



STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: siting.council@ct.gov

Web Site: portal.ct.gov/csc

VIA ELECTRONIC MAIL

October 14, 2021

Ersilia Davis
Network Building & Consulting
Project Manager
1777 Sentry Parkway W
VEVA 17, Suite 400
Blue Bell, PA 19422
edavis@nbcllc.com

RE: **EM-VER-168-210827** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 1440 Main Street North, Woodbury, Connecticut.

Dear Ms. Davis:

The Connecticut Siting Council (Council) is in receipt of your correspondence of October 14, 2021 submitted in response to the Council's October 13, 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/CW

From: Ersilia Davis <edavis@nbcllc.com>

Sent: Thursday, October 14, 2021 9:38 AM

To: Fontaine, Lisa <Lisa.Fontaine@ct.gov>

Cc: CSC-DL Siting Council <Siting.Council@ct.gov>

Subject: FW: Council Incomplete letter on EM-VER-168-210827 1440 Main Street North, Woodbury, CT

Good morning Lisa,

Please see updated Structural Analysis. Please advise if additional information is needed

Thank you

Ersilia Davis

Project Manager

NETWORK BUILDING + CONSULTING

1777 Sentry Parkway W | VEVA 17, Suite 400 | Blue Bell, PA | 19422

M 551-804-0667

Date: **August 11, 2021**



Tower Engineering Professionals
326 Tryon Road
Raleigh, NC 27603
(919) 661-6351

Subject: Structural Analysis Report

Carrier Designation: **Verizon Wireless Co-Locate**
Site Number: 467557
Site Name: WOODBURY N CT

Crown Castle Designation: **BU Number:** 876379
Site Name: N. WOODBURY / WOLFF PARCEL
JDE Job Number: 644658
Work Order Number: 1958003
Order Number: 552711 Rev. 0

Engineering Firm Designation: **TEP Project Number:** 25647.541989

Site Data: **1440 Main Street North, Woodbury, Litchfield County, CT 06798**
Latitude 41° 35' 23.81", Longitude -73° 10' 11.52"
163 Foot - Monopole Tower

Tower Engineering Professionals 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 – 50.6%

This analysis utilizes an ultimate 3-second gust wind speed of 120 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: Sean Arsenault, C.W.I. / DEN

Respectfully submitted by:

Aaron T. Rucker, P.E.



Electronic Copy

08/11/2021

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1) INTRODUCTION

This tower is a 163-ft monopole tower designed by Engineered Endeavors, Inc.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	120 mph
Exposure Category:	C
Topographic Factor:	1.0
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)
148.0	150.0	6	Antel	LPA-80080/6CF w/ Mount Pipe	7	1-5/8
		6	Andrew	SBNHH-1D65B w/ Mount Pipe		
		3	VZW	Sub6 Antenna – Samsung MT6407-77A w/ Mount Pipe		
		1	RFS Celwave	DB-C1-12C-24AB-0Z		
		3	Samsung Telecom.	RFV01U-D1A		
	3	Samsung Telecom.	RFV01U-D2A			
	148.0	1	Tower Mounts	Platform Mount [LP 401-1]		

Table 2 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
160.0	171.0	1	Sinclair	SC229-SFXLDF	1	1/2
	160.0	1	Tower Mounts	Pipe Mount [PM 601-1]		
156.0	158.0	3	RFS Celwave	APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	4	1-5/8
		3	RFS Celwave	APXVAALL24_43-U-NA20_TMO w/ Mount Pipe		
		3	Ericsson	AIR6449 B41_T-MOBILE w/ Mount Pipe		
		3	Ericsson	RADIO 4415 B66A_CCIV3		
		3	Ericsson	RADIO 4449 B71 B85A_T-MOBILE		
	3	Ericsson	RADIO 4424 B25_TMO			
	156.0	1	Tower Mounts	Platform Mount [LP 602-1]		
141.0	142.0	12	Decibel	DB846G90A-XY w/ Mount Pipe	12	1-5/8
	141.0	1	Tower Mounts	Platform Mount [LP 303-1]		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
120.0	121.0	6	Ericsson	TME-RRUS-11	-	-
118.0	119.0	3	Powerwave Technologies	7770.00 w/ Mount Pipe	2 4 12	3/8 7/8 1-5/8
		6	Commscope	NNHH-65B-R4 w/ Mount Pipe		
		3	Ericsson	RRUS 4478 B14		
		3	Powerwave Technologies	TT19-08BP111-001		
		3	Ericsson	RRUS 4449 B5/B12		
		3	Ericsson	RRUS 8843 B2/B66A		
		1	Raycap	DC6-48-60-18-8F		
	1	Raycap	DC6-48-60-0-8C-EV			
		118.0	1	Tower Mounts		
		1	Tower Mounts	Miscellaneous [NA 510-1]		
108.0	110.0	1	Telewave	ANT150D6-9	1	1/2
22.0	24.0	1	Lucent	KS24019-L112A	1	1/2
	22.0	1	Tower Mounts	Side Arm Mount [SO 701-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
Geotechnical Report	1531966	CCISites
Tower Foundation Drawings	1614612	CCISites
Tower Manufacturer Drawings	1613543	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) The 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. Tower Engineering Professionals 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)	ϕP_{allow} (k)	% Capacity	Pass / Fail	
L1	163.007 - 121.587	Pole	TP42.37x34.28x0.3125	1	-15.44	2492.97	17.4	Pass	
L2	121.587 - 84.67	Pole	TP48.83x40.6057x0.375	2	-30.45	3448.83	34.2	Pass	
L3	84.67 - 42.2067	Pole	TP56.25x46.7975x0.4375	3	-46.20	4636.15	43.8	Pass	
L4	42.2067 - 0	Pole	TP63.5x53.916x0.5	4	-70.51	6141.33	48.8	Pass	
							Summary		
							Pole (L4)	48.8	Pass
							RATING =	48.8	Pass

Table 5 - Tower Component Stresses vs. Capacity - LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Anchor Rods	-	50.6	Pass
1,2	Base Plate	-	48.2	Pass
1,2	Base Foundation Soil Interaction	-	26.7	Pass
1,2	Base Foundation Structural	-	48.2	Pass

Structure Rating (max from all components) =	50.6%
---	--------------

Notes:

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

4.1) Recommendations

- 1) 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

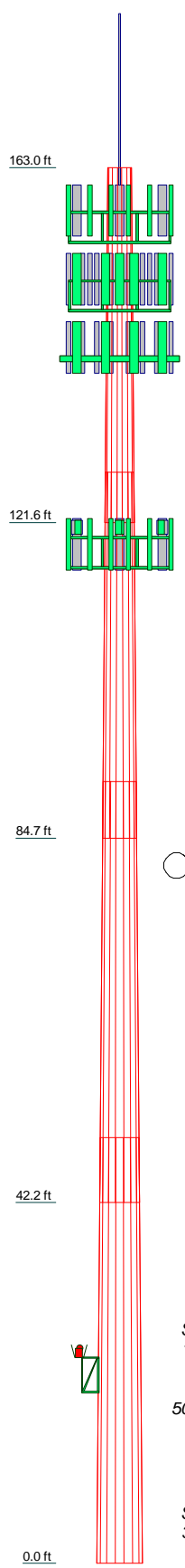
MATERIAL STRENGTH

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

TOWER DESIGN NOTES

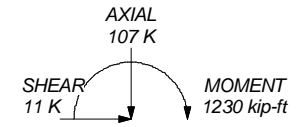
1. Tower is located in Litchfield County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 120 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in 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: 48.8%

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	41.42	18	0.3125	5.83	34.2800	42.3700		5.3
2	42.75	18	0.3750	6.67	40.6057	48.8300		7.7
3	49.13	18	0.4375	7.58	46.7975	56.2500	A572-65	11.9
4	49.79	18	0.5000	53.9160	63.5000			15.7

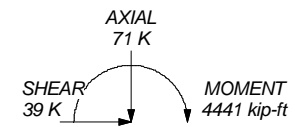


163.0 ft
121.6 ft
84.7 ft
42.2 ft
0.0 ft

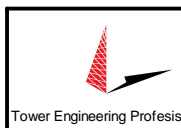
ALL REACTIONS ARE FACTORED



50 mph WIND - 1.5000 in ICE



REACTIONS - 120 mph WIND



Tower Engineering Professionals, Inc.

