



STATE OF CONNECTICUT  
*CONNECTICUT SITING COUNCIL*

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**VIA ELECTRONIC MAIL**

September 14, 2022

Denise Sabo  
Northeast Site Solutions  
54 Main Street, Unit 3  
Sturbridge, MA 01566-1359  
[denise@northeastsitesolutions.com](mailto:denise@northeastsitesolutions.com)

**RE: EM-VER-140-220801** – Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 580 Chapel Street, Thomaston, Connecticut.

Dear Denise Sabo:

The Connecticut Siting Council (Council) is in receipt of your correspondence of September 8, 2022 submitted in response to the Council's August 30, 2022 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,

Melanie A. Bachman  
Executive Director

MAB/MP/emr

**From:** Deborah Chase <[deborah@northeastsitesolutions.com](mailto:deborah@northeastsitesolutions.com)>  
**Sent:** Thursday, September 8, 2022 3:27 PM  
**To:** Robidoux, Evan <[Evan.Robidoux@ct.gov](mailto:Evan.Robidoux@ct.gov)>; CSC-DL Siting Council <[Siting.Council@ct.gov](mailto:Siting.Council@ct.gov)>;  
Bachman, Melanie <[Melanie.Bachman@ct.gov](mailto:Melanie.Bachman@ct.gov)>; Fontaine, Lisa <[Lisa.Fontaine@ct.gov](mailto:Lisa.Fontaine@ct.gov)>  
**Cc:** Denise <[denise@northeastsitesolutions.com](mailto:denise@northeastsitesolutions.com)>  
**Subject:** RE: EM-VER-140-220801-Incomplete letter- 580 CHAPEL STREET THOMASTON CT  
06787-VERIZON WIRELESS EM APPLICATION (823530\_CROWN\_VZW)-UPDATED  
**Importance:** High

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

Siting Council-

Please see updated application containing correct Structural Analysis Report that includes proposed and approved equipment by Verizon and other entities as per the incomplete letter. I have also included the Structural as a separate attachment, as well as postal label. Please let us know if this renders the application complete for further review. Please let us know if there are any questions. Thank you very much

## Deborah Chase

Senior Project Coordinator & Analyst

Mobile: 860-490-8839

🌱 Save a tree. Refuse. Reduce. Reuse. Recycle.



Date: **June 15, 2022**



B+T Group  
1717 S. Boulder, Suite 300  
Tulsa, OK 74119  
(918) 587-4630

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

**Carrier Designation:** **Verizon Wireless Co-Locate**  
**Site Number:** 468984  
**Site Name:** THOMASTON C CT

**Crown Castle Designation:** **BU Number:** 823530  
**Site Name:** CT364/Chapel St. Monopole  
**JDE Job Number:** 721888  
**Work Order Number:** 2128486  
**Order Number:** 621898 Rev. 0

**Engineering Firm Designation:** **B+T Group Project Number:** 137170.009.01

**Site Data:** **580 Chapel Street, Thomaston, Litchfield County, CT**  
**Latitude 41° 39' 48.48", Longitude -73° 4' 27.41"**  
**175 Foot - Monopole Tower**

B+T Group 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:

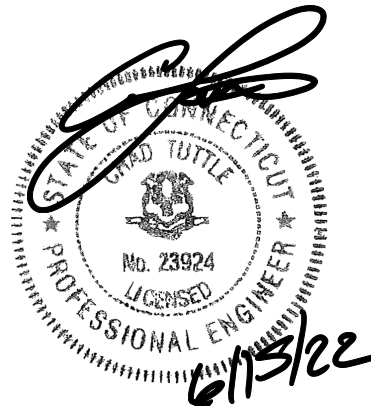
LC7: Proposed Equipment Configuration

**Sufficient Capacity**

This analysis utilizes an ultimate 3-second gust wind speed of 116 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: Massood Sattari

Respectfully submitted by: B+T Engineering, Inc.  
COA: PEC.0001564; Expires: 02/10/2023



Chad E. Tuttle, P.E.

tnxTower Report - version 8.1.1.0

## TABLE OF CONTENTS

### 1) INTRODUCTION

### 2) ANALYSIS CRITERIA

Table 1 - Proposed Equipment Configuration

Table 2 - Other Considered Equipment

### 3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

3.1) Analysis Method

3.2) Assumptions

### 4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Table 5 – Tower Component Stresses vs. Capacity – LC7

4.1) Recommendations

### 5) APPENDIX A

tnxTower Output

### 6) APPENDIX B

Base Level Drawing

### 7) APPENDIX C

Additional Calculations

## 1) INTRODUCTION

This tower is a 175 ft. Monopole tower designed by PiRod Inc.

## 2) ANALYSIS CRITERIA

<b>TIA-222 Revision:</b>	TIA-222-H
<b>Risk Category:</b>	II
<b>Wind Speed:</b>	116 mph
<b>Exposure Category:</b>	B
<b>Topographic Factor:</b>	1
<b>Ice Thickness:</b>	1 in
<b>Wind Speed with Ice:</b>	50 mph
<b>Service Wind Speed:</b>	60 mph

**Table 1 - Proposed Equipment Configuration**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
152.0	152.0	6	Antel	LPA-80080/4CF	6 1	1-5/8 1-3/8
		6	Commscope	NNHH-65B-R4		
		3	Commscope	TD-850B-10LTE78		
		1	Raycap	RVZDC-6600-PF-48		
		3	Samsung Telecomm.	MT6407-77A		
		3	Samsung Telecomm.	RFV01U-D1A		
		3	Samsung Telecomm.	RFV01U-D2A		
		1	--	Platform Mount [LP 402-1_KCKR]		

**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)
172.0	175.0	2	Andrew	VHLP2.6	2 3	1-5/8 7/8
		3	Ericsson	AIR6449 B41_T-MOBILE		
	172.0	3	Ericsson	RADIO 4449 B71 B85A_T-MOBILE		
		3	Ericsson	RADIO 4460 B2/B25 B66_TMO		
		3	RFS Celwave	APXVAARR24_43-U-NA20		
		1	Site Pro 1	F4P-HRK14 Handrail Kit		
		1	--	Platform Mount [LP 701-1]		
	168.0	168.0	1	Lone Star Electronics		
1			Bird Tech.Group	OA20-67-DIN		
168.0	171.0	1	Lone Star Electronics	LS-230C	6	7/8
	168.0	1	--	Side Arm Mount [SO 701-1]		
162.0	162.0	3	Alcatel Lucent	800MHZ 2X50W RRH W/FILTER	4	1-1/4

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
		3	Alcatel Lucent	PCS 1900MHZ 2X40W		
		3	Alcatel Lucent	TD-RRH8X20-25		
		3	RFS Celwave	APXVSP18-C-A20		
		3	RFS Celwave	APXVTM14-C-120		
		1	--	Platform Mount [LP 1201-1]		
140.0	142.0	3	Ericsson	AIR 6419 B77G_CCIV3	6 6 3	1-5/8 13/16 3/8
		3	Ericsson	RADIO 4415 B30		
		3	Ericsson	RRUS 4449 B5/B12		
		3	Ericsson	RRUS 4478 B14		
		3	Ericsson	RRUS 8843 B2/B66A		
		3	Raycap	DC6-48-60-18-8F		
	141.0	1	CCI Antennas	TPA65R-BU4D		
		2	CCI Antennas	TPA65R-BU6D_CCIV2		
		1	Kathrein	80010964		
		2	Kathrein	80010965		
	140.0	3	--	2.0" Std. Raycap Mount Pipe		
1		--	Platform Mount [LP 304-1_HR-1]			
138.0	3	Ericsson	AIR 6449 B77D			
130.0	130.0	1	Raycap	RDIDC-9181-PF-48	1	1-1/2
		3	Fujitsu	TA08025-B604		
		3	Fujitsu	TA08025-B605		
		3	JMA Wireless	MX08FRO665-21		
		1	Commscope	MC-PK8-DSH (1)		
115.0	115.0	3	RFS Celwave	APXV18-206517S-C	6	1-5/8
50.0	50.0	1	Pctel	GPS-TMG-HR-26NCM	1	1/2
		1	--	Side Arm Mount [SO 701-1]		

### 3) ANALYSIS PROCEDURE

**Table 3 - Documents Provided**

Document	Reference	Source
Tower Manufacturer Drawing	3462695	CCI Sites
Foundation Drawing	3464631	CCI Sites
Geotech Report	3462674	CCI Sites
Crown CAD Package	Date: 06/14/2022	CCI Sites

#### 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.
- 3) Base plate design methodology of the manufacturer has been reviewed and found to be an acceptable means of designing to resist the full capacity of the bolts and shaft.

