



STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

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Web Site: portal.ct.gov/csc

VIA ELECTRONIC MAIL

November 9, 2021

Jeffery Barbadora
Siting Acquisition Specialist
Crown Castle
1800 W. Park Drive
Westborough, MA 01581
Jeff.Barbadora@crrowncastle.com

RE: **EM-T-MOBILE-144-210928** - T-Mobile notice of intent to modify an existing telecommunications facility located at 425 Indian Ledge Park Road, Trumbull, Connecticut.

Dear Mr. Barbadora:

The Connecticut Siting Council (Council) is in receipt of your correspondence of November 4, 2021, submitted in response to the Council's November 4, 2021 notification of an incomplete request for exempt modification with regard to the above-referenced matter.

The submission renders the request for exempt modification complete and the Council will process the request in accordance with the Federal Communications Commission 60-day timeframe.

Thank you for your attention and cooperation

Sincerely,

A handwritten signature in black ink, appearing to read 'Melanie Bachman'.

Melanie Bachman
Executive Director

MAB/FOC/laf

From: Barbadora, Jeff <Jeff.Barbadora@crowncastle.com>
Sent: Thursday, November 4, 2021 1:46 PM
To: Fontaine, Lisa <Lisa.Fontaine@ct.gov>
Cc: CSC-DL Siting Council <Siting.Council@ct.gov>
Subject: RE: EM-T-MOBILE-144-210928 - 425 Indian Ledge Park Road, Trumbull, incomplete letter

EXTERNAL EMAIL: This email originated from outside of the organization. Do not click any links or open any attachments unless you trust the sender and know the content is safe.

Good afternoon,

Please find attached SA signed and stamped by a Professional Engineer licensed in the State of CT.

Please let me know if you have any questions or require additional information. An original hard copy is being overnighted to your office.

Thanks,

Jeffrey Barbadora
Site Acquisition Specialist
781-970-0053

Crown Castle
1800 W. Park Drive
Westborough, MA 01581

Date: July 29, 2021



Black & Veatch Corp.
6800 W. 115th St., Suite 2292
Overland Park, KS 66211
(913) 458-6909

Subject: Structural Analysis Report

Carrier Designation: T-Mobile Co-Locate
Site Number: CT11961A

Crown Castle Designation: BU Number: 881535
Site Name: TRUMBULL TOWER
JDE Job Number: 673848
Work Order Number: 2000545
Order Number: 575117 Rev. 0

Engineering Firm Designation: Black & Veatch Corp. Project Number: 406642

Site Data: 425 Indian Ledge Park Rd, Trumbull, Fairfield County, CT
Latitude 41° 16' 23.81", Longitude -73° 12' 47.18"
195 Foot - Monopole Tower

Black & Veatch Corp. 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 – 66.5%**

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: Angkoon Pansit

Respectfully submitted by:

Ping Jiang, P.E.
Professional Engineer

Digitally signed by
Jiang, Ping
DN: cn=Jiang,
Ping, o=Black
Veatch, ou=US
Date: 2021.11.04
11:40:16-0500

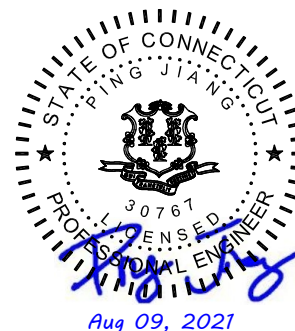


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1) INTRODUCTION

This tower is a 195 ft Monopole tower designed by Engineered Endeavors, Inc.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	125 mph
Exposure Category:	B
Topographic Factor:	1
Ice Thickness:	1.5 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	146.0	1	cci tower mounts (v2.1)	Platform Mount [LP 602-1]	3	1-5/8
	145.0	3	ericsson	AIR6449 B41_T-MOBILE w/ Mount Pipe		
		3	ericsson	RADIO 4449 B71 B85A_T-MOBILE		
		3	ericsson	RADIO 4460 B2/B25 B66_TMO		
		3	rfs celwave	APX16DWV-16DWV-S-E-A20 w/ Mount Pipe		
		3	rfs celwave	APXVAARR24_43-U-NA20 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)
185.0	187.0	3	cci antennas	HPA-65R-BUU-H6 w/ Mount Pipe	2 4 12 2	3/8 5/8 1-1/4 2" Conduit
		3	ericsson	RRUS 32		
		3	ericsson	RRUS 4449 B5/B12		
		3	ericsson	RRUS12/RRUS A2		
		3	kathrein	80010965 w/ Mount Pipe		
		3	powerwave technologies	7770.00 w/ Mount Pipe		
	185.0	6	cci tower mounts (v2.1)	Miscellaneous [NA 509-1]		
		1	cci tower mounts (v2.1)	Platform Mount [LP 602-1_KCKR]		
		6	powerwave technologies	LGP21401		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
		2	raycap	DC6-48-60-18-8F		
175.0	175.0	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		
164.0	166.0	3	dragonwave	A-ANT-23G-2-C	4 6 2 1	1-1/4 5/16 7983A 2" Conduit
		3	alcatel lucent	1900MHz RRH (65MHz)		
		3	alcatel lucent	800 EXTERNAL NOTCH FILTER		
		3	alcatel lucent	800MHZ RRH		
		3	alcatel lucent	TD-RRH8x20-25		
		3	argus technologies	LLPX310R w/ Mount Pipe		
		9	rfs celwave	ACU-A20-N		
		3	rfs celwave	APXVSP18-C-A20 w/ Mount Pipe		
		3	rfs celwave	APXVTM14-ALU-I20 w/ Mount Pipe		
	3	samsung telecommunications	FDD_R6_RRH			
	164.0	1	cci tower mounts (v2.1)	Platform Mount [LP 602-1]		
154.0	155.0	2	antel	LPA-4016 w/ Mount Pipe	20	1-5/8
		3	commscope	CBC78T-DS-43-2X		
		6	commscope	JAHH-65B-R3B		
		4	decibel	DB844G65ZAXY w/ Mount Pipe		
		2	rfs celwave	DB-B1-6C-8AB-0Z		
		3	samsung telecommunications	RFV01U-D1A		
		3	samsung telecommunications	RFV01U-D2A		
	3	vzw	Sub6 Antenna - VZS01 w/ Mount Pipe			
	154.0	1	cci tower mounts (v2.1)	Platform Mount [LP 601-1]		
134.0	135.0	12	decibel	DB844H90E-XY w/ Mount Pipe	9	1-1/4
	134.0	1	cci tower mounts (v2.1)	Platform Mount [LP 303-1]	6	1-5/8

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
4-GEOTECHNICAL REPORTS	1406210	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	1405798	CCISITES
4-TOWER MANUFACTURER DRAWINGS	1405789	CCISITES

3.1) Analysis Method

tnxTower (version 8.1.1.0), 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. Black & Veatch Corp. should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary) (Monopole Tower)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	195 - 157.65	Pole	TP33.875x25x0.25	1	-13.24	1584.12	22.9	Pass
L2	157.65 - 117.08	Pole	TP42.9063x32.2511x0.3125	2	-30.06	2511.09	56.5	Pass
L3	117.08 - 81.09	Pole	TP50.75x40.9029x0.375	3	-41.43	3565.31	64.1	Pass
L4	81.09 - 40.03	Pole	TP59.6563x48.3906x0.5	4	-59.92	5584.37	53.9	Pass
L5	40.03 - 0	Pole	TP68x56.7865x0.5	5	-85.90	6580.00	61.5	Pass
							Summary	
						Pole (L3)	64.1	Pass
						Rating =	64.1	Pass

Table 5 - Tower Component Stresses vs. Capacity (Monopole Tower) – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	62.7	Pass
	Base Plate		55.4	Pass
1	Base Foundation (Structure)	0	66.5	Pass
	Base Foundation (Soil Interaction)		64.7	Pass

Structure Rating (max from all components) =	66.5%
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Notes:

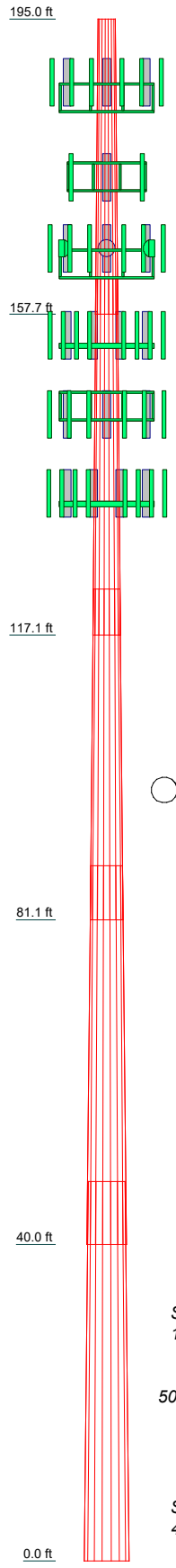
- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity. Rating per TIA-222-H Section 15.5.

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	1	2	3	4	5	Grade	Weight (K)
Length (ft)	37.35	45.30	41.85	47.90	47.98	46.2	46.2
Number of Sides	18	18	18	18	18		
Thickness (in)	0.2500	0.3125	0.3750	0.5000	0.5000		
Socket Length (ft)	4.73	5.86	6.84	7.95	56.7865		
Top Dia (in)	25.0000	32.2511	40.9029	48.3906	68.0000		
Bot Dia (in)	33.8750	42.9063	50.7500	59.6563			
Grade			A572-65				
Weight (K)	2.9	5.7	7.7	13.8	16.0		

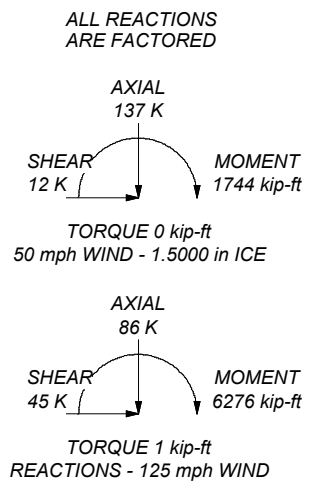


MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for Exposure B 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 1.50 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 64.1%



