



STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

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VIA ELECTRONIC MAIL

May 2, 2024

Jeffrey Barbadora
Permitting Specialist
Crown Castle
1800 West Park Drive
Westborough, MA 01581
Jeff.Barbadora@crowncastle.com

RE: **EM-VER-110A-230913** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 335 South Washington Street, Plainville, Connecticut. **Request for Project Change.**

Dear Jeffrey Barbadora:

The Connecticut Siting Council (Council) is in receipt of the correspondence dated April 29, 2024 and the associated Structural Analysis dated November 16, 2023, regarding a project change for the above-referenced exempt modification request acknowledged by the Council on October 10, 2023.

Pursuant to Condition No. 1 of the Council's October 10, 2023 exempt modification approval, the request to increase the number of Kaelus interference mitigation filters to be installed from one to two is hereby approved.

This approval applies only to the project change in the correspondence dated April 29, 2024.

Thank you for your attention and cooperation.

Sincerely,

Melanie A. Bachman
Executive Director

MAB/ANM/laf

c: The Honorable Katherine Pugliese, Chairperson, Town of Plainville
(towncouncil@plainville-ct.gov)

From: Barbadora, Jeff <Jeff.Barbadora@crowncastle.com>
Sent: Monday, April 29, 2024 7:05 AM
To: CSC-DL Siting Council <Siting.Council@ct.gov>
Subject: EM-VER-110A-230913-335 South Washington Street Southington - 857012

Good morning,

Would the CSC please update the approval for EM-VER-110A-230913 to include a total of 2 filters?

The original SA submitted with the application and dated 8/01/2023 stated only 1 filters and should have stated 2 filters.

Please see updated SA stating a total of 2 filters and let me know if you have any questions.

Thanks,

Jeffrey Barbadora
Permitting Specialist
781-970-0053

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

Date: **November 16, 2023**



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

Subject: **Structural Analysis Report**

Carrier Designation: **Verizon Wireless Co-Locate**
Site Number: 467808
Site Name: SOUTHLINGTON NORTH CT

Crown Castle Designation: **BU Number:** 857012
Site Name: PLAINVILLE SOUTH WASHINGTON ST
JDE Job Number: 673169
Work Order Number: 2269394
Order Number: 574559 Rev. 3

Engineering Firm Designation: **Crown Castle Project Number:** 2269394

Site Data: **335 South Washington Street, Plainville, Hartford County, CT**
Latitude 41° 39' 11.03", Longitude -72° 52' 36.9"
121 Foot - Monopole Tower

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

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

LC8.5: Considered Equipment

Sufficient Capacity

The installed loading for the customer is different than what was proposed per order number 574559. This analysis is to confirm the tower structure and foundation have sufficient capacity to support the loads considering those changes.

This analysis has been performed in accordance with the 2022 Connecticut Building Code based upon an ultimate 3-second gust wind speed of 117 mph. Applicable Standard references and design criteria are listed in Section 2 - "Analysis Criteria".

Structural analysis prepared by: Didi Rossmiller

Respectfully submitted by:

Bradley E. Byrom, P.E., S.E.
Senior Project Engineer



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1) INTRODUCTION

This tower is a 121 ft Monopole tower designed by ENGINEERED ENDEAVORS, INC..

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	117 mph
Exposure Category:	C
Topographic Factor:	1
Ice Thickness:	1.5 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Installed Carrier Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
108.0	114.0	3	commscope	LNX-6514DS-A1M	7	1-5/8
		3	samsung telecom.	MT6407-77A w/ Mount Pipe		
	112.0	6	andrew	SBNHH-1D65B w/ Mount Pipe		
		2	kaelus	BSF0020F3V1		
		1	raycap	RVZDC-6627-PF-48_CCIV2		
		3	samsung telecom.	RFV01U-D1A		
		3	samsung telecom.	RFV01U-D2A		
		3	samsung telecom.	CBRS w/ Mount Pipe		
	108.0	1	tower mounts	Platform Mount [LP 1201-1_KCKR]		
		1	tower mounts	Side Arm Mount [SO 102-3]		

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)
120.0	123.0	3	ericsson	AIR 6449 N77 w/ Mount Pipe	3 3 6 1 6	Conduit 3/8 3/4 7/8 1-5/8
		3	ericsson	RRUS 4449 B5/B12		
		3	kathrein	80010965 w/ Mount Pipe		
		3	quintel technology	QD6616-7 w/ Mount Pipe		
		1	raycap	DC6-48-60-18-8F		
		1	raycap	DC6-48-60-18-8F		
		1	raycap	DC9-48-60-24-8C-EV		
	121.0	3	ericsson	AIR 6419 B77G w/ Mount Pipe		
		3	ericsson	RRUS 32 B2		
		3	ericsson	RRUS 32 B30		
		3	ericsson	RRUS 4426 B66		
		3	ericsson	RRUS 4478 B14		
	120.0	1	tower mounts	Platform Mount [LP 1201-1_KCKR-HR-1]		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	
99.0	103.0	1	ericsson	RADIO 4415 B25_TMO	10	1-5/8	
	102.0	2	ericsson	RADIO 4415 B25_TMO			
	100.0		3	commscope			SDX1926Q-43
			1	ericsson			AIR 32 B2A B66AA_T-MOBILE
			3	ericsson			AIR6449 B41_T-MOBILE
	99.0		3	ericsson			RADIO 4449 B71 B85A_T-MOBILE
			3	andrew			ONEBASE TWIN DUAL DUPLEX TMA
			2	ericsson			AIR 32 B2A B66AA_T-MOBILE
		99.0	1	tower mounts			Platform Mount [LP 602-1_KCKR]
	98.0	1	rfs celwave	APXVAALL24_43-U-NA20			
97.0	2	rfs celwave	APXVAALL24_43-U-NA20				

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
4-GEOTECHNICAL REPORTS	4566990	CCSITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	4566996	CCSITES
4-TOWER MANUFACTURER DRAWINGS	5121623	CCSITES

3.1) Analysis Method

tnxTower (version 8.2.2.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A. When applicable, Crown Castle has calculated and provided the effective area for panel antennas using approved methods following the intent of the TIA-222 standard.

3.2) Assumptions

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

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	121 - 96	Pole	TP27.56x21.26x0.188	1	-12.078	968.835	41.4	Pass
L2	96 - 48	Pole	TP39.56x26.316x0.25	2	-24.066	1853.890	76.7	Pass
L3	48 - 0	Pole	TP51.56x37.786x0.313	3	-37.452	3122.301	72.6	Pass
							Summary	
						Pole (L2)	76.7	Pass
						Rating =	76.7	Pass

Table 5 - Tower Component Stresses vs. Capacity - LC8.5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	46.8	Pass
1	Base Plate	0	59.2	Pass
1	Base Foundation (Structure)	0	42.5	Pass
1	Base Foundation (Soil Interaction)	0	42.6	Pass

Structure Rating (max from all components) =	76.7%
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Notes:

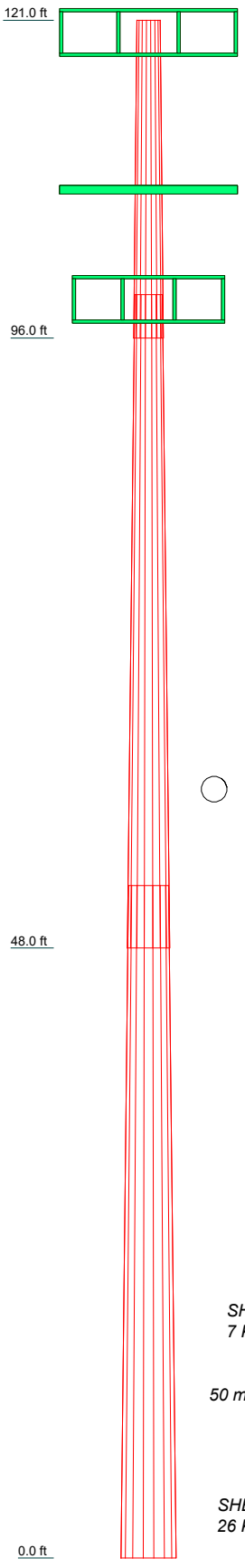
- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the considered equipment. No modifications are required at this time.

APPENDIX A
TNXTOWER OUTPUT

Section	1	2	3	
Length (ft)	25.000	51.450	52.950	
Number of Sides	18	18	18	
Thickness (in)	0.188	0.250	0.312	
Socket Length (ft)	3.450	4.950		
Top Dia (in)	21.260	26.316	37.786	
Bot Dia (in)	27.560	39.560	51.560	
Grade		A572-65		
Weight (K)	1.2	4.5	7.9	13.7



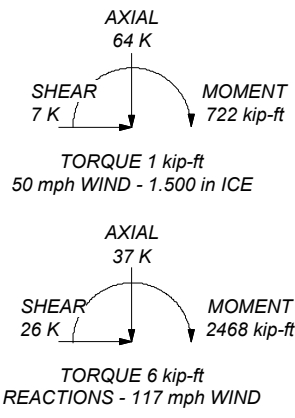
MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-H Standard.
2. Tower designed for a 117 mph basic wind in accordance with the TIA-222-H Standard.
3. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Risk Category II.
6. Topographic Category 1 with Crest Height of 0.000 ft
7. WO Comments:
8. Please provide post-install SA for Verizon at 108' per mount deviation process
9. TOWER RATING: 76.7%

ALL REACTIONS ARE FACTORED



Crown Castle
 2000 Corporate Drive
 Canonsburg PA 15317
 The Foundation for a Wireless World
 Phone: (724) 416-2000
 FAX: (724) 416-4623

Job: WO 2269394		
Project: Order No 574559		
Client: Crown Castle	Drawn by: Didi Rossmiller	App'd:
Code: TIA-222-H	Date: 11/16/23	Scale: NTS
Path:	Dwg No. E-1	

tnxTower Crown Castle 2000 Corporate Drive Canonsburg PA 15317 Phone: (724) 416-2000 FAX: (724) 416-4623	Job WO 2269394	Page 1 of 19
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	Client Crown Castle	Designed by Didi Rossmiller

Tower Input Data

The tower is a monopole.