This analysis may be affected if any assumptions are not valid or have been made in error. B+T Group 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	175 - 164.25	Pole	TP26x22x0.25	1	-6.042	1202.113	4.4	Pass
L2	164.25 - 129.67	Pole	TP34.063x24.413x0.313	2	-24.734	1996.207	29.5	Pass
L3	129.67 - 96	Pole	TP41.75x32.452x0.375	3	-36.325	2940.315	43.2	Pass
L4	96 - 63.17	Pole	TP49.063x39.842x0.375	4	-46.365	3460.726	54.9	Pass
L5	63.17 - 31.17	Pole	TP56.125x46.96x0.375	5	-57.785	3964.264	62.9	Pass
L6	31.17 - 0	Pole	TP62.938x53.848x0.375	6	-72.949	4574.010	69.8	Pass
							Summary	
						Pole (L6)	69.8	Pass
						Rating =	69.8	Pass

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

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Anchor Rods	Base	67.1	Pass
1,2,3	Base Plate	Base	69.8	Pass
1,2	Base Foundation (Structure)	Base	66.5	Pass
1,2	Base Foundation (Soil Interaction)	Base	71.8	Pass

<b>Structure Rating (max from all components) =</b>	<b>71.8%</b>
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Notes:

- 1) See additional documentation in "Appendix C - Additional Calculations" for calculations supporting the % capacity consumed.
- 2) Rating per TIA-222-H Section 15.5.
- 3) Base plate has the same capacity as its respective shaft.

### 4.1) Recommendations

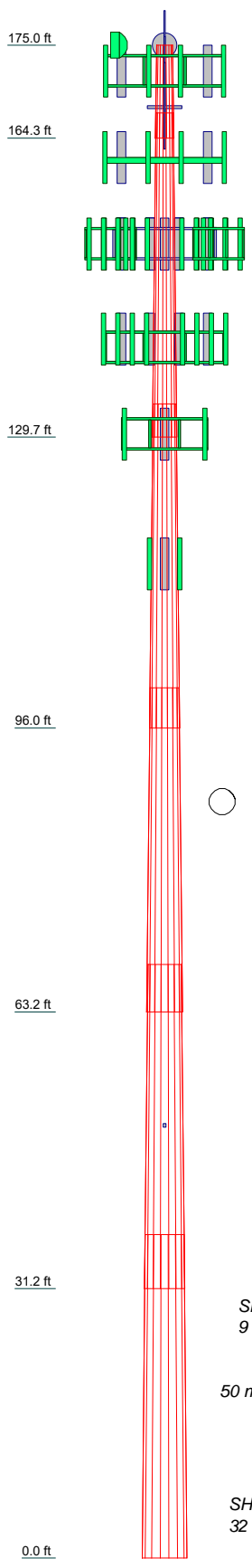
The tower and its foundations have sufficient capacity to carry the proposed load configuration. No modifications are required at this time.

**APPENDIX A**

**TNXTOWER OUTPUT**



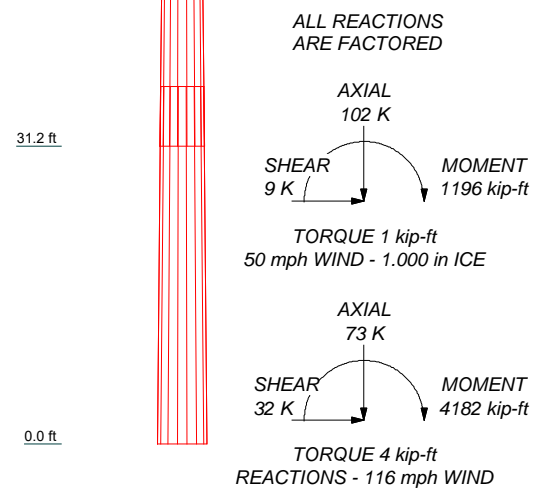
Section	1	2	3	4	5	6	
Length (ft)	10.750	37.500	37.500	37.500	37.500	37.420	
Number of Sides	18	18	18	18	18	18	
Thickness (in)	0.250	0.313	0.375	0.375	0.375	0.375	
Socket Length (ft)	2.920	3.830	4.670	5.500	6.250	53.848	
Top Dia (in)	22.000	24.413	32.452	39.842	46.960	62.938	
Bot Dia (in)	26.000	34.063	41.750	49.063	56.125		
Grade	A572-65						
Weight (K)	0.7	3.7	5.6	6.7	7.8	8.8	33.2




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 B to the TIA-222-H Standard.
3. Tower designed for a 116 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.000 ft
8. TIA-222-H Annex S
9. TOWER RATING: 69.8%



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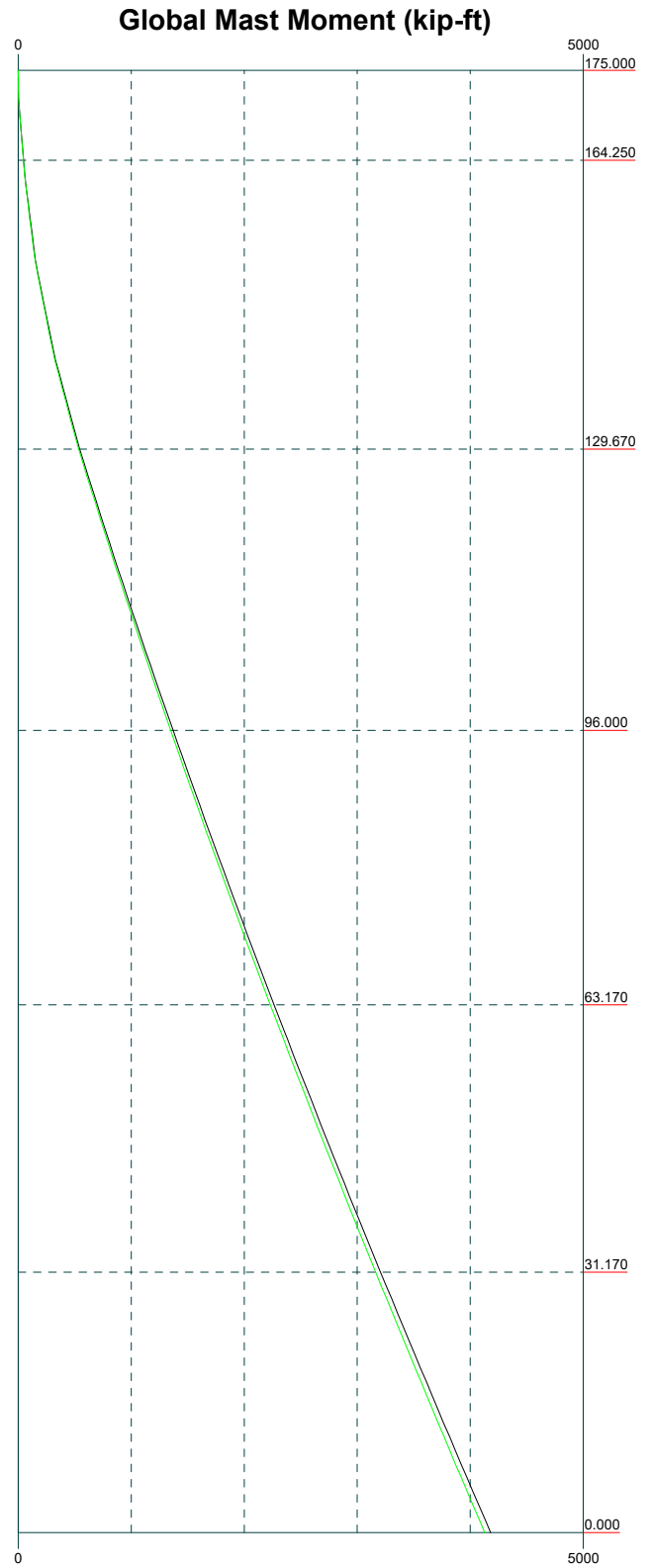
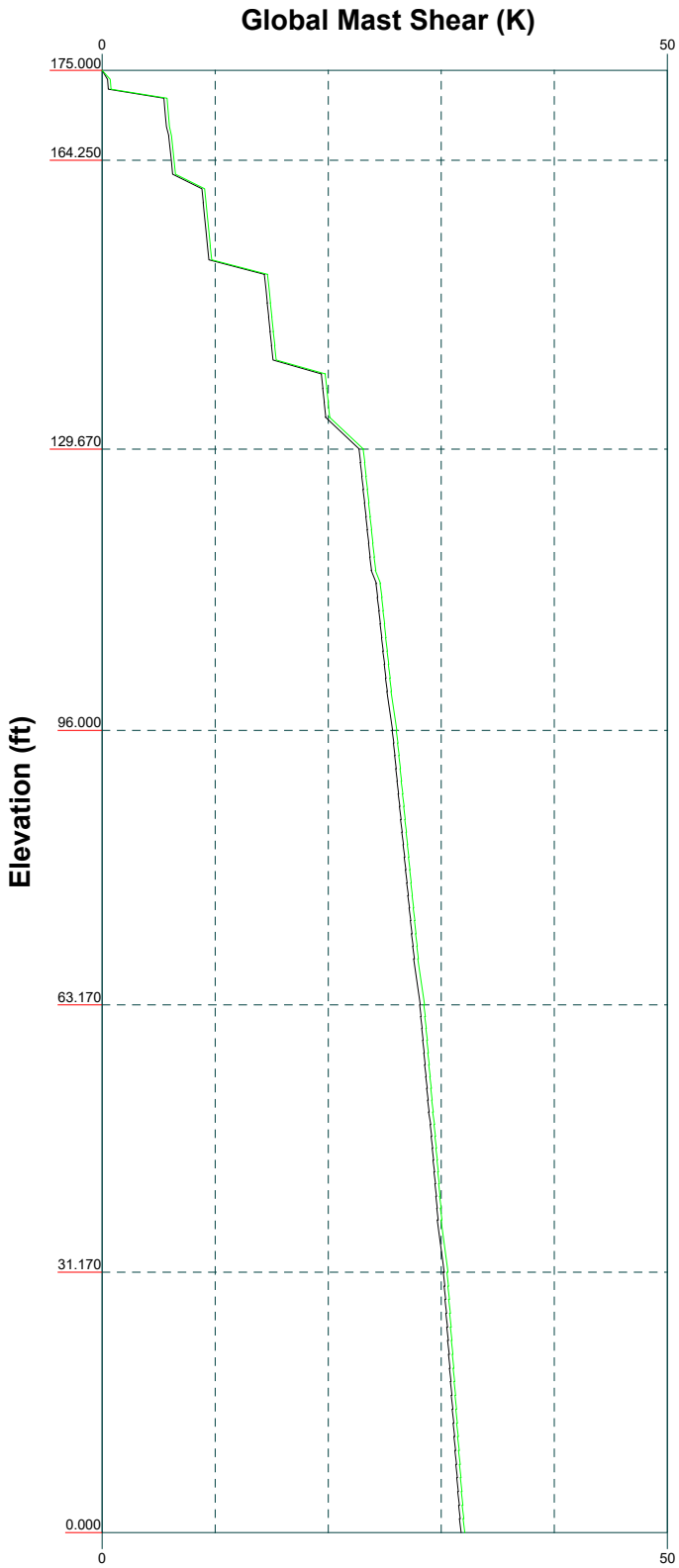
Job: 137170.009.01 - CT364/Chapel St. Monopole, CT (BU# 82353)		
Project:		
Client: Crown Castle	Drawn by: S. Shet	App'd:
Code: TIA-222-H	Date: 06/15/22	Scale: NTS
Path:		Dwg No. E-1

