Date: **April 29, 2021**

MORRISON HERSHFIELD

Morrison Hershfield
1455 Lincoln Parkway, Suite 500
Atlanta, GA 30346
(770) 379-8500

Subject:	**Structural Analysis Report**	
Carrier Designation:	***Verizon Wireless* Co-Locate**	
	Site Number:	468004
	Site Name:	New Britain 3 CT
Crown Castle Designation:	**BU Number:**	803175
	Site Name:	CT New Britain 3 CAC 803175
	JDE Job Number:	644590
	Work Order Number:	1953362
	Order Number:	552667 Rev. 0
Engineering Firm Designation:	**Morrison Hershfield Project Number:** CN7-114 / 2101398	
Site Data:	**167 Coccomo, New Britain, Hartford County, CT 06051**	
	Latitude *41° 41' 11.8"*, Longitude *-72° 45' 27.8"*	
	188 Foot – Summit Monopole Tower	

Morrison Hershfield 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 - 97.1%**

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

Respectfully submitted by:

G. Lance Cooke, P.E. (CT License No. PEN.0028133)
Senior Engineer

G. Lance Cooke
2021.05.03
07:58:17-07'00'

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1) INTRODUCTION

This tower is a 188 ft Summit monopole tower designed by Paul J. Ford and Company.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	125 mph
Exposure Category:	C
Topographic Factor:	1
Ice Thickness:	2 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	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)
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	-	Top-Rail Kit		
		1	-	Platform Mount [LP 712-1]		
	145.0	6	andrew	SBNHH-1D65B w/ Mount Pipe		
		3	amphenol	BXA-80063-6BF-EDIN-4 w/ Mount Pipe		
		1	raycap	RHSDC-3315-PF-48		
	143.0	3	samsung telecommunications	CBRS w/ Mount Pipe		

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	2	cci antennas	OPA65R-BU6D w/ Mount Pipe	8 6 2 2	3/4 1-5/8 3/8 2C
		2	cci antennas	OPA-65R-LCUU-H6 w/ Mount Pipe		
		2	cci antennas	DMP65R-BU6D w/ Mount Pipe		
		2	quintel technology	QS66512-2 w/ Mount Pipe		
		1	cci antennas	OPA65R-BU4D w/ Mount Pipe		
		1	cci antennas	OPA-65R-LCUU-H4 w/ Mount Pipe		
		1	cci antennas	DMP65R-BU4D w/ Mount Pipe		
		1	quintel technology	QS46512-2 w/ Mount Pipe		
		6	ericsson	RRUS 32 B2		
		3	ericsson	RRUS E2 B29		
		3	ericsson	RRUS 4449 B5/B12		

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	3	ericsson	RRUS 4478 B14	-	-
		1	raycap	DC6-48-60-18-8C		
	189.0	3	ericsson	RRUS 32 B30		
		3	ericsson	RRUS 32 B66		
		1	raycap	DC6-48-60-0-8F		
		2	raycap	DC6-48-60-18-8F		
	188.0	1	-	Platform Mount [LP 1201-1_KCKR-HR-1]		
173.0	173.0	3	jma wireless	MX08FRO665-21	1	1-3/4
		3	fujitsu	TA08025-B604		
		3	fujitsu	TA08025-B605		
		1	raycap	RDIDC-9181-PF-48		
		1	commscope	8' Platform Mount [#MC-PK8-DSH]		
161.0	161.0	3	rfs/celwave	APXVAARR24_43-U-NA20 w/ Mount Pipe	2 1	1-5/8 1-1/2
		3	ericsson	AIR -32 B2A/B66AA w/ Mount Pipe		
		3	ericsson	AIR6449 B41_T-MOBILE w/ Mount Pipe		
		3	ericsson	RADIO 4449 B71 B85A_T-MOBILE		
		3	ericsson	RRUS 4415 B25_CCIV2		
		1	-	Platform Mount [LP 602-1_KCKR]		

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. Morrison Hershfield 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	-17.28	1538.67	74.2	Pass
L2	137 - 90.25	Pole	TP42.03x31.3184x0.3125	2	-27.37	2474.49	97.1	Pass
L3	90.25 - 44.5	Pole	TP51.014x40.3023x0.375	3	-41.16	3602.47	94.4	Pass
L4	44.5 - 0	Pole	TP59.61x48.8988x0.5	4	-63.92	5762.13	73.4	Pass
							Summary	
						Pole (L2)	97.1	Pass
						Rating =	97.1	Pass

Table 5 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	83.3	Pass
1	Base Plate		78.7	Pass
1	Base Foundation (Structure)	0	60.1	Pass
1	Base Foundation (Soil Interaction)		96.5	Pass

Structure Rating (max from all components) =	**97.1%***

Notes:
1) See additional documentation in “Appendix C – Additional Calculations” for calculations supporting the % capacity consumed.
2) *Rating Per TIA-222-H, Section 15.5.

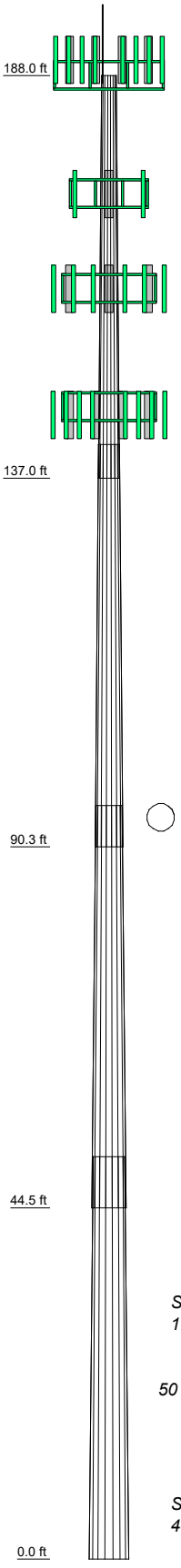
4.1) Recommendations

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	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	51.00	18	0.2500	4.25	22.0000	32.7110	A607-65	3.7
2	51.00	18	0.3125	5.25	31.3184	42.0300		6.3
3	51.00	18	0.3750	6.50	40.3023	51.0140		9.4
4	51.00	18	0.5000		48.8988	59.6100		14.8



ALL REACTIONS ARE FACTORED

AXIAL 117 K

SHEAR 12 K

MOMENT 1763 kip-ft

TORQUE 1 kip-ft
50 mph WIND - 2.0000 in ICE

AXIAL 64 K

SHEAR 44 K

MOMENT 6046 kip-ft

TORQUE 2 kip-ft
REACTIONS - 125 mph WIND

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 0.00 ft
8. TOWER RATING: 97.1%

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Job: **CN8-114 / 2101398**			
Project: ***803175 / CT New Britain 3 CAC 803175***			
Client: Crown Castle USA	Drawn by: AL	App'd:	
Code: TIA-222-H	Date: 04/29/21	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: 88.00 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: 0.00 ft.
Nominal ice thickness of 2.0000 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		Distribute Leg Loads As Uniform		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Horizontals		Assume Legs Pinned		Calculate Redundant Bracing Forces
	Consider Moments - Diagonals	√	Assume Rigid Index Plate		Ignore Redundant Members in FEA
	Use Moment Magnification	√	Use Clear Spans For Wind Area		SR Leg Bolts Resist Compression
√	Use Code Stress Ratios		Use Clear Spans For KL/r		All Leg Panels Have Same Allowable
√	Use Code Safety Factors - Guys		Retension Guys To Initial Tension		Offset Girt At Foundation
	Escalate Ice	√	Bypass Mast Stability Checks	√	Consider Feed Line Torque
	Always Use Max Kz	√	Use Azimuth Dish Coefficients		Include Angle Block Shear Check
	Use Special Wind Profile	√	Project Wind Area of Appurt.		Use TIA-222-H Bracing Resist. Exemption
	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Use TIA-222-H Tension Splice Exemption
	Leg Bolts Are At Top Of Section		Add IBC .6D+W Combination		Poles
	Secondary Horizontal Braces Leg		Sort Capacity Reports By Component	√	Include Shear-Torsion Interaction
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Always Use Sub-Critical Flow
	SR Members Have Cut Ends		Treat Feed Line Bundles As Cylinder		Use Top Mounted Sockets
	SR Members Are Concentric		Ignore KL/ry For 60 Deg. Angle Legs		Pole Without Linear Attachments
					Pole With Shroud Or No Appurtenances
					Outside and Inside Corner Radii Are Known