This tower is designed using the TIA-222-H standard.

The following design criteria apply:

- Tower base elevation above sea level: 181.000 ft.
- Basic wind speed of 117 mph.
- Risk Category II.
- Exposure Category C.
- Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- Topographic Category: 1.
- Crest Height: 0.000 ft.
- Nominal ice thickness of 1.500 in.
- Ice thickness is considered to increase with height.
- Ice density of 56.000 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50.000 °F.
- Deflections calculated using a wind speed of 60 mph.
- WO Comments: .
- Please provide post-install SA for Verizon at 108' per mount deviation process.
- 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 Distribute Leg Loads As Uniform | <ul style="list-style-type: none"> 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 Appurtenances Alternative Appurt. EPA Calculation 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 | <ul style="list-style-type: none"> 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 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Tapered Pole Section Geometry

tnxTower Crown Castle 2000 Corporate Drive Canonsburg PA 15317 Phone: (724) 416-2000 FAX: (724) 416-4623	Job WO 2269394	Page 2 of 19
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	Client Crown Castle	Designed by Didi Rossmiller

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	121.000-96.000	25.000	3.450	18	21.260	27.560	0.188	0.750	A572-65 (65 ksi)
L2	96.000-48.000	51.450	4.950	18	26.316	39.560	0.250	1.000	A572-65 (65 ksi)
L3	48.000-0.000	52.950		18	37.786	51.560	0.312	1.250	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	21.559	12.541	703.548	7.481	10.800	65.143	1408.022	6.272	3.412	18.196
	27.956	16.290	1542.017	9.717	14.000	110.140	3086.062	8.147	4.521	24.11
L2	27.585	20.683	1775.365	9.253	13.368	132.804	3553.065	10.343	4.192	16.766
	40.132	31.192	6089.667	13.955	20.096	303.022	12187.346	15.599	6.523	26.09
L3	39.628	37.169	6594.148	13.303	19.195	343.532	13196.974	18.588	6.100	19.521
	52.307	50.831	16866.014	18.193	26.192	643.926	33754.220	25.420	8.525	27.279

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 121.000-96.000	0			1	1	1			
L2 96.000-48.000				1	1	1			
L3 48.000-0.000				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 klf
* * Safety Line 3/8 * *	C	No	Surface Ar (CaAa)	121.000 - 0.000	1	1	0.350 0.360	0.375		0.000

Feed Line/Linear Appurtenances - Entered As Area

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	Client Crown Castle	Designed by Didi Rossmiller

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C _A A _A ft ² /ft	Weight klf
LDF7-50A(1-5/8)	B	No	No	Inside Pole	120.000 - 0.000	6	No Ice	0.000	0.001
							1/2" Ice	0.000	0.001
							1" Ice	0.000	0.001
							2" Ice	0.000	0.001
FB-L98B-034-XXX(3/8)	B	No	No	Inside Pole	120.000 - 0.000	2	No Ice	0.000	0.000
							1/2" Ice	0.000	0.000
							1" Ice	0.000	0.000
							2" Ice	0.000	0.000
WR-VG86ST-BRD(3/4)	B	No	No	Inside Pole	120.000 - 0.000	6	No Ice	0.000	0.001
							1/2" Ice	0.000	0.001
							1" Ice	0.000	0.001
							2" Ice	0.000	0.001
2" Rigid Conduit	B	No	No	Inside Pole	120.000 - 0.000	3	No Ice	0.000	0.003
							1/2" Ice	0.000	0.003
							1" Ice	0.000	0.003
							2" Ice	0.000	0.003
PWRT-606-S(7/8)	B	No	No	Inside Pole	120.000 - 0.000	1	No Ice	0.000	0.001
							1/2" Ice	0.000	0.001
							1" Ice	0.000	0.001
							2" Ice	0.000	0.001
FB-L98B-235-XXX(3/8)	B	No	No	Inside Pole	120.000 - 0.000	1	No Ice	0.000	0.000
							1/2" Ice	0.000	0.000
							1" Ice	0.000	0.000
							2" Ice	0.000	0.000
*									
LDF7-50A(1-5/8)	B	No	No	Inside Pole	108.000 - 0.000	7	No Ice	0.000	0.001
							1/2" Ice	0.000	0.001
							1" Ice	0.000	0.001
							2" Ice	0.000	0.001
*									
LDF7-50A(1-5/8)	A	No	No	Inside Pole	99.000 - 0.000	6	No Ice	0.000	0.001
							1/2" Ice	0.000	0.001
							1" Ice	0.000	0.001
							2" Ice	0.000	0.001
HCS 6X12 4AWG(1-5/8)	A	No	No	Inside Pole	99.000 - 0.000	3	No Ice	0.000	0.002
							1/2" Ice	0.000	0.002
							1" Ice	0.000	0.002
							2" Ice	0.000	0.002
MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	A	No	No	Inside Pole	99.000 - 0.000	1	No Ice	0.000	0.001
							1/2" Ice	0.000	0.001
							1" Ice	0.000	0.001
							2" Ice	0.000	0.001
*									
*									
*									

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	121.000-96.000	A	0.000	0.000	0.000	0.000	0.040
		B	0.000	0.000	0.000	0.000	0.498
		C	0.000	0.000	0.938	0.000	0.005

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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
L2	96.000-48.000	A	0.000	0.000	0.000	0.000	0.633
		B	0.000	0.000	0.000	0.000	1.134
		C	0.000	0.000	1.800	0.000	0.011
L3	48.000-0.000	A	0.000	0.000	0.000	0.000	0.633
		B	0.000	0.000	0.000	0.000	1.134
		C	0.000	0.000	1.800	0.000	0.011

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	121.000-96.000	A	1.435	0.000	0.000	0.000	0.000	0.040
		B		0.000	0.000	0.000	0.000	0.498
		C		0.000	0.000	8.115	0.000	0.085
L2	96.000-48.000	A	1.376	0.000	0.000	0.000	0.000	0.633
		B		0.000	0.000	0.000	0.000	1.134
		C		0.000	0.000	15.580	0.000	0.163
L3	48.000-0.000	A	1.235	0.000	0.000	0.000	0.000	0.633
		B		0.000	0.000	0.000	0.000	1.134
		C		0.000	0.000	15.014	0.000	0.152

Feed Line Center of Pressure

Section	Elevation ft	CP_x in	CP_z in	CP_x Ice in	CP_z Ice in
L1	121.000-96.000	-0.204	0.222	-0.882	0.959
L2	96.000-48.000	-0.204	0.222	-0.930	1.012
L3	48.000-0.000	-0.205	0.223	-0.938	1.020

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	18	Safety Line 3/8	96.00 - 121.00	1.0000	1.0000
L2	18	Safety Line 3/8	48.00 - 96.00	1.0000	1.0000
L3	18	Safety Line 3/8	0.00 - 48.00	1.0000	1.0000

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	Client	Crown Castle	Designed by	Didi Rossmiller

