.0000	0.3675	0.0040
			0.0000			1/2"	0.0000	0.6798	0.0074
			0.0000			Ice	0.0000	0.8994	0.0132
						1" Ice	0.0000	1.3662	0.0326
						2" Ice			
1" Dia x 3.5-ft	C	From Leg	1.5000	0.0000	100.0000	No Ice	0.0000	0.3675	0.0040
			0.0000			1/2"	0.0000	0.6798	0.0074
			0.0000			Ice	0.0000	0.8994	0.0132
						1" Ice	0.0000	1.3662	0.0326
						2" Ice			
**									
1" Dia x 3.5-ft	A	From Leg	1.5000	0.0000	70.0000	No Ice	0.0000	0.3675	0.0040
			0.0000			1/2"	0.0000	0.6798	0.0074
			0.0000			Ice	0.0000	0.8994	0.0132
						1" Ice	0.0000	1.3662	0.0326
						2" Ice			
1" Dia x 3.5-ft	B	From Leg	1.5000	0.0000	70.0000	No Ice	0.0000	0.3675	0.0040
			0.0000			1/2"	0.0000	0.6798	0.0074
			0.0000			Ice	0.0000	0.8994	0.0132
						1" Ice	0.0000	1.3662	0.0326
						2" Ice			
1" Dia x 3.5-ft	C	From Leg	1.5000	0.0000	70.0000	No Ice	0.0000	0.3675	0.0040
			0.0000			1/2"	0.0000	0.6798	0.0074
			0.0000			Ice	0.0000	0.8994	0.0132
						1" Ice	0.0000	1.3662	0.0326
						2" Ice			
**									
1" Dia x 3.5-ft	A	From Leg	1.5000	0.0000	40.0000	No Ice	0.0000	0.3675	0.0040
			0.0000			1/2"	0.0000	0.6798	0.0074
			0.0000			Ice	0.0000	0.8994	0.0132
						1" Ice	0.0000	1.3662	0.0326
						2" Ice			
1" Dia x 3.5-ft	B	From Leg	1.5000	0.0000	40.0000	No Ice	0.0000	0.3675	0.0040
			0.0000			1/2"	0.0000	0.6798	0.0074
			0.0000			Ice	0.0000	0.8994	0.0132
						1" Ice	0.0000	1.3662	0.0326
						2" Ice			
1" Dia x 3.5-ft	C	From Leg	1.5000	0.0000	40.0000	No Ice	0.0000	0.3675	0.0040
			0.0000			1/2"	0.0000	0.6798	0.0074

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K
			0.0000			Ice 0.0000	0.8994	0.0132
						1" Ice 0.0000	1.3662	0.0326
						2" Ice 0.0000		
** 1" Dia x 3.5-ft	A	From Leg	1.5000 0.0000 0.0000	0.0000	10.0000	No Ice 0.0000	0.3675	0.0040
						1/2" 0.0000	0.6798	0.0074
						Ice 0.0000	0.8994	0.0132
						1" Ice 0.0000	1.3662	0.0326
						2" Ice 0.0000		
1" Dia x 3.5-ft	B	From Leg	1.5000 0.0000 0.0000	0.0000	10.0000	No Ice 0.0000	0.3675	0.0040
						1/2" 0.0000	0.6798	0.0074
						Ice 0.0000	0.8994	0.0132
						1" Ice 0.0000	1.3662	0.0326
						2" Ice 0.0000		
1" Dia x 3.5-ft	C	From Leg	1.5000 0.0000 0.0000	0.0000	10.0000	No Ice 0.0000	0.3675	0.0040
						1/2" 0.0000	0.6798	0.0074
						Ice 0.0000	0.8994	0.0132
						1" Ice 0.0000	1.3662	0.0326
						2" Ice 0.0000		
** OPA-65R-LCUU-H4 w/ Mount Pipe	A	From Leg	4.0000 0.0000 2.0000	0.0000	188.0000	No Ice 6.0300	4.1100	0.0823
						1/2" 6.5600	4.6000	0.1307
						Ice 7.1100	5.1100	0.1872
						1" Ice 8.2600	6.1800	0.3262
						2" Ice 9.1900		
OPA-65R-LCUU-H6 w/ Mount Pipe	B	From Leg	4.0000 0.0000 2.0000	0.0000	188.0000	No Ice 9.1900	6.2100	0.1056
						1/2" 9.9400	6.9300	0.1751
						Ice 10.7100	7.6600	0.2556
						1" Ice 12.3000	9.1700	0.4508
						2" Ice 9.1900		
OPA-65R-LCUU-H6 w/ Mount Pipe	C	From Leg	4.0000 0.0000 2.0000	0.0000	188.0000	No Ice 9.1900	6.2100	0.1056
						1/2" 9.9400	6.9300	0.1751
						Ice 10.7100	7.6600	0.2556
						1" Ice 12.3000	9.1700	0.4508
						2" Ice 2.9500		
QS46512-2 w/ Mount Pipe	A	From Leg	4.0000 0.0000 2.0000	0.0000	188.0000	No Ice 2.9500	3.3300	0.0945
						1/2" 3.2500	3.6300	0.1491
						Ice 3.5500	3.9400	0.2124
						1" Ice 4.1900	4.6000	0.3664
						2" Ice 4.0400		
QS66512-2 w/ Mount Pipe	B	From Leg	4.0000 0.0000 2.0000	0.0000	188.0000	No Ice 4.0400	4.1800	0.1366
						1/2" 4.4200	4.5700	0.2062
						Ice 4.8200	4.9700	0.2868
						1" Ice 5.6300	5.7900	0.4821
						2" Ice 4.0400		
QS66512-2 w/ Mount Pipe	C	From Leg	4.0000 0.0000 2.0000	0.0000	188.0000	No Ice 4.0400	4.1800	0.1366
						1/2" 4.4200	4.5700	0.2062
						Ice 4.8200	4.9700	0.2868
						1" Ice 5.6300	5.7900	0.4821
						2" Ice 11.9600		
DMP65R-BU6D w/ Mount Pipe	A	From Leg	4.0000 0.0000 2.0000	0.0000	188.0000	No Ice 11.9600	5.9700	0.1147
						1/2" 12.7000	6.6300	0.2009
						Ice 13.4600	7.3000	0.2985
						1" Ice 15.0200	8.6900	0.5288
						2" Ice 7.5300		
DMP65R-BU4D w/ Mount Pipe	B	From Leg	4.0000 0.0000 2.0000	0.0000	188.0000	No Ice 7.5300	3.7900	0.0948
						1/2" 8.0400	4.2300	0.1556
						Ice 8.5700	4.6800	0.2249
						1" Ice 9.6800	5.6300	0.3909
						2" Ice 11.9600		
DMP65R-BU6D w/ Mount Pipe	C	From Leg	4.0000 0.0000 2.0000	0.0000	188.0000	No Ice 11.9600	5.9700	0.1147
						1/2" 12.7000	6.6300	0.2009
						Ice 13.4600	7.3000	0.2985
						1" Ice 15.0200	8.6900	0.5288
						2" Ice		

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight
			Horz	Lateral					
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K
OPA65R-BU6D w/ Mount Pipe	A	From Leg	4.0000	0.0000	188.0000	No Ice	12.2500	6.0500	0.0888
			0.0000			1/2"	13.0000	6.7100	0.1762
			2.0000			Ice	13.7600	7.3900	0.2749
						1" Ice	15.3400	8.7900	0.5075
OPA65R-BU4D w/ Mount Pipe	B	From Leg	4.0000	0.0000	188.0000	No Ice	8.1000	4.0300	0.0806
			0.0000			1/2"	8.6500	4.5000	0.1421
			2.0000			Ice	9.2100	4.9800	0.2123
						1" Ice	10.3900	5.9800	0.3799
OPA65R-BU6D w/ Mount Pipe	C	From Leg	4.0000	0.0000	188.0000	No Ice	12.2500	6.0500	0.0888
			0.0000			1/2"	13.0000	6.7100	0.1762
			2.0000			Ice	13.7600	7.3900	0.2749
						1" Ice	15.3400	8.7900	0.5075
RRUS 32 B30	A	From Leg	4.0000	0.0000	188.0000	No Ice	2.6923	1.5727	0.0600
			0.0000			1/2"	2.9115	1.7556	0.0804
			1.0000			Ice	3.1382	1.9455	0.1039
						1" Ice	3.6137	2.3462	0.1612
RRUS 32 B30	B	From Leg	4.0000	0.0000	188.0000	No Ice	2.6923	1.5727	0.0600
			0.0000			1/2"	2.9115	1.7556	0.0804
			1.0000			Ice	3.1382	1.9455	0.1039
						1" Ice	3.6137	2.3462	0.1612
RRUS 32 B30	C	From Leg	4.0000	0.0000	188.0000	No Ice	2.6923	1.5727	0.0600
			0.0000			1/2"	2.9115	1.7556	0.0804
			1.0000			Ice	3.1382	1.9455	0.1039
						1" Ice	3.6137	2.3462	0.1612
RRUS 32 B66	A	From Leg	4.0000	0.0000	188.0000	No Ice	2.7427	1.6681	0.0500
			0.0000			1/2"	2.9647	1.8552	0.0741
			1.0000			Ice	3.1941	2.0493	0.0984
						1" Ice	3.6753	2.4585	0.1574
RRUS 32 B66	B	From Leg	4.0000	0.0000	188.0000	No Ice	2.7427	1.6681	0.0500
			0.0000			1/2"	2.9647	1.8552	0.0741
			1.0000			Ice	3.1941	2.0493	0.0984
						1" Ice	3.6753	2.4585	0.1574
RRUS 32 B66	C	From Leg	4.0000	0.0000	188.0000	No Ice	2.7427	1.6681	0.0500
			0.0000			1/2"	2.9647	1.8552	0.0741
			1.0000			Ice	3.1941	2.0493	0.0984
						1" Ice	3.6753	2.4585	0.1574
RRUS 32 B2	A	From Leg	4.0000	0.0000	188.0000	No Ice	2.7313	1.6681	0.0500
			0.0000			1/2"	2.9531	1.8552	0.0740
			2.0000			Ice	3.1823	2.0493	0.0982
						1" Ice	3.6628	2.4585	0.1571
RRUS 32 B2	B	From Leg	4.0000	0.0000	188.0000	No Ice	2.7313	1.6681	0.0500
			0.0000			1/2"	2.9531	1.8552	0.0740
			2.0000			Ice	3.1823	2.0493	0.0982
						1" Ice	3.6628	2.4585	0.1571
RRUS 32 B2	C	From Leg	4.0000	0.0000	188.0000	No Ice	2.7313	1.6681	0.0500
			0.0000			1/2"	2.9531	1.8552	0.0740
			2.0000			Ice	3.1823	2.0493	0.0982
						1" Ice	3.6628	2.4585	0.1571
RRUS 32 B2	A	From Leg	4.0000	0.0000	188.0000	No Ice	2.7313	1.6681	0.0500
			0.0000			1/2"	2.9531	1.8552	0.0740
			2.0000			Ice	3.1823	2.0493	0.0982
						1" Ice	3.6628	2.4585	0.1571