Tapered Pole Section Geometry

Section	*Elevation*	*Section Length*	*Splice Length*	*Number of Sides*	*Top Diameter*	*Bottom Diameter*	*Wall Thickness*	*Bend Radius*	*Pole Grade*
	ft	*ft*	*ft*		*in*	*in*	*in*	*in*	
L1	188.00-137.00	51.00	4.25	18	22.0000	32.7110	0.2500	1.0000	A607-65 (65 ksi)
L2	137.00-90.25	51.00	5.25	18	31.3184	42.0300	0.3125	1.2500	A607-65 (65 ksi)
L3	90.25-44.50	51.00	6.50	18	40.3023	51.0140	0.3750	1.5000	A607-65 (65 ksi)

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
L4	44.50-0.00	51.00		18	48.8988	59.6100	0.5000	2.0000	A607-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	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	18208.1091	20.6932	6.8473	21.911
L3	41.9859	47.5235	9571.6471	14.1742	20.4736	467.5120	19155.8888	23.7663	6.4332	17.155
	51.7431	60.2731	19526.7966	17.9768	25.9151	753.4907	39079.2871	30.1423	8.3185	22.183
L4	50.9622	76.8089	22730.9631	17.1816	24.8406	915.0736	45491.8362	38.4117	7.7262	15.452
	60.4524	93.8076	41409.2395	20.9841	30.2819	1367.4593	82872.9664	46.9127	9.6114	19.223

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 188.00-137.00				1	1	1			
L2 137.00-90.25				1	1	1			
L3 90.25-44.50				1	1	1			
L4 44.50-0.00				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 in	Perimeter in	Weight plf
******										
Safety Line 3/8	C	No	Surface Ar (CaAa)	188.00 - 8.00	1	1	-0.450 -0.450	0.3750		0.22
Climbing Pegs	C	No	Surface Ar (CaAa)	188.00 - 8.00	1	1	-0.500 -0.400	0.7050		1.80
******										
3/8-in Detuner Wire	A	No	Surface Ar (CaAa)	133.00 - 0.00	1	1	0.000 0.000	0.3750		0.10
3/8-in Detuner Wire	B	No	Surface Ar (CaAa)	133.00 - 0.00	1	1	0.000 0.000	0.3750		0.10
3/8-in Detuner Wire	C	No	Surface Ar (CaAa)	133.00 - 0.00	1	1	0.000 0.000	0.3750		0.10
******										
****										

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
******									
LDF7-50A(1-5/8)	B	No	No	Inside Pole	188.00 - 5.00	6	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.82 0.82 0.82

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
							2" Ice	0.00	0.82
FB-L98B-002-75000(3/8)	B	No	No	Inside Pole	188.00 - 5.00	2	No Ice	0.00	0.06
							1/2" Ice	0.00	0.06
							1" Ice	0.00	0.06
							2" Ice	0.00	0.06
WR-VG86ST-BRD(3/4)	B	No	No	Inside Pole	188.00 - 5.00	2	No Ice	0.00	0.58
							1/2" Ice	0.00	0.58
							1" Ice	0.00	0.58
							2" Ice	0.00	0.58
WR-VG86ST-BRD(3/4)	B	No	No	Inside Pole	188.00 - 5.00	4	No Ice	0.00	0.58
							1/2" Ice	0.00	0.58
							1" Ice	0.00	0.58
							2" Ice	0.00	0.58
CONDUIT(2)	B	No	No	Inside Pole	188.00 - 5.00	2	No Ice	0.00	2.80
							1/2" Ice	0.00	2.80
							1" Ice	0.00	2.80
							2" Ice	0.00	2.80
***									
WR-VG86ST-BRD(3/4)	B	No	No	Inside Pole	188.00 - 5.00	2	No Ice	0.00	0.58
							1/2" Ice	0.00	0.58
							1" Ice	0.00	0.58
							2" Ice	0.00	0.58
******									
CU12PSM6P4XXX(1-3/4)	B	No	No	Inside Pole	173.00 - 0.00	1	No Ice	0.00	2.72
							1/2" Ice	0.00	2.72
							1" Ice	0.00	2.72
							2" Ice	0.00	2.72
******									
33-597(1-1/2)	C	No	No	Inside Pole	161.00 - 6.00	1	No Ice	0.00	1.61
							1/2" Ice	0.00	1.61
							1" Ice	0.00	1.61
							2" Ice	0.00	1.61
HCS 6X12 4AWG(1-5/8)	C	No	No	Inside Pole	161.00 - 6.00	1	No Ice	0.00	2.40
							1/2" Ice	0.00	2.40
							1" Ice	0.00	2.40
							2" Ice	0.00	2.40
****									
HB158-21U6S24-xxM_TMO(1-5/8)	C	No	No	Inside Pole	161.00 - 6.00	1	No Ice	0.00	2.50
							1/2" Ice	0.00	2.50
							1" Ice	0.00	2.50
							2" Ice	0.00	2.50
******									
HB158-1-08U8-S8J18(1-5/8)	B	No	No	Inside Pole	146.00 - 5.00	2	No Ice	0.00	1.30
							1/2" Ice	0.00	1.30
							1" Ice	0.00	1.30
							2" Ice	0.00	1.30
LCF158-50J(1-5/8)	B	No	No	Inside Pole	146.00 - 5.00	6	No Ice	0.00	0.92
							1/2" Ice	0.00	0.92
							1" Ice	0.00	0.92
							2" Ice	0.00	0.92
******									
****									

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	188.00-137.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.95
		C	0.000	0.000	5.508	0.000	0.26
L2	137.00-90.25	A	0.000	0.000	1.603	0.000	0.00
		B	0.000	0.000	1.603	0.000	1.23
		C	0.000	0.000	6.652	0.000	0.40
L3	90.25-44.50	A	0.000	0.000	1.716	0.000	0.00

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		B	0.000	0.000	1.716	0.000	1.20
		C	0.000	0.000	6.657	0.000	0.39
L4	44.50-0.00	A	0.000	0.000	1.669	0.000	0.00
		B	0.000	0.000	1.669	0.000	1.05
		C	0.000	0.000	5.611	0.000	0.33

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	188.00-137.00	A	1.992	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.95
		C		0.000	0.000	46.145	0.000	0.89
L2	137.00-90.25	A	1.922	0.000	0.000	18.635	0.000	0.25
		B		0.000	0.000	18.635	0.000	1.47
		C		0.000	0.000	60.934	0.000	1.23
L3	90.25-44.50	A	1.825	0.000	0.000	19.306	0.000	0.25
		B		0.000	0.000	19.306	0.000	1.45
		C		0.000	0.000	59.427	0.000	1.17
L4	44.50-0.00	A	1.636	0.000	0.000	17.909	0.000	0.22
		B		0.000	0.000	17.909	0.000	1.27
		C		0.000	0.000	48.492	0.000	0.93

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	188.00-137.00	0.6800	0.4940	2.5047	1.8198
L2	137.00-90.25	0.6587	0.4786	2.2059	1.6027
L3	90.25-44.50	0.6657	0.4836	2.3054	1.6750
L4	44.50-0.00	0.5459	0.3966	1.9494	1.4163