BLACK & VEATCH Building a world of difference.®	Black & Veatch Corp. 6800 W. 115th St., Suite 2292 Overland Park, KS 66211 Phone: (913) 458-6909 FAX:		
	Job: TRUMBULL TOWER (BU# 881535)		
	Project: 406642 (881535.2000545)		
	Client: Crown Castle	Drawn by: pan94203	App'd:
	Code: TIA-222-H	Date: 07/29/21	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 Fairfield County, Connecticut.
- Tower base elevation above sea level: 323.00 ft.
- Basic wind speed of 125 mph.
- Risk Category II.
- Exposure Category B.
- Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- Topographic Category: 1.
- Crest Height: 0.00 ft.
- Nominal ice thickness of 1.5000 in.
- Ice thickness is considered to increase with height.
- Ice density of 56 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50 °F.
- Deflections calculated using a wind speed of 60 mph.
- A non-linear (P-delta) analysis was used.
- Pressures are calculated at each section.
- Stress ratio used in pole design is 1.
- Tower analysis based on target reliabilities in accordance with Annex S.
- Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
- Maximum demand-capacity ratio is: 1.05.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification ✓ Use Code Stress Ratios ✓ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile Include Bolts In Member Capacity Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) SR Members Have Cut Ends SR Members Are Concentric	Distribute Leg Loads As Uniform Assume Legs Pinned ✓ Assume Rigid Index Plate ✓ Use Clear Spans For Wind Area Use Clear Spans For KL/r Retension Guys To Initial Tension ✓ Bypass Mast Stability Checks ✓ Use Azimuth Dish Coefficients ✓ Project Wind Area of Appurt. Autocalc Torque Arm Areas Add IBC .6D+W Combination Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Treat Feed Line Bundles As Cylinder Ignore KL/ry For 60 Deg. Angle Legs	Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation ✓ Consider Feed Line Torque Include Angle Block Shear Check Use TIA-222-H Bracing Resist. Exemption Use TIA-222-H Tension Splice Exemption <div style="text-align: center; background-color: #e0e0e0; padding: 2px;">Poles</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	195.00-157.65	37.35	4.73	18	25.0000	33.8750	0.2500	1.0000	A572-65 (65 ksi)
L2	157.65-117.08	45.30	5.86	18	32.2511	42.9063	0.3125	1.2500	A572-65 (65 ksi)
L3	117.08-81.09	41.85	6.84	18	40.9029	50.7500	0.3750	1.5000	A572-65 (65 ksi)
L4	81.09-40.03	47.90	7.95	18	48.3906	59.6563	0.5000	2.0000	A572-65 (65 ksi)
L5	40.03-0.00	47.98		18	56.7865	68.0000	0.5000	2.0000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	It/Q in ²	w in	w/t
L1	25.3471	19.6391	1519.8824	8.7863	12.7000	119.6758	3041.7647	9.8214	3.9600	15.84
	34.3590	26.6814	3811.2835	11.9369	17.2085	221.4768	7627.5821	13.3433	5.5220	22.088
L2	33.8301	31.6791	4082.6377	11.3382	16.3835	249.1914	8170.6474	15.8425	5.1262	16.404
	43.5199	42.2477	9683.4926	15.1208	21.7964	444.2708	19379.727	21.1279	7.0015	22.405
L3	42.8761	48.2383	10010.087	14.3874	20.7787	481.7482	20033.346	24.1237	6.5389	17.437
	51.4751	59.9588	19222.984	17.8831	25.7810	745.6260	38471.263	29.9851	8.2720	22.059
L4	50.6935	76.0024	22022.402	17.0012	24.5824	895.8600	44073.782	38.0084	7.6367	15.273
	60.4994	93.8810	41506.516	21.0005	30.3054	1369.6091	83067.647	46.9494	9.6195	19.239
L5	59.4720	89.3266	35754.161	19.9817	28.8475	1239.4184	71555.369	44.6718	9.1144	18.229
	68.9719	107.1225	61663.148	23.9625	34.5440	1785.0610	123407.43	53.5714	11.0880	22.176

Tower Elevation ft	Gusset Area (per face) ft ²	Gusset Thickness in	Gusset Grade	Adjust. Factor A _r	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 195.00- 157.65				1	1	1			
L2 157.65- 117.08				1	1	1			
L3 117.08- 81.09				1	1	1			
L4 81.09- 40.03				1	1	1			
L5 40.03-0.00				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 ** Safety Line 3/8	A	No	Surface Ar (CaAa)	195.00 - 8.00	1	1	0.030 0.037	0.3750		0.22
** 175R ** CU12PSM6P4XXX(1- 3/4)	C	No	Surface Ar (CaAa)	175.00 - 0.00	1	1	-0.450 -0.416	1.7500		2.72

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
** 154R ** AL7-50(1-5/8)	B	No	Surface Ar (CaAa)	154.00 - 3.00	6	6	-0.230 -0.009	1.9600		0.52

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C _A A _A ft ² /ft	Weight plf
** 185E ** LDF6-50A(1-1/4)	B	No	No	Inside Pole	185.00 - 7.00	12	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.60 0.60 0.60 0.60
FB-L98B-002-75000(3/8)	B	No	No	Inside Pole	185.00 - 7.00	2	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.06 0.06 0.06 0.06
WR-VG82ST-BRDA(5/8)	B	No	No	Inside Pole	185.00 - 7.00	4	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.31 0.31 0.31 0.31
2" innerduct conduit	B	No	No	Inside Pole	185.00 - 7.00	2	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.20 0.20 0.20 0.20
** 164E ** 7983A(ELLIPTICAL)	B	No	No	Inside Pole	164.00 - 3.00	2	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.08 0.08 0.08 0.08
9207(5/16)	B	No	No	Inside Pole	164.00 - 3.00	6	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.06 0.06 0.06 0.06
2" innerduct conduit	B	No	No	Inside Pole	164.00 - 3.00	1	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.20 0.20 0.20 0.20
HB114-1-0813U4-M5J(1-1/4)	B	No	No	Inside Pole	164.00 - 3.00	3	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	1.20 1.20 1.20 1.20
HB114-21U3M12-XXXF(1-1/4)	B	No	No	Inside Pole	164.00 - 3.00	1	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	1.22 1.22 1.22 1.22
HJ7-50A(1-5/8)	B	No	No	Inside Pole	154.00 - 3.00	12	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	1.04 1.04 1.04 1.04
HB158-1-08U8-S8J18(1-5/8)	B	No	No	Inside Pole	154.00 - 3.00	2	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	1.30 1.30 1.30 1.30
** 146P ** HCS 6X12 4AWG(1-5/8)	A	No	No	Inside Pole	146.00 - 3.00	1	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	2.40 2.40 2.40 2.40
HB158-21U6S24-xxM_TMO(1-5/8)	A	No	No	Inside Pole	146.00 - 0.00	2	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	2.50 2.50 2.50

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C _{AA} ft ² /ft	Weight plf
							2" Ice	0.00	2.50
** 134E **									
LDF6-50A(1-1/4)	A	No	No	Inside Pole	134.00 - 11.00	9	No Ice	0.00	0.60
							1/2" Ice	0.00	0.60
							1" Ice	0.00	0.60
							2" Ice	0.00	0.60
LDF7-50A(1-5/8)	A	No	No	Inside Pole	134.00 - 11.00	6	No Ice	0.00	0.82
							1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82
							2" Ice	0.00	0.82

Feed Line/Linear Appurtenances Section Areas

Tower Section n	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	195.00-157.65	A	0.000	0.000	1.401	0.000	0.01
		B	0.000	0.000	0.000	0.000	0.28
		C	0.000	0.000	3.036	0.000	0.05
L2	157.65-117.08	A	0.000	0.000	1.521	0.000	0.40
		B	0.000	0.000	43.418	0.000	1.26
		C	0.000	0.000	7.100	0.000	0.11
L3	117.08-81.09	A	0.000	0.000	1.350	0.000	0.65
		B	0.000	0.000	42.324	0.000	1.18
		C	0.000	0.000	6.298	0.000	0.10
L4	81.09-40.03	A	0.000	0.000	1.540	0.000	0.74
		B	0.000	0.000	48.287	0.000	1.34
		C	0.000	0.000	7.186	0.000	0.11
L5	40.03-0.00	A	0.000	0.000	1.201	0.000	0.60
		B	0.000	0.000	43.547	0.000	1.18
		C	0.000	0.000	7.005	0.000	0.11

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section n	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	195.00-157.65	A	1.507	0.000	0.000	12.657	0.000	0.14
		B		0.000	0.000	0.000	0.000	0.28
		C		0.000	0.000	8.265	0.000	0.15
L2	157.65-117.08	A	1.470	0.000	0.000	13.749	0.000	0.54
		B		0.000	0.000	68.181	0.000	1.98
		C		0.000	0.000	19.327	0.000	0.35
L3	117.08-81.09	A	1.423	0.000	0.000	11.929	0.000	0.76
		B		0.000	0.000	66.129	0.000	1.86
		C		0.000	0.000	16.878	0.000	0.31
L4	81.09-40.03	A	1.355	0.000	0.000	13.223	0.000	0.86
		B		0.000	0.000	74.963	0.000	2.10
		C		0.000	0.000	18.869	0.000	0.34
L5	40.03-0.00	A	1.210	0.000	0.000	9.879	0.000	0.69
		B		0.000	0.000	66.974	0.000	1.82
		C		0.000	0.000	17.850	0.000	0.31

Feed Line Center of Pressure

Section	Elevation	CP _x	CP _z	CP _x	CP _z
	ft	in	in	Ice in	Ice in
L1	195.00-157.65	0.3159	0.2728	-0.3281	-0.1398
L2	157.65-117.08	4.8575	-3.6884	3.6588	-2.9899
L3	117.08-81.09	5.3973	-4.1827	4.1593	-3.4536
L4	81.09-40.03	5.6434	-4.3739	4.4195	-3.6724
L5	40.03-0.00	5.5703	-4.1739	4.5828	-3.4856

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	157.65 - 195.00	1.0000	1.0000
L1	9	CU12PSM6P4XXX(1-3/4)	157.65 - 175.00	1.0000	1.0000
L2	2	Safety Line 3/8	117.08 - 157.65	1.0000	1.0000
L2	9	CU12PSM6P4XXX(1-3/4)	117.08 - 157.65	1.0000	1.0000
L2	17	AL7-50(1-5/8)	117.08 - 154.00	1.0000	1.0000
L3	2	Safety Line 3/8	81.09 - 117.08	1.0000	1.0000
L3	9	CU12PSM6P4XXX(1-3/4)	81.09 - 117.08	1.0000	1.0000
L3	17	AL7-50(1-5/8)	81.09 - 117.08	1.0000	1.0000
L4	2	Safety Line 3/8	40.03 - 81.09	1.0000	1.0000
L4	9	CU12PSM6P4XXX(1-3/4)	40.03 - 81.09	1.0000	1.0000
L4	17	AL7-50(1-5/8)	40.03 - 81.09	1.0000	1.0000
L5	2	Safety Line 3/8	8.00 - 40.03	1.0000	1.0000
L5	9	CU12PSM6P4XXX(1-3/4)	0.00 - 40.03	1.0000	1.0000
L5	17	AL7-50(1-5/8)	3.00 - 40.03	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
185									
7770.00 w/ Mount Pipe	A	From Leg	4.00	0.00	185.00	No Ice	5.75	4.25	0.06
						1/2" Ice	6.18	5.01	0.10
						1" Ice	6.61	5.71	0.16
						2" Ice	7.49	7.16	0.29
7770.00 w/ Mount Pipe	B	From Leg	4.00	0.00	185.00	No Ice	5.75	4.25	0.06