326 Tryon Road
Raleigh, NC 27603
Phone: (919) 661-6351
FAX: (919) 661-6350

Job: N. Woodbury / Wolff Parcel (BU 876379)		
Project: TEP No. 25647.541989		
Client: Crown Castle	Drawn by: EJB	App'd:
Code: TIA-222-H	Date: 08/11/21	Scale: NTS
Path:	Dwg No. E-1	

C:\Users\eboschart\Desktop\Woodbury SA Update\InvTower\876379_1958003_LC7.dwg

tnxTower Tower Engineering Professionals, Inc. 326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Job N. Woodbury / Wolff Parcel (BU 876379)	Page 1 of 19
	Project TEP No. 25647.541989	Date 14:14:45 08/11/21
	Client Crown Castle	Designed by EJB

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 Litchfield County, Connecticut.

Tower base elevation above sea level: 490.00 ft.

Basic wind speed of 120 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 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

- | | | |
|--|---|---|
| <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> 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 <li style="text-align: center;">Poles √ 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 |
|--|---|---|

tnxTower Tower Engineering Professionals, Inc. 326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Job N. Woodbury / Wolff Parcel (BU 876379)	Page 2 of 19
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	Client Crown Castle	Designed by EJB

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	163.01-121.59	41.42	5.83	18	34.2800	42.3700	0.3125	1.2500	A572-65 (65 ksi)
L2	121.59-84.67	42.75	6.67	18	40.6057	48.8300	0.3750	1.5000	A572-65 (65 ksi)
L3	84.67-42.21	49.13	7.58	18	46.7975	56.2500	0.4375	1.7500	A572-65 (65 ksi)
L4	42.21-0.00	49.79		18	53.9160	63.5000	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	I/Q in ²	w in	w/t
L1	34.7606	33.6915	4911.1720	12.0585	17.4142	282.0205	9828.8063	16.8490	5.4833	17.546
	42.9754	41.7158	9322.3361	14.9304	21.5240	433.1144	18656.9387	20.8619	6.9071	22.103
L2	42.3138	47.8845	9791.4486	14.2819	20.6277	474.6754	19595.7811	23.9468	6.4866	17.298
	49.5254	57.6736	17107.6924	17.2015	24.8056	689.6695	34237.8956	28.8423	7.9341	21.158
L3	48.7543	64.3766	17480.3987	16.4578	23.7731	735.3015	34983.7986	32.1944	7.4664	17.066
	57.0503	77.5026	30501.1953	19.8134	28.5750	1067.4084	61042.5248	38.7587	9.1300	20.869
L4	56.1528	84.7712	30558.2079	18.9627	27.3893	1115.6981	61156.6251	42.3936	8.6092	17.218
	64.4025	99.9810	50134.4235	22.3650	32.2580	1554.1702	100334.815	50.0000	10.2960	20.592

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 163.01-121.59				1	1	1			
L2 121.59-84.67				1	1	1			
L3 84.67-42.21				1	1	1			
L4 42.21-0.00				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)	163.00 - 0.00	1	1	-0.167 - 0.167	0.3750		0.22
***** LDF4-50A(1/2) *****	C	No	Surface Ar (CaAa)	22.00 - 0.00	1	1	0.167 - 0.167	0.6250		0.15

tnxTower Tower Engineering Professionals, Inc. 326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Job N. Woodbury / Wolff Parcel (BU 876379)	Page 3 of 19
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	Client Crown Castle	Designed by EJB

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} ft ² /ft	Weight plf

LDF4-50A(1/2)	B	No	No	Inside Pole	160.00 - 0.00	1	No Ice	0.00	0.15
							1/2" Ice	0.00	0.15
							1" Ice	0.00	0.15
							2" Ice	0.00	0.15

HB158-21U6S24-xx M_TMO(1-5/8)	A	No	No	Inside Pole	156.00 - 0.00	4	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

LDF7-50A(1-5/8)	A	No	No	Inside Pole	148.00 - 0.00	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
HB158-1-08U8-S8J 18(1-5/8)	A	No	No	Inside Pole	148.00 - 0.00	1	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

LDF7-50A(1-5/8)	A	No	No	Inside Pole	141.00 - 0.00	12	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

2" Flexible Conduit	C	No	No	Inside Pole	118.00 - 0.00	2	No Ice	0.00	0.34
							1/2" Ice	0.00	0.34
							1" Ice	0.00	0.34
							2" Ice	0.00	0.34
FB-L98B-002-75000 (3/8)	C	No	No	Inside Pole	118.00 - 0.00	1	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
FB-L98B-034-XXX(3/8")	C	No	No	Inside Pole	118.00 - 0.00	1	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-VG66ST-BRD(7/8)	C	No	No	Inside Pole	118.00 - 0.00	2	No Ice	0.00	0.91
							1/2" Ice	0.00	0.91
							1" Ice	0.00	0.91
							2" Ice	0.00	0.91
WR-VG86ST-BRD A(7/8)	C	No	No	Inside Pole	118.00 - 0.00	2	No Ice	0.00	0.68
							1/2" Ice	0.00	0.68
							1" Ice	0.00	0.68
							2" Ice	0.00	0.68
LCF158-50A(1-5/8)	C	No	No	Inside Pole	118.00 - 0.00	12	No Ice	0.00	0.80
							1/2" Ice	0.00	0.80
							1" Ice	0.00	0.80
							2" Ice	0.00	0.80

LDF4-50A(1/2)	B	No	No	Inside Pole	108.00 - 0.00	1	No Ice	0.00	0.15
							1/2" Ice	0.00	0.15
							1" Ice	0.00	0.15

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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	0.15

Feed Line/Linear Appurtenances Section Areas

Tower Section	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	163.01-121.59	A	0.000	0.000	0.000	0.000	0.70
		B	0.000	0.000	0.000	0.000	0.01
		C	0.000	0.000	1.553	0.000	0.01
L2	121.59-84.67	A	0.000	0.000	0.000	0.000	0.96
		B	0.000	0.000	0.000	0.000	0.01
		C	0.000	0.000	1.384	0.000	0.46
L3	84.67-42.21	A	0.000	0.000	0.000	0.000	1.11
		B	0.000	0.000	0.000	0.000	0.01
		C	0.000	0.000	1.592	0.000	0.59
L4	42.21-0.00	A	0.000	0.000	0.000	0.000	1.10
		B	0.000	0.000	0.000	0.000	0.01
		C	0.000	0.000	2.958	0.000	0.59

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} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	163.01-121.59	A	1.475	0.000	0.000	0.000	0.000	0.70
		B		0.000	0.000	0.000	0.000	0.01
		C		0.000	0.000	13.770	0.000	0.15
L2	121.59-84.67	A	1.428	0.000	0.000	0.000	0.000	0.96
		B		0.000	0.000	0.000	0.000	0.01
		C		0.000	0.000	12.275	0.000	0.58
L3	84.67-42.21	A	1.361	0.000	0.000	0.000	0.000	1.11
		B		0.000	0.000	0.000	0.000	0.01
		C		0.000	0.000	13.724	0.000	0.72
L4	42.21-0.00	A	1.221	0.000	0.000	0.000	0.000	1.10
		B		0.000	0.000	0.000	0.000	0.01
		C		0.000	0.000	20.431	0.000	0.78

Feed Line Center of Pressure

Section	Elevation ft	CP _X in	CP _Z in	CP _X Ice in	CP _Z Ice in
L1	163.01-121.59	0.1035	0.2838	0.4883	1.3388
L2	121.59-84.67	0.1036	0.2841	0.4992	1.3686
L3	84.67-42.21	0.1037	0.2843	0.4943	1.3552

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Section	Elevation	CP _x	CP _z	CP _x Ice	CP _z Ice
	ft	in	in	in	in
L4	42.21-0.00	0.0102	0.5359	0.1954	2.0397

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	121.59 - 163.00	1.0000	1.0000
L2	2	Safety Line 3/8	84.67 - 121.59	1.0000	1.0000
L3	2	Safety Line 3/8	42.21 - 84.67	1.0000	1.0000
L4	2	Safety Line 3/8	0.00 - 42.21	1.0000	1.0000
L4	26	LDF4-50A(1/2)	0.00 - 22.00	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			ft ft ft	°	ft	ft ²	ft ²	K	

SC229-SFXLDF	A	From Leg	1.00 0.00 11.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.95 7.97 10.00 14.12	5.95 7.97 10.00 14.12	0.03 0.07 0.13 0.28
Pipe Mount [PM 601-1]	A	From Leg	0.50 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.32 1.58 1.84 2.40	1.32 1.58 1.84 2.40	0.07 0.08 0.09 0.13