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment °	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K
			Horz Lateral ft	Vert ft					
*** 121 ***									
AIR 6419 B77G w/ Mount Pipe	A	From Leg	4.000	0.000	120.000	No Ice	4.325	2.492	0.078
			0.000			1/2" Ice	4.740	2.841	0.110
			1.000			1" Ice	5.173	3.209	0.147
						2" Ice	6.094	3.998	0.241
AIR 6419 B77G w/ Mount Pipe	B	From Leg	4.000	0.000	120.000	No Ice	4.325	2.492	0.078
			0.000			1/2" Ice	4.740	2.841	0.110
			1.000			1" Ice	5.173	3.209	0.147
						2" Ice	6.094	3.998	0.241
AIR 6419 B77G w/ Mount Pipe	C	From Leg	4.000	0.000	120.000	No Ice	4.325	2.492	0.078
			0.000			1/2" Ice	4.740	2.841	0.110
			1.000			1" Ice	5.173	3.209	0.147
						2" Ice	6.094	3.998	0.241
AIR 6449 N77 w/ Mount Pipe	A	From Leg	4.000	0.000	120.000	No Ice	3.650	2.715	0.110
			0.000			1/2" Ice	3.993	3.028	0.150
			3.000			1" Ice	4.351	3.355	0.196
						2" Ice	5.109	4.053	0.310
AIR 6449 N77 w/ Mount Pipe	B	From Leg	4.000	0.000	120.000	No Ice	3.650	2.715	0.110
			0.000			1/2" Ice	3.993	3.028	0.150
			3.000			1" Ice	4.351	3.355	0.196
						2" Ice	5.109	4.053	0.310
AIR 6449 N77 w/ Mount Pipe	C	From Leg	4.000	0.000	120.000	No Ice	3.650	2.715	0.110
			0.000			1/2" Ice	3.993	3.028	0.150
			3.000			1" Ice	4.351	3.355	0.196
						2" Ice	5.109	4.053	0.310
QD6616-7 w/ Mount Pipe	A	From Leg	4.000	0.000	120.000	No Ice	12.562	6.931	0.156
			0.000			1/2" Ice	13.305	7.596	0.252
			2.000			1" Ice	14.063	8.276	0.360
						2" Ice	15.627	9.684	0.612
QD6616-7 w/ Mount Pipe	B	From Leg	4.000	0.000	120.000	No Ice	12.562	6.931	0.156
			0.000			1/2" Ice	13.305	7.596	0.252
			2.000			1" Ice	14.063	8.276	0.360
						2" Ice	15.627	9.684	0.612
QD6616-7 w/ Mount Pipe	C	From Leg	4.000	0.000	120.000	No Ice	12.562	6.931	0.156
			0.000			1/2" Ice	13.305	7.596	0.252
			2.000			1" Ice	14.063	8.276	0.360
						2" Ice	15.627	9.684	0.612
RRUS 4449 B5/B12	A	From Leg	4.000	0.000	120.000	No Ice	1.968	1.408	0.071
			0.000			1/2" Ice	2.144	1.564	0.090
			2.000			1" Ice	2.328	1.727	0.111
						2" Ice	2.718	2.075	0.163
RRUS 4449 B5/B12	B	From Leg	4.000	0.000	120.000	No Ice	1.968	1.408	0.071
			0.000			1/2" Ice	2.144	1.564	0.090
			2.000			1" Ice	2.328	1.727	0.111
						2" Ice	2.718	2.075	0.163
RRUS 4449 B5/B12	C	From Leg	4.000	0.000	120.000	No Ice	1.968	1.408	0.071
			0.000			1/2" Ice	2.144	1.564	0.090
			2.000			1" Ice	2.328	1.727	0.111
						2" Ice	2.718	2.075	0.163
DC6-48-60-18-8F	A	From Leg	4.000	0.000	120.000	No Ice	0.850	0.850	0.020
			0.000			1/2" Ice	1.356	1.356	0.037
			2.000			1" Ice	1.532	1.532	0.056
						2" Ice	1.914	1.914	0.102
DC9-48-60-24-8C-EV	B	From Leg	4.000	0.000	120.000	No Ice	1.145	1.145	0.026

tnxTower Crown Castle 2000 Corporate Drive Canonsburg PA 15317 Phone: (724) 416-2000 FAX: (724) 416-4623	Job		WO 2269394		Page		6 of 19	
	Project		Order No 574559		Date		13:06:42 11/16/23	
	Client		Crown Castle		Designed by		Didi Rossmiller	

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Vert					
					°	ft	ft ²	ft ²	K
				0.000			1/2" Ice	1.792	0.047
				2.000			1" Ice	2.002	0.070
							2" Ice	2.451	0.125
80010965 w/ Mount Pipe	A	From Leg	4.000	0.000	120.000	No Ice	12.263	5.789	0.136
			0.000			1/2" Ice	13.026	6.470	0.226
			2.000			1" Ice	13.804	7.167	0.328
						2" Ice	15.407	8.605	0.570
80010965 w/ Mount Pipe	B	From Leg	4.000	0.000	120.000	No Ice	12.263	5.789	0.136
			0.000			1/2" Ice	13.026	6.470	0.226
			2.000			1" Ice	13.804	7.167	0.328
						2" Ice	15.407	8.605	0.570
80010965 w/ Mount Pipe	C	From Leg	4.000	0.000	120.000	No Ice	12.263	5.789	0.136
			0.000			1/2" Ice	13.026	6.470	0.226
			2.000			1" Ice	13.804	7.167	0.328
						2" Ice	15.407	8.605	0.570
RRUS 32 B2	A	From Leg	4.000	0.000	120.000	No Ice	2.731	1.668	0.053
			0.000			1/2" Ice	2.953	1.855	0.074
			1.000			1" Ice	3.182	2.049	0.098
						2" Ice	3.663	2.458	0.157
RRUS 32 B2	B	From Leg	4.000	0.000	120.000	No Ice	2.731	1.668	0.053
			0.000			1/2" Ice	2.953	1.855	0.074
			1.000			1" Ice	3.182	2.049	0.098
						2" Ice	3.663	2.458	0.157
RRUS 32 B2	C	From Leg	4.000	0.000	120.000	No Ice	2.731	1.668	0.053
			0.000			1/2" Ice	2.953	1.855	0.074
			1.000			1" Ice	3.182	2.049	0.098
						2" Ice	3.663	2.458	0.157
RRUS 32 B30	A	From Leg	4.000	0.000	120.000	No Ice	2.731	1.668	0.053
			0.000			1/2" Ice	2.953	1.855	0.074
			1.000			1" Ice	3.182	2.049	0.098
						2" Ice	3.663	2.458	0.157
RRUS 32 B30	B	From Leg	4.000	0.000	120.000	No Ice	2.731	1.668	0.053
			0.000			1/2" Ice	2.953	1.855	0.074
			1.000			1" Ice	3.182	2.049	0.098
						2" Ice	3.663	2.458	0.157
RRUS 32 B30	C	From Leg	4.000	0.000	120.000	No Ice	2.731	1.668	0.053
			0.000			1/2" Ice	2.953	1.855	0.074
			1.000			1" Ice	3.182	2.049	0.098
						2" Ice	3.663	2.458	0.157
RRUS 4426 B66	A	From Leg	4.000	0.000	120.000	No Ice	1.644	0.725	0.048
			0.000			1/2" Ice	1.804	0.842	0.061
			1.000			1" Ice	1.972	0.969	0.076
						2" Ice	2.329	1.244	0.115
RRUS 4426 B66	B	From Leg	4.000	0.000	120.000	No Ice	1.644	0.725	0.048
			0.000			1/2" Ice	1.804	0.842	0.061
			1.000			1" Ice	1.972	0.969	0.076
						2" Ice	2.329	1.244	0.115
RRUS 4426 B66	C	From Leg	4.000	0.000	120.000	No Ice	1.644	0.725	0.048
			0.000			1/2" Ice	1.804	0.842	0.061
			1.000			1" Ice	1.972	0.969	0.076
						2" Ice	2.329	1.244	0.115
RRUS 4478 B14	A	From Leg	4.000	0.000	120.000	No Ice	1.843	1.059	0.060
			0.000			1/2" Ice	2.012	1.197	0.076
			1.000			1" Ice	2.190	1.342	0.094
						2" Ice	2.566	1.656	0.140
RRUS 4478 B14	B	From Leg	4.000	0.000	120.000	No Ice	1.843	1.059	0.060
			0.000			1/2" Ice	2.012	1.197	0.076

tnxTower Crown Castle 2000 Corporate Drive Canonsburg PA 15317 Phone: (724) 416-2000 FAX: (724) 416-4623	Job		WO 2269394		Page		7 of 19	
	Project		Order No 574559		Date		13:06:42 11/16/23	
	Client		Crown Castle		Designed by		Didi Rossmiller	

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz	Vert						ft
			ft	ft	°	ft	ft ²	ft ²	K	
			1.000				1" Ice	2.190	1.342	0.094
							2" Ice	2.566	1.656	0.140
RRUS 4478 B14	C	From Leg	4.000	0.000	120.000		No Ice	1.843	1.059	0.060
			0.000				1/2" Ice	2.012	1.197	0.076
			1.000				1" Ice	2.190	1.342	0.094
							2" Ice	2.566	1.656	0.140
DC6-48-60-18-8F	C	From Leg	4.000	0.000	120.000		No Ice	0.850	0.850	0.020
			0.000				1/2" Ice	1.356	1.356	0.037
			2.000				1" Ice	1.532	1.532	0.056
							2" Ice	1.914	1.914	0.102
4' x 2.375" Pipe Mount	A	From Leg	2.000	0.000	120.000		No Ice	1.457	1.457	0.022
			0.000				1/2" Ice	1.748	1.748	0.031
			0.000				1" Ice	2.046	2.046	0.044
							2" Ice	2.664	2.664	0.082
4' x 2.375" Pipe Mount	B	From Leg	2.000	0.000	120.000		No Ice	1.457	1.457	0.022
			0.000				1/2" Ice	1.748	1.748	0.031
			0.000				1" Ice	2.046	2.046	0.044
							2" Ice	2.664	2.664	0.082
4' x 2.375" Pipe Mount	C	From Leg	2.000	0.000	120.000		No Ice	1.457	1.457	0.022
			0.000				1/2" Ice	1.748	1.748	0.031
			0.000				1" Ice	2.046	2.046	0.044
							2" Ice	2.664	2.664	0.082
6' x 2" Mount Pipe	A	From Leg	4.000	0.000	120.000		No Ice	1.425	1.425	0.022
			0.000				1/2" Ice	1.925	1.925	0.033
			0.000				1" Ice	2.294	2.294	0.048
							2" Ice	3.060	3.060	0.090
6' x 2" Mount Pipe	B	From Leg	4.000	0.000	120.000		No Ice	1.425	1.425	0.022
			0.000				1/2" Ice	1.925	1.925	0.033
			0.000				1" Ice	2.294	2.294	0.048
							2" Ice	3.060	3.060	0.090
6' x 2" Mount Pipe	C	From Leg	4.000	0.000	120.000		No Ice	1.425	1.425	0.022
			0.000				1/2" Ice	1.925	1.925	0.033
			0.000				1" Ice	2.294	2.294	0.048
							2" Ice	3.060	3.060	0.090
8' x 2.375" Mount Pipe	A	From Leg	4.000	0.000	120.000		No Ice	1.900	1.900	0.061
			0.000				1/2" Ice	2.728	2.728	0.075
			0.000				1" Ice	3.401	3.401	0.095
							2" Ice	4.396	4.396	0.150
8' x 2.375" Mount Pipe	B	From Leg	4.000	0.000	120.000		No Ice	1.900	1.900	0.061
			0.000				1/2" Ice	2.728	2.728	0.075
			0.000				1" Ice	3.401	3.401	0.095
							2" Ice	4.396	4.396	0.150
8' x 2.375" Mount Pipe	C	From Leg	4.000	0.000	120.000		No Ice	1.900	1.900	0.061
			0.000				1/2" Ice	2.728	2.728	0.075
			0.000				1" Ice	3.401	3.401	0.095
							2" Ice	4.396	4.396	0.150
6' x 2" Horizontal Mount Pipe	A	From Leg	3.000	0.000	120.000		No Ice	1.140	0.010	0.016
			0.000				1/2" Ice	1.760	0.040	0.025
			4.000				1" Ice	2.140	0.090	0.038
							2" Ice	2.900	0.210	0.077
6' x 2" Horizontal Mount Pipe	B	From Leg	3.000	0.000	120.000		No Ice	1.140	0.010	0.016
			0.000				1/2" Ice	1.760	0.040	0.025
			4.000				1" Ice	2.140	0.090	0.038
							2" Ice	2.900	0.210	0.077
6' x 2" Horizontal Mount Pipe	C	From Leg	3.000	0.000	120.000		No Ice	1.140	0.010	0.016
			0.000				1/2" Ice	1.760	0.040	0.025
			4.000				1" Ice	2.140	0.090	0.038