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Lateral					
			ft	ft	°	ft	ft ²	ft ²	K
			0.00			1/2"	6.18	5.01	0.10
			2.00			Ice	6.61	5.71	0.16
						1" Ice	7.49	7.16	0.29
						2" Ice			
7770.00 w/ Mount Pipe	C	From Leg	4.00	0.00	185.00	No Ice	5.75	4.25	0.06
			0.00			1/2"	6.18	5.01	0.10
			2.00			Ice	6.61	5.71	0.16
						1" Ice	7.49	7.16	0.29
						2" Ice			
HPA-65R-BUU-H6 w/ Mount Pipe	A	From Leg	4.00	0.00	185.00	No Ice	9.22	6.25	0.07
			0.00			1/2"	9.98	6.96	0.14
			2.00			Ice	10.76	7.70	0.22
						1" Ice	12.36	9.22	0.42
						2" Ice			
HPA-65R-BUU-H6 w/ Mount Pipe	B	From Leg	4.00	0.00	185.00	No Ice	9.22	6.25	0.07
			0.00			1/2"	9.98	6.96	0.14
			2.00			Ice	10.76	7.70	0.22
						1" Ice	12.36	9.22	0.42
						2" Ice			
HPA-65R-BUU-H6 w/ Mount Pipe	C	From Leg	4.00	0.00	185.00	No Ice	9.22	6.25	0.07
			0.00			1/2"	9.98	6.96	0.14
			2.00			Ice	10.76	7.70	0.22
						1" Ice	12.36	9.22	0.42
						2" Ice			
80010965 w/ Mount Pipe	A	From Leg	4.00	0.00	185.00	No Ice	12.26	5.79	0.14
			0.00			1/2"	13.03	6.47	0.23
			2.00			Ice	13.80	7.17	0.33
						1" Ice	15.41	8.60	0.57
						2" Ice			
80010965 w/ Mount Pipe	B	From Leg	4.00	0.00	185.00	No Ice	12.26	5.79	0.14
			0.00			1/2"	13.03	6.47	0.23
			2.00			Ice	13.80	7.17	0.33
						1" Ice	15.41	8.60	0.57
						2" Ice			
80010965 w/ Mount Pipe	C	From Leg	4.00	0.00	185.00	No Ice	12.26	5.79	0.14
			0.00			1/2"	13.03	6.47	0.23
			2.00			Ice	13.80	7.17	0.33
						1" Ice	15.41	8.60	0.57
						2" Ice			
RRUS 32	A	From Leg	4.00	0.00	185.00	No Ice	2.86	1.78	0.06
			0.00			1/2"	3.08	1.97	0.08
			2.00			Ice	3.32	2.17	0.10
						1" Ice	3.81	2.58	0.16
						2" Ice			
RRUS 32	B	From Leg	4.00	0.00	185.00	No Ice	2.86	1.78	0.06
			0.00			1/2"	3.08	1.97	0.08
			2.00			Ice	3.32	2.17	0.10
						1" Ice	3.81	2.58	0.16
						2" Ice			
RRUS 32	C	From Leg	4.00	0.00	185.00	No Ice	2.86	1.78	0.06
			0.00			1/2"	3.08	1.97	0.08
			2.00			Ice	3.32	2.17	0.10
						1" Ice	3.81	2.58	0.16
						2" Ice			
RRUS 4449 B5/B12	A	From Leg	4.00	0.00	185.00	No Ice	1.97	1.41	0.07
			0.00			1/2"	2.14	1.56	0.09
			2.00			Ice	2.33	1.73	0.11
						1" Ice	2.72	2.07	0.16
						2" Ice			
RRUS 4449 B5/B12	B	From Leg	4.00	0.00	185.00	No Ice	1.97	1.41	0.07
			0.00			1/2"	2.14	1.56	0.09
			2.00			Ice	2.33	1.73	0.11
						1" Ice	2.72	2.07	0.16
						2" Ice			
RRUS 4449 B5/B12	C	From Leg	4.00	0.00	185.00	No Ice	1.97	1.41	0.07

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A _{Front}	C _A A _{Side}	Weight
			Horz	Lateral					
			ft	ft	°	ft	ft ²	ft ²	K
			0.00			1/2"	2.14	1.56	0.09
			2.00			Ice	2.33	1.73	0.11
						1" Ice	2.72	2.07	0.16
						2" Ice			
RRUS12/RRUS A2	A	From Leg	4.00	0.00	185.00	No Ice	3.14	1.84	0.07
			0.00			1/2"	3.36	2.01	0.10
			2.00			Ice	3.59	2.20	0.13
						1" Ice	4.07	2.59	0.20
						2" Ice			
RRUS12/RRUS A2	B	From Leg	4.00	0.00	185.00	No Ice	3.14	1.84	0.07
			0.00			1/2"	3.36	2.01	0.10
			2.00			Ice	3.59	2.20	0.13
						1" Ice	4.07	2.59	0.20
						2" Ice			
RRUS12/RRUS A2	C	From Leg	4.00	0.00	185.00	No Ice	3.14	1.84	0.07
			0.00			1/2"	3.36	2.01	0.10
			2.00			Ice	3.59	2.20	0.13
						1" Ice	4.07	2.59	0.20
						2" Ice			
(2) LGP21401	A	From Leg	4.00	0.00	185.00	No Ice	1.10	0.35	0.01
			0.00			1/2"	1.24	0.44	0.02
			0.00			Ice	1.38	0.54	0.03
						1" Ice	1.69	0.77	0.05
						2" Ice			
(2) LGP21401	B	From Leg	4.00	0.00	185.00	No Ice	1.10	0.35	0.01
			0.00			1/2"	1.24	0.44	0.02
			0.00			Ice	1.38	0.54	0.03
						1" Ice	1.69	0.77	0.05
						2" Ice			
(2) LGP21401	C	From Leg	4.00	0.00	185.00	No Ice	1.10	0.35	0.01
			0.00			1/2"	1.24	0.44	0.02
			0.00			Ice	1.38	0.54	0.03
						1" Ice	1.69	0.77	0.05
						2" Ice			
DC6-48-60-18-8F	A	From Leg	4.00	0.00	185.00	No Ice	0.92	0.92	0.02
			0.00			1/2"	1.46	1.46	0.04
			0.00			Ice	1.64	1.64	0.06
						1" Ice	2.04	2.04	0.11
						2" Ice			
DC6-48-60-18-8F	B	From Leg	4.00	0.00	185.00	No Ice	0.92	0.92	0.02
			0.00			1/2"	1.46	1.46	0.04
			0.00			Ice	1.64	1.64	0.06
						1" Ice	2.04	2.04	0.11
						2" Ice			
8' x 2" Mount Pipe	A	From Leg	4.00	0.00	185.00	No Ice	1.90	1.90	0.03
			0.00			1/2"	2.73	2.73	0.04
			0.00			Ice	3.40	3.40	0.06
						1" Ice	4.40	4.40	0.12
						2" Ice			
8' x 2" Mount Pipe	B	From Leg	4.00	0.00	185.00	No Ice	1.90	1.90	0.03
			0.00			1/2"	2.73	2.73	0.04
			0.00			Ice	3.40	3.40	0.06
						1" Ice	4.40	4.40	0.12
						2" Ice			
8' x 2" Mount Pipe	C	From Leg	4.00	0.00	185.00	No Ice	1.90	1.90	0.03
			0.00			1/2"	2.73	2.73	0.04
			0.00			Ice	3.40	3.40	0.06
						1" Ice	4.40	4.40	0.12
						2" Ice			
12' horizontal x 2" Pipe Mount	A	From Leg	4.00	0.00	185.00	No Ice	2.28	0.01	0.03
			0.00			1/2"	3.50	0.04	0.05
			0.00			Ice	4.75	0.09	0.08
						1" Ice	7.28	0.21	0.15
						2" Ice			
12' horizontal x 2" Pipe	B	From Leg	4.00	0.00	185.00	No Ice	2.28	0.01	0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
Mount			0.00 0.00			1/2" Ice 4.75 0.09 0.05	0.04 0.09 0.15	0.05 0.08 0.15
12' horizontal x 2" Pipe Mount	C	From Leg	4.00 0.00 0.00	0.00	185.00	No Ice 1/2" Ice 4.75 0.09 0.05 1" Ice 7.28 0.21 0.15 2" Ice	0.01 0.04 0.09 0.08 0.15	0.03 0.05 0.08 0.15
(2) Miscellaneous [NA 509-1]	A	From Leg	2.00 0.00 0.00	0.00	185.00	No Ice 1/2" Ice 7.79 6.36 0.14 Ice 9.36 7.94 0.20 1" Ice 12.81 11.32 0.36 2" Ice	4.85 6.36 7.94 11.32	0.09 0.14 0.20 0.36
(2) Miscellaneous [NA 509-1]	B	From Leg	2.00 0.00 0.00	0.00	185.00	No Ice 1/2" Ice 7.79 6.36 0.14 Ice 9.36 7.94 0.20 1" Ice 12.81 11.32 0.36 2" Ice	4.85 6.36 7.94 11.32	0.09 0.14 0.20 0.36
(2) Miscellaneous [NA 509-1]	C	From Leg	2.00 0.00 0.00	0.00	185.00	No Ice 1/2" Ice 7.79 6.36 0.14 Ice 9.36 7.94 0.20 1" Ice 12.81 11.32 0.36 2" Ice	4.85 6.36 7.94 11.32	0.09 0.14 0.20 0.36
Platform Mount [LP 602-1_KCKR]	C	None		0.00	185.00	No Ice 1/2" Ice 49.04 49.04 2.38 Ice 55.87 55.87 3.27 1" Ice 69.85 69.85 5.40 2" Ice	42.30 49.04 55.87 69.85	1.62 2.38 3.27 5.40
** 175 ** MX08FRO665-21 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.00	175.00	No Ice 1/2" Ice 8.52 4.69 0.19 Ice 9.04 5.16 0.29 1" Ice 10.11 6.12 0.52 2" Ice	4.23 4.69 5.16 6.12	0.11 0.19 0.29 0.52
MX08FRO665-21 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.00	175.00	No Ice 1/2" Ice 8.52 4.69 0.19 Ice 9.04 5.16 0.29 1" Ice 10.11 6.12 0.52 2" Ice	4.23 4.69 5.16 6.12	0.11 0.19 0.29 0.52
MX08FRO665-21 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.00	175.00	No Ice 1/2" Ice 8.52 4.69 0.19 Ice 9.04 5.16 0.29 1" Ice 10.11 6.12 0.52 2" Ice	4.23 4.69 5.16 6.12	0.11 0.19 0.29 0.52
TA08025-B604	A	From Leg	4.00 0.00 0.00	0.00	175.00	No Ice 1/2" Ice 2.14 1.11 0.08 Ice 2.32 1.25 0.10 1" Ice 2.71 1.55 0.15 2" Ice	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	0.00	175.00	No Ice 1/2" Ice 2.14 1.11 0.08 Ice 2.32 1.25 0.10 1" Ice 2.71 1.55 0.15 2" Ice	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	0.00	175.00	No Ice 1/2" Ice 2.14 1.11 0.08 Ice 2.32 1.25 0.10 1" Ice 2.71 1.55 0.15 2" Ice	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	0.00	175.00	No Ice 1/2" Ice 2.14 1.11 0.08 Ice 2.32 1.41 0.11 1" Ice 2.71 1.72 0.16 2" Ice	1.13 1.27 1.41 1.72	0.08 0.09 0.11 0.16

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz	Lateral						ft
			ft	ft	°	ft	ft ²	ft ²	K	
TA08025-B605	B	From Leg	4.00	0.00	0.00	175.00	No Ice	1.96	1.13	0.08
			0.00	0.00			1/2"	2.14	1.27	0.09
			0.00	0.00			Ice	2.32	1.41	0.11
							1" Ice	2.71	1.72	0.16
							2" Ice			
TA08025-B605	C	From Leg	4.00	0.00	0.00	175.00	No Ice	1.96	1.13	0.08
			0.00	0.00			1/2"	2.14	1.27	0.09
			0.00	0.00			Ice	2.32	1.41	0.11
							1" Ice	2.71	1.72	0.16
							2" Ice			
RDIDC-9181-PF-48	B	From Leg	4.00	0.00	0.00	175.00	No Ice	2.01	1.17	0.02
			0.00	0.00			1/2"	2.19	1.31	0.04
			0.00	0.00			Ice	2.37	1.46	0.06
							1" Ice	2.76	1.78	0.11
							2" Ice			
(2) 8' x 2" Mount Pipe	A	From Leg	4.00	0.00	0.00	175.00	No Ice	1.90	1.90	0.03
			0.00	0.00			1/2"	2.73	2.73	0.04
			0.00	0.00			Ice	3.40	3.40	0.06
							1" Ice	4.40	4.40	0.12
							2" Ice			
(2) 8' x 2" Mount Pipe	B	From Leg	4.00	0.00	0.00	175.00	No Ice	1.90	1.90	0.03
			0.00	0.00			1/2"	2.73	2.73	0.04
			0.00	0.00			Ice	3.40	3.40	0.06
							1" Ice	4.40	4.40	0.12
							2" Ice			
(2) 8' x 2" Mount Pipe	C	From Leg	4.00	0.00	0.00	175.00	No Ice	1.90	1.90	0.03
			0.00	0.00			1/2"	2.73	2.73	0.04
			0.00	0.00			Ice	3.40	3.40	0.06
							1" Ice	4.40	4.40	0.12
							2" Ice			
Commscope MC-PK8-DSH	C	None			0.00	175.00	No Ice	34.24	34.24	1.75
							1/2"	62.95	62.95	2.10
							Ice	91.66	91.66	2.45
							1" Ice	149.08	149.08	3.15
							2" Ice			