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

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	2	Safety Line 3/8	137.00 - 188.00	1.0000	1.0000
L1	3	Climbing Pegs	137.00 - 188.00	1.0000	1.0000
L2	2	Safety Line 3/8	90.25 - 137.00	1.0000	1.0000
L2	3	Climbing Pegs	90.25 - 137.00	1.0000	1.0000
L2	27	3/8-in Detuner Wire	90.25 - 133.00	1.0000	1.0000
L2	28	3/8-in Detuner Wire	90.25 - 133.00	1.0000	1.0000
L2	29	3/8-in Detuner Wire	90.25 - 133.00	1.0000	1.0000
L3	2	Safety Line 3/8	44.50 - 90.25	1.0000	1.0000
L3	3	Climbing Pegs	44.50 - 90.25	1.0000	1.0000
L3	27	3/8-in Detuner Wire	44.50 - 90.25	1.0000	1.0000
L3	28	3/8-in Detuner Wire	44.50 - 90.25	1.0000	1.0000
L3	29	3/8-in Detuner Wire	44.50 - 90.25	1.0000	1.0000
L4	2	Safety Line 3/8	8.00 - 44.50	1.0000	1.0000
L4	3	Climbing Pegs	8.00 - 44.50	1.0000	1.0000
L4	27	3/8-in Detuner Wire	0.00 - 44.50	1.0000	1.0000
L4	28	3/8-in Detuner Wire	0.00 - 44.50	1.0000	1.0000
L4	29	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 ft Vert ft ft	Azimuth Adjustment ° ft	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
******									
Lighting Rod 3/4" x 8'	C	From Leg	0.00 0.00 4.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.60 1.41 2.25 3.67	0.60 1.41 2.25 3.67	0.03 0.04 0.05 0.09
******									
OPA-65R-LCUU-H4 w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.03 6.56 7.11 8.26	4.11 4.60 5.11 6.18	0.08 0.13 0.19 0.33
OPA-65R-LCUU-H6 w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	9.19 9.94 10.71 12.30	6.21 6.93 7.66 9.17	0.11 0.18 0.26 0.45
OPA-65R-LCUU-H6 w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	9.19 9.94 10.71 12.30	6.21 6.93 7.66 9.17	0.11 0.18 0.26 0.45
QS46512-2 w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.95 3.25 3.55 4.19	3.33 3.63 3.94 4.60	0.09 0.15 0.21 0.37
QS66512-2 w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.04 4.42 4.82 5.63	4.18 4.57 4.97 5.79	0.14 0.21 0.29 0.48
QS66512-2 w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.04 4.42 4.82 5.63	4.18 4.57 4.97 5.79	0.14 0.21 0.29 0.48
RRUS 32 B30	A	From Leg	4.00 0.00 1.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.69 2.91 3.14 3.61	1.57 1.76 1.95 2.35	0.06 0.08 0.10 0.16
RRUS 32 B30	B	From Leg	4.00 0.00 1.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.69 2.91 3.14 3.61	1.57 1.76 1.95 2.35	0.06 0.08 0.10 0.16
RRUS 32 B30	C	From Leg	4.00 0.00 1.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.69 2.91 3.14 3.61	1.57 1.76 1.95 2.35	0.06 0.08 0.10 0.16
RRUS 32 B66	A	From Leg	4.00 0.00 1.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.74 2.96 3.19 3.68	1.67 1.86 2.05 2.46	0.05 0.07 0.10 0.16
RRUS 32 B66	B	From Leg	4.00 0.00 1.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.74 2.96 3.19 3.68	1.67 1.86 2.05 2.46	0.05 0.07 0.10 0.16

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
RRUS 32 B66	C	From Leg	4.00 0.00 1.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.74 2.96 3.19 3.68	1.67 1.86 2.05 2.46	0.05 0.07 0.10 0.16
RRUS 32 B2	A	From Leg	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.73 2.95 3.18 3.66	1.67 1.86 2.05 2.46	0.05 0.07 0.10 0.16
RRUS 32 B2	B	From Leg	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.73 2.95 3.18 3.66	1.67 1.86 2.05 2.46	0.05 0.07 0.10 0.16
RRUS 32 B2	C	From Leg	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.73 2.95 3.18 3.66	1.67 1.86 2.05 2.46	0.05 0.07 0.10 0.16
DC6-48-60-18-8F	A	From Leg	4.00 0.00 1.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.92 1.46 1.64 2.04	0.92 1.46 1.64 2.04	0.02 0.04 0.06 0.11
DC6-48-60-0-8F	B	From Leg	4.00 0.00 1.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.92 1.46 1.64 2.04	0.92 1.46 1.64 2.04	0.02 0.04 0.06 0.11
DC6-48-60-18-8F	C	From Leg	4.00 0.00 1.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.92 1.46 1.64 2.04	0.92 1.46 1.64 2.04	0.02 0.04 0.06 0.11
6' x 2" Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.92 2.29 3.06	1.43 1.92 2.29 3.06	0.02 0.03 0.05 0.09
6' x 2" Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.92 2.29 3.06	1.43 1.92 2.29 3.06	0.02 0.03 0.05 0.09
6' x 2" Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.92 2.29 3.06	1.43 1.92 2.29 3.06	0.02 0.03 0.05 0.09
Platform Mount [LP 1201-1_KCKR-HR-1]	C	None		0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	37.61 45.62 53.59 69.65	37.61 45.62 53.59 69.65	2.63 3.48 4.46 6.85
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DMP65R-BU6D w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	11.96 12.70 13.46 15.02	5.97 6.63 7.30 8.69	0.11 0.20 0.30 0.53
DMP65R-BU4D w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice	7.53 8.04 8.57 9.68	3.79 4.23 4.68 5.63	0.09 0.16 0.22 0.39

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice			
DMP65R-BU6D w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	11.96 12.70 13.46 15.02	5.97 6.63 7.30 8.69	0.11 0.20 0.30 0.53
OPA65R-BU6D w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	12.25 13.00 13.76 15.34	6.05 6.71 7.39 8.79	0.09 0.18 0.27 0.51
OPA65R-BU4D w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.10 8.65 9.21 10.39	4.03 4.50 4.98 5.98	0.08 0.14 0.21 0.38
OPA65R-BU6D w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	12.25 13.00 13.76 15.34	6.05 6.71 7.39 8.79	0.09 0.18 0.27 0.51
RRUS 32 B2	A	From Leg	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.73 2.95 3.18 3.66	1.67 1.86 2.05 2.46	0.05 0.07 0.10 0.16
RRUS 32 B2	B	From Leg	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.73 2.95 3.18 3.66	1.67 1.86 2.05 2.46	0.05 0.07 0.10 0.16
RRUS 32 B2	C	From Leg	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.73 2.95 3.18 3.66	1.67 1.86 2.05 2.46	0.05 0.07 0.10 0.16
RRUS 4449 B5/B12	A	From Leg	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.97 2.14 2.33 2.72	1.41 1.56 1.73 2.07	0.07 0.09 0.11 0.16
RRUS 4449 B5/B12	B	From Leg	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.97 2.14 2.33 2.72	1.41 1.56 1.73 2.07	0.07 0.09 0.11 0.16
RRUS 4449 B5/B12	C	From Leg	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.97 2.14 2.33 2.72	1.41 1.56 1.73 2.07	0.07 0.09 0.11 0.16
RRUS 4478 B14	A	From Leg	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.84 2.01 2.19 2.57	1.06 1.20 1.34 1.66	0.06 0.08 0.09 0.14
RRUS 4478 B14	B	From Leg	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.84 2.01 2.19 2.57	1.06 1.20 1.34 1.66	0.06 0.08 0.09 0.14
RRUS 4478 B14	C	From Leg	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice	1.84 2.01 2.19 2.57	1.06 1.20 1.34 1.66	0.06 0.08 0.09 0.14

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice			
RRUS E2 B29	A	From Leg	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.15 3.36 3.59 4.07	1.29 1.44 1.60 1.95	0.06 0.08 0.11 0.17
RRUS E2 B29	B	From Leg	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.15 3.36 3.59 4.07	1.29 1.44 1.60 1.95	0.06 0.08 0.11 0.17
RRUS E2 B29	C	From Leg	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.15 3.36 3.59 4.07	1.29 1.44 1.60 1.95	0.06 0.08 0.11 0.17
DC6-48-60-18-8C	A	From Leg	4.00 0.00 2.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.74 2.96 3.20 3.68	2.74 2.96 3.20 3.68	0.03 0.05 0.08 0.15
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MX08FRO665-21	A	From Leg	4.00 0.00 0.00	0.0000	173.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.01 8.53 9.05 10.14	3.21 3.66 4.12 5.08	0.08 0.16 0.24 0.42
MX08FRO665-21	B	From Leg	4.00 0.00 0.00	0.0000	173.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.01 8.53 9.05 10.14	3.21 3.66 4.12 5.08	0.08 0.16 0.24 0.42
MX08FRO665-21	C	From Leg	4.00 0.00 0.00	0.0000	173.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.01 8.53 9.05 10.14	3.21 3.66 4.12 5.08	0.08 0.16 0.24 0.42
TA08025-B604	A	From Leg	4.00 0.00 0.00	0.0000	173.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.96 2.14 2.32 2.71	0.98 1.11 1.25 1.55	0.06 0.08 0.10 0.15
TA08025-B604	B	From Leg	4.00 0.00 0.00	0.0000	173.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.96 2.14 2.32 2.71	0.98 1.11 1.25 1.55	0.06 0.08 0.10 0.15
TA08025-B604	C	From Leg	4.00 0.00 0.00	0.0000	173.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.96 2.14 2.32 2.71	0.98 1.11 1.25 1.55	0.06 0.08 0.10 0.15
TA08025-B605	A	From Leg	4.00 0.00 0.00	0.0000	173.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.96 2.14 2.32 2.71	1.13 1.27 1.41 1.72	0.08 0.09 0.11 0.16
TA08025-B605	A	From Leg	4.00 0.00 0.00	0.0000	173.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.96 2.14 2.32 2.71	1.13 1.27 1.41 1.72	0.08 0.09 0.11 0.16
TA08025-B605	A	From Leg	4.00 0.00 0.00	0.0000	173.00	No Ice 1/2" Ice Ice	1.96 2.14 2.32	1.13 1.27 1.41	0.08 0.09 0.11