Vx

Vz

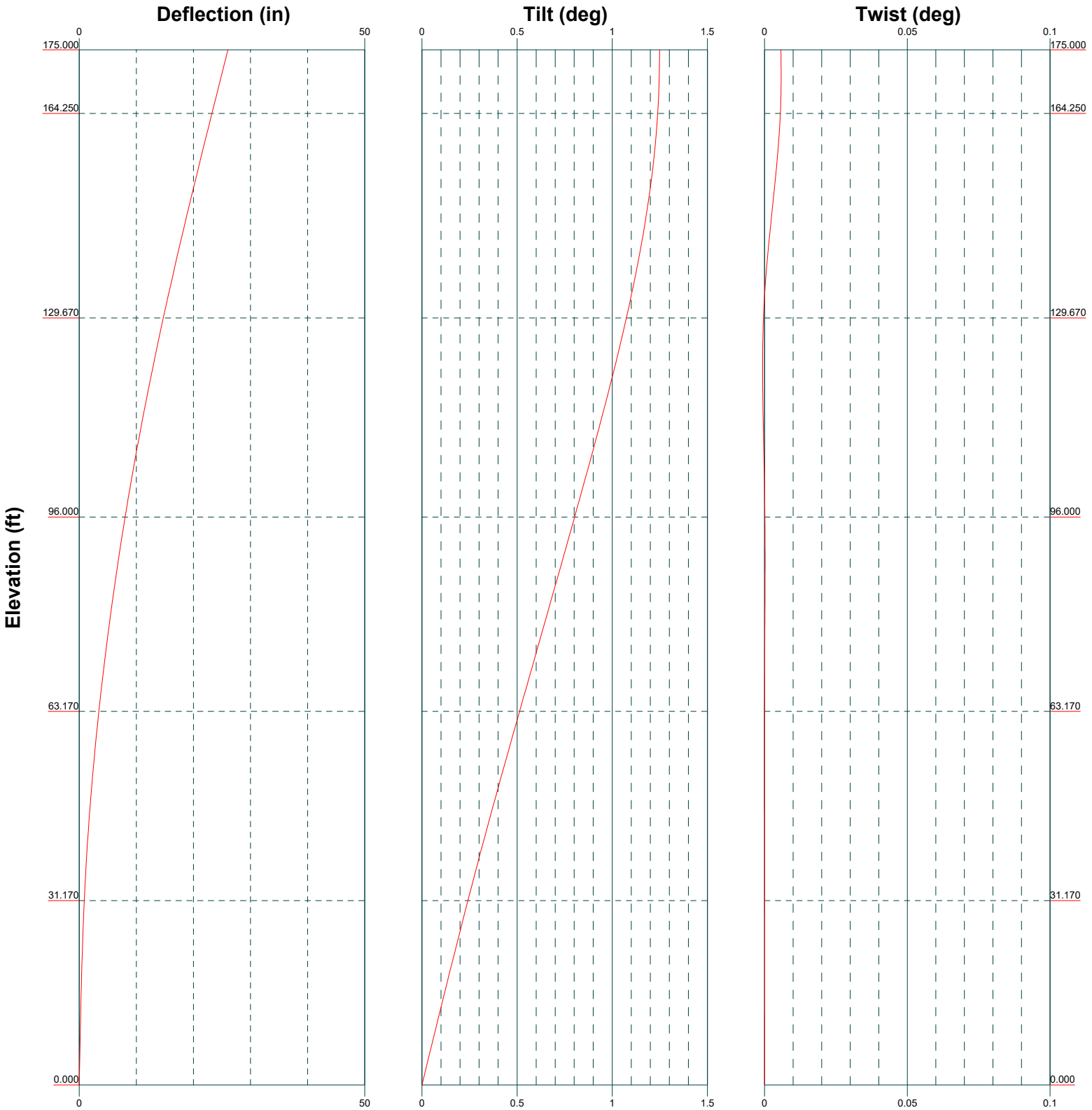
Mx

Mz



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Job: <b>137170.009.01 - CT364/Chapel St. Monopole, CT (BU# 82353)</b>		
Project:		
Client: Crown Castle	Drawn by: S. Shet	App'd:
Code: TIA-222-H	Date: 06/15/22	Scale: NTS
Path:	Dwg No. E-4	



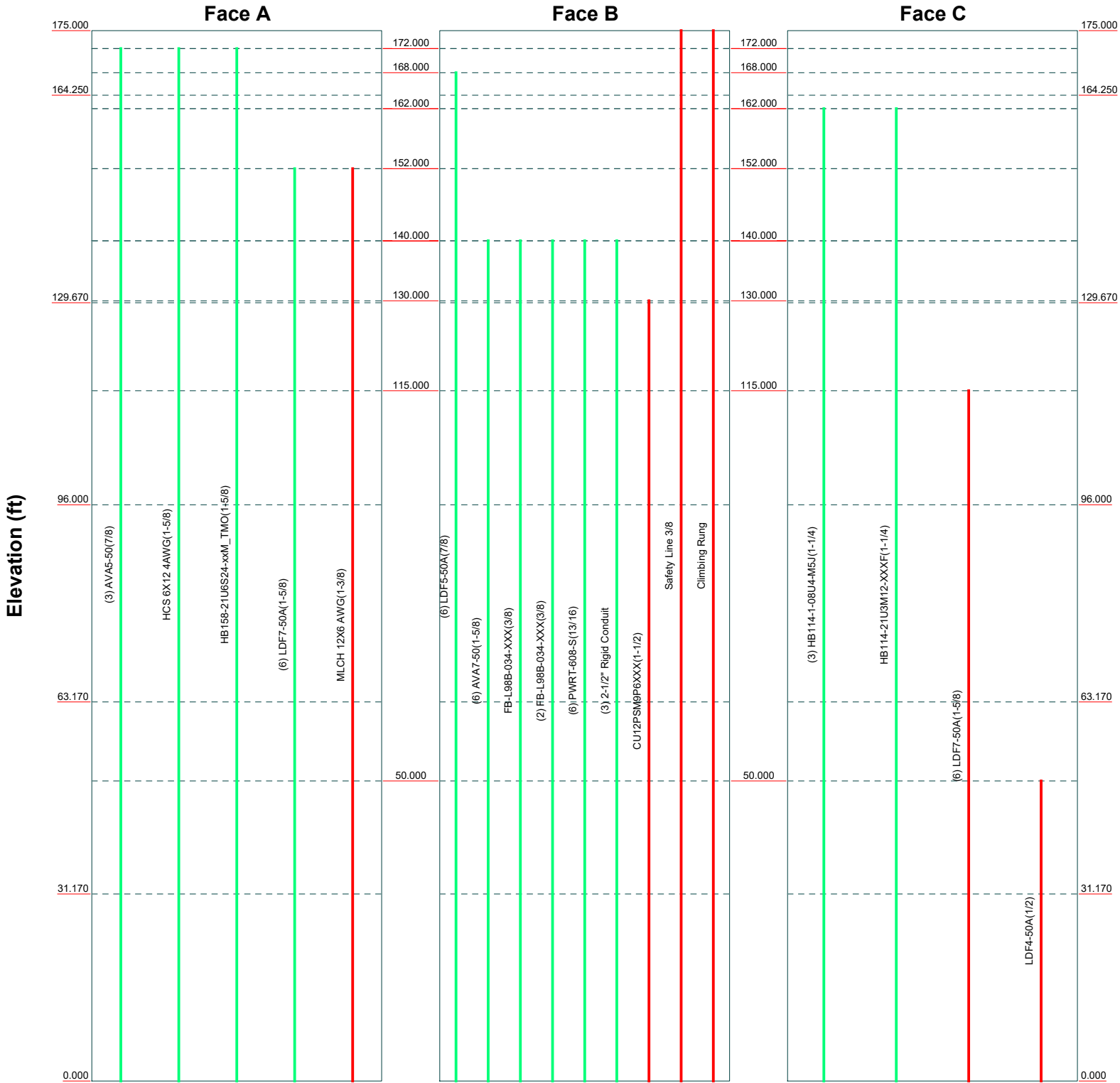
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Job: <b>137170.009.01 - CT364/Chapel St. Monopole, CT (BU# 82353)</b>		
Project:		
Client: Crown Castle	Drawn by: S. Shet	App'd:
Code: TIA-222-H	Date: 06/15/22	Scale: NTS
Path:	Dwg No. E-5	