APX16DWV-16DWV-S-E-A 20 w/ Mount Pipe	A	From Centroid-Le g	4.00 0.00 2.00	0.0000	156.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.29 6.86 7.45 8.68	2.76 3.27 3.79 4.90	0.06 0.11 0.16 0.29
APX16DWV-16DWV-S-E-A 20 w/ Mount Pipe	B	From Centroid-Le g	4.00 0.00 2.00	0.0000	156.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.29 6.86 7.45 8.68	2.76 3.27 3.79 4.90	0.06 0.11 0.16 0.29
APX16DWV-16DWV-S-E-A 20 w/ Mount Pipe	C	From Centroid-Le g	4.00 0.00 2.00	0.0000	156.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.29 6.86 7.45 8.68	2.76 3.27 3.79 4.90	0.06 0.11 0.16 0.29
APXVAALL24_43-U-NA20	A	From	4.00	0.0000	156.00	No Ice	14.69	6.87	0.18

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	CAAA Front ft ²	CAAA Side ft ²	Weight K
_TMO w/ Mount Pipe		Centroid-Le g	0.00 2.00			1/2" Ice 15.46 1" Ice 16.23 2" Ice 17.82	7.55 8.25 9.67	0.31 0.45 0.78
APXVAALL24_43-U-NA20 _TMO w/ Mount Pipe	B	From Centroid-Le g	4.00 0.00 2.00	0.0000	156.00	No Ice 14.69 1/2" Ice 15.46 1" Ice 16.23 2" Ice 17.82	6.87 7.55 8.25 9.67	0.18 0.31 0.45 0.78
APXVAALL24_43-U-NA20 _TMO w/ Mount Pipe	C	From Centroid-Le g	4.00 0.00 2.00	0.0000	156.00	No Ice 14.69 1/2" Ice 15.46 1" Ice 16.23 2" Ice 17.82	6.87 7.55 8.25 9.67	0.18 0.31 0.45 0.78
AIR6449 B41_T-MOBILE w/ Mount Pipe	A	From Centroid-Le g	4.00 0.00 2.00	0.0000	156.00	No Ice 5.19 1/2" Ice 5.59 1" Ice 6.02 2" Ice 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	B	From Centroid-Le g	4.00 0.00 2.00	0.0000	156.00	No Ice 5.19 1/2" Ice 5.59 1" Ice 6.02 2" Ice 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 Centroid-Le g	4.00 0.00 2.00	0.0000	156.00	No Ice 5.19 1/2" Ice 5.59 1" Ice 6.02 2" Ice 6.90	2.71 3.04 3.38 4.12	0.13 0.17 0.23 0.35
RADIO 4415 B66A_CCIV3	A	From Centroid-Le g	4.00 0.00 2.00	0.0000	156.00	No Ice 1.64 1/2" Ice 1.80 1" Ice 1.97 2" Ice 2.32	0.68 0.79 0.91 1.18	0.05 0.06 0.07 0.11
RADIO 4415 B66A_CCIV3	B	From Centroid-Le g	4.00 0.00 2.00	0.0000	156.00	No Ice 1.64 1/2" Ice 1.80 1" Ice 1.97 2" Ice 2.32	0.68 0.79 0.91 1.18	0.05 0.06 0.07 0.11
RADIO 4415 B66A_CCIV3	C	From Centroid-Le g	4.00 0.00 2.00	0.0000	156.00	No Ice 1.64 1/2" Ice 1.80 1" Ice 1.97 2" Ice 2.32	0.68 0.79 0.91 1.18	0.05 0.06 0.07 0.11
RADIO 4449 B71 B85A_T-MOBILE	A	From Centroid-Le g	4.00 0.00 2.00	0.0000	156.00	No Ice 1.97 1/2" Ice 2.15 1" Ice 2.33 2" Ice 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 Centroid-Le g	4.00 0.00 2.00	0.0000	156.00	No Ice 1.97 1/2" Ice 2.15 1" Ice 2.33 2" Ice 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 Centroid-Le g	4.00 0.00 2.00	0.0000	156.00	No Ice 1.97 1/2" Ice 2.15 1" Ice 2.33 2" Ice 2.72	1.59 1.75 1.92 2.28	0.07 0.09 0.12 0.17
RADIO 4424 B25_TMO	A	From Centroid-Le g	4.00 0.00 2.00	0.0000	156.00	No Ice 2.05 1/2" Ice 2.23 1" Ice 2.42 2" Ice 2.81	1.61 1.77 1.94 2.30	0.09 0.11 0.13 0.19
RADIO 4424 B25_TMO	B	From Centroid-Le g	4.00 0.00 2.00	0.0000	156.00	No Ice 2.05 1/2" Ice 2.23 1" Ice 2.42 2" Ice 2.81	1.61 1.77 1.94 2.30	0.09 0.11 0.13 0.19
RADIO 4424 B25_TMO	C	From Centroid-Le	4.00 0.00	0.0000	156.00	No Ice 2.05 1/2" Ice 2.23	1.61 1.77	0.09 0.11

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	CAAA Front	CAAA Side	Weight
			Horz	Vert					
			ft	ft	°	ft	ft ²	ft ²	K
		g		2.00			1" Ice 2.42	1.94	0.13
							2" Ice 2.81	2.30	0.19
Platform Mount [LP 602-1]	C	None			0.0000	156.00	No Ice 31.07	31.07	1.34
							1/2" Ice 34.82	34.82	1.97
							1" Ice 38.48	38.48	2.67
							2" Ice 45.60	45.60	4.31
8' Ladder	C	From Centroid-Face	2.00		0.0000	156.00	No Ice 1.53	5.33	0.10
			0.00				1/2" Ice 4.36	8.08	0.11
			-4.00				1" Ice 7.19	10.83	0.13
							2" Ice 12.86	16.33	0.16
2.4" Dia. x 6-ft	A	From Centroid-Left	4.00		0.0000	156.00	No Ice 1.43	1.43	0.02
			0.00				1/2" Ice 1.92	1.92	0.03
			0.00				1" Ice 2.29	2.29	0.05
							2" Ice 3.06	3.06	0.09
2.4" Dia. x 6-ft	B	From Centroid-Left	4.00		0.0000	156.00	No Ice 1.43	1.43	0.02
			0.00				1/2" Ice 1.92	1.92	0.03
			0.00				1" Ice 2.29	2.29	0.05
							2" Ice 3.06	3.06	0.09
2.4" Dia. x 6-ft	C	From Centroid-Left	4.00		0.0000	156.00	No Ice 1.43	1.43	0.02
			0.00				1/2" Ice 1.92	1.92	0.03
			0.00				1" Ice 2.29	2.29	0.05
							2" Ice 3.06	3.06	0.09

LPA-80080/6CF w/ Mount Pipe	A	From Centroid-Face	4.00		0.0000	148.00	No Ice 4.93	10.92	0.07
			0.00				1/2" Ice 5.58	12.21	0.14
			2.00				1" Ice 6.16	13.16	0.22
							2" Ice 7.33	15.11	0.41
(2) LPA-80080/6CF w/ Mount Pipe	B	From Centroid-Face	4.00		0.0000	148.00	No Ice 4.93	10.92	0.07
			0.00				1/2" Ice 5.58	12.21	0.14
			2.00				1" Ice 6.16	13.16	0.22
							2" Ice 7.33	15.11	0.41
(3) LPA-80080/6CF w/ Mount Pipe	C	From Centroid-Face	4.00		0.0000	148.00	No Ice 4.93	10.92	0.07
			0.00				1/2" Ice 5.58	12.21	0.14
			2.00				1" Ice 6.16	13.16	0.22
							2" Ice 7.33	15.11	0.41
(3) SBNHH-1D65B w/ Mount Pipe	A	From Centroid-Face	4.00		0.0000	148.00	No Ice 4.09	3.30	0.07
			0.00				1/2" Ice 4.49	3.68	0.13
			2.00				1" Ice 4.89	4.07	0.20
							2" Ice 5.72	4.87	0.39
(2) SBNHH-1D65B w/ Mount Pipe	B	From Centroid-Face	4.00		0.0000	148.00	No Ice 4.09	3.30	0.07
			0.00				1/2" Ice 4.49	3.68	0.13
			2.00				1" Ice 4.89	4.07	0.20
							2" Ice 5.72	4.87	0.39
SBNHH-1D65B w/ Mount Pipe	C	From Centroid-Face	4.00		0.0000	148.00	No Ice 4.09	3.30	0.07
			0.00				1/2" Ice 4.49	3.68	0.13
			2.00				1" Ice 4.89	4.07	0.20
							2" Ice 5.72	4.87	0.39
MT6407-77A w/ Mount Pipe	A	From Centroid-Face	4.00		0.0000	148.00	No Ice 4.91	2.68	0.10
			0.00				1/2" Ice 5.26	3.14	0.14
			2.00				1" Ice 5.61	3.62	0.18
							2" Ice 6.36	4.63	0.29
MT6407-77A w/ Mount Pipe	B	From Centroid-Face	4.00		0.0000	148.00	No Ice 4.91	2.68	0.10
			0.00				1/2" Ice 5.26	3.14	0.14
			2.00				1" Ice 5.61	3.62	0.18
							2" Ice 6.36	4.63	0.29
MT6407-77A w/ Mount Pipe	C	From Centroid-Face	4.00		0.0000	148.00	No Ice 4.91	2.68	0.10
			0.00				1/2" Ice 5.26	3.14	0.14