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice 2" Ice	2.71	1.72	0.16
RDIDC-9181-PF-48	A	From Leg	4.00 0.00 0.00	0.0000	173.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.01 2.19 2.37 2.76	1.17 1.31 1.46 1.78	0.02 0.04 0.06 0.11
8' Platfrom Mount [#MC-PK8-DSH]	C	None		0.0000	173.00	No Ice 1/2" Ice 1" Ice 2" Ice	16.50 22.27 28.05 39.60	16.50 22.27 28.05 39.60	0.79 1.06 1.33 1.87
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APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	161.00	No Ice 1/2" Ice 1" Ice 2" Ice	14.69 15.46 16.23 17.82	6.87 7.55 8.25 9.67	0.19 0.31 0.46 0.79
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	161.00	No Ice 1/2" Ice 1" Ice 2" Ice	14.69 15.46 16.23 17.82	6.87 7.55 8.25 9.67	0.19 0.31 0.46 0.79
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	161.00	No Ice 1/2" Ice 1" Ice 2" Ice	14.69 15.46 16.23 17.82	6.87 7.55 8.25 9.67	0.19 0.31 0.46 0.79
AIR -32 B2A/B66AA w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	161.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.76 4.12 4.48 5.24	3.15 3.49 3.84 4.58	0.19 0.25 0.32 0.48
AIR -32 B2A/B66AA w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	161.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.76 4.12 4.48 5.24	3.15 3.49 3.84 4.58	0.19 0.25 0.32 0.48
AIR -32 B2A/B66AA w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	161.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.76 4.12 4.48 5.24	3.15 3.49 3.84 4.58	0.19 0.25 0.32 0.48
6' x 2" Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	161.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.92 2.29 3.06	1.43 1.92 2.29 3.06	0.02 0.03 0.05 0.09
6' x 2" Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	161.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.92 2.29 3.06	1.43 1.92 2.29 3.06	0.02 0.03 0.05 0.09
6' x 2" Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	161.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.92 2.29 3.06	1.43 1.92 2.29 3.06	0.02 0.03 0.05 0.09
Platform Mount [LP 602-1_KCKR]	C	None		0.0000	161.00	No Ice 1/2" Ice 1" Ice 2" Ice	42.30 49.04 55.87 69.85	42.30 49.04 55.87 69.85	1.62 2.38 3.27 5.40
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AIR6449 B41_T-MOBILE	A	From Leg	4.00	0.0000	161.00	No Ice	5.19	2.71	0.13

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
w/ Mount Pipe			0.00 0.00			1/2" Ice 1" Ice 2" Ice	5.59 6.02 6.90	3.04 3.38 4.12	0.17 0.23 0.35
AIR6449 B41_T-MOBILE w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	161.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.19 5.59 6.02 6.90	2.71 3.04 3.38 4.12	0.13 0.17 0.23 0.35
AIR6449 B41_T-MOBILE w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	161.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.19 5.59 6.02 6.90	2.71 3.04 3.38 4.12	0.13 0.17 0.23 0.35
RRUS 4415 B25_CCIV2	A	From Leg	4.00 0.00 0.00	0.0000	161.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.84 2.01 2.19 2.57	0.82 0.94 1.07 1.37	0.05 0.06 0.08 0.12
RRUS 4415 B25_CCIV2	B	From Leg	4.00 0.00 0.00	0.0000	161.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.84 2.01 2.19 2.57	0.82 0.94 1.07 1.37	0.05 0.06 0.08 0.12
RRUS 4415 B25_CCIV2	C	From Leg	4.00 0.00 0.00	0.0000	161.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.84 2.01 2.19 2.57	0.82 0.94 1.07 1.37	0.05 0.06 0.08 0.12
RADIO 4449 B71 B85A_T-MOBILE	A	From Leg	4.00 0.00 0.00	0.0000	161.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.97 2.15 2.33 2.72	1.59 1.75 1.92 2.28	0.07 0.09 0.12 0.17
RADIO 4449 B71 B85A_T-MOBILE	B	From Leg	4.00 0.00 0.00	0.0000	161.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.97 2.15 2.33 2.72	1.59 1.75 1.92 2.28	0.07 0.09 0.12 0.17
RADIO 4449 B71 B85A_T-MOBILE	C	From Leg	4.00 0.00 0.00	0.0000	161.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.97 2.15 2.33 2.72	1.59 1.75 1.92 2.28	0.07 0.09 0.12 0.17
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(2) SBNHH-1D65B w/ Mount Pipe	A	From Leg	4.00 0.00 -1.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.09 4.49 4.89 5.72	3.30 3.68 4.07 4.87	0.07 0.13 0.20 0.39
(2) SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.00 0.00 -1.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.09 4.49 4.89 5.72	3.30 3.68 4.07 4.87	0.07 0.13 0.20 0.39
(2) SBNHH-1D65B w/ Mount Pipe	C	From Leg	4.00 0.00 -1.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.09 4.49 4.89 5.72	3.30 3.68 4.07 4.87	0.07 0.13 0.20 0.39
BXA-80063-6BF-EDIN-4 w/ Mount Pipe	A	From Leg	4.00 0.00 -1.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice 2" Ice	7.50 8.03 8.53 9.56	5.63 6.72 7.56 9.29	0.04 0.10 0.17 0.33

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
BXA-80063-6BF-EDIN-4 w/ Mount Pipe	B	From Leg	4.00 0.00 -1.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice 2" Ice	7.50 8.03 8.53 9.56	5.63 6.72 7.56 9.29	0.04 0.10 0.17 0.33
BXA-80063-6BF-EDIN-4 w/ Mount Pipe	C	From Leg	4.00 0.00 -1.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice 2" Ice	7.50 8.03 8.53 9.56	5.63 6.72 7.56 9.29	0.04 0.10 0.17 0.33
(2) RFV01U-D2A	A	From Leg	4.00 0.00 3.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.88 2.05 2.22 2.60	1.01 1.14 1.28 1.59	0.07 0.09 0.11 0.15
RFV01U-D2A	B	From Leg	4.00 0.00 3.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.88 2.05 2.22 2.60	1.01 1.14 1.28 1.59	0.07 0.09 0.11 0.15
RFV01U-D1A	B	From Leg	4.00 0.00 3.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.88 2.05 2.22 2.60	1.25 1.39 1.54 1.86	0.08 0.10 0.12 0.18
(2) RFV01U-D1A	C	From Leg	4.00 0.00 3.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.88 2.05 2.22 2.60	1.25 1.39 1.54 1.86	0.08 0.10 0.12 0.18
RHSDC-3315-PF-48	A	From Leg	4.00 0.00 -1.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.71 3.95 4.20 4.72	2.19 2.39 2.61 3.05	0.03 0.06 0.10 0.18
Top-Rail Kit	C	None		0.0000	146.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.56 6.39 8.18 11.66	4.56 6.39 8.18 11.66	0.25 0.31 0.40 0.66
Platform Mount [LP 712-1]	C	None		0.0000	146.00	No Ice 1/2" Ice 1" Ice 2" Ice	24.56 27.92 31.27 37.98	24.56 27.92 31.27 37.98	1.34 1.91 2.55 3.97
***									
CBRS w/ Mount Pipe	A	From Leg	4.00 0.00 -3.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.45 1.67 1.90 2.42	0.99 1.18 1.39 1.85	0.03 0.05 0.07 0.12
CBRS w/ Mount Pipe	B	From Leg	4.00 0.00 -3.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.45 1.67 1.90 2.42	0.99 1.18 1.39 1.85	0.03 0.05 0.07 0.12
CBRS w/ Mount Pipe	C	From Leg	4.00 0.00 -3.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.45 1.67 1.90 2.42	0.99 1.18 1.39 1.85	0.03 0.05 0.07 0.12
MT6407-77A w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice	4.91 5.26 5.61 6.36	2.68 3.14 3.62 4.63	0.10 0.14 0.18 0.29