# Feed Line Distribution Chart

## 0' - 175'

— Round   
 — Flat   
 — App In Face   
 — App Out Face   
 — Truss Leg




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Project:		
Client: Crown Castle	Drawn by: S. Shet	App'd:
Code: TIA-222-H	Date: 06/15/22	Scale: NTS
Path:		Dwg No. E-7

<b>tnxTower</b>  <b>B+T Group</b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	<b>Job</b> 137170.009.01 - CT364/Chapel St. Monopole, CT (BU# 823530)	<b>Page</b> 1 of 21
	<b>Project</b>	<b>Date</b> 17:14:10 06/15/22
	<b>Client</b> Crown Castle	<b>Designed by</b> S. Shet

## 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: 543.000 ft.
- Basic wind speed of 116 mph.
- Risk Category II.
- Exposure Category B.
- Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- Topographic Category: 1.
- Crest Height: 0.000 ft.
- Nominal ice thickness of 1.000 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.
- TIA-222-H Annex S.
- 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"> <li>Consider Moments - Legs</li> <li>Consider Moments - Horizontals</li> <li>Consider Moments - Diagonals</li> <li>Use Moment Magnification</li> <li>√ Use Code Stress Ratios</li> <li>√ Use Code Safety Factors - Guys</li> <li>Escalate Ice</li> <li>Always Use Max Kz</li> <li>Use Special Wind Profile</li> <li>Include Bolts In Member Capacity</li> <li>Leg Bolts Are At Top Of Section</li> <li>Secondary Horizontal Braces Leg</li> <li>Use Diamond Inner Bracing (4 Sided)</li> <li>SR Members Have Cut Ends</li> <li>SR Members Are Concentric</li> </ul> | <ul style="list-style-type: none"> <li>Distribute Leg Loads As Uniform</li> <li>Assume Legs Pinned</li> <li>√ Assume Rigid Index Plate</li> <li>√ Use Clear Spans For Wind Area</li> <li>Use Clear Spans For KL/r</li> <li>Retension Guys To Initial Tension</li> <li>√ Bypass Mast Stability Checks</li> <li>√ Use Azimuth Dish Coefficients</li> <li>√ Project Wind Area of Appurt.</li> <li>Autocalc Torque Arm Areas</li> <li>Add IBC .6D+W Combination</li> <li>Sort Capacity Reports By Component</li> <li>Triangulate Diamond Inner Bracing</li> <li>Treat Feed Line Bundles As Cylinder</li> <li>Ignore KL/ry For 60 Deg. Angle Legs</li> </ul> | <ul style="list-style-type: none"> <li>Use ASCE 10 X-Brace Ly Rules</li> <li>Calculate Redundant Bracing Forces</li> <li>Ignore Redundant Members in FEA</li> <li>SR Leg Bolts Resist Compression</li> <li>All Leg Panels Have Same Allowable</li> <li>Offset Girt At Foundation</li> <li>√ Consider Feed Line Torque</li> <li>Include Angle Block Shear Check</li> <li>Use TIA-222-H Bracing Resist. Exemption</li> <li>Use TIA-222-H Tension Splice Exemption</li> <li style="text-align: center;">Poles</li> <li>√ Include Shear-Torsion Interaction</li> <li>Always Use Sub-Critical Flow</li> <li>Use Top Mounted Sockets</li> <li>Pole Without Linear Attachments</li> <li>Pole With Shroud Or No Appurtenances</li> <li>Outside and Inside Corner Radii Are Known</li> </ul> |
|--|---|---|

<b>tnxTower</b>  <b>B+T Group</b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	<b>Job</b> 137170.009.01 - CT364/Chapel St. Monopole, CT (BU# 823530)	<b>Page</b> 2 of 21
	<b>Project</b>	<b>Date</b> 17:14:10 06/15/22
	<b>Client</b> Crown Castle	<b>Designed by</b> S. Shet

### 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	175.000-164.250	10.750	2.920	18	22.000	26.000	0.250	1.000	A572-65 (65 ksi)
L2	164.250-129.670	37.500	3.830	18	24.413	34.063	0.313	1.250	A572-65 (65 ksi)
L3	129.670-96.000	37.500	4.670	18	32.452	41.750	0.375	1.500	A572-65 (65 ksi)
L4	96.000-63.170	37.500	5.500	18	39.842	49.063	0.375	1.500	A572-65 (65 ksi)
L5	63.170-31.170	37.500	6.250	18	46.960	56.125	0.375	1.500	A572-65 (65 ksi)
L6	31.170-0.000	37.420		18	53.848	62.938	0.375	1.500	A572-65 (65 ksi)

### Tapered Pole Properties

Section	Tip Dia. in	Area in <sup>2</sup>	I in <sup>4</sup>	r in	C in	I/C in <sup>3</sup>	J in <sup>4</sup>	I/Q in <sup>2</sup>	w in	w/t
L1	22.301	17.259	1031.483	7.721	11.176	92.294	2064.324	8.631	3.432	13.728
	26.363	20.433	1711.654	9.141	13.208	129.592	3425.561	10.218	4.136	16.544
L2	25.505	23.905	1754.280	8.556	12.402	141.451	3510.869	11.955	3.747	11.99
	34.540	33.476	4817.433	11.981	17.304	278.404	9641.206	16.741	5.445	17.424
L3	33.859	38.180	4963.150	11.387	16.486	301.059	9932.832	19.093	5.052	13.471
	42.336	49.247	10650.982	14.688	21.209	502.192	21315.979	24.628	6.688	17.835
L4	41.565	46.976	9244.448	14.011	20.240	456.746	18501.060	23.492	6.352	16.939
	49.762	57.950	17355.138	17.284	24.924	696.329	34733.112	28.981	7.975	21.267
L5	48.992	55.448	15202.632	16.538	23.856	637.273	30425.268	27.729	7.605	20.28
	56.933	66.356	26056.151	19.791	28.511	913.882	52146.587	33.185	9.218	24.581
L6	56.162	63.646	22991.527	18.983	27.355	840.501	46013.307	31.829	8.817	23.512
	63.851	74.465	36822.895	22.210	31.972	1151.714	73694.242	37.240	10.417	27.779

Tower Elevation ft	Gusset Area (per face) ft <sup>2</sup>	Gusset Thickness in	Gusset Grade	Adjust. A <sub>f</sub>	Adjust. A <sub>r</sub>	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 175.000-164.250				1	1	1			
L2 164.250-129.670				1	1	1			
L3 129.670-96.000				1	1	1			
L4 96.000-63.170				1	1	1			
L5 63.170-31.170				1	1	1			
L6 31.170-0.000				1	1	1			

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	<b>Project</b>	<b>Date</b> 17:14:10 06/15/22
	<b>Client</b> Crown Castle	<b>Designed by</b> S. Shet

**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
MLCH 12X6 AWG(1-3/8) *	A	No	Surface Ar (CaAa)	152.000 - 0.000	1	1	-0.240 -0.210	1.430		0.002
CU12PSM9P6XXX(1-1/2) *	B	No	Surface Ar (CaAa)	130.000 - 0.000	1	1	-0.480 -0.450	1.600		0.002
LDF7-50A(1-5/8) *	C	No	Surface Ar (CaAa)	115.000 - 0.000	6	6	-0.250 0.000	1.980		0.001
LDF4-50A(1/2) *	C	No	Surface Ar (CaAa)	50.000 - 0.000	1	1	-0.375 -0.350	0.630		0.000
Safety Line 3/8	B	No	Surface Ar (CaAa)	175.000 - 0.000	1	1	0.050 0.060	0.375		0.000
Climbing Rung *	B	No	Surface Ar (CaAa)	175.000 - 0.000	1	1	0.000 0.100	1.000		0.008

**Feed Line/Linear Appurtenances - Entered As Area**

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C <sub>A</sub> A <sub>A</sub> ft <sup>2</sup> /ft	Weight klf
AVA5-50(7/8) *	A	No	No	Inside Pole	172.000 - 0.000	3	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.000 0.000 0.000
HCS 6X12 4AWG(1-5/8)	A	No	No	Inside Pole	172.000 - 0.000	1	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.002 0.002 0.002
HB158-21U6S24-xx M_TMO(1-5/8) *	A	No	No	Inside Pole	172.000 - 0.000	1	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.003 0.003 0.003
LDF5-50A(7/8) *	B	No	No	Inside Pole	168.000 - 0.000	6	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.000 0.000 0.000
HB114-1-08U4-M5J (1-1/4)	C	No	No	Inside Pole	162.000 - 0.000	3	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.001 0.001 0.001
HB114-21U3M12-XXF(1-1/4) *	C	No	No	Inside Pole	162.000 - 0.000	1	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.001 0.001 0.001
LDF7-50A(1-5/8) *	A	No	No	Inside Pole	152.000 - 0.000	6	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.001 0.001 0.001
AVA7-50(1-5/8)	B	No	No	Inside Pole	140.000 - 0.000	6	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.001 0.001 0.001