tnxTower Crown Castle 2000 Corporate Drive Canonsburg PA 15317 Phone: (724) 416-2000 FAX: (724) 416-4623	Job		WO 2269394		Page		8 of 19	
	Project		Order No 574559		Date		13:06:42 11/16/23	
	Client		Crown Castle		Designed by		Didi Rossmiller	

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz	Vert						ft
Platform Mount [LP 1201-1_KCKR-HR-1]	C	None			0.000	120.000	2" Ice	2.900	0.210	0.077
							No Ice	37.610	37.610	2.631
							1/2" Ice	45.620	45.620	3.478
							1" Ice	53.590	53.590	4.462
							2" Ice	69.650	69.650	6.848
* *** 110 ***										
LNX-6514DS-A1M w/ Mount Pipe	A	From Leg	4.000	0.000	0.000	108.000	No Ice	4.095	3.296	0.065
							1/2" Ice	4.485	3.675	0.128
							1" Ice	4.885	4.064	0.202
							2" Ice	5.712	4.869	0.383
							6.000			
LNX-6514DS-A1M w/ Mount Pipe	B	From Leg	4.000	0.000	0.000	108.000	No Ice	4.095	3.296	0.065
							1/2" Ice	4.485	3.675	0.128
							1" Ice	4.885	4.064	0.202
							2" Ice	5.712	4.869	0.383
							6.000			
LNX-6514DS-A1M w/ Mount Pipe	C	From Leg	4.000	0.000	0.000	108.000	No Ice	4.095	3.296	0.065
							1/2" Ice	4.485	3.675	0.128
							1" Ice	4.885	4.064	0.202
							2" Ice	5.712	4.869	0.383
							6.000			
CBRS w/ Mount Pipe	A	From Leg	4.000	0.000	0.000	108.000	No Ice	1.452	0.994	0.032
							1/2" Ice	1.671	1.185	0.048
							1" Ice	1.905	1.391	0.068
							2" Ice	2.418	1.847	0.123
							2.000			
CBRS w/ Mount Pipe	B	From Leg	4.000	0.000	0.000	108.000	No Ice	1.452	0.994	0.032
							1/2" Ice	1.671	1.185	0.048
							1" Ice	1.905	1.391	0.068
							2" Ice	2.418	1.847	0.123
							2.000			
CBRS w/ Mount Pipe	C	From Leg	4.000	0.000	0.000	108.000	No Ice	1.452	0.994	0.032
							1/2" Ice	1.671	1.185	0.048
							1" Ice	1.905	1.391	0.068
							2" Ice	2.418	1.847	0.123
							2.000			
MT6407-77A w/ Mount Pipe	A	From Leg	4.000	0.000	0.000	108.000	No Ice	5.940	3.100	0.096
							1/2" Ice	6.470	3.550	0.132
							1" Ice	7.020	4.020	0.175
							2" Ice	8.170	5.010	0.282
							6.000			
MT6407-77A w/ Mount Pipe	B	From Leg	4.000	0.000	0.000	108.000	No Ice	5.940	3.100	0.096
							1/2" Ice	6.470	3.550	0.132
							1" Ice	7.020	4.020	0.175
							2" Ice	8.170	5.010	0.282
							6.000			
MT6407-77A w/ Mount Pipe	C	From Leg	4.000	0.000	0.000	108.000	No Ice	5.940	3.100	0.096
							1/2" Ice	6.470	3.550	0.132
							1" Ice	7.020	4.020	0.175
							2" Ice	8.170	5.010	0.282
							6.000			
BSF0020F3V1	A	From Leg	4.000	0.000	0.000	108.000	No Ice	0.963	0.287	0.018
							1/2" Ice	1.086	0.364	0.024
							1" Ice	1.217	0.449	0.033
							2" Ice	1.500	0.643	0.056
							4.000			
BSF0020F3V1	C	From Leg	4.000	0.000	0.000	108.000	No Ice	0.963	0.287	0.018
							1/2" Ice	1.086	0.364	0.024
							1" Ice	1.217	0.449	0.033
							2" Ice	1.500	0.643	0.056
							4.000			
RVZDC-6627-PF-48_CCIV2	B	From Leg	4.000	0.000	0.000	108.000	No Ice	4.056	3.098	0.032
							1/2" Ice	4.316	3.335	0.068
							1" Ice	4.582	3.580	0.109
							2" Ice	5.138	4.092	0.203
							4.000			
RFV01U-D1A	A	From Leg	4.000	0.000	0.000	108.000	No Ice	1.875	1.250	0.084
							1/2" Ice	2.045	1.393	0.103

tnxTower Crown Castle 2000 Corporate Drive Canonsburg PA 15317 Phone: (724) 416-2000 FAX: (724) 416-4623	Job		WO 2269394		Page		9 of 19	
	Project		Order No 574559		Date		13:06:42 11/16/23	
	Client		Crown Castle		Designed by		Didi Rossmiller	

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Vert					
			4.000						
						1" Ice	2.223	1.543	0.124
						2" Ice	2.601	1.865	0.175
						No Ice	1.875	1.250	0.084
						1/2" Ice	2.045	1.393	0.103
						1" Ice	2.223	1.543	0.124
						2" Ice	2.601	1.865	0.175
						No Ice	1.875	1.250	0.084
						1/2" Ice	2.045	1.393	0.103
						1" Ice	2.223	1.543	0.124
						2" Ice	2.601	1.865	0.175
						No Ice	1.875	1.012	0.070
						1/2" Ice	2.045	1.145	0.087
						1" Ice	2.223	1.284	0.106
						2" Ice	2.601	1.585	0.153
						No Ice	1.875	1.012	0.070
						1/2" Ice	2.045	1.145	0.087
						1" Ice	2.223	1.284	0.106
						2" Ice	2.601	1.585	0.153
						No Ice	1.875	1.012	0.070
						1/2" Ice	2.045	1.145	0.087
						1" Ice	2.223	1.284	0.106
						2" Ice	2.601	1.585	0.153
						No Ice	4.090	3.300	0.066
						1/2" Ice	4.490	3.680	0.130
						1" Ice	4.890	4.070	0.204
						2" Ice	5.720	4.870	0.386
						No Ice	4.090	3.300	0.066
						1/2" Ice	4.490	3.680	0.130
						1" Ice	4.890	4.070	0.204
						2" Ice	5.720	4.870	0.386
						No Ice	4.090	3.300	0.066
						1/2" Ice	4.490	3.680	0.130
						1" Ice	4.890	4.070	0.204
						2" Ice	5.720	4.870	0.386
						No Ice	1.425	1.425	0.041
						1/2" Ice	1.925	1.925	0.051
						1" Ice	2.294	2.294	0.066
						2" Ice	3.060	3.060	0.109
						No Ice	3.600	3.600	0.075
						1/2" Ice	4.180	4.180	0.105
						1" Ice	4.750	4.750	0.135
						2" Ice	5.900	5.900	0.195
						No Ice	29.600	29.600	2.375
						1/2" Ice	36.330	36.330	3.069
						1" Ice	43.260	43.260	3.861
						2" Ice	57.720	57.720	5.747
						No Ice	1.900	1.900	0.029
						1/2" Ice	2.728	2.728	0.044
						1" Ice	3.401	3.401	0.063
						2" Ice	4.396	4.396	0.119
						No Ice	1.900	1.900	0.029
						1/2" Ice	2.728	2.728	0.044
						1" Ice	3.401	3.401	0.063
						2" Ice	4.396	4.396	0.119
						No Ice	1.900	1.900	0.029
						1/2" Ice	2.728	2.728	0.044
						1" Ice	3.401	3.401	0.063

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Project	Order No 574559	Date	13:06:42 11/16/23
Client	Crown Castle	Designed by	Didi Rossmiller