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight	
			Horz	Lateral						Vert
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K	
RRUS 32 B2	B	From Leg	4.0000	0.0000	0.0000	188.0000	No Ice	2.7313	1.6681	0.0500
			0.0000				1/2"	2.9531	1.8552	0.0740
			2.0000				Ice	3.1823	2.0493	0.0982
							1" Ice	3.6628	2.4585	0.1571
							2" Ice			
RRUS 32 B2	C	From Leg	4.0000	0.0000	0.0000	188.0000	No Ice	2.7313	1.6681	0.0500
			0.0000				1/2"	2.9531	1.8552	0.0740
			2.0000				Ice	3.1823	2.0493	0.0982
							1" Ice	3.6628	2.4585	0.1571
							2" Ice			
RRUS 4449 B5/B12	A	From Leg	4.0000	0.0000	0.0000	188.0000	No Ice	1.9675	1.4081	0.0700
			0.0000				1/2"	2.1439	1.5637	0.0895
			2.0000				Ice	2.3278	1.7267	0.1108
							1" Ice	2.7177	2.0749	0.1627
							2" Ice			
RRUS 4449 B5/B12	B	From Leg	4.0000	0.0000	0.0000	188.0000	No Ice	1.9675	1.4081	0.0700
			0.0000				1/2"	2.1439	1.5637	0.0895
			2.0000				Ice	2.3278	1.7267	0.1108
							1" Ice	2.7177	2.0749	0.1627
							2" Ice			
RRUS 4449 B5/B12	C	From Leg	4.0000	0.0000	0.0000	188.0000	No Ice	1.9675	1.4081	0.0700
			0.0000				1/2"	2.1439	1.5637	0.0895
			2.0000				Ice	2.3278	1.7267	0.1108
							1" Ice	2.7177	2.0749	0.1627
							2" Ice			
RRUS 4478 B14	A	From Leg	4.0000	0.0000	0.0000	188.0000	No Ice	1.8425	1.0588	0.0600
			0.0000				1/2"	2.0123	1.1969	0.0758
			2.0000				Ice	2.1895	1.3425	0.0943
							1" Ice	2.5662	1.6558	0.1400
							2" Ice			
RRUS 4478 B14	B	From Leg	4.0000	0.0000	0.0000	188.0000	No Ice	1.8425	1.0588	0.0600
			0.0000				1/2"	2.0123	1.1969	0.0758
			2.0000				Ice	2.1895	1.3425	0.0943
							1" Ice	2.5662	1.6558	0.1400
							2" Ice			
RRUS 4478 B14	C	From Leg	4.0000	0.0000	0.0000	188.0000	No Ice	1.8425	1.0588	0.0600
			0.0000				1/2"	2.0123	1.1969	0.0758
			2.0000				Ice	2.1895	1.3425	0.0943
							1" Ice	2.5662	1.6558	0.1400
							2" Ice			
RRUS E2 B29	A	From Leg	4.0000	0.0000	0.0000	188.0000	No Ice	3.1450	1.2854	0.0600
			0.0000				1/2"	3.3648	1.4379	0.0832
			2.0000				Ice	3.5920	1.5998	0.1096
							1" Ice	4.0687	1.9543	0.1729
							2" Ice			
RRUS E2 B29	B	From Leg	4.0000	0.0000	0.0000	188.0000	No Ice	3.1450	1.2854	0.0600
			0.0000				1/2"	3.3648	1.4379	0.0832
			2.0000				Ice	3.5920	1.5998	0.1096
							1" Ice	4.0687	1.9543	0.1729
							2" Ice			
RRUS E2 B29	C	From Leg	4.0000	0.0000	0.0000	188.0000	No Ice	3.1450	1.2854	0.0600
			0.0000				1/2"	3.3648	1.4379	0.0832
			2.0000				Ice	3.5920	1.5998	0.1096
							1" Ice	4.0687	1.9543	0.1729
							2" Ice			
DC6-48-60-18-8F	A	From Leg	4.0000	0.0000	0.0000	188.0000	No Ice	1.2117	1.2117	0.0200
			0.0000				1/2"	1.8924	1.8924	0.0420
			1.0000				Ice	2.1051	2.1051	0.0668
							1" Ice	2.5703	2.5703	0.1256
							2" Ice			
DC6-48-60-0-8F	B	From Leg	4.0000	0.0000	0.0000	188.0000	No Ice	0.9167	0.9167	0.0300
			0.0000				1/2"	1.4583	1.4583	0.0505
			1.0000				Ice	1.6431	1.6431	0.0707
							1" Ice	2.0417	2.0417	0.1192
							2" Ice			

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight	
			Horz	Lateral						ft
DC6-48-60-18-8F	C	From Leg	4.0000	0.0000	0.0000	188.0000	No Ice	1.2117	1.2117	0.0200
			0.0000				1/2"	1.8924	1.8924	0.0420
			1.0000				Ice	2.1051	2.1051	0.0668
							1" Ice	2.5703	2.5703	0.1256
							2" Ice			
DC6-48-60-18-8C	A	From Leg	4.0000	0.0000	0.0000	188.0000	No Ice	1.1450	1.1450	0.0300
			0.0000				1/2"	1.7924	1.7924	0.0466
			2.0000				Ice	2.0024	2.0024	0.0698
							1" Ice	2.4512	2.4512	0.1251
							2" Ice			
Platform Mount [LP 1201-1_KCKR-HR-1]	C	None			0.0000	188.0000	No Ice	37.6100	37.6100	2.6307
							1/2"	45.6200	45.6200	3.4778
							Ice	53.5900	53.5900	4.4618
							1" Ice	69.6500	69.6500	6.8485
							2" Ice			
6' x 2" Mount Pipe	A	From Leg	4.0000	0.0000	0.0000	188.0000	No Ice	1.4250	1.4250	0.0200
			0.0000				1/2"	1.9250	1.9250	0.0328
			0.0000				Ice	2.2939	2.2939	0.0477
							1" Ice	3.0596	3.0596	0.0903
							2" Ice			
6' x 2" Mount Pipe	B	From Leg	4.0000	0.0000	0.0000	188.0000	No Ice	1.4250	1.4250	0.0200
			0.0000				1/2"	1.9250	1.9250	0.0328
			0.0000				Ice	2.2939	2.2939	0.0477
							1" Ice	3.0596	3.0596	0.0903
							2" Ice			
6' x 2" Mount Pipe	C	From Leg	4.0000	0.0000	0.0000	188.0000	No Ice	1.4250	1.4250	0.0200
			0.0000				1/2"	1.9250	1.9250	0.0328
			0.0000				Ice	2.2939	2.2939	0.0477
							1" Ice	3.0596	3.0596	0.0903
							2" Ice			
**										
MX08FRO665-21 w/ Mount Pipe	A	From Leg	4.0000	0.0000	0.0000	173.0000	No Ice	8.0100	4.2300	0.1081
			0.0000				1/2"	8.5200	4.6900	0.1943
			0.0000				Ice	9.0400	5.1600	0.2919
							1" Ice	10.1100	6.1200	0.5225
							2" Ice			
MX08FRO665-21 w/ Mount Pipe	B	From Leg	4.0000	0.0000	0.0000	173.0000	No Ice	8.0100	4.2300	0.1081
			0.0000				1/2"	8.5200	4.6900	0.1943
			0.0000				Ice	9.0400	5.1600	0.2919
							1" Ice	10.1100	6.1200	0.5225
							2" Ice			
MX08FRO665-21 w/ Mount Pipe	C	From Leg	4.0000	0.0000	0.0000	173.0000	No Ice	8.0100	4.2300	0.1081
			0.0000				1/2"	8.5200	4.6900	0.1943
			0.0000				Ice	9.0400	5.1600	0.2919
							1" Ice	10.1100	6.1200	0.5225
							2" Ice			
TA08025-B604	A	From Leg	4.0000	0.0000	0.0000	173.0000	No Ice	1.9635	0.9811	0.0639
			0.0000				1/2"	2.1378	1.1117	0.0807
			0.0000				Ice	2.3195	1.2496	0.1001
							1" Ice	2.7052	1.5477	0.1479
							2" Ice			
TA08025-B604	B	From Leg	4.0000	0.0000	0.0000	173.0000	No Ice	1.9635	0.9811	0.0639
			0.0000				1/2"	2.1378	1.1117	0.0807
			0.0000				Ice	2.3195	1.2496	0.1001
							1" Ice	2.7052	1.5477	0.1479
							2" Ice			
TA08025-B604	C	From Leg	4.0000	0.0000	0.0000	173.0000	No Ice	1.9635	0.9811	0.0639
			0.0000				1/2"	2.1378	1.1117	0.0807
			0.0000				Ice	2.3195	1.2496	0.1001
							1" Ice	2.7052	1.5477	0.1479
							2" Ice			
TA08025-B605	A	From Leg	4.0000	0.0000	0.0000	173.0000	No Ice	1.9635	1.1295	0.0750
			0.0000				1/2"	2.1378	1.2666	0.0930
			0.0000				Ice	2.3195	1.4112	0.1137
							1" Ice	2.7052	1.7225	0.1643
							2" Ice			



Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K
TA08025-B605	B	From Leg	4.0000 0.0000 0.0000	0.0000	173.0000	2" Ice			
						No Ice	1.9635	1.1295	0.0750
						1/2"	2.1378	1.2666	0.0930
						Ice	2.3195	1.4112	0.1137
TA08025-B605	C	From Leg	4.0000 0.0000 0.0000	0.0000	173.0000	1" Ice	2.7052	1.7225	0.1643
						2" Ice			
						No Ice	1.9635	1.1295	0.0750
						1/2"	2.1378	1.2666	0.0930
RDIDC-9181-PF-48	A	From Leg	4.0000 0.0000 0.0000	0.0000	173.0000	Ice	2.3195	1.4112	0.1137
						1" Ice	2.7052	1.7225	0.1643
						2" Ice			
						No Ice	2.3118	1.2931	0.0219
Commscope MC-PK8-DSH	C	None		0.0000	173.0000	1/2"	2.5022	1.4479	0.0411
						Ice	2.7000	1.6101	0.0633
						1" Ice	3.1179	1.9566	0.1170
						2" Ice			
(2) 6' x 2" Mount Pipe	A	From Leg	4.0000 0.0000 0.0000	0.0000	173.0000	No Ice	34.2400	34.2400	1.7490
						1/2"	62.9500	62.9500	2.0994
						Ice	91.6600	91.6600	2.4498
						1" Ice	149.0800	149.0800	3.1506
(2) 6' x 2" Mount Pipe	B	From Leg	4.0000 0.0000 0.0000	0.0000	173.0000	2" Ice			
						No Ice	1.4250	1.4250	0.0220
						1/2"	1.9250	1.9250	0.0328
						Ice	2.2939	2.2939	0.0477
(2) 6' x 2" Mount Pipe	C	From Leg	4.0000 0.0000 0.0000	0.0000	173.0000	1" Ice	3.0596	3.0596	0.0903
						2" Ice			
						No Ice	1.4250	1.4250	0.0220
						1/2"	1.9250	1.9250	0.0328
APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Leg	4.0000 0.0000 0.0000	0.0000	161.0000	Ice	2.2939	2.2939	0.0477
						1" Ice	3.0596	3.0596	0.0903
						2" Ice			
						No Ice	1.4250	1.4250	0.0220
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Leg	4.0000 0.0000 0.0000	0.0000	161.0000	1/2"	1.9250	1.9250	0.0328
						Ice	2.2939	2.2939	0.0477
						1" Ice	3.0596	3.0596	0.0903
						2" Ice			
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Leg	4.0000 0.0000 0.0000	0.0000	161.0000	No Ice	14.6900	6.8700	0.1862
						1/2"	15.4600	7.5500	0.3147
						Ice	16.2300	8.2500	0.4577
						1" Ice	17.8200	9.6700	0.7882
AIR -32 B2A/B66AA w/ Mount Pipe	A	From Leg	4.0000 0.0000 0.0000	0.0000	161.0000	2" Ice			
						No Ice	3.7600	3.1500	0.1937
						1/2"	4.1200	3.4900	0.2519
						Ice	4.4800	3.8400	0.3195
AIR -32 B2A/B66AA w/ Mount Pipe	B	From Leg	4.0000 0.0000 0.0000	0.0000	161.0000	1" Ice	5.2400	4.5800	0.4845
						2" Ice			
						No Ice	3.7600	3.1500	0.1937
						1/2"	4.1200	3.4900	0.2519
AIR -32 B2A/B66AA w/ Mount Pipe	C	From Leg	4.0000 0.0000 0.0000	0.0000	161.0000	Ice	4.4800	3.8400	0.3195
						1" Ice	5.2400	4.5800	0.4845
						2" Ice			
						No Ice	3.7600	3.1500	0.1937
AIR -32 B2A/B66AA w/ Mount Pipe	A	From Leg	4.0000 0.0000 0.0000	0.0000	161.0000	1/2"	4.1200	3.4900	0.2519
						Ice	4.4800	3.8400	0.3195
						1" Ice	5.2400	4.5800	0.4845
						2" Ice			
AIR -32 B2A/B66AA w/ Mount Pipe	B	From Leg	4.0000 0.0000 0.0000	0.0000	161.0000	No Ice	3.7600	3.1500	0.1937
						1/2"	4.1200	3.4900	0.2519
						Ice	4.4800	3.8400	0.3195
						1" Ice	5.2400	4.5800	0.4845
AIR -32 B2A/B66AA w/ Mount Pipe	C	From Leg	4.0000 0.0000 0.0000	0.0000	161.0000	2" Ice			
						No Ice	3.7600	3.1500	0.1937
						1/2"	4.1200	3.4900	0.2519
						Ice	4.4800	3.8400	0.3195

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight	
			Horz	Lateral						ft
AIR6449 B41_T-MOBILE w/ Mount Pipe	A	From Leg	4.0000	0.0000	0.0000	161.0000	1" Ice	5.2400	4.5800	0.4845
							2" Ice			
							No Ice	5.1900	2.7100	0.1284
							1/2" Ice	5.5900	3.0400	0.1740
AIR6449 B41_T-MOBILE w/ Mount Pipe	B	From Leg	4.0000	0.0000	0.0000	161.0000	1" Ice	6.0200	3.3800	0.2266
							2" Ice			
							No Ice	5.1900	2.7100	0.1284
							1/2" Ice	5.5900	3.0400	0.1740
AIR6449 B41_T-MOBILE w/ Mount Pipe	C	From Leg	4.0000	0.0000	0.0000	161.0000	1" Ice	6.0200	3.3800	0.2266
							2" Ice			
							No Ice	5.1900	2.7100	0.1284
							1/2" Ice	5.5900	3.0400	0.1740
RRUS 4415 B25_CCIV2	A	From Leg	4.0000	0.0000	0.0000	161.0000	1" Ice	6.9000	4.1200	0.3538
							2" Ice			
							No Ice	5.1900	2.7100	0.1284
							1/2" Ice	5.5900	3.0400	0.1740
RRUS 4415 B25_CCIV2	B	From Leg	4.0000	0.0000	0.0000	161.0000	1" Ice	6.9000	4.1200	0.3538
							2" Ice			
							No Ice	5.1900	2.7100	0.1284
							1/2" Ice	5.5900	3.0400	0.1740
RRUS 4415 B25_CCIV2	C	From Leg	4.0000	0.0000	0.0000	161.0000	1" Ice	6.9000	4.1200	0.3538
							2" Ice			
							No Ice	5.1900	2.7100	0.1284
							1/2" Ice	5.5900	3.0400	0.1740
RRUS 4415 B25_CCIV2	A	From Leg	4.0000	0.0000	0.0000	161.0000	1" Ice	2.5662	1.3683	0.1182
							2" Ice			
							No Ice	1.8425	0.8202	0.0500
							1/2" Ice	2.0123	0.9434	0.0601
RRUS 4415 B25_CCIV2	B	From Leg	4.0000	0.0000	0.0000	161.0000	1" Ice	2.5662	1.3683	0.1182
							2" Ice			
							No Ice	1.8425	0.8202	0.0500
							1/2" Ice	2.0123	0.9434	0.0601
RRUS 4415 B25_CCIV2	C	From Leg	4.0000	0.0000	0.0000	161.0000	1" Ice	2.5662	1.3683	0.1182
							2" Ice			
							No Ice	1.8425	0.8202	0.0500
							1/2" Ice	2.0123	0.9434	0.0601
RADIO 4449 B71 B85A_T-MOBILE	A	From Leg	4.0000	0.0000	0.0000	161.0000	1" Ice	2.7207	2.2800	0.1704
							2" Ice			
							No Ice	1.9701	1.5865	0.0700
							1/2" Ice	2.1466	1.7488	0.0930
RADIO 4449 B71 B85A_T-MOBILE	B	From Leg	4.0000	0.0000	0.0000	161.0000	1" Ice	2.7207	2.2800	0.1704
							2" Ice			
							No Ice	1.9701	1.5865	0.0700
							1/2" Ice	2.1466	1.7488	0.0930
RADIO 4449 B71 B85A_T-MOBILE	C	From Leg	4.0000	0.0000	0.0000	161.0000	1" Ice	2.7207	2.2800	0.1704
							2" Ice			
							No Ice	1.9701	1.5865	0.0700
							1/2" Ice	2.1466	1.7488	0.0930
Platform Mount [LP 602-1_KCKR]	C	None			0.0000	161.0000	1" Ice	2.7207	2.2800	0.1704
							2" Ice			
							No Ice	42.3000	42.3000	1.6183
							1/2" Ice	49.0400	49.0400	2.3836
6' x 2" Mount Pipe	A	From Leg	4.0000	0.0000	0.0000	161.0000	1" Ice	69.8500	69.8500	5.3981
							2" Ice			
							No Ice	1.4250	1.4250	0.0200
							1/2" Ice	1.9250	1.9250	0.0328
6' x 2" Mount Pipe	B	From Leg	4.0000	0.0000	0.0000	161.0000	1" Ice	3.0596	3.0596	0.0903
							2" Ice			
							No Ice	1.4250	1.4250	0.0200
							1/2" Ice	1.9250	1.9250	0.0328
6' x 2" Mount Pipe	C	From Leg	4.0000	0.0000	0.0000	161.0000	1" Ice	3.0596	3.0596	0.0903
							2" Ice			
							No Ice	1.4250	1.4250	0.0200
							1/2" Ice	1.9250	1.9250	0.0328