<b>tnxTower</b>  <b>B+T Group</b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	<b>Job</b> 137170.009.01 - CT364/Chapel St. Monopole, CT (BU# 823530)	<b>Page</b> 4 of 21
	<b>Project</b>	<b>Date</b> 17:14:10 06/15/22
	<b>Client</b> Crown Castle	<b>Designed by</b> S. Shet

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C <sub>A</sub> A <sub>A</sub> ft <sup>2</sup> /ft	Weight klf
FB-L98B-034-XXX(3/8)	B	No	No	Inside Pole	140.000 - 0.000	1	No Ice	0.000	0.000
							1/2" Ice	0.000	0.000
							1" Ice	0.000	0.000
FB-L98B-034-XXX(3/8)	B	No	No	Inside Pole	140.000 - 0.000	2	No Ice	0.000	0.000
							1/2" Ice	0.000	0.000
							1" Ice	0.000	0.000
PWRT-608-S(13/16)	B	No	No	Inside Pole	140.000 - 0.000	6	No Ice	0.000	0.001
							1/2" Ice	0.000	0.001
							1" Ice	0.000	0.001
2-1/2" Rigid Conduit	B	No	No	Inside Pole	140.000 - 0.000	3	No Ice	0.000	0.003
							1/2" Ice	0.000	0.003
							1" Ice	0.000	0.003
*									

### Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> In Face ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Out Face ft <sup>2</sup>	Weight K
L1	175.000-164.250	A	0.000	0.000	0.000	0.000	0.045
		B	0.000	0.000	1.478	0.000	0.100
		C	0.000	0.000	0.000	0.000	0.000
L2	164.250-129.670	A	0.000	0.000	3.193	0.000	0.349
		B	0.000	0.000	4.808	0.000	0.544
		C	0.000	0.000	0.000	0.000	0.144
L3	129.670-96.000	A	0.000	0.000	4.815	0.000	0.419
		B	0.000	0.000	10.017	0.000	1.011
		C	0.000	0.000	22.572	0.000	0.244
L4	96.000-63.170	A	0.000	0.000	4.695	0.000	0.408
		B	0.000	0.000	9.767	0.000	0.986
		C	0.000	0.000	39.002	0.000	0.308
L5	63.170-31.170	A	0.000	0.000	4.576	0.000	0.398
		B	0.000	0.000	9.520	0.000	0.961
		C	0.000	0.000	39.202	0.000	0.303
L6	31.170-0.000	A	0.000	0.000	4.457	0.000	0.388
		B	0.000	0.000	9.273	0.000	0.936
		C	0.000	0.000	38.994	0.000	0.297

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

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> In Face ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Out Face ft <sup>2</sup>	Weight K
L1	175.000-164.250	A	1.001	0.000	0.000	0.000	0.000	0.045
		B		0.000	0.000	5.783	0.000	0.144
		C		0.000	0.000	0.000	0.000	0.000
L2	164.250-129.670	A	0.986	0.000	0.000	7.664	0.000	0.415
		B		0.000	0.000	18.721	0.000	0.688
		C		0.000	0.000	0.000	0.000	0.144
L3	129.670-96.000	A	0.961	0.000	0.000	11.458	0.000	0.517
		B		0.000	0.000	29.945	0.000	1.252



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	<b>Project</b>	<b>Date</b> 17:14:10 06/15/22
	<b>Client</b> Crown Castle	<b>Designed by</b> S. Shet

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight K
L4	96.000-63.170	C		0.000	0.000	32.901	0.000	0.487
		A	0.928	0.000	0.000	11.003	0.000	0.501
		B		0.000	0.000	28.693	0.000	1.212
L5	63.170-31.170	C		0.000	0.000	56.638	0.000	0.718
		A	0.881	0.000	0.000	10.515	0.000	0.484
		B		0.000	0.000	27.336	0.000	1.170
L6	31.170-0.000	C		0.000	0.000	59.624	0.000	0.723
		A	0.787	0.000	0.000	9.949	0.000	0.465
		B		0.000	0.000	25.748	0.000	1.125
		C		0.000	0.000	60.607	0.000	0.706

### Feed Line Center of Pressure

Section	Elevation ft	CP <sub>x</sub> in	CP <sub>z</sub> in	CP <sub>x</sub> Ice in	CP <sub>z</sub> Ice in
L1	175.000-164.250	0.965	-0.426	1.919	-0.844
L2	164.250-129.670	0.200	-0.463	0.975	-0.892
L3	129.670-96.000	1.006	2.642	1.302	1.248
L4	96.000-63.170	1.604	4.948	1.743	3.152
L5	63.170-31.170	1.810	5.291	2.110	3.631
L6	31.170-0.000	1.965	5.560	2.360	4.008

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 <sub>a</sub> No Ice	K <sub>a</sub> Ice
L1	30	Safety Line 3/8	164.25 - 175.00	1.0000	1.0000
L1	31	Climbing Rung	164.25 - 175.00	1.0000	1.0000
L2	13	MLCH 12X6 AWG(1-3/8)	129.67 - 152.00	1.0000	1.0000
L2	24	CU12PSM9P6XXX(1-1/2)	129.67 - 130.00	1.0000	1.0000
L2	30	Safety Line 3/8	129.67 - 164.25	1.0000	1.0000
L2	31	Climbing Rung	129.67 - 164.25	1.0000	1.0000
L3	13	MLCH 12X6 AWG(1-3/8)	96.00 - 129.67	1.0000	1.0000
L3	24	CU12PSM9P6XXX(1-1/2)	96.00 - 129.67	1.0000	1.0000
L3	26	LDF7-50A(1-5/8)	96.00 - 115.00	1.0000	1.0000
L3	30	Safety Line 3/8	96.00 - 129.67	1.0000	1.0000
L3	31	Climbing Rung	96.00 - 129.67	1.0000	1.0000
L4	13	MLCH 12X6 AWG(1-3/8)	63.17 - 96.00	1.0000	1.0000
L4	24	CU12PSM9P6XXX(1-1/2)	63.17 - 96.00	1.0000	1.0000
L4	26	LDF7-50A(1-5/8)	63.17 - 96.00	1.0000	1.0000

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	<b>Project</b>	<b>Date</b> 17:14:10 06/15/22
	<b>Client</b> Crown Castle	<b>Designed by</b> S. Shet

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
L4	30	Safety Line 3/8	63.17 - 96.00	1.0000	1.0000
L4	31	Climbing Rung	63.17 - 96.00	1.0000	1.0000
L5	13	MLCH 12X6 AWG(1-3/8)	31.17 - 63.17	1.0000	1.0000
L5	24	CU12PSM9P6XXX(1-1/2)	31.17 - 63.17	1.0000	1.0000
L5	26	LDF7-50A(1-5/8)	31.17 - 63.17	1.0000	1.0000
L5	28	LDF4-50A(1/2)	31.17 - 50.00	1.0000	1.0000
L5	30	Safety Line 3/8	31.17 - 63.17	1.0000	1.0000
L5	31	Climbing Rung	31.17 - 63.17	1.0000	1.0000
L6	13	MLCH 12X6 AWG(1-3/8)	0.00 - 31.17	1.0000	1.0000
L6	24	CU12PSM9P6XXX(1-1/2)	0.00 - 31.17	1.0000	1.0000
L6	26	LDF7-50A(1-5/8)	0.00 - 31.17	1.0000	1.0000
L6	28	LDF4-50A(1/2)	0.00 - 31.17	1.0000	1.0000
L6	30	Safety Line 3/8	0.00 - 31.17	1.0000	1.0000
L6	31	Climbing Rung	0.00 - 31.17	1.0000	1.0000

### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C <sub>A</sub> A <sub>A</sub> Front ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Side ft <sup>2</sup>	Weight K	
Lightning Rod 5/8" x 6'	A	From Leg	4.000	0.000	174.000	No Ice	0.375	0.375	0.006
			0.000			1/2" Ice	0.989	0.989	0.010
			3.000			1" Ice	1.619	1.619	0.019
* LS-230C	A	From Leg	4.000	0.000	172.000	No Ice	1.610	1.610	0.011
			0.000			1/2" Ice	2.337	2.337	0.023
			-4.000			1" Ice	2.796	2.796	0.040
OA20-67-DIN	A	From Leg	4.000	0.000	172.000	No Ice	5.020	4.400	0.009
			0.000			1/2" Ice	7.960	6.800	0.043
			-4.000			1" Ice	10.930	9.200	0.080
* APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Leg	4.000	0.000	172.000	No Ice	14.690	6.870	0.186
			0.000			1/2" Ice	15.460	7.550	0.315
			0.000			1" Ice	16.230	8.250	0.458
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Leg	4.000	0.000	172.000	No Ice	14.690	6.870	0.186
			0.000			1/2" Ice	15.460	7.550	0.315
			0.000			1" Ice	16.230	8.250	0.458
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Leg	4.000	0.000	172.000	No Ice	14.690	6.870	0.186
			0.000			1/2" Ice	15.460	7.550	0.315
			0.000			1" Ice	16.230	8.250	0.458
AIR6449 B41_T-MOBILE w/ Mount Pipe	A	From Leg	4.000	0.000	172.000	No Ice	5.190	2.710	0.128
			0.000			1/2" Ice	5.590	3.040	0.174
			0.000			1" Ice	6.020	3.380	0.227
AIR6449 B41_T-MOBILE w/ Mount Pipe	B	From Leg	4.000	0.000	172.000	No Ice	5.190	2.710	0.128
			0.000			1/2" Ice	5.590	3.040	0.174
			0.000			1" Ice	6.020	3.380	0.227
AIR6449 B41_T-MOBILE w/ Mount Pipe	C	From Leg	4.000	0.000	172.000	No Ice	5.190	2.710	0.128
			0.000			1/2" Ice	5.590	3.040	0.174
			0.000			1" Ice	6.020	3.380	0.227
RADIO 4460 B2/B25 B66_TMO	A	From Leg	4.000	0.000	172.000	No Ice	2.139	1.686	0.109
			0.000			1/2" Ice	2.321	1.850	0.131