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	
						2" Ice	4.396	4.396	0.119	
* AIR 32 B2A B66AA_T-MOBILE w/ Mount Pipe	A	From Leg	4.000 0.000 1.000		0.000	99.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.763 4.117 4.480 5.236	3.146 3.489 3.842 4.577	0.194 0.252 0.320 0.485
AIR 32 B2A B66AA_T-MOBILE w/ Mount Pipe	B	From Leg	4.000 0.000 0.000		0.000	99.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.763 4.117 4.480 5.236	3.146 3.489 3.842 4.577	0.194 0.252 0.320 0.485
AIR 32 B2A B66AA_T-MOBILE w/ Mount Pipe	C	From Leg	4.000 0.000 0.000		0.000	99.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.763 4.117 4.480 5.236	3.146 3.489 3.842 4.577	0.194 0.252 0.320 0.485
AIR6449 B41_T-MOBILE w/ Mount Pipe	A	From Leg	4.000 0.000 1.000		0.000	99.000	No Ice 1/2" Ice 1" Ice 2" Ice	5.187 5.594 6.016 6.904	2.705 3.038 3.385 4.122	0.128 0.174 0.227 0.354
AIR6449 B41_T-MOBILE w/ Mount Pipe	B	From Leg	4.000 0.000 1.000		0.000	99.000	No Ice 1/2" Ice 1" Ice 2" Ice	5.187 5.594 6.016 6.904	2.705 3.038 3.385 4.122	0.128 0.174 0.227 0.354
AIR6449 B41_T-MOBILE w/ Mount Pipe	C	From Leg	4.000 0.000 1.000		0.000	99.000	No Ice 1/2" Ice 1" Ice 2" Ice	5.187 5.594 6.016 6.904	2.705 3.038 3.385 4.122	0.128 0.174 0.227 0.354
APXVAALL24_43-U-NA20 w/ Mount Pipe	A	From Leg	4.000 0.000 -2.000		0.000	99.000	No Ice 1/2" Ice 1" Ice 2" Ice	14.694 15.455 16.230 17.816	6.873 7.554 8.247 9.670	0.183 0.311 0.453 0.782
APXVAALL24_43-U-NA20 w/ Mount Pipe	B	From Leg	4.000 0.000 -2.000		0.000	99.000	No Ice 1/2" Ice 1" Ice 2" Ice	14.694 15.455 16.230 17.816	6.873 7.554 8.247 9.670	0.183 0.311 0.453 0.782
APXVAALL24_43-U-NA20 w/ Mount Pipe	C	From Leg	4.000 0.000 -1.000		0.000	99.000	No Ice 1/2" Ice 1" Ice 2" Ice	14.694 15.455 16.230 17.816	6.873 7.554 8.247 9.670	0.183 0.311 0.453 0.782
ONEBASE TWIN DUAL DUPLEX TMA	A	From Leg	4.000 0.000 0.000		0.000	99.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.578 0.674 0.778 1.008	0.263 0.336 0.416 0.600	0.011 0.016 0.022 0.040
ONEBASE TWIN DUAL DUPLEX TMA	B	From Leg	4.000 0.000 0.000		0.000	99.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.578 0.674 0.778 1.008	0.263 0.336 0.416 0.600	0.011 0.016 0.022 0.040
ONEBASE TWIN DUAL DUPLEX TMA	C	From Leg	4.000 0.000 0.000		0.000	99.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.578 0.674 0.778 1.008	0.263 0.336 0.416 0.600	0.011 0.016 0.022 0.040
(3) SDX1926Q-43	A	From Leg	4.000 0.000 1.000		0.000	99.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.241 0.306 0.379 0.547	0.101 0.144 0.195 0.318	0.006 0.009 0.012 0.023
RADIO 4415 B25_TMO	A	From Leg	4.000 0.000 3.000		0.000	99.000	No Ice 1/2" Ice 1" Ice	1.856 2.027 2.204	0.870 0.997 1.134	0.047 0.062 0.079

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	Client Crown Castle	Designed by Didi Rossmiller

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

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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
L1	121 - 96	Pole	Max Tension	36	0.000	-0.002	0.001
			Max. Compression	26	-27.292	-0.560	-0.212
			Max. Mx	8	-12.078	-236.111	0.275
			Max. My	2	-12.078	-0.075	235.981
			Max. Vy	8	13.987	-236.111	0.275
			Max. Vx	2	-13.982	-0.075	235.981
			Max. Torque	13			4.768
L2	96 - 48	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-47.652	-0.558	-0.154
			Max. Mx	8	-24.067	-1187.828	0.231
			Max. My	2	-24.066	-0.104	1188.113
			Max. Vy	8	22.220	-1187.828	0.231
			Max. Vx	2	-22.230	-0.104	1188.113
			Max. Torque	13			6.498
L3	48 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-64.346	-0.558	-0.471
			Max. Mx	8	-37.452	-2467.605	0.183
			Max. My	2	-37.452	-0.108	2468.367
			Max. Vy	8	25.983	-2467.605	0.183
			Max. Vx	2	-25.993	-0.108	2468.367
			Max. Torque	13			6.469

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	33	64.346	-0.000	-7.419
	Max. H _x	20	37.476	25.949	-0.000
	Max. H _z	3	28.107	-0.000	25.958
	Max. M _x	2	2468.367	-0.000	25.958
	Max. M _z	8	2467.605	-25.949	-0.000
	Max. Torsion	13	6.459	-12.980	-22.481
	Min. Vert	7	28.107	-22.471	12.974
	Min. H _x	8	37.476	-25.949	-0.000
	Min. H _z	15	28.107	-0.000	-25.958
	Min. M _x	14	-2468.143	-0.000	-25.958
	Min. M _z	20	-2467.380	25.949	-0.000
	Min. Torsion	25	-6.459	12.980	22.481

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overtuning Moment, M _x kip-ft	Overtuning Moment, M _z kip-ft	Torque kip-ft
Dead Only	31.230	0.000	0.000	-0.085	-0.086	0.000
1.2 Dead+1.0 Wind 0 deg - No Ice	37.476	0.000	-25.958	-2468.367	-0.107	0.496
0.9 Dead+1.0 Wind 0 deg - No Ice	28.107	0.000	-25.958	-2438.746	-0.079	0.497
1.2 Dead+1.0 Wind 30 deg - No Ice	37.476	12.976	-22.475	-2137.200	-1234.037	-5.597
0.9 Dead+1.0 Wind 30 deg - No Ice	28.107	12.976	-22.475	-2111.562	-1219.201	-5.599

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<i>Load Combination</i>	<i>Vertical</i>	<i>Shear_x</i>	<i>Shear_z</i>	<i>Overturning Moment, M_x</i>	<i>Overturning Moment, M_z</i>	<i>Torque</i>
	K	K	K	kip-ft	kip-ft	kip-ft
Ice						
1.2 Dead+1.0 Wind 60 deg - No Ice	37.476	22.471	-12.974	-1233.793	-2136.902	0.348
0.9 Dead+1.0 Wind 60 deg - No Ice	28.107	22.471	-12.974	-1218.973	-2111.258	0.349
1.2 Dead+1.0 Wind 90 deg - No Ice	37.476	25.949	0.000	-0.185	-2467.605	6.200
0.9 Dead+1.0 Wind 90 deg - No Ice	28.107	25.949	0.000	-0.135	-2437.997	6.203
1.2 Dead+1.0 Wind 120 deg - No Ice	37.476	22.477	12.977	1233.896	-2137.476	-0.147
0.9 Dead+1.0 Wind 120 deg - No Ice	28.107	22.477	12.977	1219.134	-2111.825	-0.148
1.2 Dead+1.0 Wind 150 deg - No Ice	37.476	12.980	22.481	2137.619	-1234.246	-6.456
0.9 Dead+1.0 Wind 150 deg - No Ice	28.107	12.980	22.481	2112.015	-1219.440	-6.459
1.2 Dead+1.0 Wind 180 deg - No Ice	37.476	0.000	25.958	2468.143	-0.107	-0.496
0.9 Dead+1.0 Wind 180 deg - No Ice	28.107	0.000	25.958	2438.583	-0.079	-0.497
1.2 Dead+1.0 Wind 210 deg - No Ice	37.476	-12.976	22.475	2137.043	1233.699	5.597
0.9 Dead+1.0 Wind 210 deg - No Ice	28.107	-12.976	22.475	2111.446	1218.954	5.599
1.2 Dead+1.0 Wind 240 deg - No Ice	37.476	-22.471	12.974	1233.562	2136.681	-0.348
0.9 Dead+1.0 Wind 240 deg - No Ice	28.107	-22.471	12.974	1218.804	2111.096	-0.349
1.2 Dead+1.0 Wind 270 deg - No Ice	37.476	-25.949	0.000	-0.185	2467.380	-6.200
0.9 Dead+1.0 Wind 270 deg - No Ice	28.107	-25.949	0.000	-0.135	2437.832	-6.203
1.2 Dead+1.0 Wind 300 deg - No Ice	37.476	-22.477	-12.977	-1234.119	2137.251	0.147
0.9 Dead+1.0 Wind 300 deg - No Ice	28.107	-22.477	-12.977	-1219.297	2111.661	0.148
1.2 Dead+1.0 Wind 330 deg - No Ice	37.476	-12.980	-22.481	-2137.768	1234.150	6.456
0.9 Dead+1.0 Wind 330 deg - No Ice	28.107	-12.980	-22.481	-2112.124	1219.368	6.459
1.2 Dead+1.0 Ice+1.0 Temp	64.346	0.000	0.000	0.471	-0.558	0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	64.346	0.000	-7.419	-720.318	-0.675	0.106
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	64.346	3.709	-6.424	-623.639	-361.038	-1.135
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	64.346	6.423	-3.708	-359.770	-624.696	0.052
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	64.346	7.416	-0.000	0.500	-721.198	1.225
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	64.346	6.423	3.709	360.829	-624.768	-0.055
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	64.346	3.709	6.425	624.738	-361.064	-1.319
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	64.346	0.000	7.419	721.336	-0.675	-0.106
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	64.346	-3.709	6.424	624.666	359.671	1.135
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	64.346	-6.423	3.708	360.787	623.345	-0.052
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	64.346	-7.416	-0.000	0.500	719.847	-1.225