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice			
MT6407-77A w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.91 5.26 5.61 6.36	2.68 3.14 3.62 4.63	0.10 0.14 0.18 0.29
MT6407-77A w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.91 5.26 5.61 6.36	2.68 3.14 3.62 4.63	0.10 0.14 0.18 0.29
******									
1" Dia x 3.5-ft	A	From Leg	1.50 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.37 0.68 0.90 1.37	0.00 0.01 0.01 0.03
1" Dia x 3.5-ft	B	From Leg	1.50 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.37 0.68 0.90 1.37	0.00 0.01 0.01 0.03
1" Dia x 3.5-ft	C	From Leg	1.50 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.37 0.68 0.90 1.37	0.00 0.01 0.01 0.03
*****									
1" Dia x 3.5-ft	A	From Leg	1.50 0.00 0.00	0.0000	70.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.37 0.68 0.90 1.37	0.00 0.01 0.01 0.03
1" Dia x 3.5-ft	B	From Leg	1.50 0.00 0.00	0.0000	70.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.37 0.68 0.90 1.37	0.00 0.01 0.01 0.03
1" Dia x 3.5-ft	C	From Leg	1.50 0.00 0.00	0.0000	70.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.37 0.68 0.90 1.37	0.00 0.01 0.01 0.03
*****									
1" Dia x 3.5-ft	A	From Leg	1.50 0.00 0.00	0.0000	40.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.37 0.68 0.90 1.37	0.00 0.01 0.01 0.03
1" Dia x 3.5-ft	B	From Leg	1.50 0.00 0.00	0.0000	40.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.37 0.68 0.90 1.37	0.00 0.01 0.01 0.03
1" Dia x 3.5-ft	C	From Leg	1.50 0.00 0.00	0.0000	40.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.37 0.68 0.90 1.37	0.00 0.01 0.01 0.03
*****									
1" Dia x 3.5-ft	A	From Leg	1.50 0.00 0.00	0.0000	10.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.37 0.68 0.90 1.37	0.00 0.01 0.01 0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
1" Dia x 3.5-ft	B	From Leg	1.50 0.00 0.00	0.0000	10.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.37 0.68 0.90 1.37	0.00 0.01 0.01 0.03
1" Dia x 3.5-ft	C	From Leg	1.50 0.00 0.00	0.0000	10.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.37 0.68 0.90 1.37	0.00 0.01 0.01 0.03
****** **** **									

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

Comb. No.	Description
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	0.00	-0.00	-0.00
			Max. Compression	26	-54.36	1.60	3.88
			Max. Mx	20	-17.37	837.18	-4.39
			Max. My	2	-17.29	-5.53	846.59
			Max. Vy	20	-28.75	837.18	-4.39
			Max. Vx	2	-29.05	-5.53	846.59
			Max. Torque	6			2.34
L2	137 - 90.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-69.15	1.74	3.08
			Max. Mx	20	-27.43	2267.62	-9.74
			Max. My	2	-27.38	-10.80	2290.82
			Max. Vy	20	-33.77	2267.62	-9.74
			Max. Vx	2	-34.08	-10.80	2290.82
			Max. Torque	6			2.33
L3	90.25 - 44.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-88.17	1.74	1.89
			Max. Mx	20	-41.18	3882.65	-14.91
			Max. My	2	-41.16	-15.80	3919.06
			Max. Vy	20	-38.69	3882.65	-14.91
			Max. Vx	2	-38.98	-15.80	3919.06
			Max. Torque	6			2.31
L4	44.5 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-117.36	1.74	0.63
			Max. Mx	20	-63.92	5989.32	-20.64
			Max. My	2	-63.92	-21.30	6040.34
			Max. Vy	20	-43.55	5989.32	-20.64
			Max. Vx	2	-43.83	-21.30	6040.34
			Max. Torque	6			2.30

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	27	117.36	-0.02	11.74
	Max. H_x	20	63.95	43.50	-0.10
	Max. H_z	2	63.95	-0.10	43.78
	Max. M_x	2	6040.34	-0.10	43.78
	Max. M_z	8	5988.81	-43.50	0.10
	Max. Torsion	6	2.29	-37.72	21.98
	Min. Vert	7	47.97	-37.72	21.98
	Min. H_x	8	63.95	-43.50	0.10
	Min. H_z	14	63.95	0.10	-43.78
	Min. M_x	14	-6038.51	0.10	-43.78
	Min. M_z	20	-5989.32	43.50	-0.10
	Min. Torsion	18	-2.28	37.72	-21.98

Tower Mast Reaction Summary

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead Only	53.29	0.00	0.00	-0.69	0.20	-0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	63.95	0.10	-43.78	-6040.34	-21.30	-1.06
0.9 Dead+1.0 Wind 0 deg - No Ice	47.97	0.10	-43.78	-5940.66	-20.93	-1.06
1.2 Dead+1.0 Wind 30 deg - No Ice	63.95	21.84	-37.97	-5241.89	-3012.68	-1.93
0.9 Dead+1.0 Wind 30 deg - No Ice	47.97	21.84	-37.97	-5155.31	-2963.12	-1.91
1.2 Dead+1.0 Wind 60 deg - No Ice	63.95	37.72	-21.98	-3039.32	-5196.94	-2.29
0.9 Dead+1.0 Wind 60 deg - No Ice	47.97	37.72	-21.98	-2988.97	-5111.47	-2.27
1.2 Dead+1.0 Wind 90 deg - No Ice	63.95	43.50	-0.10	-22.42	-5988.81	-2.04
0.9 Dead+1.0 Wind 90 deg - No Ice	47.97	43.50	-0.10	-21.73	-5890.34	-2.01
1.2 Dead+1.0 Wind 120 deg - No Ice	63.95	37.62	21.80	3000.45	-5175.74	-1.21
0.9 Dead+1.0 Wind 120 deg - No Ice	47.97	37.62	21.80	2951.35	-5090.68	-1.19
1.2 Dead+1.0 Wind 150 deg - No Ice	63.95	21.66	37.86	5218.90	-2975.57	-0.05
0.9 Dead+1.0 Wind 150 deg - No Ice	47.97	21.66	37.86	5133.25	-2926.75	-0.04
1.2 Dead+1.0 Wind 180 deg - No Ice	63.95	-0.10	43.78	6038.51	21.75	1.12
0.9 Dead+1.0 Wind 180 deg - No Ice	47.97	-0.10	43.78	5939.35	21.26	1.11
1.2 Dead+1.0 Wind 210 deg - No Ice	63.95	-21.84	37.97	5240.10	3013.12	1.97
0.9 Dead+1.0 Wind 210 deg - No Ice	47.97	-21.84	37.97	5154.03	2963.43	1.95
1.2 Dead+1.0 Wind 240 deg - No Ice	63.95	-37.72	21.98	3037.56	5197.41	2.28
0.9 Dead+1.0 Wind 240 deg - No Ice	47.97	-37.72	21.98	2987.71	5111.81	2.25
1.2 Dead+1.0 Wind 270 deg - No Ice	63.95	-43.50	0.10	20.64	5989.32	1.98
0.9 Dead+1.0 Wind 270 deg - No Ice	47.97	-43.50	0.10	20.46	5890.71	1.96
1.2 Dead+1.0 Wind 300 deg - No Ice	63.95	-37.62	-21.80	-3002.26	5176.26	1.18
0.9 Dead+1.0 Wind 300 deg - No Ice	47.97	-37.62	-21.80	-2952.64	5091.06	1.16
1.2 Dead+1.0 Wind 330 deg - No Ice	63.95	-21.66	-37.86	-5220.74	2976.06	0.07
0.9 Dead+1.0 Wind 330 deg - No Ice	47.97	-21.66	-37.86	-5134.57	2927.10	0.06
1.2 Dead+1.0 Ice+1.0 Temp	117.36	-0.00	-0.00	-0.63	1.74	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	117.36	0.02	-11.74	-1762.52	-2.00	-0.34
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	117.36	5.86	-10.18	-1528.47	-877.16	-0.57
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	117.36	10.13	-5.89	-885.14	-1516.85	-0.65
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	117.36	11.69	-0.02	-4.78	-1749.44	-0.56
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	117.36	10.12	5.86	876.60	-1512.83	-0.31
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	117.36	5.83	10.16	1522.85	-870.34	0.01
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	117.36	-0.02	11.74	1760.84	5.88	0.34
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	117.36	-5.86	10.18	1526.87	881.09	0.57