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Vert					
			ft	ft	°	ft	ft ²	ft ²	K
			0.00			1/2" Ice	2.99	1.33	0.07
			1.00			1" Ice	3.21	1.49	0.09
						2" Ice	3.66	1.83	0.15
(2) TME-RRUS-11	C	From Leg	1.00	0.0000	120.00	No Ice	2.78	1.19	0.05
			0.00			1/2" Ice	2.99	1.33	0.07
			1.00			1" Ice	3.21	1.49	0.09
						2" Ice	3.66	1.83	0.15
2.4" Dia. x 6-ft	A	From Leg	0.50	0.0000	120.00	No Ice	1.43	1.43	0.02
			0.00			1/2" Ice	1.92	1.92	0.03
			0.00			1" Ice	2.29	2.29	0.05
						2" Ice	3.06	3.06	0.09
2.4" Dia. x 6-ft	B	From Leg	0.50	0.0000	120.00	No Ice	1.43	1.43	0.02
			0.00			1/2" Ice	1.92	1.92	0.03
			0.00			1" Ice	2.29	2.29	0.05
						2" Ice	3.06	3.06	0.09
2.4" Dia. x 6-ft	C	From Leg	0.50	0.0000	120.00	No Ice	1.43	1.43	0.02
			0.00			1/2" Ice	1.92	1.92	0.03
			0.00			1" Ice	2.29	2.29	0.05
						2" Ice	3.06	3.06	0.09

7770.00 w/ Mount Pipe	A	From Centroid-Le g	4.00	0.0000	118.00	No Ice	5.75	4.25	0.06
			0.00			1/2" Ice	6.18	5.01	0.10
			1.00			1" Ice	6.61	5.71	0.16
						2" Ice	7.49	7.16	0.29
7770.00 w/ Mount Pipe	B	From Centroid-Le g	4.00	0.0000	118.00	No Ice	5.75	4.25	0.06
			0.00			1/2" Ice	6.18	5.01	0.10
			1.00			1" Ice	6.61	5.71	0.16
						2" Ice	7.49	7.16	0.29
7770.00 w/ Mount Pipe	C	From Centroid-Le g	4.00	0.0000	118.00	No Ice	5.75	4.25	0.06
			0.00			1/2" Ice	6.18	5.01	0.10
			1.00			1" Ice	6.61	5.71	0.16
						2" Ice	7.49	7.16	0.29
(2) NNHH-65B-R4 w/ Mount Pipe	A	From Centroid-Le g	4.00	0.0000	118.00	No Ice	7.55	4.23	0.11
			0.00			1/2" Ice	8.04	4.67	0.20
			1.00			1" Ice	8.53	5.12	0.30
						2" Ice	9.56	6.05	0.53
(2) NNHH-65B-R4 w/ Mount Pipe	B	From Centroid-Le g	4.00	0.0000	118.00	No Ice	7.55	4.23	0.11
			0.00			1/2" Ice	8.04	4.67	0.20
			1.00			1" Ice	8.53	5.12	0.30
						2" Ice	9.56	6.05	0.53
(2) NNHH-65B-R4 w/ Mount Pipe	C	From Centroid-Le g	4.00	0.0000	118.00	No Ice	7.55	4.23	0.11
			0.00			1/2" Ice	8.04	4.67	0.20
			1.00			1" Ice	8.53	5.12	0.30
						2" Ice	9.56	6.05	0.53
RRUS 4478 B14	A	From Centroid-Le g	4.00	0.0000	118.00	No Ice	1.84	1.06	0.06
			0.00			1/2" Ice	2.01	1.20	0.08
			1.00			1" Ice	2.19	1.34	0.09
						2" Ice	2.57	1.66	0.14
RRUS 4478 B14	B	From Centroid-Le g	4.00	0.0000	118.00	No Ice	1.84	1.06	0.06
			0.00			1/2" Ice	2.01	1.20	0.08
			1.00			1" Ice	2.19	1.34	0.09
						2" Ice	2.57	1.66	0.14
RRUS 4478 B14	C	From Centroid-Le g	4.00	0.0000	118.00	No Ice	1.84	1.06	0.06
			0.00			1/2" Ice	2.01	1.20	0.08
			1.00			1" Ice	2.19	1.34	0.09
						2" Ice	2.57	1.66	0.14
TT19-08BP111-001	A	From	4.00	0.0000	118.00	No Ice	0.55	0.44	0.02

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Vert					
			ft	ft	°	ft	ft ²	ft ²	K
TT19-08BP111-001	B	Centroid-Le	0.00			1/2" Ice	0.64	0.53	0.02
		g	1.00			1" Ice	0.74	0.63	0.03
		From	4.00	0.0000	118.00	No Ice	0.55	0.44	0.02
		Centroid-Le	0.00			1/2" Ice	0.64	0.53	0.02
TT19-08BP111-001	C	g	1.00			1" Ice	0.74	0.63	0.03
		From	4.00	0.0000	118.00	No Ice	0.55	0.44	0.02
		Centroid-Le	0.00			1/2" Ice	0.64	0.53	0.02
		g	1.00			1" Ice	0.74	0.63	0.03
RRUS 4449 B5/B12	A	From	4.00	0.0000	118.00	No Ice	1.97	1.41	0.07
		Centroid-Le	0.00			1/2" Ice	2.14	1.56	0.09
		g	1.00			1" Ice	2.33	1.73	0.11
		From	4.00	0.0000	118.00	No Ice	1.97	1.41	0.07
RRUS 4449 B5/B12	B	Centroid-Le	0.00			1/2" Ice	2.14	1.56	0.09
		g	1.00			1" Ice	2.33	1.73	0.11
		From	4.00	0.0000	118.00	No Ice	1.97	1.41	0.07
		Centroid-Le	0.00			1/2" Ice	2.14	1.56	0.09
RRUS 4449 B5/B12	C	g	1.00			1" Ice	2.33	1.73	0.11
		From	4.00	0.0000	118.00	No Ice	1.97	1.41	0.07
		Centroid-Le	0.00			1/2" Ice	2.14	1.56	0.09
		g	1.00			1" Ice	2.33	1.73	0.11
RRUS 8843 B2/B66A	A	From	4.00	0.0000	118.00	No Ice	1.64	1.35	0.07
		Centroid-Le	0.00			1/2" Ice	1.80	1.50	0.09
		g	1.00			1" Ice	1.97	1.65	0.11
		From	4.00	0.0000	118.00	No Ice	1.64	1.35	0.07
RRUS 8843 B2/B66A	B	Centroid-Le	0.00			1/2" Ice	1.80	1.50	0.09
		g	1.00			1" Ice	1.97	1.65	0.11
		From	4.00	0.0000	118.00	No Ice	1.64	1.35	0.07
		Centroid-Le	0.00			1/2" Ice	1.80	1.50	0.09
RRUS 8843 B2/B66A	C	g	1.00			1" Ice	1.97	1.65	0.11
		From	4.00	0.0000	118.00	No Ice	1.64	1.35	0.07
		Centroid-Le	0.00			1/2" Ice	1.80	1.50	0.09
		g	1.00			1" Ice	1.97	1.65	0.11
DC6-48-60-18-8F	B	From	4.00	0.0000	118.00	No Ice	1.21	1.21	0.03
		Centroid-Le	0.00			1/2" Ice	1.89	1.89	0.05
		g	1.00			1" Ice	2.11	2.11	0.08
		From	4.00	0.0000	118.00	No Ice	1.14	1.14	0.03
DC6-48-60-0-8C-EV	C	Centroid-Le	0.00			1/2" Ice	1.79	1.79	0.05
		g	1.00			1" Ice	2.00	2.00	0.07
		From	4.00	0.0000	118.00	No Ice	1.14	1.14	0.03
		Centroid-Le	0.00			1/2" Ice	1.79	1.79	0.05
Platform Mount [LP 401-1_KCKR]	C	g	1.00			1" Ice	2.00	2.00	0.07
		From	4.00	0.0000	118.00	No Ice	35.26	35.26	1.92
		Centroid-Le	0.00			1/2" Ice	43.15	43.15	2.58
		g	1.00			1" Ice	51.27	51.27	3.36
Miscellaneous [NA 510-1]	C	From	4.00	0.0000	118.00	No Ice	6.36	6.36	0.26
		Centroid-Le	0.00			1/2" Ice	8.52	8.52	0.34
		g	0.00			1" Ice	10.62	10.62	0.46
		From	4.00	0.0000	118.00	No Ice	1.43	1.43	0.02
2.4" Dia. x 6-ft	A	Centroid-Le	0.00			1/2" Ice	1.92	1.92	0.03
		g	0.00			1" Ice	2.29	2.29	0.05
		From	4.00	0.0000	118.00	No Ice	1.43	1.43	0.02
		Centroid-Le	0.00			1/2" Ice	1.92	1.92	0.03
2.4" Dia. x 6-ft	B	From	4.00	0.0000	118.00	No Ice	1.43	1.43	0.02
		Centroid-Le	0.00			1/2" Ice	1.92	1.92	0.03