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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
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 300	64.346	-6.423	-3.709	-359.811	623.417	0.055
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 330	64.346	-3.709	-6.425	-623.711	359.729	1.319
deg+1.0 Ice+1.0 Temp						
Dead+Wind 0 deg - Service	31.230	0.000	-6.433	-607.840	-0.093	0.128
Dead+Wind 30 deg - Service	31.230	3.216	-5.570	-526.304	-303.905	-1.397
Dead+Wind 60 deg - Service	31.230	5.569	-3.215	-303.855	-526.225	0.091
Dead+Wind 90 deg - Service	31.230	6.431	0.000	-0.096	-607.652	1.554
Dead+Wind 120 deg - Service	31.230	5.571	3.216	303.751	-526.366	-0.037
Dead+Wind 150 deg - Service	31.230	3.217	5.572	526.266	-303.982	-1.618
Dead+Wind 180 deg - Service	31.230	0.000	6.433	607.655	-0.093	-0.128
Dead+Wind 210 deg - Service	31.230	-3.216	5.570	526.125	303.715	1.397
Dead+Wind 240 deg - Service	31.230	-5.569	3.215	303.670	526.039	-0.091
Dead+Wind 270 deg - Service	31.230	-6.431	0.000	-0.096	607.466	-1.554
Dead+Wind 300 deg - Service	31.230	-5.571	-3.216	-303.936	526.180	0.037
Dead+Wind 330 deg - Service	31.230	-3.217	-5.572	-526.445	303.801	1.618

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	0.000	-31.230	0.000	0.000	31.230	0.000	0.000%
2	0.000	-37.476	-25.958	-0.000	37.476	25.958	0.000%
3	0.000	-28.107	-25.958	-0.000	28.107	25.958	0.000%
4	12.976	-37.476	-22.475	-12.976	37.476	22.475	0.000%
5	12.976	-28.107	-22.475	-12.976	28.107	22.475	0.000%
6	22.471	-37.476	-12.974	-22.471	37.476	12.974	0.000%
7	22.471	-28.107	-12.974	-22.471	28.107	12.974	0.000%
8	25.949	-37.476	0.000	-25.949	37.476	-0.000	0.000%
9	25.949	-28.107	0.000	-25.949	28.107	-0.000	0.000%
10	22.477	-37.476	12.977	-22.477	37.476	-12.977	0.000%
11	22.477	-28.107	12.977	-22.477	28.107	-12.977	0.000%
12	12.980	-37.476	22.481	-12.980	37.476	-22.481	0.000%
13	12.980	-28.107	22.481	-12.980	28.107	-22.481	0.000%
14	0.000	-37.476	25.958	-0.000	37.476	-25.958	0.000%
15	0.000	-28.107	25.958	-0.000	28.107	-25.958	0.000%
16	-12.976	-37.476	22.475	12.976	37.476	-22.475	0.000%
17	-12.976	-28.107	22.475	12.976	28.107	-22.475	0.000%
18	-22.471	-37.476	12.974	22.471	37.476	-12.974	0.000%
19	-22.471	-28.107	12.974	22.471	28.107	-12.974	0.000%
20	-25.949	-37.476	0.000	25.949	37.476	-0.000	0.000%
21	-25.949	-28.107	0.000	25.949	28.107	-0.000	0.000%
22	-22.477	-37.476	-12.977	22.477	37.476	12.977	0.000%
23	-22.477	-28.107	-12.977	22.477	28.107	12.977	0.000%
24	-12.980	-37.476	-22.481	12.980	37.476	22.481	0.000%
25	-12.980	-28.107	-22.481	12.980	28.107	22.481	0.000%
26	0.000	-64.346	0.000	0.000	64.346	0.000	0.000%
27	0.000	-64.346	-7.419	-0.000	64.346	7.419	0.000%
28	3.709	-64.346	-6.424	-3.709	64.346	6.424	0.000%
29	6.422	-64.346	-3.708	-6.423	64.346	3.708	0.000%
30	7.416	-64.346	0.000	-7.416	64.346	0.000	0.000%
31	6.423	-64.346	3.709	-6.423	64.346	-3.709	0.000%
32	3.709	-64.346	6.425	-3.709	64.346	-6.425	0.000%
33	0.000	-64.346	7.419	-0.000	64.346	-7.419	0.000%
34	-3.709	-64.346	6.424	3.709	64.346	-6.424	0.000%
35	-6.422	-64.346	3.708	6.423	64.346	-3.708	0.000%

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	Client Crown Castle	Designed by Didi Rossmiller

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
36	-7.416	-64.346	0.000	7.416	64.346	0.000	0.000%
37	-6.423	-64.346	-3.709	6.423	64.346	3.709	0.000%
38	-3.709	-64.346	-6.425	3.709	64.346	6.425	0.000%
39	0.000	-31.230	-6.433	0.000	31.230	6.433	0.000%
40	3.216	-31.230	-5.570	-3.216	31.230	5.570	0.000%
41	5.569	-31.230	-3.215	-5.569	31.230	3.215	0.000%
42	6.431	-31.230	0.000	-6.431	31.230	-0.000	0.000%
43	5.571	-31.230	3.216	-5.571	31.230	-3.216	0.000%
44	3.217	-31.230	5.572	-3.217	31.230	-5.572	0.000%
45	0.000	-31.230	6.433	0.000	31.230	-6.433	0.000%
46	-3.216	-31.230	5.570	3.216	31.230	-5.570	0.000%
47	-5.569	-31.230	3.215	5.569	31.230	-3.215	0.000%
48	-6.431	-31.230	0.000	6.431	31.230	-0.000	0.000%
49	-5.571	-31.230	-3.216	5.571	31.230	3.216	0.000%
50	-3.217	-31.230	-5.572	3.217	31.230	5.572	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00005899
3	Yes	4	0.00000001	0.00065679
4	Yes	6	0.00000001	0.00012314
5	Yes	5	0.00000001	0.00095524
6	Yes	6	0.00000001	0.00013758
7	Yes	6	0.00000001	0.00004419
8	Yes	5	0.00000001	0.00070720
9	Yes	5	0.00000001	0.00033526
10	Yes	6	0.00000001	0.00013843
11	Yes	6	0.00000001	0.00004450
12	Yes	6	0.00000001	0.00016852
13	Yes	6	0.00000001	0.00005547
14	Yes	5	0.00000001	0.00005898
15	Yes	4	0.00000001	0.00065672
16	Yes	6	0.00000001	0.00016399
17	Yes	6	0.00000001	0.00005383
18	Yes	6	0.00000001	0.00014024
19	Yes	6	0.00000001	0.00004518
20	Yes	5	0.00000001	0.00070716
21	Yes	5	0.00000001	0.00033526
22	Yes	6	0.00000001	0.00013944
23	Yes	6	0.00000001	0.00004487
24	Yes	6	0.00000001	0.00012175
25	Yes	5	0.00000001	0.00094511
26	Yes	4	0.00000001	0.00000001
27	Yes	5	0.00000001	0.00049136
28	Yes	5	0.00000001	0.00081492
29	Yes	5	0.00000001	0.00083204
30	Yes	5	0.00000001	0.00054619
31	Yes	5	0.00000001	0.00083413
32	Yes	5	0.00000001	0.00092764
33	Yes	5	0.00000001	0.00049190
34	Yes	5	0.00000001	0.00090562
35	Yes	5	0.00000001	0.00083376
36	Yes	5	0.00000001	0.00054400

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37	Yes	5	0.00000001	0.00083187
38	Yes	5	0.00000001	0.00081050
39	Yes	4	0.00000001	0.00009552
40	Yes	4	0.00000001	0.00081687
41	Yes	4	0.00000001	0.00078941
42	Yes	4	0.00000001	0.00085441
43	Yes	4	0.00000001	0.00080293
44	Yes	5	0.00000001	0.00007709
45	Yes	4	0.00000001	0.00009544
46	Yes	5	0.00000001	0.00007144
47	Yes	4	0.00000001	0.00083530
48	Yes	4	0.00000001	0.00085382
49	Yes	4	0.00000001	0.00082030
50	Yes	4	0.00000001	0.00087967

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	121 - 96	18.079	39	1.346	0.019
L2	99.45 - 48	12.219	39	1.209	0.011
L3	52.95 - 0	3.245	39	0.581	0.003

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
120.000	AIR 6419 B77G w/ Mount Pipe	39	17.799	1.341	0.018	22398
108.000	LNx-6514DS-A1M w/ Mount Pipe	39	14.475	1.275	0.014	8614
99.000	AIR 32 B2A B66AA_T-MOBILE w/ Mount Pipe	39	12.104	1.205	0.011	5291

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	121 - 96	73.487	2	5.475	0.074
L2	99.45 - 48	49.672	2	4.921	0.045
L3	52.95 - 0	13.190	2	2.362	0.011