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	<b>Project</b>	<b>Date</b> 17:14:10 06/15/22
	<b>Client</b> Crown Castle	<b>Designed by</b> S. Shet

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment °	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K	
			Horz Lateral ft	Vert ft						
RADIO 4460 B2/B25 B66_TMO	B	From Leg	0.000		0.000	172.000	1" Ice	2.511	2.022	0.156
			4.000				No Ice	2.139	1.686	0.109
			0.000				1/2" Ice	2.321	1.850	0.131
RADIO 4460 B2/B25 B66_TMO	C	From Leg	0.000		0.000	172.000	1" Ice	2.511	2.022	0.156
			4.000				No Ice	2.139	1.686	0.109
			0.000				1/2" Ice	2.321	1.850	0.131
RADIO 4449 B71 B85A_T-MOBILE	A	From Leg	0.000		0.000	172.000	1" Ice	2.511	2.022	0.156
			4.000				No Ice	1.970	1.587	0.073
			0.000				1/2" Ice	2.147	1.749	0.093
RADIO 4449 B71 B85A_T-MOBILE	B	From Leg	0.000		0.000	172.000	1" Ice	2.331	1.918	0.116
			4.000				No Ice	1.970	1.587	0.073
			0.000				1/2" Ice	2.147	1.749	0.093
RADIO 4449 B71 B85A_T-MOBILE	C	From Leg	0.000		0.000	172.000	1" Ice	2.331	1.918	0.116
			4.000				No Ice	1.970	1.587	0.073
			0.000				1/2" Ice	2.147	1.749	0.093
(2) 6' x 2" Mount Pipe	A	From Leg	0.000		0.000	172.000	1" Ice	2.331	1.918	0.116
			4.000				No Ice	1.425	1.425	0.022
			0.000				1/2" Ice	1.925	1.925	0.033
(2) 6' x 2" Mount Pipe	C	From Leg	0.000		0.000	172.000	1" Ice	2.294	2.294	0.048
			4.000				No Ice	1.425	1.425	0.022
			0.000				1/2" Ice	1.925	1.925	0.033
Platform Mount [LP 701-1_HR-1]	C	None	0.000		0.000	172.000	1" Ice	2.294	2.294	0.048
			4.000				No Ice	55.580	55.580	3.082
			0.000				1/2" Ice	62.440	62.440	4.291
* LS-230C	A	From Leg	0.000		0.000	168.000	1" Ice	69.140	69.140	5.677
			3.000				No Ice	1.610	1.610	0.011
			0.000				1/2" Ice	2.337	2.337	0.023
Side Arm Mount [SO 701-1]	A	From Leg	3.000		0.000	168.000	1" Ice	2.796	2.796	0.040
			1.500				No Ice	0.850	1.670	0.065
			0.000				1/2" Ice	1.140	2.340	0.079
* APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	0.000		0.000	162.000	1" Ice	1.430	3.010	0.093
			4.000				No Ice	4.600	4.010	0.095
			0.000				1/2" Ice	5.050	4.450	0.160
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	0.000		0.000	162.000	1" Ice	5.500	4.890	0.235
			4.000				No Ice	4.600	4.010	0.095
			0.000				1/2" Ice	5.050	4.450	0.160
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	0.000		0.000	162.000	1" Ice	5.500	4.890	0.235
			4.000				No Ice	4.600	4.010	0.095
			0.000				1/2" Ice	5.050	4.450	0.160
PCS 1900MHZ 2X40W	A	From Leg	0.000		0.000	162.000	1" Ice	5.500	4.890	0.235
			4.000				No Ice	2.351	1.278	0.044
			0.000				1/2" Ice	2.547	1.434	0.062
PCS 1900MHZ 2X40W	B	From Leg	0.000		0.000	162.000	1" Ice	2.751	1.598	0.084
			4.000				No Ice	2.351	1.278	0.044
			0.000				1/2" Ice	2.547	1.434	0.062
PCS 1900MHZ 2X40W	C	From Leg	0.000		0.000	162.000	1" Ice	2.751	1.598	0.084
			4.000				No Ice	2.351	1.278	0.044
			0.000				1/2" Ice	2.547	1.434	0.062
800MHZ 2X50W RRH W/FILTER	A	From Leg	0.000		0.000	162.000	1" Ice	2.751	1.598	0.084
			4.000				No Ice	2.058	1.932	0.064
			0.000				1/2" Ice	2.240	2.109	0.086
800MHZ 2X50W RRH W/FILTER	B	From Leg	0.000		0.000	162.000	1" Ice	2.429	2.293	0.111
			4.000				No Ice	2.058	1.932	0.064
			0.000				1/2" Ice	2.240	2.109	0.086
			0.000				1" Ice	2.429	2.293	0.111

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	<b>Project</b>	<b>Date</b> 17:14:10 06/15/22
	<b>Client</b> Crown Castle	<b>Designed by</b> S. Shet

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment °	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K
			Horz Lateral ft	Vert ft					
800MHZ 2X50W RRH W/FILTER	C	From Leg	4.000 0.000 0.000	0.000	0.000	162.000	No Ice 2.058 1/2" Ice 2.240 1" Ice 2.429	1.932 2.109 2.293	0.064 0.086 0.111
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	0.000	162.000	No Ice 4.090 1/2" Ice 4.480 1" Ice 4.880	2.860 3.230 3.610	0.077 0.127 0.185
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	0.000	162.000	No Ice 4.090 1/2" Ice 4.480 1" Ice 4.880	2.860 3.230 3.610	0.077 0.127 0.185
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	0.000	162.000	No Ice 4.090 1/2" Ice 4.480 1" Ice 4.880	2.860 3.230 3.610	0.077 0.127 0.185
TD-RRH8X20-25	A	From Leg	4.000 0.000 0.000	0.000	0.000	162.000	No Ice 4.045 1/2" Ice 4.298 1" Ice 4.557	1.535 1.714 1.901	0.070 0.097 0.128
TD-RRH8X20-25	B	From Leg	4.000 0.000 0.000	0.000	0.000	162.000	No Ice 4.045 1/2" Ice 4.298 1" Ice 4.557	1.535 1.714 1.901	0.070 0.097 0.128
TD-RRH8X20-25	C	From Leg	4.000 0.000 0.000	0.000	0.000	162.000	No Ice 4.045 1/2" Ice 4.298 1" Ice 4.557	1.535 1.714 1.901	0.070 0.097 0.128
6' x 2" Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	0.000	162.000	No Ice 1.425 1/2" Ice 1.925 1" Ice 2.294	1.425 1.925 2.294	0.022 0.033 0.048
6' x 2" Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	0.000	162.000	No Ice 1.425 1/2" Ice 1.925 1" Ice 2.294	1.425 1.925 2.294	0.022 0.033 0.048
6' x 2" Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	0.000	162.000	No Ice 1.425 1/2" Ice 1.925 1" Ice 2.294	1.425 1.925 2.294	0.022 0.033 0.048
Platform Mount [LP 1201-1]	C	None		0.000	0.000	162.000	No Ice 18.380 1/2" Ice 22.110 1" Ice 25.870	18.380 22.110 25.870	2.100 2.652 3.263
*									
(2) LPA-80080/4CF w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	0.000	152.000	No Ice 2.040 1/2" Ice 2.420 1" Ice 2.820	5.220 5.670 6.130	0.042 0.084 0.134
(2) LPA-80080/4CF w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	0.000	152.000	No Ice 2.040 1/2" Ice 2.420 1" Ice 2.820	5.220 5.670 6.130	0.042 0.084 0.134
(2) LPA-80080/4CF w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	0.000	152.000	No Ice 2.040 1/2" Ice 2.420 1" Ice 2.820	5.220 5.670 6.130	0.042 0.084 0.134
(2) NNHH-65B-R4 w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	0.000	152.000	No Ice 7.550 1/2" Ice 8.040 1" Ice 8.530	4.230 4.670 5.120	0.110 0.197 0.296
(2) NNHH-65B-R4 w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	0.000	152.000	No Ice 7.550 1/2" Ice 8.040 1" Ice 8.530	4.230 4.670 5.120	0.110 0.197 0.296
(2) NNHH-65B-R4 w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	0.000	152.000	No Ice 7.550 1/2" Ice 8.040 1" Ice 8.530	4.230 4.670 5.120	0.110 0.197 0.296
RVZDC-6600-PF-48	C	From Leg	4.000 0.000 0.000	0.000	0.000	152.000	No Ice 4.056 1/2" Ice 4.316 1" Ice 4.582	3.098 3.335 3.580	0.032 0.068 0.108
RFV01U-D1A	A	From Leg	4.000 0.000	0.000	0.000	152.000	No Ice 1.875 1/2" Ice 2.045	1.250 1.393	0.084 0.103