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	117.36	-10.13	5.89	883.42	1520.65	0.65
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	117.36	-11.69	0.02	3.10	1753.33	0.55
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	117.36	-10.12	-5.86	-878.32	1516.81	0.31
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	117.36	-5.83	-10.16	-1524.54	874.23	-0.01
Dead+Wind 0 deg - Service	53.29	0.02	-9.50	-1302.45	-4.42	-0.24
Dead+Wind 30 deg - Service	53.29	4.74	-8.24	-1130.40	-649.18	-0.43
Dead+Wind 60 deg - Service	53.29	8.19	-4.77	-655.64	-1119.94	-0.51
Dead+Wind 90 deg - Service	53.29	9.44	-0.02	-5.40	-1290.53	-0.45
Dead+Wind 120 deg - Service	53.29	8.17	4.73	646.07	-1115.31	-0.27
Dead+Wind 150 deg - Service	53.29	4.70	8.22	1124.22	-641.16	-0.01
Dead+Wind 180 deg - Service	53.29	-0.02	9.50	1300.91	4.84	0.25
Dead+Wind 210 deg - Service	53.29	-4.74	8.24	1128.86	649.60	0.44
Dead+Wind 240 deg - Service	53.29	-8.19	4.77	654.10	1120.36	0.51
Dead+Wind 270 deg - Service	53.29	-9.44	0.02	3.86	1290.95	0.45
Dead+Wind 300 deg - Service	53.29	-8.17	-4.73	-647.61	1115.73	0.26
Dead+Wind 330 deg - Service	53.29	-4.70	-8.22	-1125.77	641.58	0.01

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-53.29	0.00	0.00	53.29	0.00	0.000%
2	0.10	-63.95	-43.78	-0.10	63.95	43.78	0.000%
3	0.10	-47.97	-43.78	-0.10	47.97	43.78	0.000%
4	21.84	-63.95	-37.97	-21.84	63.95	37.97	0.000%
5	21.84	-47.97	-37.97	-21.84	47.97	37.97	0.000%
6	37.72	-63.95	-21.98	-37.72	63.95	21.98	0.000%
7	37.72	-47.97	-21.98	-37.72	47.97	21.98	0.000%
8	43.50	-63.95	-0.10	-43.50	63.95	0.10	0.000%
9	43.50	-47.97	-0.10	-43.50	47.97	0.10	0.000%
10	37.62	-63.95	21.80	-37.62	63.95	-21.80	0.000%
11	37.62	-47.97	21.80	-37.62	47.97	-21.80	0.000%
12	21.66	-63.95	37.86	-21.66	63.95	-37.86	0.000%
13	21.66	-47.97	37.86	-21.66	47.97	-37.86	0.000%
14	-0.10	-63.95	43.78	0.10	63.95	-43.78	0.000%
15	-0.10	-47.97	43.78	0.10	47.97	-43.78	0.000%
16	-21.84	-63.95	37.97	21.84	63.95	-37.97	0.000%
17	-21.84	-47.97	37.97	21.84	47.97	-37.97	0.000%
18	-37.72	-63.95	21.98	37.72	63.95	-21.98	0.000%
19	-37.72	-47.97	21.98	37.72	47.97	-21.98	0.000%
20	-43.50	-63.95	0.10	43.50	63.95	-0.10	0.000%
21	-43.50	-47.97	0.10	43.50	47.97	-0.10	0.000%
22	-37.62	-63.95	-21.80	37.62	63.95	21.80	0.000%
23	-37.62	-47.97	-21.80	37.62	47.97	21.80	0.000%
24	-21.66	-63.95	-37.86	21.66	63.95	37.86	0.000%
25	-21.66	-47.97	-37.86	21.66	47.97	37.86	0.000%
26	0.00	-117.36	0.00	0.00	117.36	0.00	0.000%
27	0.02	-117.36	-11.74	-0.02	117.36	11.74	0.000%
28	5.86	-117.36	-10.18	-5.86	117.36	10.18	0.000%
29	10.13	-117.36	-5.89	-10.13	117.36	5.89	0.000%
30	11.69	-117.36	-0.02	-11.69	117.36	0.02	0.000%
31	10.12	-117.36	5.86	-10.12	117.36	-5.86	0.000%
32	5.83	-117.36	10.16	-5.83	117.36	-10.16	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
33	-0.02	-117.36	11.74	0.02	117.36	-11.74	0.000%
34	-5.86	-117.36	10.18	5.86	117.36	-10.18	0.000%
35	-10.13	-117.36	5.89	10.13	117.36	-5.89	0.000%
36	-11.69	-117.36	0.02	11.69	117.36	-0.02	0.000%
37	-10.12	-117.36	-5.86	10.12	117.36	5.86	0.000%
38	-5.83	-117.36	-10.16	5.83	117.36	10.16	0.000%
39	0.02	-53.29	-9.50	-0.02	53.29	9.50	0.000%
40	4.74	-53.29	-8.24	-4.74	53.29	8.24	0.000%
41	8.19	-53.29	-4.77	-8.19	53.29	4.77	0.000%
42	9.44	-53.29	-0.02	-9.44	53.29	0.02	0.000%
43	8.17	-53.29	4.73	-8.17	53.29	-4.73	0.000%
44	4.70	-53.29	8.22	-4.70	53.29	-8.22	0.000%
45	-0.02	-53.29	9.50	0.02	53.29	-9.50	0.000%
46	-4.74	-53.29	8.24	4.74	53.29	-8.24	0.000%
47	-8.19	-53.29	4.77	8.19	53.29	-4.77	0.000%
48	-9.44	-53.29	0.02	9.44	53.29	-0.02	0.000%
49	-8.17	-53.29	-4.73	8.17	53.29	4.73	0.000%
50	-4.70	-53.29	-8.22	4.70	53.29	8.22	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	0.00004162
3	Yes	5	0.00000001	0.00001686
4	Yes	6	0.00000001	0.00059320
5	Yes	6	0.00000001	0.00016287
6	Yes	6	0.00000001	0.00061402
7	Yes	6	0.00000001	0.00017025
8	Yes	5	0.00000001	0.00031434
9	Yes	5	0.00000001	0.00013387
10	Yes	6	0.00000001	0.00059127
11	Yes	6	0.00000001	0.00016397
12	Yes	6	0.00000001	0.00059768
13	Yes	6	0.00000001	0.00016609
14	Yes	5	0.00000001	0.00022163
15	Yes	5	0.00000001	0.00009423
16	Yes	6	0.00000001	0.00061297
17	Yes	6	0.00000001	0.00016988
18	Yes	6	0.00000001	0.00059088
19	Yes	6	0.00000001	0.00016225
20	Yes	5	0.00000001	0.00011557
21	Yes	5	0.00000001	0.00005008
22	Yes	6	0.00000001	0.00060357
23	Yes	6	0.00000001	0.00016809
24	Yes	6	0.00000001	0.00059839
25	Yes	6	0.00000001	0.00016619
26	Yes	4	0.00000001	0.00005075
27	Yes	6	0.00007987	0.00048918
28	Yes	6	0.00007899	0.00099076
29	Yes	7	0.00000001	0.00022119
30	Yes	6	0.00007979	0.00048433
31	Yes	6	0.00007892	0.00096871
32	Yes	6	0.00007890	0.00097595
33	Yes	6	0.00007973	0.00048543
34	Yes	7	0.00000001	0.00022016
35	Yes	6	0.00007895	0.00098240
36	Yes	6	0.00007985	0.00048614
37	Yes	7	0.00000001	0.00021846
38	Yes	6	0.00007903	0.00099868
39	Yes	4	0.00000001	0.00025834
40	Yes	5	0.00000001	0.00013232
41	Yes	5	0.00000001	0.00014486
42	Yes	4	0.00000001	0.00030832
43	Yes	5	0.00000001	0.00012900

44	Yes	5	0.00000001	0.00013298
45	Yes	4	0.00000001	0.00026992
46	Yes	5	0.00000001	0.00014352
47	Yes	5	0.00000001	0.00013007
48	Yes	4	0.00000001	0.00028778
49	Yes	5	0.00000001	0.00013753
50	Yes	5	0.00000001	0.00013446

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	188 - 137	43.677	40	2.2290	0.0055
L2	141.25 - 90.25	23.537	40	1.7684	0.0023
L3	95.5 - 44.5	9.779	40	1.0594	0.0009
L4	51 - 0	2.564	40	0.4674	0.0003