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K
						1" Ice	3.0596	3.0596	0.0903
						2" Ice			
** (2) SBNHH-1D65B w/ Mount Pipe	A	From Leg	4.0000 0.0000 -1.0000	0.0000	146.0000	No Ice	4.0900	3.3000	0.0665
						1/2"	4.4900	3.6800	0.1297
						Ice	4.8900	4.0700	0.2037
						1" Ice	5.7200	4.8700	0.3859
						2" Ice			
(2) SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.0000 0.0000 -1.0000	0.0000	146.0000	No Ice	4.0900	3.3000	0.0665
						1/2"	4.4900	3.6800	0.1297
						Ice	4.8900	4.0700	0.2037
						1" Ice	5.7200	4.8700	0.3859
						2" Ice			
(2) SBNHH-1D65B w/ Mount Pipe	C	From Leg	4.0000 0.0000 -1.0000	0.0000	146.0000	No Ice	4.0900	3.3000	0.0665
						1/2"	4.4900	3.6800	0.1297
						Ice	4.8900	4.0700	0.2037
						1" Ice	5.7200	4.8700	0.3859
						2" Ice			
BXA-80063-6BF-EDIN-4 w/ Mount Pipe	A	From Leg	4.0000 0.0000 -1.0000	0.0000	146.0000	No Ice	7.4998	5.6302	0.0400
						1/2"	8.0328	6.7191	0.1029
						Ice	8.5348	7.5606	0.1696
						1" Ice	9.5641	9.2937	0.3290
						2" Ice			
BXA-80063-6BF-EDIN-4 w/ Mount Pipe	B	From Leg	4.0000 0.0000 -1.0000	0.0000	146.0000	No Ice	7.4998	5.6302	0.0400
						1/2"	8.0328	6.7191	0.1029
						Ice	8.5348	7.5606	0.1696
						1" Ice	9.5641	9.2937	0.3290
						2" Ice			
BXA-80063-6BF-EDIN-4 w/ Mount Pipe	C	From Leg	4.0000 0.0000 -1.0000	0.0000	146.0000	No Ice	7.4998	5.6302	0.0400
						1/2"	8.0328	6.7191	0.1029
						Ice	8.5348	7.5606	0.1696
						1" Ice	9.5641	9.2937	0.3290
						2" Ice			
CBRS w/ Mount Pipe	A	From Leg	4.0000 0.0000 -3.0000	0.0000	146.0000	No Ice	1.4500	0.9900	0.0317
						1/2"	1.6700	1.1800	0.0479
						Ice	1.9000	1.3900	0.0683
						1" Ice	2.4200	1.8500	0.1229
						2" Ice			
CBRS w/ Mount Pipe	B	From Leg	4.0000 0.0000 -3.0000	0.0000	146.0000	No Ice	1.4500	0.9900	0.0317
						1/2"	1.6700	1.1800	0.0479
						Ice	1.9000	1.3900	0.0683
						1" Ice	2.4200	1.8500	0.1229
						2" Ice			
CBRS w/ Mount Pipe	C	From Leg	4.0000 0.0000 -3.0000	0.0000	146.0000	No Ice	1.4500	0.9900	0.0317
						1/2"	1.6700	1.1800	0.0479
						Ice	1.9000	1.3900	0.0683
						1" Ice	2.4200	1.8500	0.1229
						2" Ice			
MT6407-77A w/ Mount Pipe	A	From Leg	4.0000 0.0000 1.0000	0.0000	146.0000	No Ice	4.9069	2.6821	0.1000
						1/2"	5.2559	3.1450	0.1356
						Ice	5.6147	3.6241	0.1804
						1" Ice	6.3615	4.6310	0.2880
						2" Ice			
MT6407-77A w/ Mount Pipe	C	From Leg	4.0000 0.0000 1.0000	0.0000	146.0000	No Ice	4.9069	2.6821	0.1000
						1/2"	5.2559	3.1450	0.1356
						Ice	5.6147	3.6241	0.1804
						1" Ice	6.3615	4.6310	0.2880
						2" Ice			
MT6407-77A w/ Mount Pipe	B	From Leg	4.0000 0.0000 1.0000	0.0000	146.0000	No Ice	4.9069	2.6821	0.1000
						1/2"	5.2559	3.1450	0.1356
						Ice	5.6147	3.6241	0.1804
						1" Ice	6.3615	4.6310	0.2880
						2" Ice			
(2) RFV01U-D2A	A	From Leg	4.0000 0.0000	0.0000	146.0000	No Ice	1.8750	1.0125	0.0700
						1/2"	2.0454	1.1445	0.0867

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C <sub>A</sub> A <sub>Front</sub>	C <sub>A</sub> A <sub>Side</sub>	Weight
			Horz	Lateral	Vert					
					3.0000					
							Ice	2.2231	1.2840	0.1058
							1" Ice	2.6009	1.5851	0.1528
							2" Ice			
RFV01U-D2A	B	From Leg	4.0000	0.0000	146.0000		No Ice	1.8750	1.0125	0.0700
			0.0000				1/2"	2.0454	1.1445	0.0867
			3.0000				Ice	2.2231	1.2840	0.1058
							1" Ice	2.6009	1.5851	0.1528
							2" Ice			
RFV01U-D1A	B	From Leg	4.0000	0.0000	146.0000		No Ice	1.8750	1.2500	0.0800
			0.0000				1/2"	2.0454	1.3926	0.1027
			3.0000				Ice	2.2231	1.5426	0.1239
							1" Ice	2.6009	1.8648	0.1753
							2" Ice			
(2) RFV01U-D1A	C	From Leg	4.0000	0.0000	146.0000		No Ice	1.8750	1.2500	0.0800
			0.0000				1/2"	2.0454	1.3926	0.1027
			3.0000				Ice	2.2231	1.5426	0.1239
							1" Ice	2.6009	1.8648	0.1753
							2" Ice			
RHSDC-3315-PF-48	A	From Leg	4.0000	0.0000	146.0000		No Ice	3.3636	2.1921	0.0300
			0.0000				1/2"	3.5972	2.3950	0.0605
			-1.0000				Ice	3.8383	2.6056	0.0926
							1" Ice	4.3426	3.0491	0.1682
							2" Ice			
Platform Mount [LP 712-1]	C	None		0.0000	146.0000		No Ice	24.5600	24.5600	1.3350
							1/2"	27.9200	27.9200	1.9148
							Ice	31.2700	31.2700	2.5477
							1" Ice	37.9800	37.9800	3.9714
							2" Ice			
Top-Rail Kit	C	None		0.0000	146.0000		No Ice	4.5600	4.5600	0.2450
							1/2"	6.3900	6.3900	0.3114
							Ice	8.1800	8.1800	0.4019
							1" Ice	11.6600	11.6600	0.6570
							2" Ice			
**										