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	CAAA Front	CAAA Side	Weight
			ft ft ft	°	ft	ft ²	ft ²	K
		g	0.00			1" Ice	2.29	0.05
						2" Ice	3.06	0.09
2.4" Dia. x 6-ft	C	From Centroid-Le	4.00	0.0000	118.00	No Ice	1.43	0.02
		g	0.00			1/2" Ice	1.92	0.03
			0.00			1" Ice	2.29	0.05
						2" Ice	3.06	0.09

ANT150D6-9	A	From Leg	2.00	0.0000	108.00	No Ice	5.00	0.03
			0.00			1/2" Ice	7.03	0.06
			2.00			1" Ice	9.07	0.11
						2" Ice	13.22	0.25

KS24019-L112A	C	From Leg	3.00	0.0000	22.00	No Ice	0.08	0.01
			0.00			1/2" Ice	0.13	0.01
			2.00			1" Ice	0.19	0.01
						2" Ice	0.35	0.02
Side Arm Mount [SO 701-1]	C	From Leg	1.50	0.0000	22.00	No Ice	0.85	0.07
			0.00			1/2" Ice	1.14	0.08
			0.00			1" Ice	1.43	0.09
						2" Ice	2.01	0.12

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

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Comb. No.	Description
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	163.007 - 121.587	Pole	Max Tension	20	0.00	-0.00	0.00
			Max. Compression	26	-33.21	-0.64	0.41
			Max. Mx	8	-15.44	-406.23	-2.24
			Max. My	2	-15.49	2.23	391.56
			Max. Vy	8	18.20	-406.23	-2.24
			Max. Vx	14	17.57	-2.42	-391.48
			Max. Torque	4			-1.90
L2	121.587 - 84.67	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-58.32	-0.67	0.43
			Max. Mx	8	-30.45	-1304.83	-6.06
			Max. My	2	-30.49	5.97	1267.16
			Max. Vy	8	28.68	-1304.83	-6.06
			Max. Vx	14	28.04	-6.21	-1267.13
			Max. Torque	4			-2.00
L3	84.67 - 42.2067	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-78.14	-0.67	0.12
			Max. Mx	8	-46.20	-2609.18	-10.43
			Max. My	14	-46.23	-10.56	-2545.03
			Max. Vy	8	33.99	-2609.18	-10.43
			Max. Vx	14	33.35	-10.56	-2545.03
			Max. Torque	4			-1.55
L4	42.2067 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-107.27	-0.24	-0.72
			Max. Mx	20	-70.51	4441.04	15.54
			Max. My	14	-70.51	-15.60	-4346.30

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	20	-39.24	4441.04	15.54
			Max. Vx	14	38.64	-15.60	-4346.30
			Max. Torque	4			-1.55

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	30	107.27	-10.86	-0.03
	Max. H _x	20	70.53	39.20	0.11
	Max. H _z	2	70.53	0.11	38.60
	Max. M _x	2	4345.85	0.11	38.60
	Max. M _z	8	4440.74	-39.20	-0.11
	Max. Torsion	16	1.41	19.50	-33.38
	Min. Vert	17	52.89	19.50	-33.38
	Min. H _x	8	70.53	-39.20	-0.11
	Min. H _z	14	70.53	-0.11	-38.60
	Min. M _x	14	-4346.30	-0.11	-38.60
	Min. M _z	20	-4441.04	39.20	0.11
	Min. Torsion	4	-1.43	-19.50	33.38

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	58.77	0.00	0.00	0.18	0.13	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	70.53	-0.11	-38.60	-4345.85	15.92	1.27
0.9 Dead+1.0 Wind 0 deg - No Ice	52.89	-0.11	-38.60	-4312.76	15.75	1.27
1.2 Dead+1.0 Wind 30 deg - No Ice	70.53	19.50	-33.38	-3755.71	-2206.68	1.43
0.9 Dead+1.0 Wind 30 deg - No Ice	52.89	19.50	-33.38	-3727.12	-2189.85	1.43
1.2 Dead+1.0 Wind 60 deg - No Ice	70.53	33.89	-19.20	-2159.14	-3837.93	1.20
0.9 Dead+1.0 Wind 60 deg - No Ice	52.89	33.89	-19.20	-2142.74	-3808.61	1.20
1.2 Dead+1.0 Wind 90 deg - No Ice	70.53	39.20	0.11	15.98	-4440.74	0.63
0.9 Dead+1.0 Wind 90 deg - No Ice	52.89	39.20	0.11	15.79	-4406.81	0.63
1.2 Dead+1.0 Wind 120 deg - No Ice	70.53	34.00	19.40	2186.87	-3853.67	-0.11
0.9 Dead+1.0 Wind 120 deg - No Ice	52.89	34.00	19.40	2170.12	-3824.22	-0.11
1.2 Dead+1.0 Wind 150 deg - No Ice	70.53	19.70	33.49	3771.89	-2233.97	-0.81
0.9 Dead+1.0 Wind 150 deg - No Ice	52.89	19.70	33.49	3743.06	-2216.91	-0.81
1.2 Dead+1.0 Wind 180 deg - No Ice	70.53	0.11	38.60	4346.30	-15.60	-1.29

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	<p style="text-align: center;">Project</p> <p style="text-align: center;">TEP No. 25647.541989</p>	<p style="text-align: center;">Date</p> <p style="text-align: center;">14:14:45 08/11/21</p>
	<p style="text-align: center;">Client</p> <p style="text-align: center;">Crown Castle</p>	<p style="text-align: center;">Designed by</p> <p style="text-align: center;">EJB</p>