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
188.00	Lighting Rod 3/4" x 8'	40	43.677	2.2290	0.0055	32428
173.00	MX08FRO665-21	40	36.851	2.1030	0.0043	10809
161.00	APXVAARR24_43-U-NA20 w/ Mount Pipe	40	31.559	1.9921	0.0035	6004
146.00	(2) SBNHH-1D65B w/ Mount Pipe	40	25.365	1.8283	0.0026	3858
100.00	1" Dia x 3.5-ft	40	10.836	1.1303	0.0010	3901
70.00	1" Dia x 3.5-ft	40	4.938	0.6951	0.0005	4132
40.00	1" Dia x 3.5-ft	40	1.643	0.3526	0.0002	5450
10.00	1" Dia x 3.5-ft	40	0.273	0.0829	0.0000	21799

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	188 - 137	201.742	2	10.3272	0.0253
L2	141.25 - 90.25	108.966	4	8.2052	0.0107
L3	95.5 - 44.5	45.357	4	4.9190	0.0040
L4	51 - 0	11.895	4	2.1698	0.0013

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
188.00	Lighting Rod 3/4" x 8'	2	201.742	10.3272	0.0253	7442
173.00	MX08FRO665-21	2	170.320	9.7481	0.0200	2477
161.00	APXVAARR24_43-U-NA20 w/ Mount Pipe	2	145.948	9.2377	0.0161	1371
146.00	(2) SBNHH-1D65B w/ Mount Pipe	2	117.396	8.4821	0.0118	876
100.00	1" Dia x 3.5-ft	4	50.254	5.2483	0.0044	855
70.00	1" Dia x 3.5-ft	4	22.911	3.2277	0.0022	896
40.00	1" Dia x 3.5-ft	4	7.626	1.6366	0.0009	1176

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
10.00	1" Dia x 3.5-ft	4	1.268	0.3848	0.0002	4700

Compression Checks

Pole Design Data

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
L1	188 - 137 (1)	TP32.711x22x0.25	51.00	0.00	0.0	25.0495	-17.28	1465.40	0.012
L2	137 - 90.25 (2)	TP42.03x31.3184x0.3125	51.00	0.00	0.0	40.2848	-27.37	2356.66	0.012
L3	90.25 - 44.5 (3)	TP51.014x40.3023x0.375	51.00	0.00	0.0	58.6481	-41.16	3430.92	0.012
L4	44.5 - 0 (4)	TP59.61x48.8988x0.5	51.00	0.00	0.0	93.8076	-63.92	5487.74	0.012

Pole Bending Design Data

Section No.	Elevation	Size	M_{ux}	ϕM_{nx}	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy}	ϕM_{ny}	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	ft		kip-ft	kip-ft		kip-ft	kip-ft	
L1	188 - 137 (1)	TP32.711x22x0.25	849.04	1113.48	0.763	0.00	1113.48	0.000
L2	137 - 90.25 (2)	TP42.03x31.3184x0.3125	2294.35	2281.22	1.006	0.00	2281.22	0.000
L3	90.25 - 44.5 (3)	TP51.014x40.3023x0.375	3923.60	4013.65	0.978	0.00	4013.65	0.000
L4	44.5 - 0 (4)	TP59.61x48.8988x0.5	6045.96	7974.63	0.758	0.00	7974.63	0.000

Pole Shear Design Data

Section No.	Elevation	Size	Actual V_u	ϕV_n	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u	ϕT_n	Ratio $\frac{T_u}{\phi T_n}$
	ft		K	K		kip-ft	kip-ft	
L1	188 - 137 (1)	TP32.711x22x0.25	29.08	439.62	0.066	1.97	1215.38	0.002
L2	137 - 90.25 (2)	TP42.03x31.3184x0.3125	34.10	707.00	0.048	1.95	2514.68	0.001
L3	90.25 - 44.5 (3)	TP51.014x40.3023x0.375	39.01	1029.27	0.038	1.93	4441.48	0.000
L4	44.5 - 0 (4)	TP59.61x48.8988x0.5	43.85	1646.32	0.027	1.93	8522.25	0.000

Pole Interaction Design Data

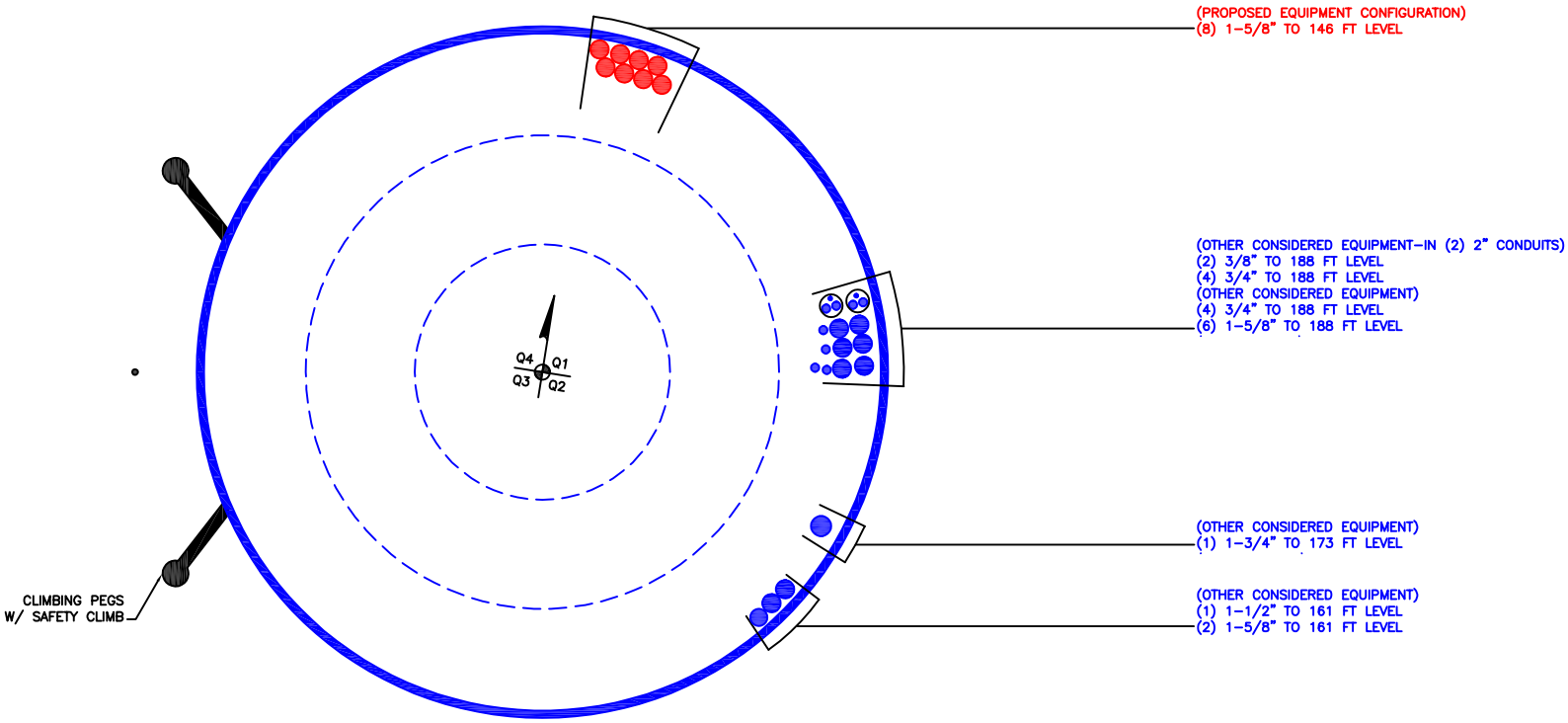
Section No.	Elevation	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	ft								
L1	188 - 137 (1)	0.012	0.763	0.000	0.066	0.002	0.779	1.050	4.8.2
L2	137 - 90.25 (2)	0.012	1.006	0.000	0.048	0.001	1.020	1.050	4.8.2
L3	90.25 - 44.5 (3)	0.012	0.978	0.000	0.038	0.000	0.991	1.050	4.8.2
L4	44.5 - 0 (4)	0.012	0.758	0.000	0.027	0.000	0.771	1.050	4.8.2

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	188 - 137	Pole	TP32.711x22x0.25	1	-17.28	1538.67	74.2	Pass
L2	137 - 90.25	Pole	TP42.03x31.3184x0.3125	2	-27.37	2474.49	97.1	Pass
L3	90.25 - 44.5	Pole	TP51.014x40.3023x0.375	3	-41.16	3602.47	94.4	Pass
L4	44.5 - 0	Pole	TP59.61x48.8988x0.5	4	-63.92	5762.13	73.4	Pass
							Summary	
						Pole (L2)	97.1	Pass
						RATING =	**97.1**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 803175 TOWER ID:C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