<b>tnxTower</b>  <b>B+T Group</b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	<b>Job</b> 137170.009.01 - CT364/Chapel St. Monopole, CT (BU# 823530)	<b>Page</b> 9 of 21
	<b>Project</b>	<b>Date</b> 17:14:10 06/15/22
	<b>Client</b> Crown Castle	<b>Designed by</b> S. Shet

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight	
			Horz	Lateral						Vert
(2) RFV01U-D1A	B	From Leg	0.000		0.000	152.000	1" Ice	2.223	1.543	0.124
			4.000				No Ice	1.875	1.250	0.084
			0.000				1/2" Ice	2.045	1.393	0.103
(2) RFV01U-D2A	A	From Leg	0.000		0.000	152.000	1" Ice	2.223	1.543	0.124
			4.000				No Ice	1.875	1.013	0.070
			0.000				1/2" Ice	2.045	1.145	0.087
MT6407-77A w/ Mount Pipe	A	From Leg	0.000		0.000	152.000	1" Ice	2.223	1.284	0.106
			4.000				No Ice	4.907	2.682	0.096
			0.000				1/2" Ice	5.256	3.145	0.136
MT6407-77A w/ Mount Pipe	B	From Leg	0.000		0.000	152.000	1" Ice	5.615	3.624	0.180
			4.000				No Ice	4.907	2.682	0.096
			0.000				1/2" Ice	5.256	3.145	0.136
MT6407-77A w/ Mount Pipe	C	From Leg	0.000		0.000	152.000	1" Ice	5.615	3.624	0.180
			4.000				No Ice	4.907	2.682	0.096
			0.000				1/2" Ice	5.256	3.145	0.136
TD-850B-10LTE78	A	From Leg	0.000		0.000	152.000	1" Ice	5.615	3.624	0.180
			4.000				No Ice	0.546	0.268	0.018
			0.000				1/2" Ice	0.642	0.335	0.023
TD-850B-10LTE78	B	From Leg	0.000		0.000	152.000	1" Ice	0.746	0.409	0.031
			4.000				No Ice	0.546	0.268	0.018
			0.000				1/2" Ice	0.642	0.335	0.023
TD-850B-10LTE78	C	From Leg	0.000		0.000	152.000	1" Ice	0.746	0.409	0.031
			4.000				No Ice	0.546	0.268	0.018
			0.000				1/2" Ice	0.642	0.335	0.023
RFV01U-D2A	B	From Leg	0.000		0.000	152.000	1" Ice	0.746	0.409	0.031
			4.000				No Ice	1.875	1.013	0.070
			0.000				1/2" Ice	2.045	1.145	0.087
6' x 2" Mount Pipe	A	From Leg	0.000		0.000	152.000	1" Ice	2.223	1.284	0.106
			4.000				No Ice	1.425	1.425	0.022
			0.000				1/2" Ice	1.925	1.925	0.033
6' x 2" Mount Pipe	B	From Leg	0.000		0.000	152.000	1" Ice	2.294	2.294	0.048
			4.000				No Ice	1.425	1.425	0.022
			0.000				1/2" Ice	1.925	1.925	0.033
6' x 2" Mount Pipe	C	From Leg	0.000		0.000	152.000	1" Ice	2.294	2.294	0.048
			4.000				No Ice	1.425	1.425	0.022
			0.000				1/2" Ice	1.925	1.925	0.033
Platform Mount [LP 402-1_KCKR]	C	None	0.000		0.000	152.000	1" Ice	2.294	2.294	0.048
							No Ice	47.033	47.033	2.954
							1/2" Ice	59.242	59.242	3.934
* 80010965 w/ Mount Pipe	A	From Leg	0.000		0.000	140.000	1" Ice	71.451	71.451	4.914
			4.000				No Ice	12.260	5.790	0.136
			0.000				1/2" Ice	13.030	6.470	0.226
80010964 w/ Mount Pipe	B	From Leg	1.000		0.000	140.000	1" Ice	13.800	7.170	0.328
			4.000				No Ice	8.610	4.100	0.116
			0.000				1/2" Ice	9.180	4.590	0.186
80010965 w/ Mount Pipe	C	From Leg	1.000		0.000	140.000	1" Ice	9.770	5.100	0.265
			4.000				No Ice	12.260	5.790	0.136
			0.000				1/2" Ice	13.030	6.470	0.226
RRUS 4478 B14	A	From Leg	1.000		0.000	140.000	1" Ice	13.800	7.170	0.328
			4.000				No Ice	1.843	1.059	0.060
			0.000				1/2" Ice	2.012	1.197	0.076
RRUS 4478 B14	B	From Leg	2.000		0.000	140.000	1" Ice	2.190	1.342	0.094
			4.000				No Ice	1.843	1.059	0.060
			0.000				1/2" Ice	2.012	1.197	0.076
RRUS 4478 B14	C	From Leg	2.000		0.000	140.000	1" Ice	2.190	1.342	0.094
			4.000				No Ice	1.843	1.059	0.060
			0.000				1/2" Ice	2.012	1.197	0.076

<b>tnxTower</b>  <b>B+T Group</b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	<b>Job</b> 137170.009.01 - CT364/Chapel St. Monopole, CT (BU# 823530)	<b>Page</b> 10 of 21
	<b>Project</b>	<b>Date</b> 17:14:10 06/15/22
	<b>Client</b> Crown Castle	<b>Designed by</b> S. Shet

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight
			Horz	Lateral					
			0.000						
			2.000			1/2" Ice	2.012	1.197	0.076
			2.000			1" Ice	2.190	1.342	0.094
RADIO 4415 B30	A	From Leg	4.000	0.000	140.000	No Ice	1.643	0.639	0.043
			0.000			1/2" Ice	1.803	0.750	0.055
			2.000			1" Ice	1.971	0.867	0.069
RADIO 4415 B30	B	From Leg	4.000	0.000	140.000	No Ice	1.643	0.639	0.043
			0.000			1/2" Ice	1.803	0.750	0.055
			2.000			1" Ice	1.971	0.867	0.069
RADIO 4415 B30	C	From Leg	4.000	0.000	140.000	No Ice	1.643	0.639	0.043
			0.000			1/2" Ice	1.803	0.750	0.055
			2.000			1" Ice	1.971	0.867	0.069
RRUS 4449 B5/B12	A	From Leg	4.000	0.000	140.000	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
RRUS 4449 B5/B12	B	From Leg	4.000	0.000	140.000	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
RRUS 4449 B5/B12	C	From Leg	4.000	0.000	140.000	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
RRUS 8843 B2/B66A	A	From Leg	4.000	0.000	140.000	No Ice	1.639	1.353	0.072
			0.000			1/2" Ice	1.799	1.500	0.090
			2.000			1" Ice	1.966	1.655	0.110
RRUS 8843 B2/B66A	B	From Leg	4.000	0.000	140.000	No Ice	1.639	1.353	0.072
			0.000			1/2" Ice	1.799	1.500	0.090
			2.000			1" Ice	1.966	1.655	0.110
RRUS 8843 B2/B66A	C	From Leg	4.000	0.000	140.000	No Ice	1.639	1.353	0.072
			0.000			1/2" Ice	1.799	1.500	0.090
			2.000			1" Ice	1.966	1.655	0.110
DC6-48-60-18-8F	A	From Leg	4.000	0.000	140.000	No Ice	1.212	1.212	0.033
			0.000			1/2" Ice	1.892	1.892	0.055
			2.000			1" Ice	2.105	2.105	0.080
DC6-48-60-18-8F	B	From Leg	4.000	0.000	140.000	No Ice	1.212	1.212	0.033
			0.000			1/2" Ice	1.892	1.892	0.055
			2.000			1" Ice	2.105	2.105	0.080
DC6-48-60-18-8F	C	From Leg	4.000	0.000	140.000	No Ice	1.212	1.212	0.033
			0.000			1/2" Ice	1.892	1.892	0.055
			2.000			1" Ice	2.105	2.105	0.080
AIR 6419 B77G_CCIV3	A	From Leg	4.000	0.000	140.000	No Ice	3.840	1.510	0.055
			0.000			1/2" Ice	4.210	1.810	0.085
			2.000			1" Ice	4.600	2.120	0.118
AIR 6419 B77G_CCIV3	B	From Leg	4.000	0.000	140.000	No Ice	3.840	1.510	0.055
			0.000			1/2" Ice	4.210	1.810	0.085
			2.000			1" Ice	4.600	2.120	0.118
AIR 6419 B77G_CCIV3	C	From Leg	4.000	0.000	140.000	No Ice	3.840	1.510	0.055
			0.000			1/2" Ice	4.210	1.810	0.085
			2.000			1" Ice	4.600	2.120	0.118
AIR 6449 B77D	A	From Leg	4.000	0.000	140.000	No Ice	3.640	1.720	0.082
			0.000			1/2" Ice	4.000	2.020	0.111
			-2.000			1" Ice	4.370	2.330	0.145
AIR 6449 B77D	B	From Leg	4.000	0.000	140.000	No Ice	3.640	1.720	0.082
			0.000			1/2" Ice	4.000	2.020	0.111
			-2.000			1" Ice	4.370	2.330	0.145
AIR 6449 B77D	C	From Leg	4.000	0.000	140.000	No Ice	3.640	1.720	0.082
			0.000			1/2" Ice	4.000	2.020	0.111
			-2.000			1" Ice	4.370	2.330	0.145
TPA65R-BU6D_CCIV2 w/	A	From Leg	4.000	0.000	140.000	No Ice	11.960	5.970	0.094