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APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.00	0.00	2.00	164.00	No Ice	4.60	4.01	0.10
			0.00	0.00			1/2"	5.05	4.45	0.16
			2.00	0.00			Ice	5.50	4.89	0.23
							1" Ice	6.44	5.82	0.42
							2" Ice			
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.00	0.00	2.00	164.00	No Ice	4.60	4.01	0.10
			0.00	0.00			1/2"	5.05	4.45	0.16
			2.00	0.00			Ice	5.50	4.89	0.23
							1" Ice	6.44	5.82	0.42
							2" Ice			
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.00	0.00	2.00	164.00	No Ice	4.60	4.01	0.10
			0.00	0.00			1/2"	5.05	4.45	0.16
			2.00	0.00			Ice	5.50	4.89	0.23
							1" Ice	6.44	5.82	0.42
							2" Ice			
APXVTM14-ALU-I20 w/ Mount Pipe	A	From Leg	4.00	0.00	2.00	164.00	No Ice	4.09	2.86	0.08
			0.00	0.00			1/2"	4.48	3.23	0.13
			2.00	0.00			Ice	4.88	3.61	0.19
							1" Ice	5.71	4.40	0.33
							2" Ice			
APXVTM14-ALU-I20 w/ Mount Pipe	B	From Leg	4.00	0.00	2.00	164.00	No Ice	4.09	2.86	0.08
			0.00	0.00			1/2"	4.48	3.23	0.13
			2.00	0.00			Ice	4.88	3.61	0.19
							1" Ice	5.71	4.40	0.33
							2" Ice			
APXVTM14-ALU-I20 w/ Mount Pipe	C	From Leg	4.00	0.00	2.00	164.00	No Ice	4.09	2.86	0.08
			0.00	0.00			1/2"	4.48	3.23	0.13
			2.00	0.00			Ice	4.88	3.61	0.19
							Ice	4.88	3.61	0.19

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C _A A _{Front}	C _A A _{Side}	Weight
			Horz	Lateral	Vert					
			ft	ft	ft	°	ft	ft ²	ft ²	K
LLPX310R w/ Mount Pipe	A	From Leg	4.00	0.00	164.00	0.00	1" Ice	5.71	4.40	0.33
							2" Ice	4.54	2.98	0.05
							No Ice	4.89	3.53	0.08
							1/2" Ice	5.25	4.09	0.13
LLPX310R w/ Mount Pipe	B	From Leg	4.00	0.00	164.00	0.00	1" Ice	6.01	5.24	0.23
							2" Ice	4.54	2.98	0.05
							No Ice	4.89	3.53	0.08
							1/2" Ice	5.25	4.09	0.13
LLPX310R w/ Mount Pipe	C	From Leg	4.00	0.00	164.00	0.00	1" Ice	6.01	5.24	0.23
							2" Ice	4.54	2.98	0.05
							No Ice	4.89	3.53	0.08
							1/2" Ice	5.25	4.09	0.13
1900MHz RRH (65MHz)	A	From Leg	4.00	0.00	164.00	0.00	1" Ice	6.01	5.24	0.23
							2" Ice	4.54	2.98	0.05
							No Ice	2.32	2.24	0.06
							1/2" Ice	2.53	2.44	0.08
1900MHz RRH (65MHz)	B	From Leg	4.00	0.00	164.00	0.00	1" Ice	3.19	3.09	0.17
							2" Ice	2.32	2.24	0.06
							No Ice	2.53	2.44	0.08
							1/2" Ice	2.74	2.65	0.11
1900MHz RRH (65MHz)	C	From Leg	4.00	0.00	164.00	0.00	1" Ice	3.19	3.09	0.17
							2" Ice	2.32	2.24	0.06
							No Ice	2.53	2.44	0.08
							1/2" Ice	2.74	2.65	0.11
800MHz RRH	A	From Leg	4.00	0.00	164.00	0.00	1" Ice	2.92	2.51	0.16
							2" Ice	2.13	1.77	0.05
							No Ice	2.32	1.95	0.07
							1/2" Ice	2.51	2.13	0.10
800MHz RRH	B	From Leg	4.00	0.00	164.00	0.00	1" Ice	2.92	2.51	0.16
							2" Ice	2.13	1.77	0.05
							No Ice	2.32	1.95	0.07
							1/2" Ice	2.51	2.13	0.10
800MHz RRH	C	From Leg	4.00	0.00	164.00	0.00	1" Ice	2.92	2.51	0.16
							2" Ice	2.13	1.77	0.05
							No Ice	2.32	1.95	0.07
							1/2" Ice	2.51	2.13	0.10
800 EXTERNAL NOTCH FILTER	A	From Leg	4.00	0.00	164.00	0.00	1" Ice	1.11	0.67	0.04
							2" Ice	0.66	0.32	0.01
							No Ice	0.76	0.40	0.02
							1/2" Ice	0.87	0.48	0.02
800 EXTERNAL NOTCH FILTER	B	From Leg	4.00	0.00	164.00	0.00	1" Ice	1.11	0.67	0.04
							2" Ice	0.66	0.32	0.01
							No Ice	0.76	0.40	0.02
							1/2" Ice	0.87	0.48	0.02
800 EXTERNAL NOTCH FILTER	C	From Leg	4.00	0.00	164.00	0.00	1" Ice	1.11	0.67	0.04
							2" Ice	0.66	0.32	0.01
							No Ice	0.76	0.40	0.02
							1/2" Ice	0.87	0.48	0.02
(3) ACU-A20-N	A	From Leg	4.00	0.00	164.00	0.00	1" Ice	0.15	0.21	0.00
							2" Ice	0.07	0.12	0.00
							No Ice	0.10	0.16	0.00

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Lateral					
			ft	ft	°	ft	ft ²	ft ²	K
(3) ACU-A20-N	B	From Leg	4.00	0.00	164.00	1" Ice	0.26	0.34	0.01
						2" Ice			
						No Ice	0.07	0.12	0.00
						1/2" Ice	0.10	0.16	0.00
(3) ACU-A20-N	C	From Leg	4.00	0.00	164.00	1" Ice	0.15	0.21	0.00
						2" Ice	0.26	0.34	0.01
						No Ice	0.07	0.12	0.00
						1/2" Ice	0.10	0.16	0.00
TD-RRH8x20-25	B	From Leg	4.00	0.00	164.00	Ice	0.15	0.21	0.00
						1" Ice	0.26	0.34	0.01
						2" Ice			
						No Ice	4.05	1.53	0.07
TD-RRH8x20-25	B	From Leg	4.00	0.00	164.00	1/2" Ice	4.30	1.71	0.10
						Ice	4.56	1.90	0.13
						1" Ice	5.10	2.30	0.20
						2" Ice			
TD-RRH8x20-25	B	From Leg	4.00	0.00	164.00	No Ice	4.05	1.53	0.07
						1/2" Ice	4.30	1.71	0.10
						Ice	4.56	1.90	0.13
						1" Ice	5.10	2.30	0.20
TD-RRH8x20-25	C	From Leg	4.00	0.00	164.00	2" Ice			
						No Ice	4.05	1.53	0.07
						1/2" Ice	4.30	1.71	0.10
						Ice	4.56	1.90	0.13
FDD_R6_RRH	A	From Leg	4.00	0.00	164.00	1" Ice	5.10	2.30	0.20
						2" Ice			
						No Ice	1.53	0.68	0.03
						1/2" Ice	1.69	0.80	0.04
FDD_R6_RRH	B	From Leg	4.00	0.00	164.00	Ice	1.85	0.92	0.06
						1" Ice	2.20	1.19	0.09
						2" Ice			
						No Ice	1.53	0.68	0.03
FDD_R6_RRH	B	From Leg	4.00	0.00	164.00	1/2" Ice	1.69	0.80	0.04
						Ice	1.85	0.92	0.06
						1" Ice	2.20	1.19	0.09
						2" Ice			
FDD_R6_RRH	C	From Leg	4.00	0.00	164.00	No Ice	1.53	0.68	0.03
						1/2" Ice	1.69	0.80	0.04
						Ice	1.85	0.92	0.06
						1" Ice	2.20	1.19	0.09
(2) 8' x 2" Mount Pipe	A	From Leg	4.00	0.00	164.00	2" Ice			
						No Ice	1.90	1.90	0.03
						1/2" Ice	2.73	2.73	0.04
						Ice	3.40	3.40	0.06
(2) 8' x 2" Mount Pipe	B	From Leg	4.00	0.00	164.00	1" Ice	4.40	4.40	0.12
						2" Ice			
						No Ice	1.90	1.90	0.03
						1/2" Ice	2.73	2.73	0.04
(2) 8' x 2" Mount Pipe	B	From Leg	4.00	0.00	164.00	Ice	3.40	3.40	0.06
						1" Ice	4.40	4.40	0.12
						2" Ice			
						No Ice	1.90	1.90	0.03
(2) 8' x 2" Mount Pipe	C	From Leg	4.00	0.00	164.00	1/2" Ice	2.73	2.73	0.04
						Ice	3.40	3.40	0.06
						1" Ice	4.40	4.40	0.12
						2" Ice			
8' Ladder	A	From Leg	2.00	0.00	164.00	No Ice	1.53	5.33	0.10
						1/2" Ice	4.36	8.08	0.11
						Ice	7.19	10.83	0.13
						1" Ice	12.86	16.33	0.16
Platform Mount [LP 602-1]	C	None			0.00	2" Ice			
						No Ice	31.07	31.07	1.34
						1/2" Ice	34.82	34.82	1.97
						Ice	38.48	38.48	2.67