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
No Ice						
0.9 Dead+1.0 Wind 180 deg - No Ice	52.89	0.11	38.60	4313.09	-15.51	-1.28
1.2 Dead+1.0 Wind 210 deg - No Ice	70.53	-19.50	33.38	3756.15	2207.00	-1.41
0.9 Dead+1.0 Wind 210 deg - No Ice	52.89	-19.50	33.38	3727.45	2190.09	-1.41
1.2 Dead+1.0 Wind 240 deg - No Ice	70.53	-33.89	19.20	2159.58	3838.24	-1.16
0.9 Dead+1.0 Wind 240 deg - No Ice	52.89	-33.89	19.20	2143.07	3808.84	-1.16
1.2 Dead+1.0 Wind 270 deg - No Ice	70.53	-39.20	-0.11	-15.54	4441.04	-0.62
0.9 Dead+1.0 Wind 270 deg - No Ice	52.89	-39.20	-0.11	-15.46	4407.04	-0.62
1.2 Dead+1.0 Wind 300 deg - No Ice	70.53	-34.00	-19.40	-2186.42	3853.97	0.09
0.9 Dead+1.0 Wind 300 deg - No Ice	52.89	-34.00	-19.40	-2169.79	3824.45	0.09
1.2 Dead+1.0 Wind 330 deg - No Ice	70.53	-19.70	-33.49	-3771.44	2234.28	0.77
0.9 Dead+1.0 Wind 330 deg - No Ice	52.89	-19.70	-33.49	-3742.72	2217.14	0.77
1.2 Dead+1.0 Ice+1.0 Temp	107.27	0.00	0.00	0.72	-0.24	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	107.27	-0.03	-10.74	-1209.92	3.22	0.26
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	107.27	5.41	-9.29	-1045.97	-612.05	0.25
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	107.27	9.39	-5.35	-601.56	-1063.41	0.17
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	107.27	10.86	0.03	4.23	-1229.90	0.04
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	107.27	9.42	5.39	609.08	-1066.93	-0.09
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	107.27	5.45	9.32	1050.91	-618.15	-0.20
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	107.27	0.03	10.74	1211.35	-3.82	-0.26
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	107.27	-5.41	9.29	1047.39	611.45	-0.25
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	107.27	-9.39	5.35	602.98	1062.81	-0.17
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	107.27	-10.86	-0.03	-2.81	1229.30	-0.04
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	107.27	-9.42	-5.39	-607.65	1066.33	0.09
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	107.27	-5.45	-9.32	-1049.49	617.55	0.20
Dead+Wind 0 deg - Service	58.77	-0.03	-9.09	-1018.65	3.82	0.30
Dead+Wind 30 deg - Service	58.77	4.59	-7.86	-880.31	-517.21	0.34
Dead+Wind 60 deg - Service	58.77	7.98	-4.52	-506.04	-899.62	0.28
Dead+Wind 90 deg - Service	58.77	9.23	0.03	3.88	-1040.94	0.15
Dead+Wind 120 deg - Service	58.77	8.01	4.57	512.80	-903.31	-0.02
Dead+Wind 150 deg - Service	58.77	4.64	7.89	884.37	-523.60	-0.18
Dead+Wind 180 deg - Service	58.77	0.03	9.09	1019.03	-3.56	-0.30
Dead+Wind 210 deg - Service	58.77	-4.59	7.86	880.68	517.47	-0.34
Dead+Wind 240 deg - Service	58.77	-7.98	4.52	506.41	899.88	-0.28
Dead+Wind 270 deg - Service	58.77	-9.23	-0.03	-3.51	1041.20	-0.15
Dead+Wind 300 deg - Service	58.77	-8.01	-4.57	-512.43	903.57	0.02
Dead+Wind 330 deg - Service	58.77	-4.64	-7.89	-884.00	523.86	0.18

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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	-58.77	0.00	0.00	58.77	0.00	0.000%
2	-0.11	-70.53	-38.60	0.11	70.53	38.60	0.000%
3	-0.11	-52.89	-38.60	0.11	52.89	38.60	0.000%
4	19.50	-70.53	-33.38	-19.50	70.53	33.38	0.000%
5	19.50	-52.89	-33.38	-19.50	52.89	33.38	0.000%
6	33.89	-70.53	-19.20	-33.89	70.53	19.20	0.000%
7	33.89	-52.89	-19.20	-33.89	52.89	19.20	0.000%
8	39.20	-70.53	0.11	-39.20	70.53	-0.11	0.000%
9	39.20	-52.89	0.11	-39.20	52.89	-0.11	0.000%
10	34.00	-70.53	19.40	-34.00	70.53	-19.40	0.000%
11	34.00	-52.89	19.40	-34.00	52.89	-19.40	0.000%
12	19.70	-70.53	33.49	-19.70	70.53	-33.49	0.000%
13	19.70	-52.89	33.49	-19.70	52.89	-33.49	0.000%
14	0.11	-70.53	38.60	-0.11	70.53	-38.60	0.000%
15	0.11	-52.89	38.60	-0.11	52.89	-38.60	0.000%
16	-19.50	-70.53	33.38	19.50	70.53	-33.38	0.000%
17	-19.50	-52.89	33.38	19.50	52.89	-33.38	0.000%
18	-33.89	-70.53	19.20	33.89	70.53	-19.20	0.000%
19	-33.89	-52.89	19.20	33.89	52.89	-19.20	0.000%
20	-39.20	-70.53	-0.11	39.20	70.53	0.11	0.000%
21	-39.20	-52.89	-0.11	39.20	52.89	0.11	0.000%
22	-34.00	-70.53	-19.40	34.00	70.53	19.40	0.000%
23	-34.00	-52.89	-19.40	34.00	52.89	19.40	0.000%
24	-19.70	-70.53	-33.49	19.70	70.53	33.49	0.000%
25	-19.70	-52.89	-33.49	19.70	52.89	33.49	0.000%
26	0.00	-107.27	0.00	0.00	107.27	0.00	0.000%
27	-0.03	-107.27	-10.74	0.03	107.27	10.74	0.000%
28	5.41	-107.27	-9.29	-5.41	107.27	9.29	0.000%
29	9.39	-107.27	-5.35	-9.39	107.27	5.35	0.000%
30	10.86	-107.27	0.03	-10.86	107.27	-0.03	0.000%
31	9.42	-107.27	5.39	-9.42	107.27	-5.39	0.000%
32	5.45	-107.27	9.32	-5.45	107.27	-9.32	0.000%
33	0.03	-107.27	10.74	-0.03	107.27	-10.74	0.000%
34	-5.41	-107.27	9.29	5.41	107.27	-9.29	0.000%
35	-9.39	-107.27	5.35	9.39	107.27	-5.35	0.000%
36	-10.86	-107.27	-0.03	10.86	107.27	0.03	0.000%
37	-9.42	-107.27	-5.39	9.42	107.27	5.39	0.000%
38	-5.45	-107.27	-9.32	5.45	107.27	9.32	0.000%
39	-0.03	-58.77	-9.09	0.03	58.77	9.09	0.000%
40	4.59	-58.77	-7.86	-4.59	58.77	7.86	0.000%
41	7.98	-58.77	-4.52	-7.98	58.77	4.52	0.000%
42	9.23	-58.77	0.03	-9.23	58.77	-0.03	0.000%
43	8.01	-58.77	4.57	-8.01	58.77	-4.57	0.000%
44	4.64	-58.77	7.89	-4.64	58.77	-7.89	0.000%
45	0.03	-58.77	9.09	-0.03	58.77	-9.09	0.000%
46	-4.59	-58.77	7.86	4.59	58.77	-7.86	0.000%
47	-7.98	-58.77	4.52	7.98	58.77	-4.52	0.000%
48	-9.23	-58.77	-0.03	9.23	58.77	0.03	0.000%
49	-8.01	-58.77	-4.57	8.01	58.77	4.57	0.000%
50	-4.64	-58.77	-7.89	4.64	58.77	7.89	0.000%

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Non-Linear Convergence Results

<i>Load Combination</i>	<i>Converged?</i>	<i>Number of Cycles</i>	<i>Displacement Tolerance</i>	<i>Force Tolerance</i>
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00029394
3	Yes	4	0.00000001	0.00018814
4	Yes	5	0.00000001	0.00020657
5	Yes	5	0.00000001	0.00009893
6	Yes	5	0.00000001	0.00019670
7	Yes	5	0.00000001	0.00009376
8	Yes	4	0.00000001	0.00024517
9	Yes	4	0.00000001	0.00015165
10	Yes	5	0.00000001	0.00020578
11	Yes	5	0.00000001	0.00009806
12	Yes	5	0.00000001	0.00020821
13	Yes	5	0.00000001	0.00009949
14	Yes	4	0.00000001	0.00038990
15	Yes	4	0.00000001	0.00025335
16	Yes	5	0.00000001	0.00019437
17	Yes	5	0.00000001	0.00009279
18	Yes	5	0.00000001	0.00020752
19	Yes	5	0.00000001	0.00009921
20	Yes	4	0.00000001	0.00016769
21	Yes	4	0.00000001	0.00009518
22	Yes	5	0.00000001	0.00020696
23	Yes	5	0.00000001	0.00009866
24	Yes	5	0.00000001	0.00020113
25	Yes	5	0.00000001	0.00009593
26	Yes	4	0.00000001	0.00000001
27	Yes	5	0.00000001	0.00014451
28	Yes	5	0.00000001	0.00016214
29	Yes	5	0.00000001	0.00016299
30	Yes	5	0.00000001	0.00014724
31	Yes	5	0.00000001	0.00016424
32	Yes	5	0.00000001	0.00016327
33	Yes	5	0.00000001	0.00014446
34	Yes	5	0.00000001	0.00016137
35	Yes	5	0.00000001	0.00016289
36	Yes	5	0.00000001	0.00014691
37	Yes	5	0.00000001	0.00016409
38	Yes	5	0.00000001	0.00016271
39	Yes	4	0.00000001	0.00003182
40	Yes	4	0.00000001	0.00010547
41	Yes	4	0.00000001	0.00009169
42	Yes	4	0.00000001	0.00002903
43	Yes	4	0.00000001	0.00009873
44	Yes	4	0.00000001	0.00010329
45	Yes	4	0.00000001	0.00003260
46	Yes	4	0.00000001	0.00009070
47	Yes	4	0.00000001	0.00010508
48	Yes	4	0.00000001	0.00002857
49	Yes	4	0.00000001	0.00009998
50	Yes	4	0.00000001	0.00009472