Critical Deflections and Radius of Curvature - Design Wind

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Elevation	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
120.000	AIR 6419 B77G w/ Mount Pipe	2	72.348	5.455	0.073	5598
108.000	LNx-6514DS-A1M w/ Mount Pipe	2	58.843	5.186	0.056	2152
99.000	AIR 32 B2A B66AA_T-MOBILE w/ Mount Pipe	2	49.206	4.904	0.045	1319

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
L1	121 - 96 (1)	TP27.56x21.26x0.188	25.000	0.000	0.0	15.773	-12.078	922.700	0.013
L2	96 - 48 (2)	TP39.56x26.316x0.25	51.450	0.000	0.0	30.181	-24.066	1765.610	0.014
L3	48 - 0 (3)	TP51.56x37.786x0.313	52.950	0.000	0.0	50.831	-37.452	2973.620	0.013

Pole Bending Design Data

Section No.	Elevation ft	Size	M _{ux} kip-ft	φM _{ux} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{ux}}$	M _{uy} kip-ft	φM _{uy} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{uy}}$
L1	121 - 96 (1)	TP27.56x21.26x0.188	236.112	564.949	0.418	0.000	564.949	0.000
L2	96 - 48 (2)	TP39.56x26.316x0.25	1188.108	1504.700	0.790	0.000	1504.700	0.000
L3	48 - 0 (3)	TP51.56x37.786x0.313	2468.433	3297.608	0.749	0.000	3297.608	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	121 - 96 (1)	TP27.56x21.26x0.188	13.987	276.810	0.051	4.617	642.478	0.007
L2	96 - 48 (2)	TP39.56x26.316x0.25	22.231	529.683	0.042	6.468	1764.367	0.004
L3	48 - 0 (3)	TP51.56x37.786x0.313	25.994	892.086	0.029	6.456	4003.683	0.002

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{ux}}$	Ratio $\frac{M_{uy}}{\phi M_{uy}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	121 - 96 (1)	0.013	0.418	0.000	0.051	0.007	0.434	1.050	

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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
L2	96 - 48 (2)	0.014	0.790	0.000	0.042	0.004	0.805	1.050	
L3	48 - 0 (3)	0.013	0.749	0.000	0.029	0.002	0.762	1.050	

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail	
L1	121 - 96	Pole	TP27.56x21.26x0.188	1	-12.078	968.835	41.4	Pass	
L2	96 - 48	Pole	TP39.56x26.316x0.25	2	-24.066	1853.890	76.7	Pass	
L3	48 - 0	Pole	TP51.56x37.786x0.313	3	-37.452	3122.301	72.6	Pass	
							Summary		
							Pole (L2)	76.7	Pass
							RATING =	76.7	Pass

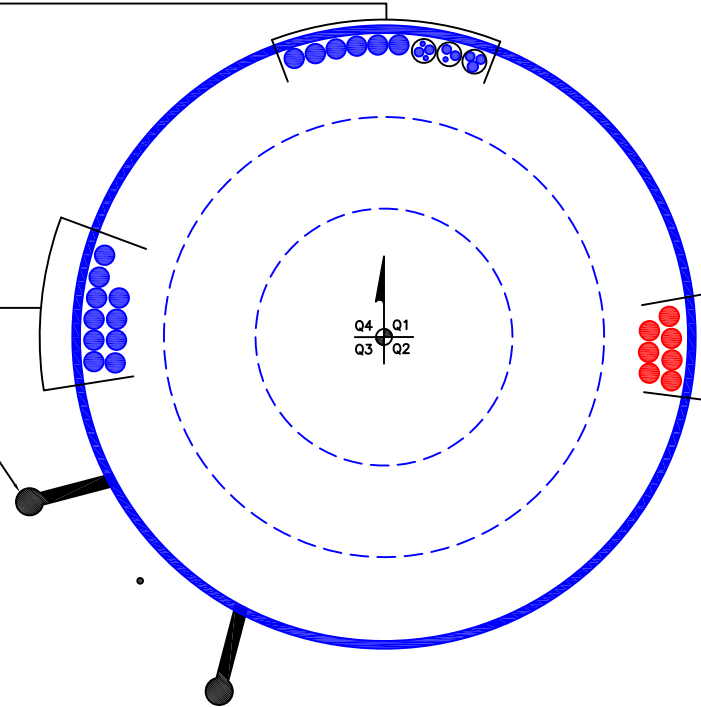
APPENDIX B
BASE LEVEL DRAWING



(OTHER CONSIDERED EQUIPMENT)
(3) 3/8" TO 120 FT LEVEL
(6) 3/4" TO 120 FT LEVEL
(1) 7/8" TO 120 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(6) 1-5/8" TO 120 FT LEVEL

(OTHER CONSIDERED EQUIPMENT)
(10) 1-5/8" TO 99 FT LEVEL

CLIMBING PEGS
W/ SAFETY CLIMB



(INSTALLED CARRIER EQUIPMENT CONFIGURATION)
(7) 1-5/8" TO 108 FT LEVEL

APPENDIX C
ADDITIONAL CALCULATIONS

Monopole Base Plate Connection

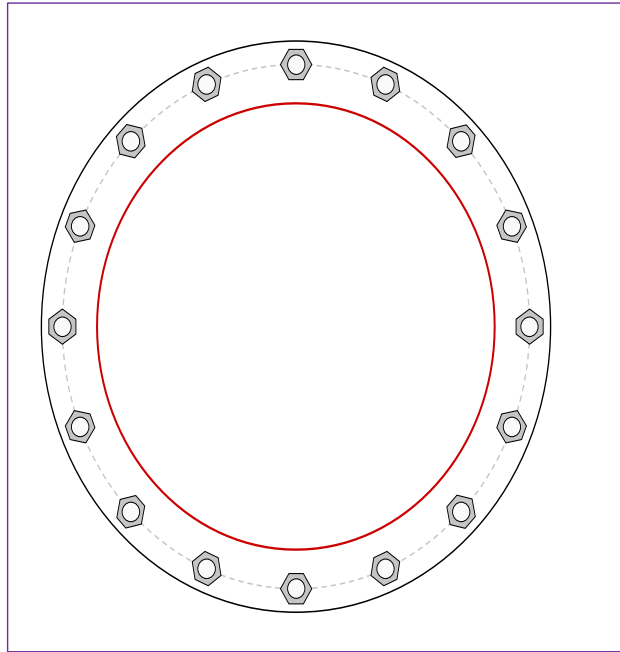


Site Info	
BU #	857012
Site Name	LE SOUTH WASHINGTON
Order #	

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	2.75

Applied Loads	
Moment (kip-ft)	2468.44
Axial Force (kips)	37.45
Shear Force (kips)	25.99

*TIA-222-H Section 15.5 Applied



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

Anchor Rod Data
 (16) 2-1/4" ϕ bolts (A615-75 N; $F_y=75$ ksi, $F_u=100$ ksi) on 60.56" BC

Base Plate Data
 66" OD x 2" Plate (A572-60; $F_y=60$ ksi, $F_u=75$ ksi)

Stiffener Data
 N/A

Pole Data
 51.56" x 0.3125" 18-sided pole (A572-65; $F_y=65$ ksi, $F_u=80$ ksi)

Anchor Rod Summary		<i>(units of kips, kip-in)</i>
$Pu_t = 119.87$	$\phi Pn_t = 243.75$	Stress Rating
$Vu = 1.62$	$\phi Vn = 149.1$	46.8%
$Mu = 2.9$	$\phi Mn = 128.14$	Pass

Base Plate Summary		
Max Stress (ksi):	33.57	(Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	59.2%	Pass

Drilled Pier Foundation

BU # :	857012
Site Name:	PLAINVILLE SOUTH WASH
Order Number:	
TIA-222 Revision:	H
Tower Type:	Monopole



Applied Loads		
	Comp.	Uplift
Moment (kip-ft)	2468.44	
Axial Force (kips)	37.48	
Shear Force (kips)	25.96	

Material Properties		
Concrete Strength, f _c :	3 ksi	Rebar 2, F _y Override (ksi)
Rebar Strength, F _y :	60 ksi	
Tie Yield Strength, F _y t:	40 ksi	

Pier Design Data		
Depth	32 ft	Rebar & Pier Options
Ext. Above Grade	0.5 ft	
Pier Section 1		
From 0.5' above grade to 32' below grade		
Pier Diameter	7 ft	Embedded Pole Inputs
Rebar Quantity	27	
Rebar Size	11	Belled Pier Inputs
Clear Cover to Ties	3 in	
Tie Size	3	
Tie Spacing	in	

Analysis Results

Soil Lateral Check	Compression	Uplift
D _{v=0} (ft from TOC)	7.12	-
Soil Safety Factor	4.50	-
Max Moment (kip-ft)	2628.73	-
Rating*	28.1%	-

Soil Vertical Check	Compression	Uplift
Skin Friction (kips)	169.92	-
End Bearing (kips)	237.10	-
Weight of Concrete (kips)	144.40	-
Total Capacity (kips)	407.02	-
Axial (kips)	181.88	-
Rating*	42.6%	-

Reinforced Concrete Flexure	Compression	Uplift
Critical Depth (ft from TOC)	7.05	-
Critical Moment (kip-ft)	2628.71	-
Critical Moment Capacity	6564.09	-
Rating*	38.1%	-