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
						1" Ice 2" Ice	45.60 45.60	4.31	
154 (2) DB844G65ZAXY w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.00	154.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.23 4.71 5.21 6.26	4.51 5.00 5.50 6.57	0.03 0.08 0.13 0.25
(2) DB844G65ZAXY w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.00	154.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.23 4.71 5.21 6.26	4.51 5.00 5.50 6.57	0.03 0.08 0.13 0.25
(2) LPA-4016 w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.00	154.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.06 8.44 11.82 18.58	6.03 6.06 6.09 6.15	0.04 0.08 0.12 0.19
(2) JAHH-65B-R3B	A	From Leg	4.00 0.00 1.00	0.00	154.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.29 5.75 6.22 7.20	3.05 3.48 3.93 4.84	0.06 0.12 0.19 0.33
(2) JAHH-65B-R3B	B	From Leg	4.00 0.00 1.00	0.00	154.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.29 5.75 6.22 7.20	3.05 3.48 3.93 4.84	0.06 0.12 0.19 0.33
(2) JAHH-65B-R3B	C	From Leg	4.00 0.00 1.00	0.00	154.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.29 5.75 6.22 7.20	3.05 3.48 3.93 4.84	0.06 0.12 0.19 0.33
Sub6 Antenna - VZS01 w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.00	154.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.91 6.72 7.44 8.68	3.74 4.79 5.70 7.17	0.12 0.17 0.22 0.36
Sub6 Antenna - VZS01 w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.00	154.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.91 6.72 7.44 8.68	3.74 4.79 5.70 7.17	0.12 0.17 0.22 0.36
Sub6 Antenna - VZS01 w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.00	154.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.91 6.72 7.44 8.68	3.74 4.79 5.70 7.17	0.12 0.17 0.22 0.36
(2) DB-B1-6C-8AB-0Z	C	From Leg	4.00 0.00 1.00	0.00	154.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.80 5.07 5.35 5.93	2.00 2.19 2.39 2.81	0.04 0.08 0.12 0.21
CBC78T-DS-43-2X	A	From Leg	4.00 0.00 1.00	0.00	154.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.37 0.45 0.53 0.72	0.51 0.60 0.70 0.93	0.02 0.03 0.04 0.06
CBC78T-DS-43-2X	B	From Leg	4.00 0.00 1.00	0.00	154.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.37 0.45 0.53 0.72	0.51 0.60 0.70 0.93	0.02 0.03 0.04 0.06
CBC78T-DS-43-2X	C	From Leg	4.00 0.00	0.00	154.00	No Ice 1/2"	0.37 0.45	0.51 0.60	0.02 0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
			1.00			Ice 0.53	0.70	0.04
						1" Ice 0.72	0.93	0.06
						2" Ice		
RFV01U-D1A	A	From Leg	4.00	0.00	154.00	No Ice 1.88	1.25	0.08
			0.00			1/2" 2.05	1.39	0.10
			1.00			Ice 2.22	1.54	0.12
						1" Ice 2.60	1.86	0.18
						2" Ice		
RFV01U-D1A	B	From Leg	4.00	0.00	154.00	No Ice 1.88	1.25	0.08
			0.00			1/2" 2.05	1.39	0.10
			1.00			Ice 2.22	1.54	0.12
						1" Ice 2.60	1.86	0.18
						2" Ice		
RFV01U-D1A	C	From Leg	4.00	0.00	154.00	No Ice 1.88	1.25	0.08
			0.00			1/2" 2.05	1.39	0.10
			1.00			Ice 2.22	1.54	0.12
						1" Ice 2.60	1.86	0.18
						2" Ice		
RFV01U-D2A	A	From Leg	4.00	0.00	154.00	No Ice 1.88	1.01	0.07
			0.00			1/2" 2.05	1.14	0.09
			1.00			Ice 2.22	1.28	0.11
						1" Ice 2.60	1.59	0.15
						2" Ice		
RFV01U-D2A	B	From Leg	4.00	0.00	154.00	No Ice 1.88	1.01	0.07
			0.00			1/2" 2.05	1.14	0.09
			1.00			Ice 2.22	1.28	0.11
						1" Ice 2.60	1.59	0.15
						2" Ice		
RFV01U-D2A	C	From Leg	4.00	0.00	154.00	No Ice 1.88	1.01	0.07
			0.00			1/2" 2.05	1.14	0.09
			1.00			Ice 2.22	1.28	0.11
						1" Ice 2.60	1.59	0.15
						2" Ice		
(2) 8' x 2" Mount Pipe	A	From Leg	4.00	0.00	154.00	No Ice 1.90	1.90	0.03
			0.00			1/2" 2.73	2.73	0.04
			0.00			Ice 3.40	3.40	0.06
						1" Ice 4.40	4.40	0.12
						2" Ice		
(2) 8' x 2" Mount Pipe	B	From Leg	4.00	0.00	154.00	No Ice 1.90	1.90	0.03
			0.00			1/2" 2.73	2.73	0.04
			0.00			Ice 3.40	3.40	0.06
						1" Ice 4.40	4.40	0.12
						2" Ice		
(2) 8' x 2" Mount Pipe	C	From Leg	4.00	0.00	154.00	No Ice 1.90	1.90	0.03
			0.00			1/2" 2.73	2.73	0.04
			0.00			Ice 3.40	3.40	0.06
						1" Ice 4.40	4.40	0.12
						2" Ice		
BSAMNT-SBS-2-2 Side By Side Bracket	A	From Leg	4.00	0.00	154.00	No Ice 0.00	0.00	0.07
			0.00			1/2" 0.00	0.00	0.09
			0.00			Ice 0.00	0.00	0.11
						1" Ice 0.00	0.00	0.15
						2" Ice		
BSAMNT-SBS-2-2 Side By Side Bracket	B	From Leg	4.00	0.00	154.00	No Ice 0.00	0.00	0.07
			0.00			1/2" 0.00	0.00	0.09
			0.00			Ice 0.00	0.00	0.11
						1" Ice 0.00	0.00	0.15
						2" Ice		
BSAMNT-SBS-2-2 Side By Side Bracket	B	From Leg	4.00	0.00	154.00	No Ice 0.00	0.00	0.07
			0.00			1/2" 0.00	0.00	0.09
			0.00			Ice 0.00	0.00	0.11
						1" Ice 0.00	0.00	0.15
						2" Ice		
Platform Mount [LP 601-1]	C	None		0.00	154.00	No Ice 28.50	28.50	1.12
						1/2" 31.69	31.69	1.68

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
						Ice	34.87	34.87	2.28
						1" Ice	41.23	41.23	3.65
						2" Ice			
146									
APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	A	From Leg	4.00 0.00 -1.00	0.00	146.00	No Ice	6.29	2.76	0.06
						1/2"	6.86	3.27	0.11
						Ice	7.45	3.79	0.16
						1" Ice	8.68	4.90	0.29
						2" Ice			
APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	B	From Leg	4.00 0.00 -1.00	0.00	146.00	No Ice	6.29	2.76	0.06
						1/2"	6.86	3.27	0.11
						Ice	7.45	3.79	0.16
						1" Ice	8.68	4.90	0.29
						2" Ice			
APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	C	From Leg	4.00 0.00 -1.00	0.00	146.00	No Ice	6.29	2.76	0.06
						1/2"	6.86	3.27	0.11
						Ice	7.45	3.79	0.16
						1" Ice	8.68	4.90	0.29
						2" Ice			
APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Leg	4.00 0.00 -1.00	0.00	146.00	No Ice	14.69	6.87	0.19
						1/2"	15.46	7.55	0.31
						Ice	16.23	8.25	0.46
						1" Ice	17.82	9.67	0.79
						2" Ice			
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Leg	4.00 0.00 -1.00	0.00	146.00	No Ice	14.69	6.87	0.19
						1/2"	15.46	7.55	0.31
						Ice	16.23	8.25	0.46
						1" Ice	17.82	9.67	0.79
						2" Ice			
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Leg	4.00 0.00 -1.00	0.00	146.00	No Ice	14.69	6.87	0.19
						1/2"	15.46	7.55	0.31
						Ice	16.23	8.25	0.46
						1" Ice	17.82	9.67	0.79
						2" Ice			
AIR6449 B41_T-MOBILE w/ Mount Pipe	A	From Leg	4.00 0.00 -1.00	0.00	146.00	No Ice	5.19	2.71	0.13
						1/2"	5.59	3.04	0.17
						Ice	6.02	3.38	0.23
						1" Ice	6.90	4.12	0.35
						2" Ice			
AIR6449 B41_T-MOBILE w/ Mount Pipe	B	From Leg	4.00 0.00 -1.00	0.00	146.00	No Ice	5.19	2.71	0.13
						1/2"	5.59	3.04	0.17
						Ice	6.02	3.38	0.23
						1" Ice	6.90	4.12	0.35
						2" Ice			
AIR6449 B41_T-MOBILE w/ Mount Pipe	C	From Leg	4.00 0.00 -1.00	0.00	146.00	No Ice	5.19	2.71	0.13
						1/2"	5.59	3.04	0.17
						Ice	6.02	3.38	0.23
						1" Ice	6.90	4.12	0.35
						2" Ice			
RADIO 4449 B71 B85A_T-MOBILE	A	From Leg	4.00 0.00 -1.00	0.00	146.00	No Ice	1.97	1.59	0.07
						1/2"	2.15	1.75	0.09
						Ice	2.33	1.92	0.12
						1" Ice	2.72	2.28	0.17
						2" Ice			
RADIO 4449 B71 B85A_T-MOBILE	B	From Leg	4.00 0.00 -1.00	0.00	146.00	No Ice	1.97	1.59	0.07
						1/2"	2.15	1.75	0.09
						Ice	2.33	1.92	0.12
						1" Ice	2.72	2.28	0.17
						2" Ice			
RADIO 4449 B71 B85A_T-MOBILE	C	From Leg	4.00 0.00 -1.00	0.00	146.00	No Ice	1.97	1.59	0.07
						1/2"	2.15	1.75	0.09
						Ice	2.33	1.92	0.12
						1" Ice	2.72	2.28	0.17
						2" Ice			
RADIO 4460 B2/B25	A	From Leg	4.00	0.00	146.00	No Ice	2.14	1.69	0.11

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
B66_TMO			0.00 -1.00			1/2" Ice 1" Ice 2" Ice	2.32 2.51 2.91 2.39	1.85 2.02 2.39 2.39	0.13 0.16 0.22 0.22
RADIO 4460 B2/B25 B66_TMO	B	From Leg	4.00 0.00 -1.00	0.00	146.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.14 2.32 2.51 2.91	1.69 1.85 2.02 2.39	0.11 0.13 0.16 0.22
RADIO 4460 B2/B25 B66_TMO	C	From Leg	4.00 0.00 -1.00	0.00	146.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.14 2.32 2.51 2.91	1.69 1.85 2.02 2.39	0.11 0.13 0.16 0.22
6' x 2" Mount Pipe	A	From Leg	4.00 0.00 0.00	0.00	146.00	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	0.00	146.00	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	0.00	146.00	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]	C	None		0.00	146.00	No Ice 1/2" Ice 1" Ice 2" Ice	31.07 34.82 38.48 45.60	31.07 34.82 38.48 45.60	1.34 1.97 2.67 4.31
**** **134**									
(4) DB844H90E-XY w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.00	134.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.30 3.67 4.03 4.80	4.80 5.42 6.04 7.34	0.03 0.07 0.12 0.23
(4) DB844H90E-XY w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.00	134.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.30 3.67 4.03 4.80	4.80 5.42 6.04 7.34	0.03 0.07 0.12 0.23
(4) DB844H90E-XY w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.00	134.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.30 3.67 4.03 4.80	4.80 5.42 6.04 7.34	0.03 0.07 0.12 0.23
Platform Mount [LP 303-1]	C	None		0.00	134.00	No Ice 1/2" Ice 1" Ice 2" Ice	14.69 18.01 21.34 28.08	14.69 18.01 21.34 28.08	1.25 1.57 1.94 2.85
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Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft ²	Weight K	
164											
A-ANT-23G-2-C	A	Paraboloid w/Shroud (HP)	From Leg	4.00 0.00 2.00	0.00		164.00	2.17	No Ice 1/2" Ice 1" Ice 2" Ice	3.72 4.01 4.30 4.88	0.01 0.02 0.03 0.05
A-ANT-23G-2-C	B	Paraboloid w/Shroud (HP)	From Leg	4.00 0.00 2.00	40.00		164.00	2.17	No Ice 1/2" Ice 1" Ice 2" Ice	3.72 4.01 4.30 4.88	0.01 0.02 0.03 0.05
A-ANT-23G-2-C	C	Paraboloid w/Shroud (HP)	From Leg	4.00 0.00 2.00	20.00		164.00	2.17	No Ice 1/2" Ice 1" Ice 2" Ice	3.72 4.01 4.30 4.88	0.01 0.02 0.03 0.05