Maximum Tower Deflections - Service Wind

tnxTower Tower Engineering Professionals, Inc. 326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Job N. Woodbury / Wolff Parcel (BU 876379)	Page 17 of 19
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	Client Crown Castle	Designed by EJB

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	163.007 - 121.587	14.243	42	0.6803	0.0012
L2	127.42 - 84.67	9.264	42	0.6349	0.0008
L3	91.3367 - 42.2067	4.921	42	0.4906	0.0004
L4	49.79 - 0	1.513	48	0.2708	0.0002

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
160.00	SC229-SFXLDF	42	13.812	0.6784	0.0012	147736
156.00	APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	42	13.240	0.6757	0.0011	105425
148.00	LPA-80080/6CF w/ Mount Pipe	42	12.101	0.6691	0.0010	49223
141.00	(4) DB846G90A-XY w/ Mount Pipe	42	11.118	0.6609	0.0009	33566
120.00	(2) TME-RRUS-11	42	8.294	0.6132	0.0007	18321
118.00	7770.00 w/ Mount Pipe	42	8.038	0.6064	0.0007	17759
108.00	ANT150D6-9	42	6.802	0.5679	0.0006	15398
22.00	KS24019-L112A	48	0.451	0.1195	0.0001	18362

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	163.007 - 121.587	60.801	8	2.9049	0.0050
L2	127.42 - 84.67	39.548	8	2.7114	0.0032
L3	91.3367 - 42.2067	21.006	8	2.0951	0.0016
L4	49.79 - 0	6.459	20	1.1559	0.0006

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
160.00	SC229-SFXLDF	8	58.962	2.8967	0.0050	34791
156.00	APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	8	56.518	2.8852	0.0048	24827
148.00	LPA-80080/6CF w/ Mount Pipe	8	51.658	2.8569	0.0044	11591
141.00	(4) DB846G90A-XY w/ Mount Pipe	8	47.460	2.8223	0.0041	7903
120.00	(2) TME-RRUS-11	8	35.405	2.6185	0.0030	4309
118.00	7770.00 w/ Mount Pipe	8	34.314	2.5897	0.0029	4176
108.00	ANT150D6-9	8	29.037	2.4249	0.0024	3618
22.00	KS24019-L112A	20	1.926	0.5101	0.0003	4301

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	Client Crown Castle	Designed by EJB

Section No.	Elevation ft	Ratio P_u	Ratio M_{ux}	Ratio M_{uy}	Ratio V_u	Ratio T_u	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	163.007 - 121.587 (1)	0.007	0.176	0.000	0.026	0.000	0.183	1.050	4.8.2
L2	121.587 - 84.67 (2)	0.009	0.349	0.000	0.029	0.000	0.360	1.050	4.8.2
L3	84.67 - 42.2067 (3)	0.010	0.449	0.000	0.026	0.000	0.460	1.050	4.8.2
L4	42.2067 - 0 (4)	0.012	0.500	0.000	0.022	0.000	0.513	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	163.007 - 121.587	Pole	TP42.37x34.28x0.3125	1	-15.44	2492.97	17.4	Pass	
L2	121.587 - 84.67	Pole	TP48.83x40.6057x0.375	2	-30.45	3448.83	34.2	Pass	
L3	84.67 - 42.2067	Pole	TP56.25x46.7975x0.4375	3	-46.20	4636.15	43.8	Pass	
L4	42.2067 - 0	Pole	TP63.5x53.916x0.5	4	-70.51	6141.33	48.8	Pass	
							Summary		
							Pole (L4)	48.8	Pass
							RATING =	48.8	Pass

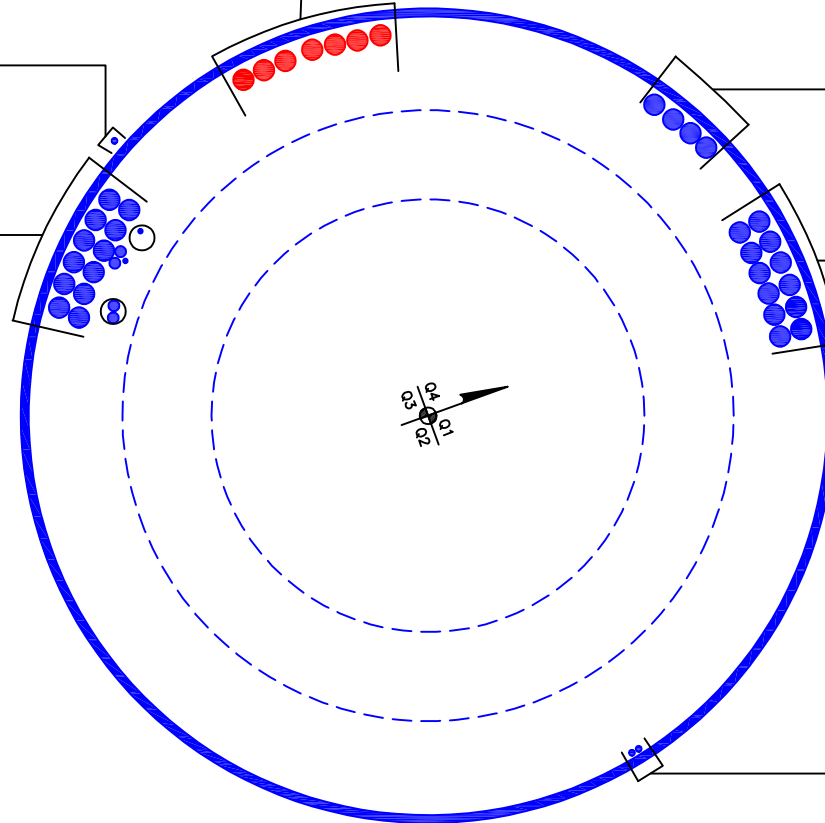
APPENDIX B
BASE LEVEL DRAWING



(PROPOSED EQUIPMENT CONFIGURATION)
(7) 1-5/8" TO 148 FT LEVEL

(OTHER CONSIDERED EQUIPMENT)
(1) 1/2" TO 22 FT LEVEL

(OTHER CONSIDERED EQUIPMENT—IN CONDUIT)
(1) 3/8" TO 118 FT LEVEL
(2) 7/8" TO 118 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(1) 3/8" TO 118 FT LEVEL
(2) 7/8" TO 118 FT LEVEL
(12) 1-5/8" TO 118 FT LEVEL



(OTHER CONSIDERED EQUIPMENT)
(4) 1-5/8" TO 156 FT LEVEL

(OTHER CONSIDERED EQUIPMENT)
(12) 1-5/8" TO 141 FT LEVEL

(OTHER CONSIDERED EQUIPMENT)
(1) 1/2" TO 108 FT LEVEL
(1) 1/2" TO 160 FT LEVEL

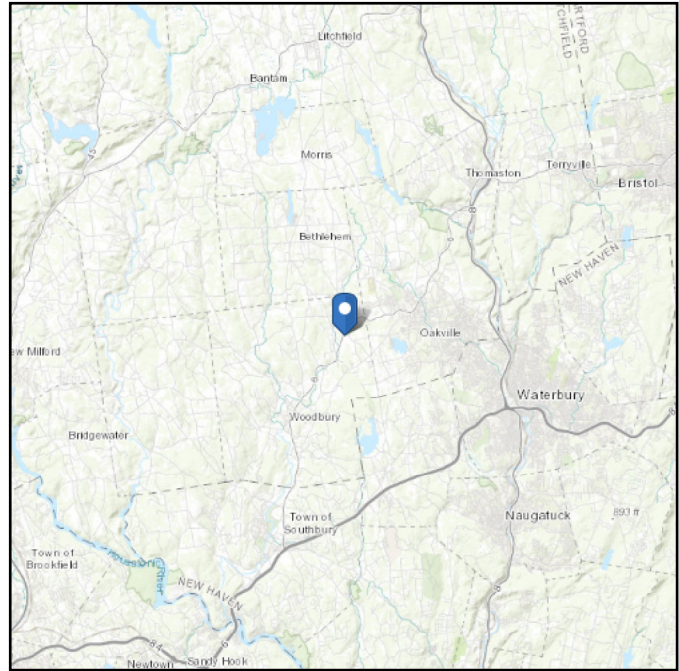
APPENDIX C
ADDITIONAL CALCULATIONS

ASCE 7 Hazards Report

Address:
No Address at This
Location

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

Elevation: 490.19 ft (NAVD 88)
Latitude: 41.589947
Longitude: -73.169867



Wind

Results:

Wind Speed:	118 Vmph	*120 Vmph per jurisdiction
10-year MRI	76 Vmph	
25-year MRI	85 Vmph	
50-year MRI	90 Vmph	
100-year MRI	97 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).