## 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

Comb. No.	Description
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	188 - 137	Pole	Max Tension	27	0.0001	-0.0013	-0.0056
			Max. Compression	26	-55.7540	1.6275	1.5745
			Max. Mx	20	-18.1335	873.5669	-5.7169
			Max. My	2	-18.0868	-5.6229	878.0431
			Max. Vy	20	-29.7328	873.5669	-5.7169
			Max. Vx	2	-29.9080	-5.6229	878.0431
			Max. Torque	16			-1.4274
L2	137 - 90.25	Pole	Max Tension	1	0.0000	0.0000	0.0000
			Max. Compression	26	-69.5686	1.7347	1.6783
			Max. Mx	20	-27.9466	2330.4355	-11.0215
			Max. My	2	-27.9169	-10.9026	2342.9534
			Max. Vy	20	-33.9264	2330.4355	-11.0215
			Max. Vx	2	-34.1015	-10.9026	2342.9534
			Max. Torque	16			-1.4250
L3	90.25 - 44.5	Pole	Max Tension	1	0.0000	0.0000	0.0000
			Max. Compression	26	-87.6600	1.7344	1.6780
			Max. Mx	20	-41.3611	3933.2484	-16.0435
			Max. My	2	-41.3474	-15.9161	3953.4932
			Max. Vy	20	-37.9826	3933.2484	-16.0435
			Max. Vx	2	-38.1537	-15.9161	3953.4932
			Max. Torque	16			-1.4097
L4	44.5 - 0	Pole	Max Tension	1	0.0000	0.0000	0.0000
			Max. Compression	26	-115.9708	1.7338	1.6775
			Max. Mx	20	-63.6630	5980.5247	-21.5472
			Max. My	2	-63.6627	-21.4194	6009.3276
			Max. Vy	20	-41.9531	5980.5247	-21.5472
			Max. Vx	2	-42.1165	-21.4194	6009.3276
			Max. Torque	16			-1.4017

### Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	27	115.9708	-0.0167	12.3163
	Max. H <sub>x</sub>	20	63.6985	41.8992	-0.1043
	Max. H <sub>z</sub>	2	63.6985	-0.1043	42.0624
	Max. M <sub>x</sub>	2	6009.3276	-0.1043	42.0624
	Max. M <sub>z</sub>	8	5980.1282	-41.8992	0.1043
	Max. Torsion	4	1.3740	-21.0399	36.4792
	Min. Vert	19	47.7739	36.3379	-21.1215
	Min. H <sub>x</sub>	8	63.6985	-41.8992	0.1043
	Min. H <sub>z</sub>	14	63.6985	0.1043	-42.0624
	Min. M <sub>x</sub>	14	-6009.2084	0.1043	-42.0624
	Min. M <sub>z</sub>	20	-5980.5247	41.8992	-0.1043
	Min. Torsion	16	-1.3998	21.0399	-36.4792

### Tower Mast Reaction Summary

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 Only	53.0821	0.0000	0.0000	-0.0466	0.1468	0.0000
1.2 Dead+1.0 Wind 0 deg - No Ice	63.6985	0.1043	-42.0624	-6009.3276	-21.4197	-1.1218
0.9 Dead+1.0 Wind 0 deg - No Ice	47.7739	0.1043	-42.0624	-5905.5934	-21.0131	-1.1181
1.2 Dead+1.0 Wind 30 deg - No Ice	63.6985	21.0399	-36.4792	-5214.8919	-3008.4841	-1.3740
0.9 Dead+1.0 Wind 30 deg - No Ice	47.7739	21.0399	-36.4792	-5124.8366	-2956.5514	-1.3728
1.2 Dead+1.0 Wind 60 deg - No Ice	63.6985	36.3379	-21.1215	-3023.3555	-5189.4890	-1.2684
0.9 Dead+1.0 Wind 60 deg - No Ice	47.7739	36.3379	-21.1215	-2971.0948	-5099.9526	-1.2692
1.2 Dead+1.0 Wind 90 deg - No Ice	63.6985	41.8992	-0.1043	-21.6188	-5980.1282	-0.8107
0.9 Dead+1.0 Wind 90 deg - No Ice	47.7739	41.8992	-0.1043	-21.1587	-5876.9841	-0.8141
1.2 Dead+1.0 Wind 120 deg - No Ice	63.6985	36.2336	20.9409	2986.1072	-5168.2596	-0.1142
0.9 Dead+1.0 Wind 120 deg - No Ice	47.7739	36.2336	20.9409	2934.6301	-5079.1472	-0.1201
1.2 Dead+1.0 Wind 150 deg - No Ice	63.6985	20.8593	36.3749	5193.5792	-2971.2979	0.6215
0.9 Dead+1.0 Wind 150 deg - No Ice	47.7739	20.8593	36.3749	5103.9702	-2920.1331	0.6150
1.2 Dead+1.0 Wind 180 deg - No Ice	63.6985	-0.1043	42.0624	6009.2084	21.7437	1.1792
0.9 Dead+1.0 Wind 180 deg - No Ice	47.7739	-0.1043	42.0624	5905.5063	21.2487	1.1736
1.2 Dead+1.0 Wind 210 deg - No Ice	63.6985	-21.0399	36.4792	5214.8161	3008.8049	1.3998
0.9 Dead+1.0 Wind 210 deg - No Ice	47.7739	-21.0399	36.4792	5124.7803	2956.7847	1.3975
1.2 Dead+1.0 Wind 240 deg - No Ice	63.6985	-36.3379	21.1215	3023.3037	5189.8460	1.2361
0.9 Dead+1.0 Wind 240 deg - No Ice	47.7739	-36.3379	21.1215	2971.0556	5100.2116	1.2383
1.2 Dead+1.0 Wind 270 deg - No Ice	63.6985	-41.8992	0.1043	21.5474	5980.5247	0.7536
0.9 Dead+1.0 Wind 270 deg - No Ice	47.7739	-41.8992	0.1043	21.1057	5877.2712	0.7589
1.2 Dead+1.0 Wind 300 deg - No Ice	63.6985	-36.2336	-20.9409	-2986.2220	5168.6591	0.0895
0.9 Dead+1.0 Wind 300 deg	47.7739	-36.2336	-20.9409	-2934.7139	5079.4366	0.0959

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
- No Ice						
1.2 Dead+1.0 Wind 330 deg	63.6985	-20.8593	-36.3749	-5193.7178	2971.6611	-0.5899
- No Ice						
0.9 Dead+1.0 Wind 330 deg	47.7739	-20.8593	-36.3749	-5104.0711	2920.3967	-0.5841
- No Ice						
1.2 Dead+1.0 Ice+1.0 Temp	115.9708	-0.0000	-0.0000	-1.6775	1.7338	-0.0001
1.2 Dead+1.0 Wind 0	115.9708	0.0167	-12.3163	-1944.3507	-1.9730	-0.3659
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 30	115.9708	6.1581	-10.6742	-1686.1926	-969.8533	-0.4476
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 60	115.9708	10.6495	-6.1724	-976.6196	-1677.3305	-0.4100
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 90	115.9708	12.2877	-0.0167	-5.8754	-1934.7199	-0.2617
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 120	115.9708	10.6328	6.1435	965.9316	-1673.3818	-0.0421
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 150	115.9708	6.1292	10.6575	1678.4014	-963.0051	0.1891
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 180	115.9708	-0.0167	12.3163	1940.5047	5.9372	0.3690
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 210	115.9708	-6.1581	10.6742	1682.3533	973.8186	0.4489
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 240	115.9708	-10.6495	6.1724	972.7830	1681.3024	0.4078
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 270	115.9708	-12.2877	0.0167	2.0349	1938.6971	0.2582
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 300	115.9708	-10.6328	-6.1435	-969.7797	1677.3588	0.0407
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 330	115.9708	-6.1292	-10.6575	-1682.2523	966.9755	-0.1874
deg+1.0 Ice+1.0 Temp						
Dead+Wind 0 deg - Service	53.0821	0.0226	-9.1326	-1295.2989	-4.4799	-0.2587
Dead+Wind 30 deg - Service	53.0821	4.5682	-7.9204	-1124.1124	-648.3495	-0.3173
Dead+Wind 60 deg - Service	53.0821	7.8897	-4.5859	-651.7090	-1118.4507	-0.2912
Dead+Wind 90 deg - Service	53.0821	9.0972	-0.0226	-4.6935	-1288.7944	-0.1866
Dead+Wind 120 deg - Service	53.0821	7.8671	4.5467	643.5678	-1113.8099	-0.0311
Dead+Wind 150 deg - Service	53.0821	4.5290	7.8978	1119.3713	-640.3076	0.1331
Dead+Wind 180 deg - Service	53.0821	-0.0226	9.1326	1295.1972	4.8072	0.2612
Dead+Wind 210 deg - Service	53.0821	-4.5682	7.9204	1124.0125	648.6765	0.3184
Dead+Wind 240 deg - Service	53.0821	-7.8897	4.5859	651.6100	1118.7793	0.2898
Dead+Wind 270 deg - Service	53.0821	-9.0972	0.0226	4.5937	1289.1245	0.1841
Dead+Wind 300 deg - Service	53.0821	-7.8671	-4.5467	-643.6693	1114.1402	0.0300
Dead+Wind 330 deg - Service	53.0821	-4.5290	-7.8978	-1119.4738	640.6365	-0.1318

## 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	0.0000	-53.0821	0.0000	0.0000	53.0821	0.0000	0.000%
2	0.1043	-63.6985	-42.0624	-0.1043	63.6985	42.0624	0.000%
3	0.1043	-47.7739	-42.0624	-0.1043	47.7739	42.0624	0.000%
4	21.0399	-63.6985	-36.4792	-21.0399	63.6985	36.4792	0.000%
5	21.0399	-47.7739	-36.4792	-21.0399	47.7739	36.4792	0.000%
6	36.3379	-63.6985	-21.1215	-36.3379	63.6985	21.1215	0.000%
7	36.3379	-47.7739	-21.1215	-36.3379	47.7739	21.1215	0.000%
8	41.8992	-63.6985	-0.1043	-41.8992	63.6985	0.1043	0.000%
9	41.8992	-47.7739	-0.1043	-41.8992	47.7739	0.1043	0.000%
10	36.2336	-63.6985	20.9409	-36.2336	63.6985	-20.9409	0.000%