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

Comb. No.	Description
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	195 - 157.65	Pole	Max Tension	8	0.00	0.00	0.00			
			Max. Compression	26	-32.54	-1.54	-1.04			
			Max. Mx	8	-13.23	-268.98	-0.74			
			Max. My	14	-13.27	-0.81	-268.14			
			Max. Vy	8	18.35	-268.98	-0.74			
			Max. Vx	14	18.10	-0.81	-268.14			
			Max. Torque	4			-1.17			
			Max Tension	1	0.00	0.00	0.00			
			L2	157.65 - 117.08	Pole	Max. Compression	26	-67.44	-1.96	-1.72
						Max. Mx	8	-30.06	-1352.30	-0.33
Max. My	14	-30.11				0.28	-1339.09			
Max. Vy	8	33.89				-1352.30	-0.33			
Max. Vx	14	33.56				0.28	-1339.09			
Max. Torque	4						-1.39			
Max Tension	1	0.00				0.00	0.00			
L3	117.08 - 81.09	Pole				Max. Compression	26	-82.55	-3.09	-1.45
						Max. Mx	8	-41.43	-2603.53	0.96
						Max. My	14	-41.46	2.27	-2578.77
			Max. Vy	8	37.49	-2603.53	0.96			
			Max. Vx	14	37.16	2.27	-2578.77			
			Max. Torque	4			-1.39			
			Max Tension	1	0.00	0.00	0.00			
			L4	81.09 - 40.03	Pole	Max. Compression	26	-105.78	-4.60	-1.09
						Max. Mx	8	-59.92	-4185.99	2.42
						Max. My	14	-59.94	4.49	-4148.14
Max. Vy	8	41.55				-4185.99	2.42			
Max. Vx	14	41.23				4.49	-4148.14			
Max. Torque	4						-1.39			
Max Tension	1	0.00				0.00	0.00			
L5	40.03 - 0	Pole				Max. Compression	26	-137.32	-6.51	-0.73
						Max. Mx	8	-85.90	-6275.79	4.12
						Max. My	14	-85.90	7.10	-6222.60
			Max. Vy	8	45.34	-6275.79	4.12			
			Max. Vx	14	45.03	7.10	-6222.60			
			Max. Torque	4			-1.38			

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	30	137.32	-11.98	-0.04
	Max. H _x	20	85.92	45.25	0.03
	Max. H _z	2	85.92	-0.04	44.98
	Max. M _x	2	6219.99	-0.04	44.98
	Max. M _z	8	6275.79	-45.29	0.04

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Max. Torsion	16	1.18	22.65	-39.00
	Min. Vert	25	64.44	22.61	38.94
	Min. H _x	8	85.92	-45.29	0.04
	Min. H _z	14	85.92	0.06	-44.98
	Min. M _x	14	-6222.60	0.06	-44.98
	Min. M _z	20	-6263.83	45.25	0.03
	Min. Torsion	4	-1.38	-22.66	39.00

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead Only	71.60	0.00	0.00	0.93	-1.64	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	85.92	0.04	-44.98	-6219.99	-7.37	0.86
0.9 Dead+1.0 Wind 0 deg - No Ice	64.44	0.04	-44.98	-6146.56	-6.76	0.85
1.2 Dead+1.0 Wind 30 deg - No Ice	85.92	22.66	-39.00	-5392.96	-3140.80	1.38
0.9 Dead+1.0 Wind 30 deg - No Ice	64.44	22.66	-39.00	-5329.30	-3103.02	1.37
1.2 Dead+1.0 Wind 60 deg - No Ice	85.92	39.23	-22.56	-3119.84	-5435.48	1.08
0.9 Dead+1.0 Wind 60 deg - No Ice	64.44	39.23	-22.56	-3083.14	-5370.47	1.07
1.2 Dead+1.0 Wind 90 deg - No Ice	85.92	45.29	-0.04	-4.12	-6275.79	0.48
0.9 Dead+1.0 Wind 90 deg - No Ice	64.44	45.29	-0.04	-4.38	-6200.84	0.47
1.2 Dead+1.0 Wind 120 deg - No Ice	85.92	39.17	22.51	3116.00	-5427.47	0.12
0.9 Dead+1.0 Wind 120 deg - No Ice	64.44	39.17	22.51	3078.74	-5362.55	0.11
1.2 Dead+1.0 Wind 150 deg - No Ice	85.92	22.62	38.92	5384.33	-3135.79	-0.22
0.9 Dead+1.0 Wind 150 deg - No Ice	64.44	22.62	38.92	5320.17	-3098.05	-0.21
1.2 Dead+1.0 Wind 180 deg - No Ice	85.92	-0.06	44.98	6222.60	7.10	-0.70
0.9 Dead+1.0 Wind 180 deg - No Ice	64.44	-0.06	44.98	6148.53	7.54	-0.69
1.2 Dead+1.0 Wind 210 deg - No Ice	85.92	-22.65	39.00	5395.69	3134.26	-1.18
0.9 Dead+1.0 Wind 210 deg - No Ice	64.44	-22.65	39.00	5331.40	3097.61	-1.17
1.2 Dead+1.0 Wind 240 deg - No Ice	85.92	-39.17	22.60	3128.97	5421.29	-1.16
0.9 Dead+1.0 Wind 240 deg - No Ice	64.44	-39.17	22.60	3091.56	5357.51	-1.15
1.2 Dead+1.0 Wind 270 deg - No Ice	85.92	-45.25	-0.03	-5.36	6263.83	-0.27
0.9 Dead+1.0 Wind 270 deg - No Ice	64.44	-45.25	-0.03	-5.58	6190.08	-0.27
1.2 Dead+1.0 Wind 300 deg - No Ice	85.92	-39.17	-22.50	-3112.05	5422.29	0.19
0.9 Dead+1.0 Wind 300 deg - No Ice	64.44	-39.17	-22.50	-3075.43	5358.48	0.19
1.2 Dead+1.0 Wind 330 deg - No Ice	85.92	-22.61	-38.94	-5384.05	3129.00	0.34
0.9 Dead+1.0 Wind 330 deg - No Ice	64.44	-22.61	-38.94	-5320.49	3092.40	0.33
1.2 Dead+1.0 Ice+1.0 Temp	137.32	0.00	0.00	0.73	-6.51	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	137.32	-0.04	-11.87	-1716.01	0.50	0.10

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 30 deg+1.0 Ice+1.0 Temp	137.32	5.95	-10.27	-1483.03	-867.62	0.13
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	137.32	10.35	-5.91	-852.30	-1505.61	0.04
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	137.32	11.98	0.04	8.36	-1742.37	-0.07
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	137.32	10.39	5.98	867.65	-1512.56	-0.08
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	137.32	6.03	10.30	1491.06	-881.46	-0.06
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	137.32	0.04	11.87	1717.78	-13.68	-0.07
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	137.32	-5.95	10.27	1484.84	853.13	-0.09
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	137.32	-10.34	5.91	855.44	1489.53	-0.05
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	137.32	-11.97	-0.06	-9.10	1726.76	0.11
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	137.32	-10.39	-5.98	-865.57	1498.33	0.15
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	137.32	-6.03	-10.30	-1489.77	866.92	0.09
Dead+Wind 0 deg - Service	71.60	0.01	-9.76	-1340.25	-2.88	0.19
Dead+Wind 30 deg - Service	71.60	4.92	-8.46	-1161.95	-678.42	0.30
Dead+Wind 60 deg - Service	71.60	8.51	-4.90	-671.89	-1173.14	0.24
Dead+Wind 90 deg - Service	71.60	9.83	-0.01	-0.16	-1354.32	0.10
Dead+Wind 120 deg - Service	71.60	8.50	4.89	672.52	-1171.41	0.02
Dead+Wind 150 deg - Service	71.60	4.91	8.45	1161.55	-677.33	-0.05
Dead+Wind 180 deg - Service	71.60	-0.01	9.76	1342.28	0.24	-0.16
Dead+Wind 210 deg - Service	71.60	-4.92	8.46	1164.00	674.43	-0.26
Dead+Wind 240 deg - Service	71.60	-8.50	4.90	675.32	1167.51	-0.25
Dead+Wind 270 deg - Service	71.60	-9.82	-0.01	-0.42	1349.17	-0.06
Dead+Wind 300 deg - Service	71.60	-8.50	-4.88	-670.21	1167.72	0.05
Dead+Wind 330 deg - Service	71.60	-4.91	-8.45	-1160.02	673.30	0.08

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-71.60	0.00	0.00	71.60	0.00	0.000%
2	0.04	-85.92	-44.98	-0.04	85.92	44.98	0.000%
3	0.04	-64.44	-44.98	-0.04	64.44	44.98	0.000%
4	22.66	-85.92	-39.00	-22.66	85.92	39.00	0.000%
5	22.66	-64.44	-39.00	-22.66	64.44	39.00	0.000%
6	39.23	-85.92	-22.56	-39.23	85.92	22.56	0.000%
7	39.23	-64.44	-22.56	-39.23	64.44	22.56	0.000%
8	45.29	-85.92	-0.04	-45.29	85.92	0.04	0.000%
9	45.29	-64.44	-0.04	-45.29	64.44	0.04	0.000%
10	39.17	-85.92	22.51	-39.17	85.92	-22.51	0.000%
11	39.17	-64.44	22.51	-39.17	64.44	-22.51	0.000%
12	22.62	-85.92	38.92	-22.62	85.92	-38.92	0.000%
13	22.62	-64.44	38.92	-22.62	64.44	-38.92	0.000%
14	-0.06	-85.92	44.98	0.06	85.92	-44.98	0.000%
15	-0.06	-64.44	44.98	0.06	64.44	-44.98	0.000%
16	-22.65	-85.92	39.00	22.65	85.92	-39.00	0.000%
17	-22.65	-64.44	39.00	22.65	64.44	-39.00	0.000%
18	-39.17	-85.92	22.60	39.17	85.92	-22.60	0.000%

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
19	-39.17	-64.44	22.60	39.17	64.44	-22.60	0.000%
20	-45.25	-85.92	-0.03	45.25	85.92	0.03	0.000%
21	-45.25	-64.44	-0.03	45.25	64.44	0.03	0.000%
22	-39.17	-85.92	-22.50	39.17	85.92	22.50	0.000%
23	-39.17	-64.44	-22.50	39.17	64.44	22.50	0.000%
24	-22.61	-85.92	-38.94	22.61	85.92	38.94	0.000%
25	-22.61	-64.44	-38.94	22.61	64.44	38.94	0.000%
26	0.00	-137.32	0.00	-0.00	137.32	-0.00	0.000%
27	-0.04	-137.32	-11.87	0.04	137.32	11.87	0.000%
28	5.95	-137.32	-10.27	-5.95	137.32	10.27	0.000%
29	10.35	-137.32	-5.91	-10.35	137.32	5.91	0.000%
30	11.98	-137.32	0.04	-11.98	137.32	-0.04	0.000%
31	10.39	-137.32	5.98	-10.39	137.32	-5.98	0.000%
32	6.03	-137.32	10.30	-6.03	137.32	-10.30	0.000%
33	0.04	-137.32	11.87	-0.04	137.32	-11.87	0.000%
34	-5.95	-137.32	10.27	5.95	137.32	-10.27	0.000%
35	-10.34	-137.32	5.91	10.34	137.32	-5.91	0.000%
36	-11.97	-137.32	-0.06	11.97	137.32	0.06	0.000%
37	-10.39	-137.32	-5.98	10.39	137.32	5.98	0.000%
38	-6.03	-137.32	-10.30	6.03	137.32	10.30	0.000%
39	0.01	-71.60	-9.76	-0.01	71.60	9.76	0.000%
40	4.92	-71.60	-8.46	-4.92	71.60	8.46	0.000%
41	8.51	-71.60	-4.90	-8.51	71.60	4.90	0.000%
42	9.83	-71.60	-0.01	-9.83	71.60	0.01	0.000%
43	8.50	-71.60	4.89	-8.50	71.60	-4.89	0.000%
44	4.91	-71.60	8.45	-4.91	71.60	-8.45	0.000%
45	-0.01	-71.60	9.76	0.01	71.60	-9.76	0.000%
46	-4.92	-71.60	8.46	4.92	71.60	-8.46	0.000%
47	-8.50	-71.60	4.90	8.50	71.60	-4.90	0.000%
48	-9.82	-71.60	-0.01	9.82	71.60	0.01	0.000%
49	-8.50	-71.60	-4.88	8.50	71.60	4.88	0.000%
50	-4.91	-71.60	-8.45	4.91	71.60	8.45	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00086200
3	Yes	4	0.00000001	0.00048048
4	Yes	6	0.00000001	0.00010234
5	Yes	5	0.00000001	0.00086588
6	Yes	6	0.00000001	0.00010013
7	Yes	5	0.00000001	0.00084650
8	Yes	4	0.00000001	0.00063208
9	Yes	4	0.00000001	0.00029155
10	Yes	6	0.00000001	0.00010114
11	Yes	5	0.00000001	0.00085508
12	Yes	6	0.00000001	0.00010096
13	Yes	5	0.00000001	0.00085398
14	Yes	4	0.00000001	0.00069101
15	Yes	4	0.00000001	0.00034505
16	Yes	6	0.00000001	0.00009956
17	Yes	5	0.00000001	0.00084215
18	Yes	6	0.00000001	0.00010234
19	Yes	5	0.00000001	0.00086569
20	Yes	4	0.00000001	0.00059282
21	Yes	4	0.00000001	0.00025618
22	Yes	6	0.00000001	0.00010094
23	Yes	5	0.00000001	0.00085409
24	Yes	6	0.00000001	0.00009998
25	Yes	5	0.00000001	0.00084616
26	Yes	4	0.00000001	0.00001406
27	Yes	5	0.00000001	0.00077881
28	Yes	5	0.00000001	0.00098329