Reinforced Concrete Shear	Compression	Uplift
Critical Depth (ft from TOC)	22.17	-
Critical Shear (kip)	219.88	-
Critical Shear Capacity	492.54	-
Rating*	42.5%	-

Structural Foundation Rating*	42.5%
Soil Interaction Rating*	42.6%

*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"/>
Design Options	
Input Effective Depths (else Actual):	<input type="checkbox"/>
Consider non-tapered moment capacity:	<input type="checkbox"/>
Check Shear along Depth of Pier:	<input checked="" type="checkbox"/>
Utilize Shear-Friction Methodology:	<input type="checkbox"/>
Override Critical Depth:	<input type="checkbox"/>

[Go to Soil Calculations](#)

Groundwater Depth		Soil Profile	
Groundwater Depth	4	# of Layers	8

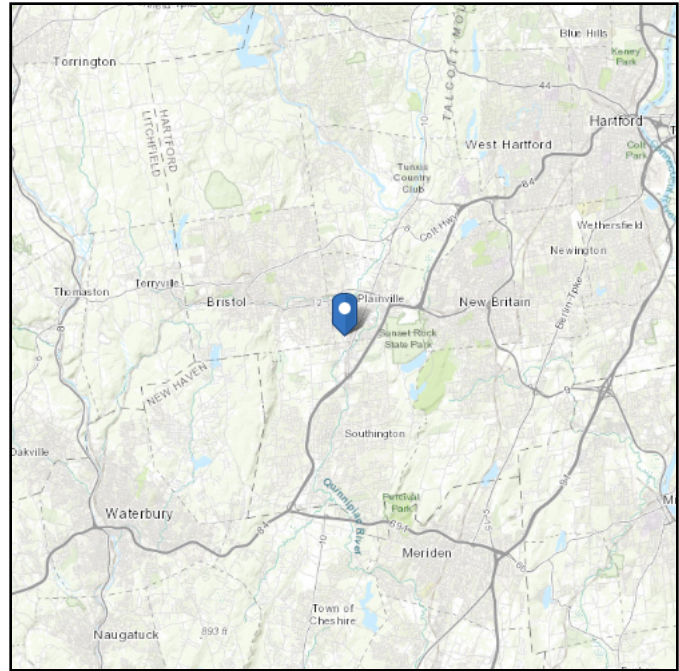
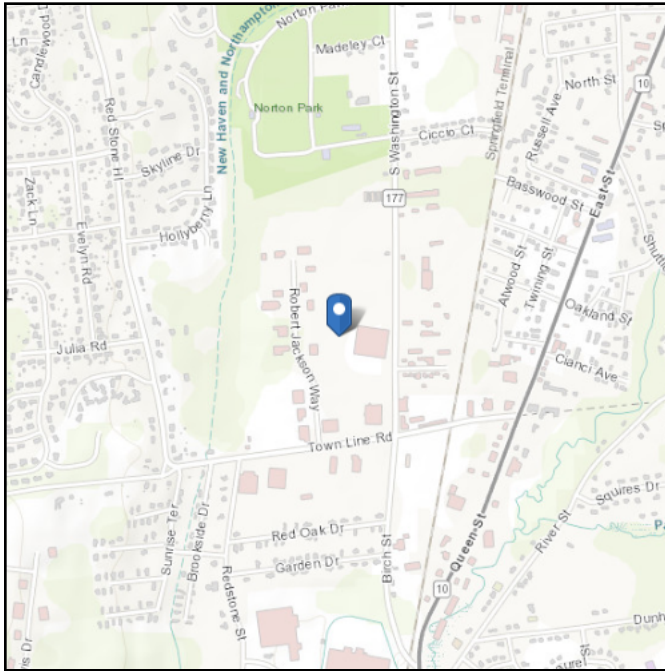
Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ _{soil} (pcf)	γ _{concrete} (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Net Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	3.5	3.5	117.4	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
2	3.5	4	0.5	117.4	150	0	33	0.000	0.000	0.32	0.32			Cohesionless
3	4	13	9	55	87.6	0	33	0.000	0.000	0.32	0.32			Cohesionless
4	13	15	2	45	87.6	0	28	0.000	0.000	0.50	0.50			Cohesionless
5	15	19	4	45	87.6	0	28	0.000	0.000	0.56	0.56			Cohesionless
6	19	23	4	55	87.6	0	33	0.000	0.000	0.64	0.64			Cohesionless
7	23	25	2	40	87.6	0	28	0.00	0.00	0.76	0.76			Cohesionless
8	25	32	7	40	87.6	0	28	0.00	0.00	0.00	0.00	6.4		Cohesionless

ASCE 7 Hazards Report

Address:
No Address at This Location

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

Latitude: 41.653064
Longitude: -72.876917
Elevation: 180.15312661135656 ft (NAVD 88)



Wind

Results:

Wind Speed	117 Vmph
10-year MRI	75 Vmph
25-year MRI	84 Vmph
50-year MRI	90 Vmph
100-year MRI	97 Vmph

Data Source: ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2

Date Accessed: Wed Nov 15 2023

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

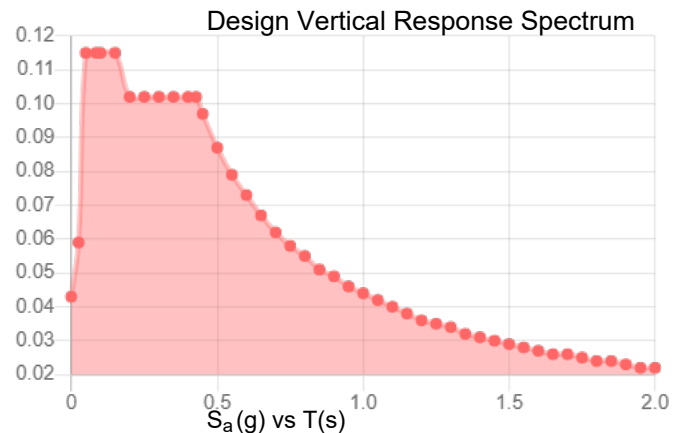
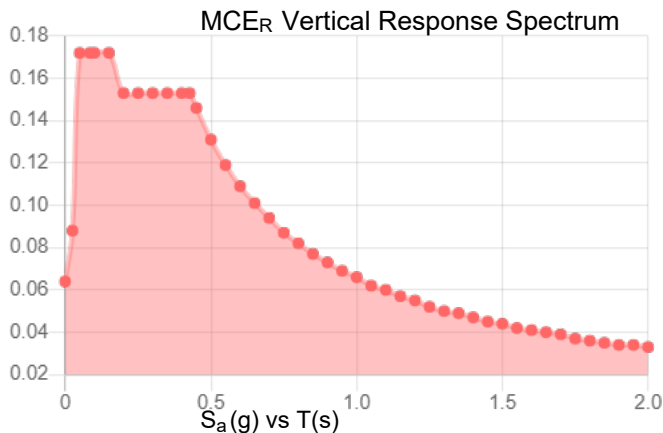
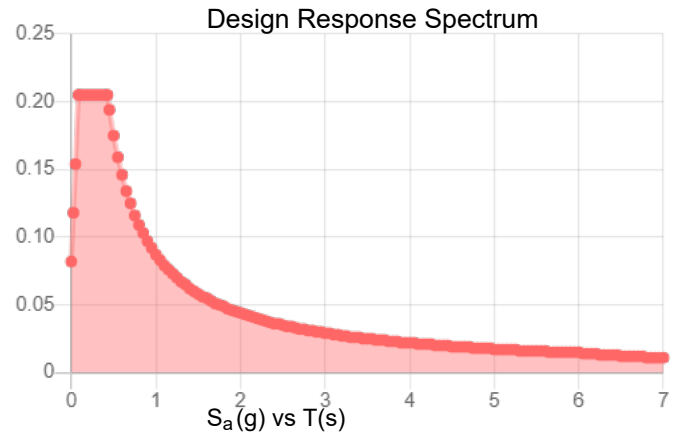
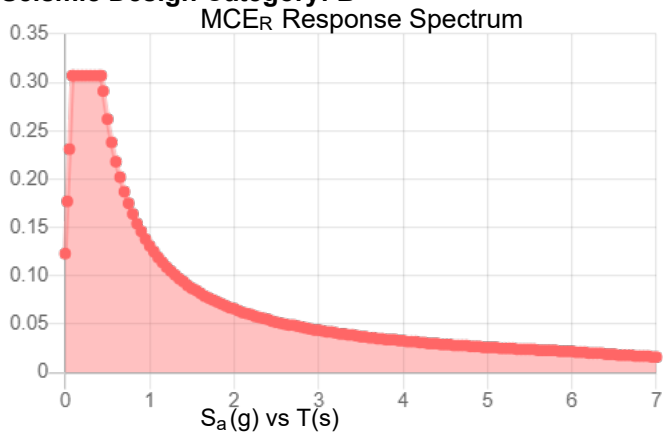
Site is in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

Site Soil Class:

Results:

S_s :	0.192	S_{D1} :	0.087
S_1 :	0.055	T_L :	6
F_a :	1.6	PGA :	0.105
F_v :	2.4	PGA _M :	0.166
S_{MS} :	0.307	F_{PGA} :	1.591
S_{M1} :	0.131	I_e :	1
S_{DS} :	0.205	C_v :	0.7

Seismic Design Category: B



Data Accessed:

Wed Nov 15 2023

Date Source:

USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.

Ice

Results:

Ice Thickness: 1.50 in.
Concurrent Temperature: 15 F
Gust Speed 50 mph

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

Date Accessed: Wed Nov 15 2023

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

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

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