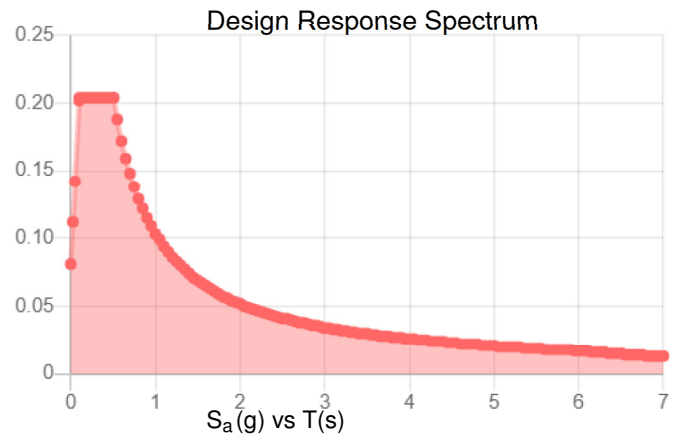
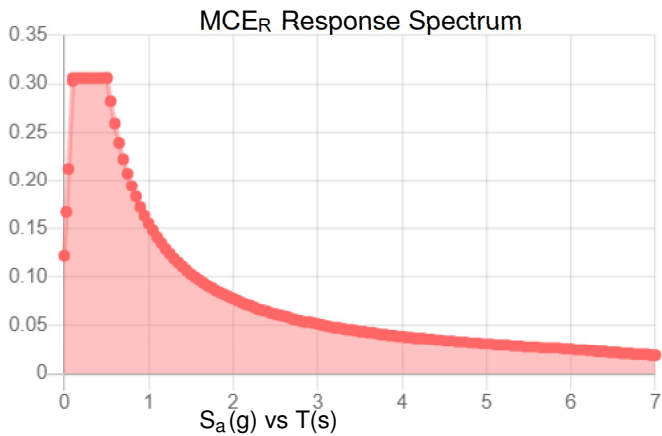
Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

Site Soil Class: D - Stiff Soil

Results:

S_s :	0.191	S_{DS} :	0.204
S_1 :	0.065	S_{D1} :	0.103
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.099
S_{MS} :	0.306	PGA _M :	0.159
S_{M1} :	0.155	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: 0.75 in.

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.

The ASCE 7 Hazard Tool is provided for your convenience, for informational purposes only, and is provided "as is" and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE 7 standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

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Monopole Base Plate Connection

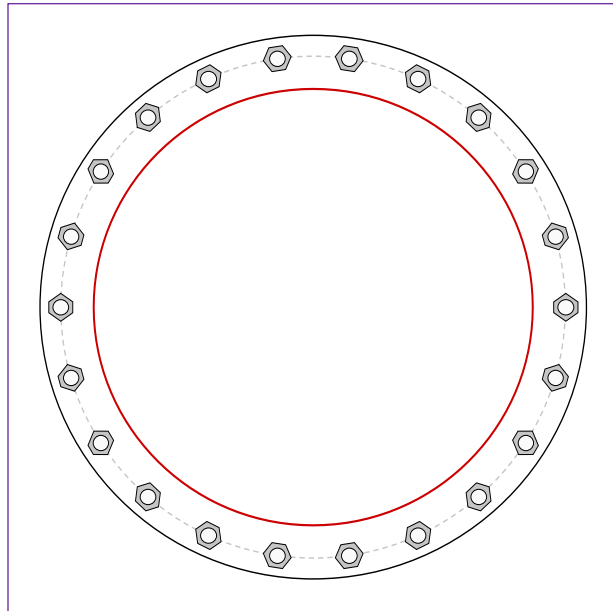


Site Info	
BU #	876379
Site Name	Woodbury / Wolff Park
Order #	552711 Rev. 0

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	0.75

Applied Loads	
Moment (kip-ft)	4441.00
Axial Force (kips)	71.00
Shear Force (kips)	39.00

*TIA-222-H Section 15.5 Applied



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

Anchor Rod Data
(22) 2-1/4" ϕ bolts (A615-75 N; $F_y=75$ ksi, $F_u=100$ ksi) on 73" BC
Base Plate Data
79" OD x 2.5" Plate (A871 Gr. 60; $F_y=60$ ksi, $F_u=75$ ksi)
Stiffener Data
N/A
Pole Data
63.5" 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>	
$Pu_t = 129.45$	$\phi Pn_t = 243.75$	Stress Rating
$Vu = 1.77$	$\phi Vn = 149.1$	50.6%
$Mu = n/a$	$\phi Mn = n/a$	Pass
Base Plate Summary		
Max Stress (ksi):	27.34	(Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	48.2%	Pass

Drilled Pier Foundation



BU #: 876379
 Site Name: N. Woodbury / Wolff P.
 Order Number: 552711 Rev. 0

TIA-222 Revision: H
 Tower Type: Monopole

Applied Loads		
	Comp.	Uplift
Moment (kip-ft)	4441	
Axial Force (kips)	71	
Shear Force (kips)	39	

Material Properties		
Concrete Strength, f'c:	4	ksi
Rebar Strength, Fy:	60	ksi
Tie Yield Strength, Fyt:	60	ksi

Pier Design Data		
Depth	28	ft
Ext. Above Grade	1	ft
Pier Section 1		
<i>From 1' above grade to 28' below grade</i>		
Pier Diameter	8	ft
Rebar Quantity	32	
Rebar Size	11	
Clear Cover to Ties	4	in
Tie Size	5	
Tie Spacing	12	in

[Rebar & Pier Options](#)

[Embedded Pole Inputs](#)

[Belled Pier Inputs](#)

Analysis Results		
Soil Lateral Check		
	Compression	Uplift
D _{v=0} (ft from TOC)	7.60	-
Soil Safety Factor	4.74	-
Max Moment (kip-ft)	4695.87	-
Rating*	26.7%	-
Soil Vertical Check		
	Compression	Uplift
Skin Friction (kips)	542.87	-
End Bearing (kips)	1350.10	-
Weight of Concrete (kips)	211.52	-
Total Capacity (kips)	1892.96	-
Axial (kips)	282.52	-
Rating*	14.2%	-
Reinforced Concrete Flexure		
	Compression	Uplift
Critical Depth (ft from TOC)	7.28	-
Critical Moment (kip-ft)	4694.89	-
Critical Moment Capacity	9268.22	-
Rating*	48.2%	-
Reinforced Concrete Shear		
	Compression	Uplift
Critical Depth (ft from TOC)	25.42	-
Critical Shear (kip)	211.64	-
Critical Shear Capacity	1230.38	-
Rating*	16.4%	-

Shear-Friciton Methodology is Applied

Soil Interaction Rating*	26.7%
Structural Foundation Rating*	48.2%

*Rating per TIA-222-H Section 15.5

Check Limitation	
Apply TIA-222-H Section 15.5:	<input checked="" type="checkbox"/>
N/A	<input type="checkbox"/>
Shear Design Options	
Check Shear along Depth of Pier:	<input checked="" type="checkbox"/>
Utilize Shear-Friction Methodology:	<input checked="" type="checkbox"/>
Override Critical Depth:	<input type="checkbox"/>

[Go to Soil Calculations](#)

Soil Profile													
Groundwater Depth	14.5	# of Layers	5										

Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ _{soil} (pcf)	γ _{concrete} (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Net Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	4	4	135	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
2	4	5	1	135	150	0	38	0.000	0.000	0.00	0.00			Cohesionless
3	5	14.5	9.5	135	150	0	38	0.000	0.000	0.80	0.80			Cohesionless
4	14.5	15	0.5	75	87.6	0	38	0.000	0.000	0.80	0.80			Cohesionless
5	15	28	13	75	87.6	0	38	0.000	0.000	1.60	1.60	32		Cohesionless