29	Yes	5	0.00000001	0.00098586
30	Yes	5	0.00000001	0.00079257
31	Yes	6	0.00000001	0.00012361
32	Yes	5	0.00000001	0.00099978
33	Yes	5	0.00000001	0.00078215
34	Yes	5	0.00000001	0.00097563
35	Yes	5	0.00000001	0.00098095
36	Yes	5	0.00000001	0.00078461
37	Yes	5	0.00000001	0.00099056
38	Yes	5	0.00000001	0.00098427
39	Yes	4	0.00000001	0.00009803
40	Yes	4	0.00000001	0.00047018
41	Yes	4	0.00000001	0.00043903
42	Yes	4	0.00000001	0.00009534
43	Yes	4	0.00000001	0.00045383
44	Yes	4	0.00000001	0.00045470
45	Yes	4	0.00000001	0.00009643
46	Yes	4	0.00000001	0.00043387
47	Yes	4	0.00000001	0.00046704
48	Yes	4	0.00000001	0.00009411
49	Yes	4	0.00000001	0.00045029
50	Yes	4	0.00000001	0.00043939

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	195 - 157.65	26.5278	42	1.17	0.00
L2	162.38 - 117.08	18.6327	42	1.11	0.00
L3	122.94 - 81.09	10.3760	42	0.84	0.00
L4	87.93 - 40.03	5.1676	42	0.55	0.00
L5	47.98 - 0	1.5587	42	0.29	0.00

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
185.00	7770.00 w/ Mount Pipe	42	24.0657	1.16	0.00	46113
175.00	MX08FRO665-21 w/ Mount Pipe	42	21.6295	1.15	0.00	23056
166.00	A-ANT-23G-2-C	42	19.4808	1.13	0.00	15900
164.00	APXVSP18-C-A20 w/ Mount Pipe	42	19.0109	1.12	0.00	14875
154.00	(2) DB844G65ZAXY w/ Mount Pipe	42	16.7141	1.07	0.00	11264
146.00	APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	42	14.9521	1.02	0.00	9427
134.00	(4) DB844H90E-XY w/ Mount Pipe	42	12.4661	0.93	0.00	7574

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	195 - 157.65	122.9323	8	5.43	0.01
L2	162.38 - 117.08	86.3759	8	5.16	0.01
L3	122.94 - 81.09	48.1168	8	3.91	0.00
L4	87.93 - 40.03	23.9643	8	2.57	0.00

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L5	47.98 - 0	7.2269	8	1.36	0.00

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
185.00	7770.00 w/ Mount Pipe	8	111.5334	5.39	0.01	10170
175.00	MX08FRO665-21 w/ Mount Pipe	8	100.2541	5.32	0.01	5083
166.00	A-ANT-23G-2-C	8	90.3038	5.22	0.01	3503
164.00	APXVSP18-C-A20 w/ Mount Pipe	8	88.1277	5.18	0.01	3277
154.00	(2) DB844G65ZAXY w/ Mount Pipe	8	77.4889	4.97	0.00	2471
146.00	APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	8	69.3256	4.74	0.00	2063
134.00	(4) DB844H90E-XY w/ Mount Pipe	8	57.8054	4.33	0.00	1653

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	KI/r	A in ²	P _u K	φP _n K	Ratio P _u / φP _n
L1	195 - 157.65 (1)	TP33.875x25x0.25	37.35	0.00	0.0	25.789 6	-13.24	1508.69	0.009
L2	157.65 - 117.08 (2)	TP42.9063x32.2511x0.31 25	45.30	0.00	0.0	40.880 5	-30.06	2391.51	0.013
L3	117.08 - 81.09 (3)	TP50.75x40.9029x0.375	41.85	0.00	0.0	58.043 2	-41.43	3395.53	0.012
L4	81.09 - 40.03 (4)	TP59.6563x48.3906x0.5	47.90	0.00	0.0	90.913 6	-59.92	5318.45	0.011
L5	40.03 - 0 (5)	TP68x56.7865x0.5	47.98	0.00	0.0	107.12 20	-85.90	6266.67	0.014

Pole Bending Design Data

Section No.	Elevation ft	Size	M _{ux} kip-ft	φM _{nx} kip-ft	Ratio M _{ux} / φM _{nx}	M _{uy} kip-ft	φM _{ny} kip-ft	Ratio M _{uy} / φM _{ny}
L1	195 - 157.65 (1)	TP33.875x25x0.25	269.24	1168.53	0.230	0.00	1168.53	0.000
L2	157.65 - 117.08 (2)	TP42.9063x32.2511x0.31 25	1352.30	2337.04	0.579	0.00	2337.04	0.000
L3	117.08 - 81.09 (3)	TP50.75x40.9029x0.375	2603.53	3945.68	0.660	0.00	3945.68	0.000
L4	81.09 - 40.03 (4)	TP59.6563x48.3906x0.5	4185.99	7560.90	0.554	0.00	7560.90	0.000
L5	40.03 - 0 (5)	TP68x56.7865x0.5	6275.79	9944.92	0.631	0.00	9944.92	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	195 - 157.65 (1)	TP33.875x25x0.25	18.34	452.61	0.041	0.54	1288.25	0.000
L2	157.65 - 117.08 (2)	TP42.9063x32.2511x0.31 25	33.89	717.45	0.047	0.48	2589.60	0.000
L3	117.08 - 81.09 (3)	TP50.75x40.9029x0.375	37.49	1018.66	0.037	0.48	4350.33	0.000
L4	81.09 - 40.03 (4)	TP59.6563x48.3906x0.5	41.55	1595.53	0.026	0.48	8004.57	0.000
L5	40.03 - 0 (5)	TP68x56.7865x0.5	45.34	1880.00	0.024	0.48	11113.25	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	195 - 157.65 (1)	0.009	0.230	0.000	0.041	0.000	0.241	1.050	4.8.2
L2	157.65 - 117.08 (2)	0.013	0.579	0.000	0.047	0.000	0.593	1.050	4.8.2
L3	117.08 - 81.09 (3)	0.012	0.660	0.000	0.037	0.000	0.673	1.050	4.8.2
L4	81.09 - 40.03 (4)	0.011	0.554	0.000	0.026	0.000	0.566	1.050	4.8.2
L5	40.03 - 0 (5)	0.014	0.631	0.000	0.024	0.000	0.645	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	195 - 157.65	Pole	TP33.875x25x0.25	1	-13.24	1584.12	22.9	Pass
L2	157.65 - 117.08	Pole	TP42.9063x32.2511x0.3125	2	-30.06	2511.09	56.5	Pass
L3	117.08 - 81.09	Pole	TP50.75x40.9029x0.375	3	-41.43	3565.31	64.1	Pass
L4	81.09 - 40.03	Pole	TP59.6563x48.3906x0.5	4	-59.92	5584.37	53.9	Pass
L5	40.03 - 0	Pole	TP68x56.7865x0.5	5	-85.90	6580.00	61.5	Pass
Summary								
Pole (L3)							64.1	Pass
RATING =							64.1	Pass

APPENDIX B
BASE LEVEL DRAWING



(PROPOSED EQUIPMENT CONFIGURATION)
(3) 1-5/8" TO 146 FT LEVEL

(OTHER CONSIDERED EQUIPMENT)
(9) 1-1/4" TO 134 FT LEVEL
(6) 1-5/8" TO 134 FT LEVEL

CLIMBING PEGS
W/ SAFETY CLIMB

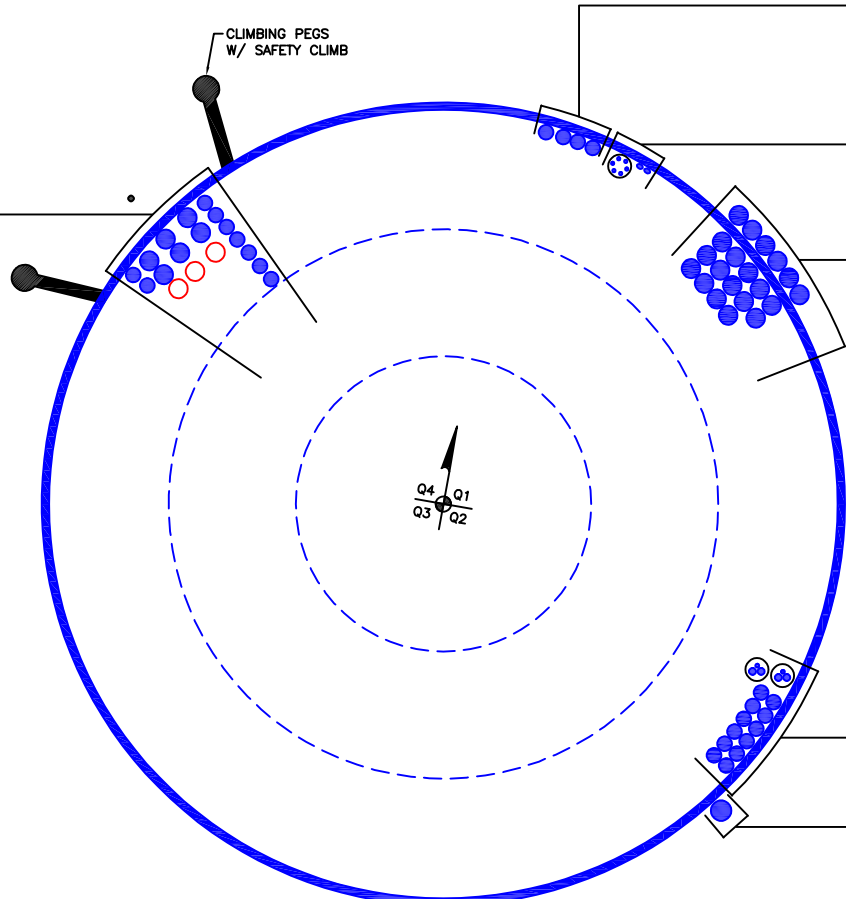
(OTHER CONSIDERED EQUIPMENT)
(4) 1-1/4" TO 164 FT LEVEL