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
11	36.2336	-47.7739	20.9409	-36.2336	47.7739	-20.9409	0.000%
12	20.8593	-63.6985	36.3749	-20.8593	63.6985	-36.3749	0.000%
13	20.8593	-47.7739	36.3749	-20.8593	47.7739	-36.3749	0.000%
14	-0.1043	-63.6985	42.0624	0.1043	63.6985	-42.0624	0.000%
15	-0.1043	-47.7739	42.0624	0.1043	47.7739	-42.0624	0.000%
16	-21.0399	-63.6985	36.4792	21.0399	63.6985	-36.4792	0.000%
17	-21.0399	-47.7739	36.4792	21.0399	47.7739	-36.4792	0.000%
18	-36.3379	-63.6985	21.1215	36.3379	63.6985	-21.1215	0.000%
19	-36.3379	-47.7739	21.1215	36.3379	47.7739	-21.1215	0.000%
20	-41.8992	-63.6985	0.1043	41.8992	63.6985	-0.1043	0.000%
21	-41.8992	-47.7739	0.1043	41.8992	47.7739	-0.1043	0.000%
22	-36.2336	-63.6985	-20.9409	36.2336	63.6985	20.9409	0.000%
23	-36.2336	-47.7739	-20.9409	36.2336	47.7739	20.9409	0.000%
24	-20.8593	-63.6985	-36.3749	20.8593	63.6985	36.3749	0.000%
25	-20.8593	-47.7739	-36.3749	20.8593	47.7739	36.3749	0.000%
26	0.0000	-115.9708	0.0000	0.0000	115.9708	0.0000	0.000%
27	0.0167	-115.9708	-12.3158	-0.0167	115.9708	12.3163	0.000%
28	6.1581	-115.9708	-10.6741	-6.1581	115.9708	10.6742	0.000%
29	10.6494	-115.9708	-6.1724	-10.6495	115.9708	6.1724	0.000%
30	12.2872	-115.9708	-0.0167	-12.2877	115.9708	0.0167	0.000%
31	10.6327	-115.9708	6.1434	-10.6328	115.9708	-6.1435	0.000%
32	6.1291	-115.9708	10.6574	-6.1292	115.9708	-10.6575	0.000%
33	-0.0167	-115.9708	12.3158	0.0167	115.9708	-12.3163	0.000%
34	-6.1581	-115.9708	10.6741	6.1581	115.9708	-10.6742	0.000%
35	-10.6494	-115.9708	6.1724	10.6495	115.9708	-6.1724	0.000%
36	-12.2872	-115.9708	0.0167	12.2877	115.9708	-0.0167	0.000%
37	-10.6327	-115.9708	-6.1434	10.6328	115.9708	6.1435	0.000%
38	-6.1291	-115.9708	-10.6574	6.1292	115.9708	10.6575	0.000%
39	0.0226	-53.0821	-9.1326	-0.0226	53.0821	9.1326	0.000%
40	4.5682	-53.0821	-7.9204	-4.5682	53.0821	7.9204	0.000%
41	7.8897	-53.0821	-4.5859	-7.8897	53.0821	4.5859	0.000%
42	9.0972	-53.0821	-0.0226	-9.0972	53.0821	0.0226	0.000%
43	7.8671	-53.0821	4.5467	-7.8671	53.0821	-4.5467	0.000%
44	4.5290	-53.0821	7.8978	-4.5290	53.0821	-7.8978	0.000%
45	-0.0226	-53.0821	9.1326	0.0226	53.0821	-9.1326	0.000%
46	-4.5682	-53.0821	7.9204	4.5682	53.0821	-7.9204	0.000%
47	-7.8897	-53.0821	4.5859	7.8897	53.0821	-4.5859	0.000%
48	-9.0972	-53.0821	0.0226	9.0972	53.0821	-0.0226	0.000%
49	-7.8671	-53.0821	-4.5467	7.8671	53.0821	4.5467	0.000%
50	-4.5290	-53.0821	-7.8978	4.5290	53.0821	7.8978	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	0.00004953
3	Yes	5	0.00000001	0.00002032
4	Yes	6	0.00000001	0.00073051
5	Yes	6	0.00000001	0.00020091
6	Yes	6	0.00000001	0.00074607
7	Yes	6	0.00000001	0.00020649
8	Yes	5	0.00000001	0.00020830
9	Yes	5	0.00000001	0.00008908
10	Yes	6	0.00000001	0.00073247
11	Yes	6	0.00000001	0.00020355
12	Yes	6	0.00000001	0.00072906
13	Yes	6	0.00000001	0.00020229
14	Yes	5	0.00000001	0.00026241
15	Yes	5	0.00000001	0.00011211
16	Yes	6	0.00000001	0.00074777
17	Yes	6	0.00000001	0.00020698
18	Yes	6	0.00000001	0.00073137
19	Yes	6	0.00000001	0.00020124
20	Yes	5	0.00000001	0.00005397



21	Yes	5	0.00000001	0.00001961
22	Yes	6	0.00000001	0.00073315
23	Yes	6	0.00000001	0.00020378
24	Yes	6	0.00000001	0.00073736
25	Yes	6	0.00000001	0.00020517
26	Yes	4	0.00000001	0.00002664
27	Yes	6	0.00009082	0.00059442
28	Yes	7	0.00000001	0.00031434
29	Yes	7	0.00000001	0.00031967
30	Yes	6	0.00009080	0.00059007
31	Yes	7	0.00000001	0.00031081
32	Yes	7	0.00000001	0.00031001
33	Yes	6	0.00009080	0.00059272
34	Yes	7	0.00000001	0.00032061
35	Yes	7	0.00000001	0.00031465
36	Yes	6	0.00009086	0.00059233
37	Yes	7	0.00000001	0.00031579
38	Yes	7	0.00000001	0.00031723
39	Yes	4	0.00000001	0.00030426
40	Yes	5	0.00000001	0.00015676
41	Yes	5	0.00000001	0.00016580
42	Yes	4	0.00000001	0.00030088
43	Yes	5	0.00000001	0.00015646
44	Yes	5	0.00000001	0.00015486
45	Yes	4	0.00000001	0.00031899
46	Yes	5	0.00000001	0.00016705
47	Yes	5	0.00000001	0.00015712
48	Yes	4	0.00000001	0.00029134
49	Yes	5	0.00000001	0.00015726
50	Yes	5	0.00000001	0.00015973

### Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	188 - 137	44.2987	46	2.2701	0.0038
L2	141.25 - 90.25	23.7815	46	1.7992	0.0014
L3	95.5 - 44.5	9.8273	46	1.0696	0.0006
L4	51 - 0	2.5636	46	0.4684	0.0002

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

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
188.0000	Lighting Rod 3/4" x 8'	46	44.2987	2.2701	0.0039	31483
173.0000	MX08FRO665-21 w/ Mount Pipe	46	37.3411	2.1418	0.0030	10493
161.0000	APXVAARR24_43-U-NA20 w/ Mount Pipe	46	31.9484	2.0286	0.0023	5829
146.0000	(2) SBNHH-1D65B w/ Mount Pipe	46	25.6407	1.8608	0.0016	3746
100.0000	1" Dia x 3.5-ft	46	10.8954	1.1424	0.0006	3804
70.0000	1" Dia x 3.5-ft	46	4.9478	0.6985	0.0003	4074
40.0000	1" Dia x 3.5-ft	46	1.6412	0.3529	0.0001	5419
10.0000	1" Dia x 3.5-ft	40	0.2719	0.0828	0.0000	21674

### Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	188 - 137	204.6474	16	10.5334	0.0165
L2	141.25 - 90.25	110.1597	16	8.3572	0.0062
L3	95.5 - 44.5	45.5986	16	4.9695	0.0024
L4	51 - 0	11.8991	16	2.1749	0.0008

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

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
188.0000	Lighting Rod 3/4" x 8'	16	204.6474	10.5334	0.0177	7221
173.0000	MX08FRO665-21 w/ Mount Pipe	16	172.6296	9.9418	0.0136	2403
161.0000	APXVAARR24_43-U-NA20 w/ Mount Pipe	16	147.8024	9.4191	0.0106	1330
146.0000	(2) SBNHH-1D65B w/ Mount Pipe	16	118.7360	8.6425	0.0073	849
100.0000	1" Dia x 3.5-ft	16	50.5509	5.3075	0.0026	834
70.0000	1" Dia x 3.5-ft	16	22.9644	3.2445	0.0014	883
40.0000	1" Dia x 3.5-ft	16	7.6176	1.6384	0.0006	1169
10.0000	1" Dia x 3.5-ft	4	1.2619	0.3843	0.0001	4670

### 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	188 - 137 (1)	TP32.711x22x0.25	51.000	0.0000	0.0	25.049	-18.0680	1465.4000	0.012
L2	137 - 90.25 (2)	TP42.03x31.3184x0.3125	51.000	0.0000	0.0	40.284	-27.9058	2356.6600	0.012
L3	90.25 - 44.5 (3)	TP51.014x40.3023x0.375	51.000	0.0000	0.0	58.648	-41.3424	3430.9200	0.012
L4	44.5 - 0 (4)	TP59.61x48.8988x0.5	51.000	0.0000	0.0	93.807	-63.6626	5487.7400	0.012