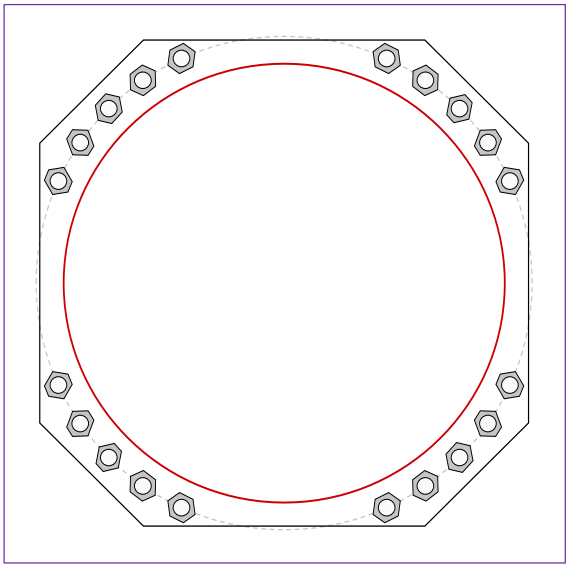
Monopole Base Plate Connection

Site Info	
BU #	803175
Site Name	New Britain 3 CAC 803
Order #	552667 Rev. 0

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

Applied Loads	
Moment (kip-ft)	6045.96
Axial Force (kips)	63.92
Shear Force (kips)	43.85

**TIA-222-H Section 15.5 Applied*



Connection Properties

Anchor Rod Data

(20) 2-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 67" BC

Anchor Spacing: 6 in

Base Plate Data

66" W x 3" Plate (A572-50; Fy=50 ksi, Fu=65 ksi); Clip: 14 in

Stiffener Data

N/A

Pole Data

59.61" x 0.5" 18-sided pole (A607-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

Anchor Rod Summary *(units of kips, kip-in)*

Pu_t = 213.28	ϕPn_t = 243.75	**Stress Rating**
Vu = 2.19	ϕVn = 149.1	**83.3%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary

Max Stress (ksi):	37.17	(Flexural)
Allowable Stress (ksi):	45	
Stress Rating:	**78.7%**	**Pass**

Pier and Pad Foundation

BU # :	803175
Site Name:	CT New Britain 3 C
App. Number:	552667 Rev. 0

TIA-222 Revision:	H
Tower Type:	Monopole

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

Superstructure Analysis Reactions		
Compression, P_{comp}:	63.95	kips
Base Shear, Vu_comp:	43.8	kips
Moment, M_u:	6045.96	ft-kips
Tower Height, **H**:	188	ft
BP Dist. Above Fdn, bp_{dist}:	3.5	in

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

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, **Fy**:	60	ksi
Concrete Compressive Strength, **F'c**:	3	ksi
Dry Concrete Density, δc:	150	pcf

Soil Properties		
Total Soil Unit Weight, γ:	110	pcf
Ultimate Gross Bearing, Qult:	12.000	ksf
Cohesion, **Cu**:	0.000	ksf
Friction Angle, φ:	30	degrees
SPT Blow Count, N_{blows}:		
Base Friction, μ:		
Neglected Depth, **N**:	3.33	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, **gw**:	17.9	ft

<--Toggle between Gross and Net

Foundation Analysis Checks	Capacity	Demand	Rating*	Check
Lateral (Sliding) (kips)	222.65	43.80	**18.7%**	**Pass**
Bearing Pressure (ksf)	9.00	6.47	**71.9%**	**Pass**
*Overturning (kip*ft)*	6593.30	6365.48	**96.5%**	**Pass**
*Pier Flexure (Comp.) (kip*ft)*	9863.92	6221.30	**60.1%**	**Pass**
Pier Compression (kip)	30551.04	110.07	**0.3%**	**Pass**
*Pad Flexure (kip*ft)*	6473.47	3501.62	**51.5%**	**Pass**
Pad Shear - 1-way (kips)	766.05	415.78	**51.7%**	**Pass**
Pad Shear - 2-way (Comp) (ksi)	0.164	0.000	**0.0%**	**Pass**
*Flexural 2-way (Comp) (kip*ft)*	8464.14	3732.78	**42.0%**	**Pass**

**Rating per TIA-222-H Section 15.5*

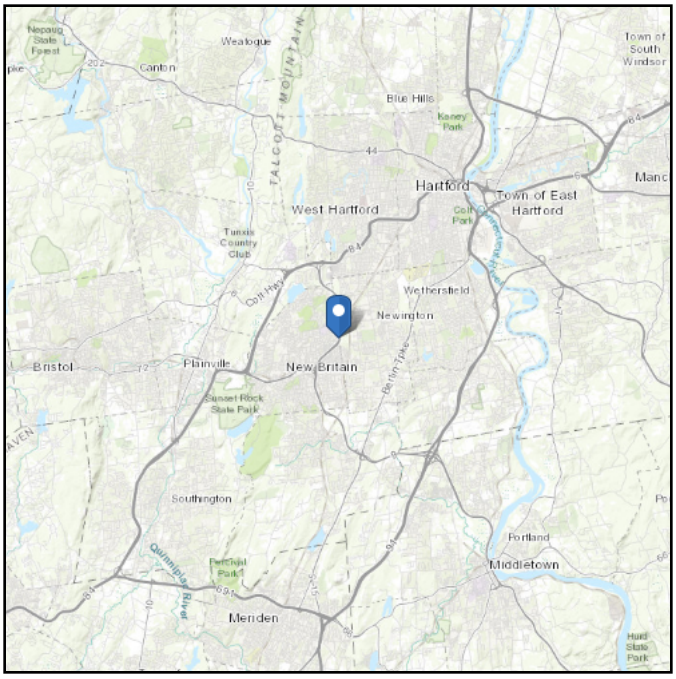
Soil Rating*:	**96.5%**
Structural Rating*:	**60.1%**

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



Wind

Results:

Wind Speed:	122 Vmph
10-year MRI	76 Vmph
25-year MRI	86 Vmph
50-year MRI	93 Vmph
100-year MRI	100 Vmph

*Ultimate Wind Speed of 125mph as per Appendix N, 2018 Connecticut State Building Code.

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

Date Accessed: Thu Apr 29 2021

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-10 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

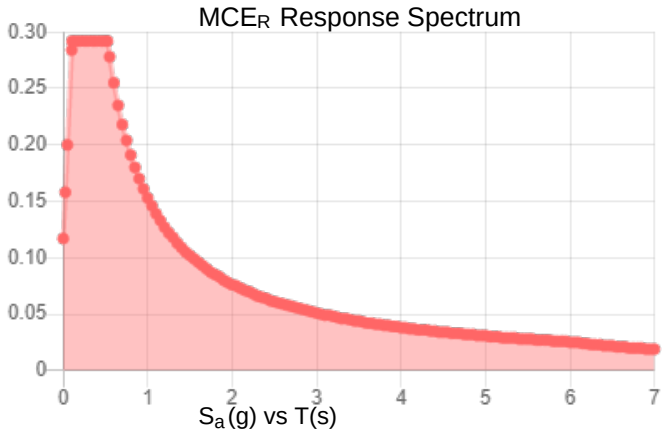
Seismic

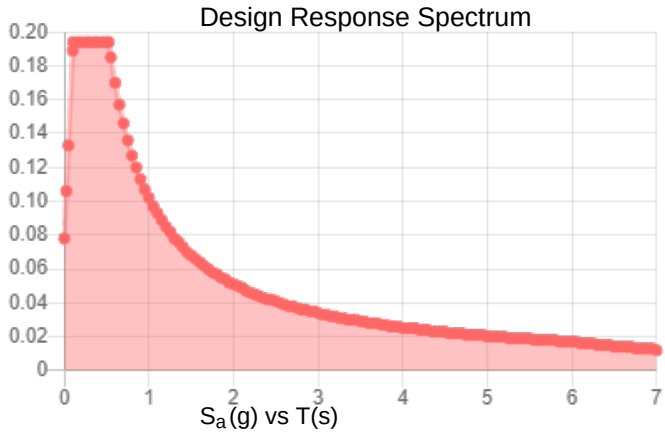
Site Soil Class: D - Stiff Soil

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: Thu Apr 29 2021

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

Ice

Results:

Ice Thickness:	1.00 in.	Design Ice Thickness = 2*1.0in = 2.0in
Concurrent Temperature:	5 F	
Gust Speed:	50 mph	

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

Date Accessed: Thu Apr 29 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.