(OTHER CONSIDERED EQUIPMENT-IN CONDUIT)
(6) 5/16" TO 164 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(2) 7983A TO 164 FT LEVEL

(OTHER CONSIDERED EQUIPMENT)
(20) 1-5/8" TO 154 FT LEVEL

(OTHER CONSIDERED EQUIPMENT-IN CONDUIT)
(2) 3/8" TO 185 FT LEVEL
(4) 5/8" TO 185 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(12) 1-1/4" TO 185 FT LEVEL

(OTHER CONSIDERED EQUIPMENT)
(1) 1-3/4" TO 175 FT LEVEL



APPENDIX C
ADDITIONAL CALCULATIONS

Monopole Base Plate Connection

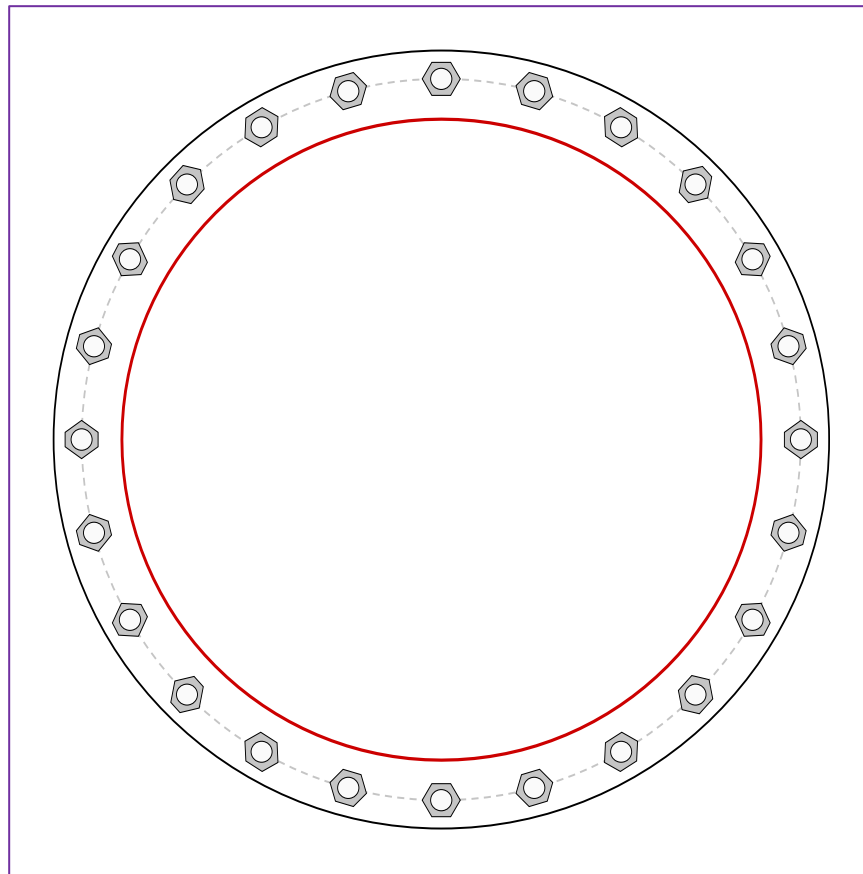


Site Info	
BU #	881535
Site Name	TRUMBULL TOWER
Order #	575117 (Rev. 0)

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	2.0625

Applied Loads	
Moment (kip-ft)	6275.79
Axial Force (kips)	85.90
Shear Force (kips)	45.34

*TIA-222-H Section 15.5 Applied



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

Anchor Rod Data
(24) 2-1/4" ϕ bolts (A615-75 N; $F_y=75$ ksi, $F_u=100$ ksi) on 76.5" BC
Base Plate Data
82.5" OD x 2.5" Plate (A572-60; $F_y=60$ ksi, $F_u=75$ ksi)
Stiffener Data
N/A
Pole Data
68" x 0.5" 18-sided pole (A572-65; $F_y=65$ ksi, $F_u=80$ ksi)

Anchor Rod Summary			<i>(units of kips, kip-in)</i>
$P_{u,t} = 160.44$	$\phi P_{n,t} = 243.75$	Stress Rating	
$V_u = 1.89$	$\phi V_n = 149.1$	62.7%	
$M_u = n/a$	$\phi M_n = n/a$	Pass	
Base Plate Summary			
Max Stress (ksi):	31.39	(Flexural)	
Allowable Stress (ksi):	54		
Stress Rating:	55.4%	Pass	

Pier and Pad Foundation



BU #: 881535
Site Name: TRUMBULL TOWER
App. Number: 575117 (Rev. 0)

TIA-222 Revision: H
Tower Type: Monopole

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

Superstructure Analysis Reactions		
Compression, P_{comp} :	85.92	kips
Base Shear, V_u_{comp} :	45.29	kips
Moment, M_u :	6275.79	ft-kips
Tower Height, H :	195	ft
BP Dist. Above Fdn, bp_{dist} :	4.25	in

Foundation Analysis Checks				
	Capacity	Demand	Rating*	Check
<i>Lateral (Sliding) (kips)</i>	488.37	45.29	8.8%	Pass
<i>Bearing Pressure (ksf)</i>	9.00	2.53	28.1%	Pass
<i>Overturning (kip*ft)</i>	10291.80	6654.15	64.7%	Pass
<i>Pier Flexure (Comp.) (kip*ft)</i>	9308.40	6502.24	66.5%	Pass
<i>Pier Compression (kip)</i>	51554.88	158.82	0.3%	Pass
<i>Pad Flexure (kip*ft)</i>	5943.63	2328.02	37.3%	Pass
<i>Pad Shear - 1-way (kips)</i>	1039.95	330.91	30.3%	Pass
<i>Pad Shear - 2-way (Comp) (ksi)</i>	0.190	0.046	22.9%	Pass
<i>Flexural 2-way (Comp) (kip*ft)</i>	5714.52	3901.34	65.0%	Pass

Pier Properties		
Pier Shape:	Square	
Pier Diameter, $dpier$:	9	ft
Ext. Above Grade, E :	1	ft
Pier Rebar Size, Sc :	8	
Pier Rebar Quantity, mc :	54	
Pier Tie/Spiral Size, St :	4	
Pier Tie/Spiral Quantity, mt :	10	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier} :	3	in

*Rating per TIA-222-H Section 15.5

Structural Rating*:	66.5%
Soil Rating*:	64.7%

Pad Properties		
Depth, D :	7	ft
Pad Width, W_1 :	29	ft
Pad Thickness, T :	3	ft
Pad Rebar Size (Top dir.2), Sp_{top2} :	8	
Pad Rebar Quantity (Top dir. 2), mp_{top2} :	30	
Pad Rebar Size (Bottom dir. 2), Sp_2 :	8	
Pad Rebar Quantity (Bottom dir. 2), mp_2 :	55	
Pad Clear Cover, cc_{pad} :	3	in

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

Soil Properties		
Total Soil Unit Weight, γ :	120	pcf
Ultimate Gross Bearing, Q_{ult} :	12.000	ksf
Cohesion, C_u :	0.000	ksf
Friction Angle, ϕ :	30	degrees
SPT Blow Count, N_{blows} :	60	
Base Friction, μ :	0.6	
Neglected Depth, N :	3.50	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, gw :	15	ft

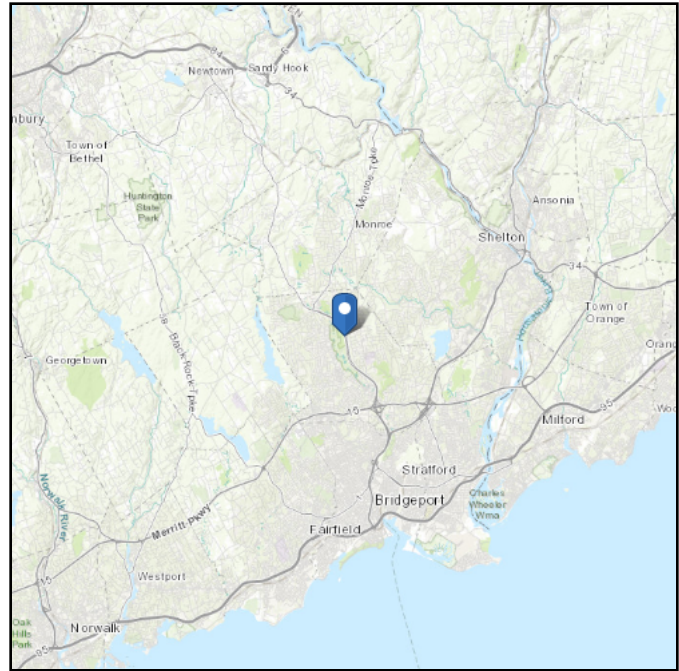
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ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 322.51 ft (NAVD 88)
Latitude: 41.273281
Longitude: -73.213106



Wind

Results:

Wind Speed:	121 Vmph	(125 mph per jurisdiction requirement)
10-year MRI	76 Vmph	
25-year MRI	86 Vmph	
50-year MRI	92 Vmph	
100-year MRI	99 Vmph	

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

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).

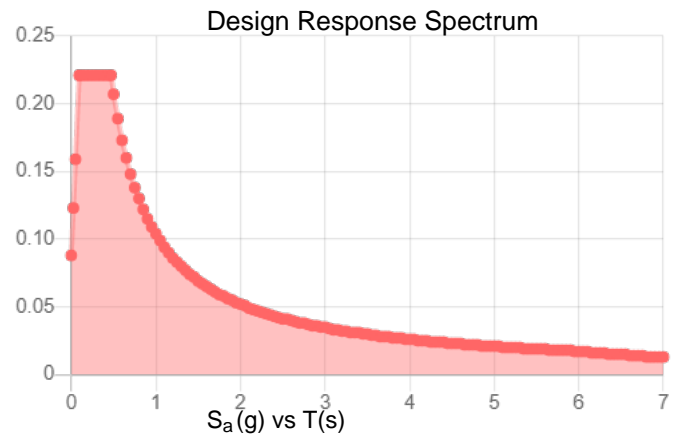
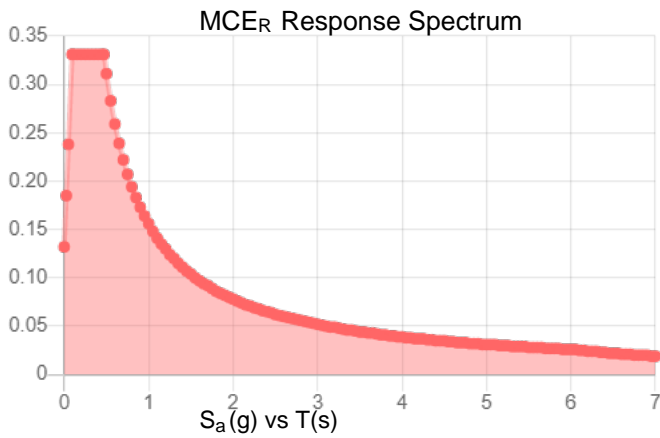
Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

Site Soil Class: D - Stiff Soil

Results:

S_s :	0.207	S_{DS} :	0.221
S_1 :	0.065	S_{D1} :	0.104
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.112
S_{MS} :	0.331	PGA _M :	0.176
S_{M1} :	0.156	F _{PGA} :	1.577
		I_e :	1

Seismic Design Category B



Data Accessed:

Mon Jul 26 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: 0.75 in.

Concurrent Temperature: 15 F

Gust Speed: 50 mph

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

Date Accessed: Mon Jul 26 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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