### Pole Bending Design Data

Section No.	Elevation ft	Size	M <sub>ux</sub> kip-ft	φM <sub>rx</sub> kip-ft	Ratio M <sub>ux</sub> / φM <sub>rx</sub>	M <sub>uy</sub> kip-ft	φM <sub>ry</sub> kip-ft	Ratio M <sub>uy</sub> / φM <sub>ry</sub>
L1	188 - 137 (1)	TP32.711x22x0.25	881.7167	1113.4833	0.792	0.0000	1113.4833	0.000
L2	137 - 90.25 (2)	TP42.03x31.3184x0.3125	2349.1667	2281.2250	1.030	0.0000	2281.2250	0.000
L3	90.25 - 44.5 (3)	TP51.014x40.3023x0.375	3962.1083	4013.6500	0.987	0.0000	4013.6500	0.000
L4	44.5 - 0 (4)	TP59.61x48.8988x0.5	6020.5667	7974.6333	0.755	0.0000	7974.6333	0.000

### Pole Shear Design Data

Section No.	Elevation ft	Size	Actual $V_u$ K	$\phi V_n$ K	Ratio $\frac{V_u}{\phi V_n}$	Actual $T_u$ kip-ft	$\phi T_n$ kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	188 - 137 (1)	TP32.711x22x0.25	29.9666	439.6190	0.068	1.4266	1215.3750	0.001
L2	137 - 90.25 (2)	TP42.03x31.3184x0.3125	34.1580	706.9990	0.048	1.4111	2514.6833	0.001
L3	90.25 - 44.5 (3)	TP51.014x40.3023x0.375	38.2065	1029.2700	0.037	1.4023	4441.4750	0.000
L4	44.5 - 0 (4)	TP59.61x48.8988x0.5	42.1661	1646.3200	0.026	1.3998	8522.2500	0.000

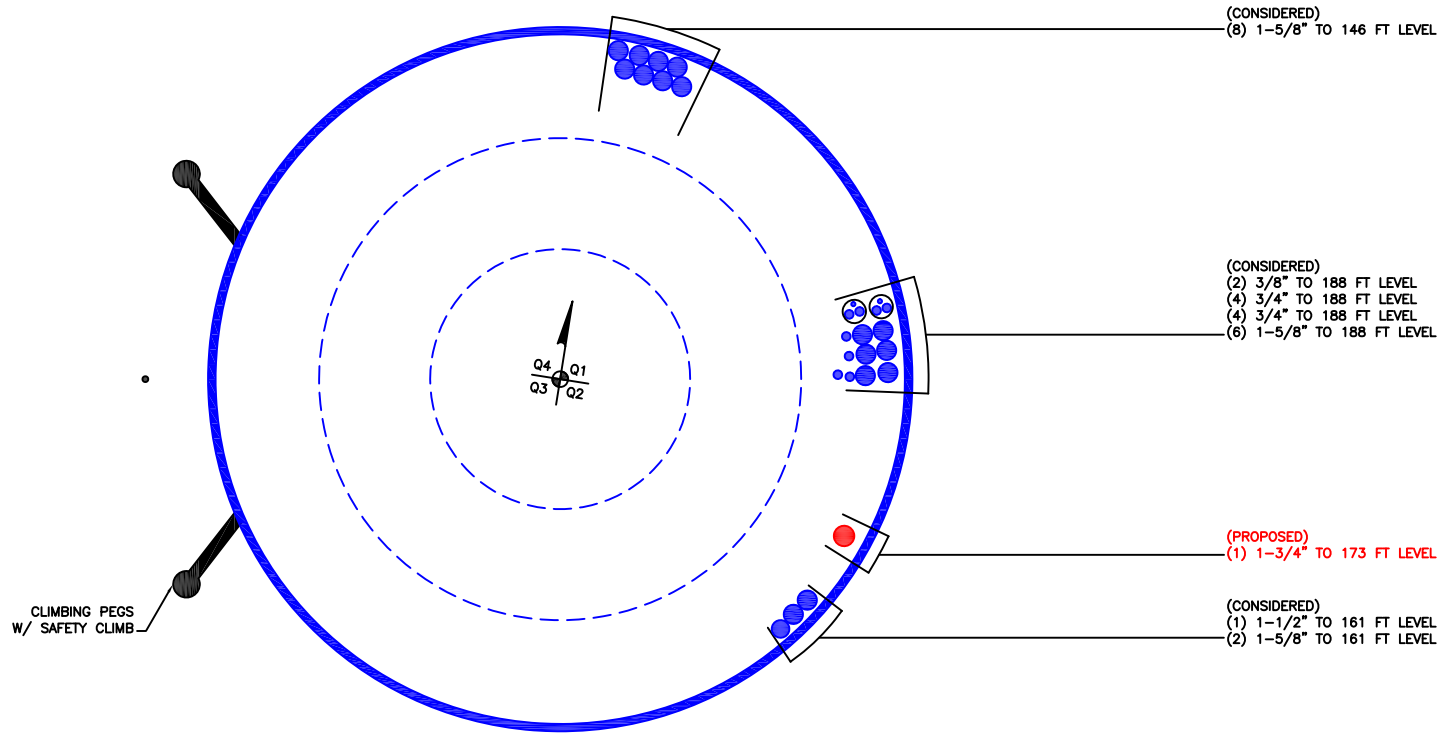
### Pole Interaction Design Data

Section No.	Elevation ft	Ratio $P_u$ $\phi P_n$	Ratio $M_{ux}$ $\phi M_{nx}$	Ratio $M_{uy}$ $\phi M_{ny}$	Ratio $V_u$ $\phi V_n$	Ratio $T_u$ $\phi T_n$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	188 - 137 (1)	0.012	0.792	0.000	0.068	0.001	0.809	1.050	4.8.2
L2	137 - 90.25 (2)	0.012	1.030	0.000	0.048	0.001	1.044	1.050	4.8.2
L3	90.25 - 44.5 (3)	0.012	0.987	0.000	0.037	0.000	1.001	1.050	4.8.2
L4	44.5 - 0 (4)	0.012	0.755	0.000	0.026	0.000	0.767	1.050	4.8.2

### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$\phi P_{allow}$ K	% Capacity	Pass Fail
L1	188 - 137	Pole	TP32.711x22x0.25	1	-18.0680	1538.6699	77.0	Pass
L2	137 - 90.25	Pole	TP42.03x31.3184x0.3125	2	-27.9058	2474.4929	99.4	Pass
L3	90.25 - 44.5	Pole	TP51.014x40.3023x0.375	3	-41.3424	3602.4658	95.3	Pass
L4	44.5 - 0	Pole	TP59.61x48.8988x0.5	4	-63.6626	5762.1267	73.1	Pass
Summary								
Pole (L2)							99.4	Pass
<b>RATING =</b>							<b>99.4</b>	<b>Pass</b>

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



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

# Monopole Base Plate Connection

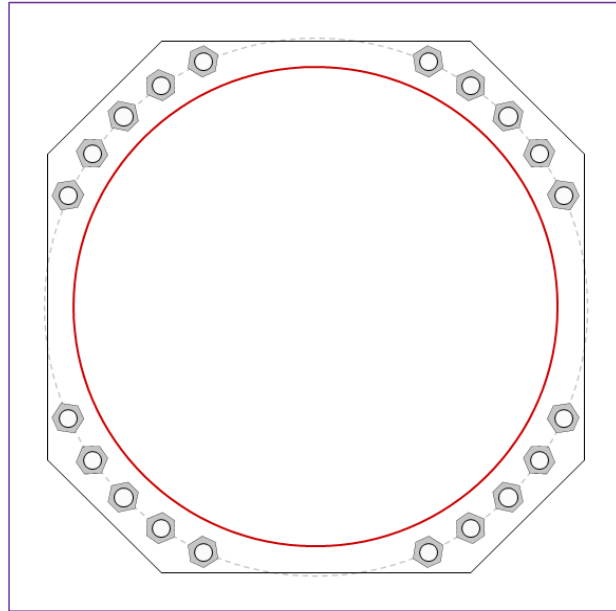


Site Info	
BU #	803175
Site Name	NEW BRITAIN 3 CAC 803
Order #	556644 Rev. 0

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
$l_{ar}$ (in)	1.25

Applied Loads	
Moment (kip-ft)	6020.57
Axial Force (kips)	63.66
Shear Force (kips)	42.17

\*TIA-222-H Section 15.5 Applied



Connection Properties	Analysis Results
-----------------------	------------------

**Anchor Rod Data**  
 (20) 2-1/4"  $\phi$  bolts (A615-75 N;  $F_y=75$  ksi,  $F_u=100$  ksi) on 67" BC  
 Anchor Spacing: 6 in

**Base Plate Data**  
 66" W x 3" Plate (A572-50;  $F_y=50$  ksi,  $F_u=65$  ksi); Clip: 14 in

**Stiffener Data**  
 N/A

**Pole Data**  
 59.61" x 0.5" 18-sided pole (A607-65;  $F_y=65$  ksi,  $F_u=80$  ksi)

Anchor Rod Summary		<i>(units of kips, kip-in)</i>
$Pu_t = 212.38$	$\phi Pn_t = 243.75$	<b>Stress Rating</b>
$Vu = 2.11$	$\phi Vn = 149.1$	<b>83.0%</b>
$Mu = n/a$	$\phi Mn = n/a$	<b>Pass</b>

Base Plate Summary	
Max Stress (ksi):	37.01 (Flexural)
Allowable Stress (ksi):	45
Stress Rating:	<b>78.3%</b> <b>Pass</b>

# Pier and Pad Foundation



BU #: 803175  
 Site Name: CT NEW BRITAIN  
 App. Number: 556644 Rev. 0

TIA-222 Revision: H  
 Tower Type: Monopole

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

Superstructure Analysis Reactions		
Compression, $P_{comp}$ :	63.7	kips
Base Shear, $V_{u\_comp}$ :	42.11	kips
Moment, $M_u$ :	6020.57	ft-kips
Tower Height, $H$ :	188	ft
BP Dist. Above Fdn, $bp_{dist}$ :	3.5	in

Foundation Analysis Checks				
	Capacity	Demand	Rating*	Check
<i>Lateral (Sliding) (kips)</i>	222.60	42.11	18.0%	Pass
<i>Bearing Pressure (ksf)</i>	9.00	6.23	69.3%	Pass
<i>Overtuning (kip*ft)</i>	6589.81	6327.76	96.0%	Pass
<i>Pier Flexure (Comp.) (kip*ft)</i>	9863.32	6189.15	59.8%	Pass
<i>Pier Compression (kip)</i>	30551.04	109.82	0.3%	Pass
<i>Pad Flexure (kip*ft)</i>	6473.47	3464.65	51.0%	Pass
<i>Pad Shear - 1-way (kips)</i>	766.05	415.59	51.7%	Pass
<i>Pad Shear - 2-way (Comp) (ksi)</i>	0.164	0.000	0.0%	Pass
<i>Flexural 2-way (Comp) (kip*ft)</i>	8464.14	3713.49	41.8%	Pass

Pier Properties		
Pier Shape:	Square	
Pier Diameter, $dpier$ :	8	ft
Ext. Above Grade, $E$ :	1.0833	ft
Pier Rebar Size, $Sc$ :	11	
Pier Rebar Quantity, $mc$ :	36	
Pier Tie/Spiral Size, $St$ :	5	
Pier Tie/Spiral Quantity, $mt$ :	12	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, $cc_{pier}$ :	4	in

\*Rating per TIA-222-H Section 15.5

Soil Rating*:	96.0%
Structural Rating*:	59.8%

Pad Properties		
Depth, $D$ :	5.92	ft
Pad Width, $W_1$ :	26	ft
Pad Thickness, $T$ :	3	ft
Pad Rebar Size (Bottom dir. 2), $Sp_2$ :	11	
Pad Rebar Quantity (Bottom dir. 2), $mp_2$ :	33	
Pad Clear Cover, $cc_{pad}$ :	4	in

Material Properties		
Rebar Grade, $F_y$ :	60	ksi
Concrete Compressive Strength, $F'_c$ :	3	ksi
Dry Concrete Density, $\delta_c$ :	150	pcf

Soil Properties		
Total Soil Unit Weight, $\gamma$ :	110	pcf
Ultimate Gross Bearing, $Q_{ult}$ :	12.000	ksf
Cohesion, $C_u$ :	0.000	ksf
Friction Angle, $\phi$ :	30	degrees
SPT Blow Count, $N_{blows}$ :		
Base Friction, $\mu$ :		
Neglected Depth, $N$ :	3.33	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, $gw$ :	N/A	ft

<-- Toggle between Gross and Net

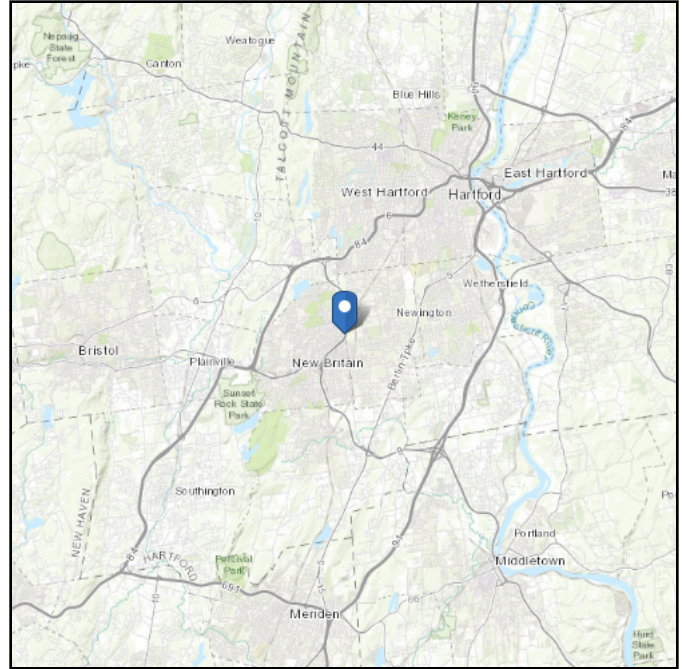
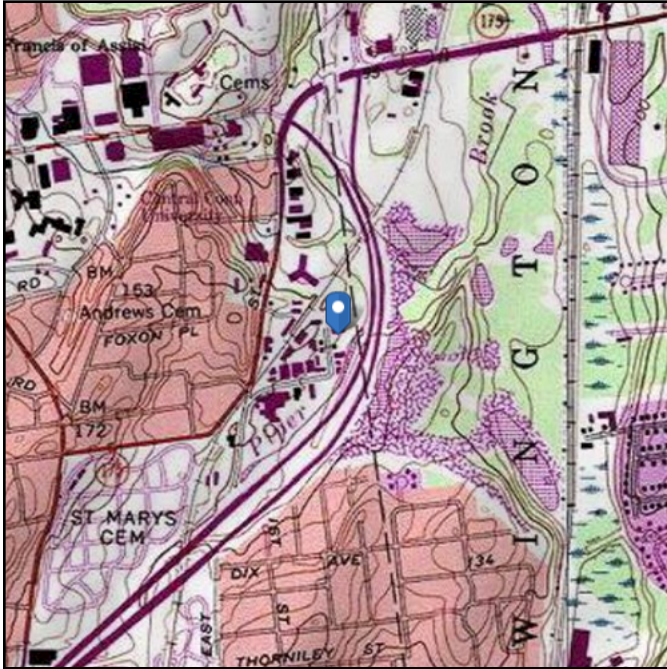


# ASCE 7 Hazards Report

**Address:**  
No Address at This  
Location

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

**Elevation:** 88.33 ft (NAVD 88)  
**Latitude:** 41.686611  
**Longitude:** -72.757722

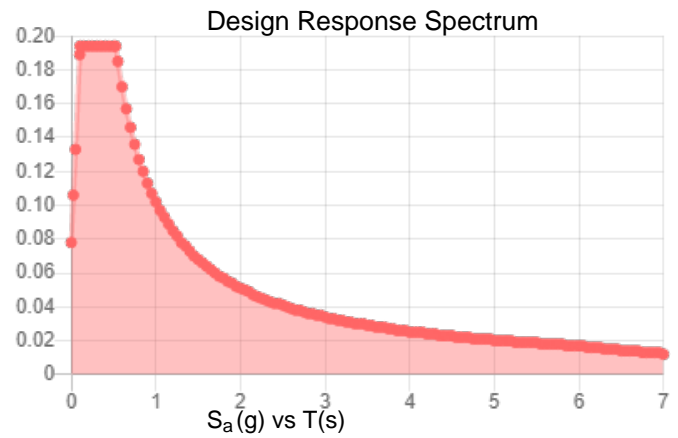
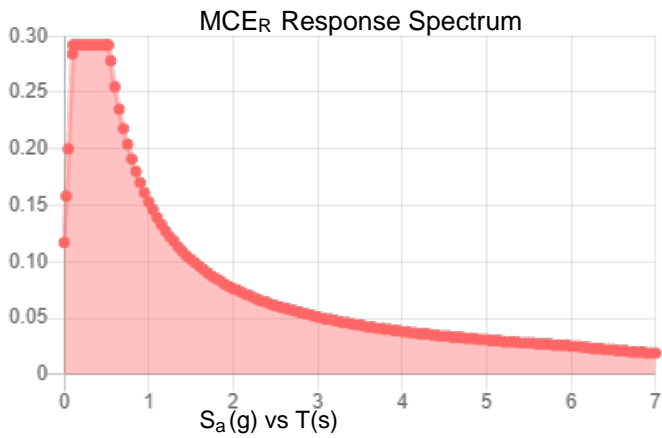


**Site Soil Class:** D - Stiff Soil

**Results:**

$S_S$ :	0.182	$S_{DS}$ :	0.194
$S_1$ :	0.064	$S_{D1}$ :	0.102
$F_a$ :	1.6	$T_L$ :	6
$F_v$ :	2.4	PGA :	0.092
$S_{MS}$ :	0.292	$PGA_M$ :	0.148
$S_{M1}$ :	0.153	$F_{PGA}$ :	1.6
		$I_e$ :	1

**Seismic Design Category** B



**Data Accessed:**

Mon Mar 15 2021

**Date Source:**

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

## Ice

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**Results:**

Ice Thickness: 1.00 in.  
Concurrent Temperature: 5 F  
Gust Speed: 50 mph

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

**Date Accessed:** Mon Mar 15 2021

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

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 50-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

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