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	<b>Project</b>	<b>Date</b> 17:14:10 06/15/22
	<b>Client</b> Crown Castle	<b>Designed by</b> S. Shet

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment °	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K
			Horz Lateral ft	Vert ft					
Mount Pipe			0.000						
			1.000			1/2" Ice	12.700	6.630	0.181
			1.000			1" Ice	13.460	7.300	0.278
TPA65R-BU4D w/ Mount Pipe	B	From Leg	4.000	0.000	140.000	No Ice	8.100	4.030	0.080
			0.000			1/2" Ice	8.650	4.500	0.141
			1.000			1" Ice	9.210	4.980	0.212
TPA65R-BU6D_CCIV2 w/ Mount Pipe	C	From Leg	4.000	0.000	140.000	No Ice	11.960	5.970	0.094
			0.000			1/2" Ice	12.700	6.630	0.181
			1.000			1" Ice	13.460	7.300	0.278
(2) 8' x 2.375" Mount Pipe	A	From Leg	4.000	0.000	140.000	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) 8' x 2.375" Mount Pipe	B	From Leg	4.000	0.000	140.000	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) 8' x 2.375" Mount Pipe	C	From Leg	4.000	0.000	140.000	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
5' x 2" Pipe Mount	A	From Leg	4.000	0.000	140.000	No Ice	1.188	1.188	0.018
			0.000			1/2" Ice	1.496	1.496	0.027
			0.000			1" Ice	1.807	1.807	0.040
5' x 2" Pipe Mount	B	From Leg	4.000	0.000	140.000	No Ice	1.188	1.188	0.018
			0.000			1/2" Ice	1.496	1.496	0.027
			0.000			1" Ice	1.807	1.807	0.040
5' x 2" Pipe Mount	C	From Leg	4.000	0.000	140.000	No Ice	1.188	1.188	0.018
			0.000			1/2" Ice	1.496	1.496	0.027
			0.000			1" Ice	1.807	1.807	0.040
4.5' x 2" Mount Pipe	A	From Leg	4.000	0.000	140.000	No Ice	1.024	1.024	0.002
			0.000			1/2" Ice	1.298	1.298	0.010
			0.000			1" Ice	1.580	1.580	0.021
3.5' x 2" Pipe Mount	A	From Leg	2.000	0.000	140.000	No Ice	0.785	0.785	0.029
			0.000			1/2" Ice	1.028	1.028	0.035
			0.000			1" Ice	1.281	1.281	0.044
3.5' x 2" Pipe Mount	B	From Leg	2.000	0.000	140.000	No Ice	0.785	0.785	0.029
			0.000			1/2" Ice	1.028	1.028	0.035
			0.000			1" Ice	1.281	1.281	0.044
3.5' x 2" Pipe Mount	C	From Leg	2.000	0.000	140.000	No Ice	0.785	0.785	0.029
			0.000			1/2" Ice	1.028	1.028	0.035
			0.000			1" Ice	1.281	1.281	0.044
Platform Mount [LP 304-1_HR-1]	C	None		0.000	140.000	No Ice	21.410	21.410	1.605
						1/2" Ice	26.620	26.620	2.056
						1" Ice	31.660	31.660	2.598
*									
MX08FRO665-21 w/ Mount Pipe	A	From Leg	4.000	0.000	130.000	No Ice	8.010	4.230	0.108
			0.000			1/2" Ice	8.520	4.690	0.194
			0.000			1" Ice	9.040	5.160	0.292
MX08FRO665-21 w/ Mount Pipe	B	From Leg	4.000	0.000	130.000	No Ice	8.010	4.230	0.108
			0.000			1/2" Ice	8.520	4.690	0.194
			0.000			1" Ice	9.040	5.160	0.292
MX08FRO665-21 w/ Mount Pipe	C	From Leg	4.000	0.000	130.000	No Ice	8.010	4.230	0.108
			0.000			1/2" Ice	8.520	4.690	0.194
			0.000			1" Ice	9.040	5.160	0.292
TA08025-B604	A	From Leg	4.000	0.000	130.000	No Ice	1.964	0.981	0.064
			0.000			1/2" Ice	2.138	1.112	0.081
			0.000			1" Ice	2.320	1.250	0.100
TA08025-B604	B	From Leg	4.000	0.000	130.000	No Ice	1.964	0.981	0.064
			0.000			1/2" Ice	2.138	1.112	0.081
			0.000			1" Ice	2.320	1.250	0.100





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	<b>Project</b>	<b>Date</b> 17:14:10 06/15/22
	<b>Client</b> Crown Castle	<b>Designed by</b> S. Shet

## Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets:		Azimuth Adjustment	3 dB Beam Width	Elevation	Outside Diameter	Aperture Area	Weight
				Horz	Lateral Vert						
				ft	ft	°	°	ft	ft	ft <sup>2</sup>	K
VHLP2.6	A	Paraboloid w/Shroud (HP)	From Leg	4.000	-20.000	90.000	172.000	2.917	No Ice	6.680	0.048
				0.000					1/2" Ice	7.070	0.080
				3.000					1" Ice	7.460	0.120
VHLP2.6	C	Paraboloid w/Shroud (HP)	From Leg	4.000	90.000	172.000	2.917	No Ice	6.680	0.048	
				0.000				1/2" Ice	7.070	0.080	
				3.000				1" Ice	7.460	0.120	
*											

## 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

<b>tnxTower</b>  <b>B+T Group</b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	<b>Job</b> 137170.009.01 - CT364/Chapel St. Monopole, CT (BU# 823530)	<b>Page</b> 14 of 21
	<b>Project</b>	<b>Date</b> 17:14:10 06/15/22
	<b>Client</b> Crown Castle	<b>Designed by</b> S. Shet

Comb. No.	Description
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	175 - 164.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-11.224	0.898	1.808
			Max. Mx	20	-6.062	28.250	2.063
			Max. My	2	-6.045	1.356	29.536
			Max. Vy	8	5.895	-27.559	-1.691
			Max. Vx	14	6.137	-1.109	-29.164
			Max. Torque	6			2.664
L2	164.25 - 129.67	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-42.333	-0.240	3.503
			Max. Mx	8	-24.781	-457.196	-10.969
			Max. My	14	-24.734	-8.539	-466.031
			Max. Vy	8	19.784	-457.196	-10.969
			Max. Vx	14	20.128	-8.539	-466.031
			Max. Torque	6			3.255
L3	129.67 - 96	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-58.006	-1.010	4.187
			Max. Mx	8	-36.365	-1230.020	-19.844
			Max. My	14	-36.324	-14.215	-1250.086
			Max. Vy	8	25.231	-1230.020	-19.844
			Max. Vx	14	25.601	-14.215	-1250.086
			Max. Torque	6			3.415
L4	96 - 63.17	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-70.246	-1.818	3.902
			Max. Mx	8	-46.393	-2077.413	-28.621
			Max. My	14	-46.365	-19.778	-2108.559
			Max. Vy	8	27.620	-2077.413	-28.621
			Max. Vx	14	27.984	-19.778	-2108.559
			Max. Torque	6			3.409
L5	63.17 - 31.17	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-84.030	-2.851	3.719
			Max. Mx	8	-57.799	-2976.126	-36.785
			Max. My	14	-57.785	-25.273	-3017.181
			Max. Vy	8	29.733	-2976.126	-36.785
			Max. Vx	14	30.067	-25.273	-3017.181
			Max. Torque	6			3.504
L6	31.17 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-101.941	-4.022	3.028
			Max. Mx	8	-72.949	-4129.142	-46.397
			Max. My	14	-72.949	-31.546	-4181.385
			Max. Vy	8	31.762	-4129.142	-46.397
			Max. Vx	14	32.080	-31.546	-4181.385
			Max. Torque	6			3.502

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	<b>Project</b>	<b>Date</b> 17:14:10 06/15/22
	<b>Client</b> Crown Castle	<b>Designed by</b> S. Shet

### Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	27	101.941	0.022	9.114
	Max. H <sub>x</sub>	20	72.964	31.716	0.153
	Max. H <sub>z</sub>	2	72.964	0.101	31.911
	Max. M <sub>x</sub>	2	4161.655	0.101	31.911
	Max. M <sub>z</sub>	8	4129.142	-31.729	-0.252
	Max. Torsion	6	3.501	-27.407	15.984
	Min. Vert	19	54.723	27.437	-15.916
	Min. H <sub>x</sub>	8	72.964	-31.729	-0.252
	Min. H <sub>z</sub>	14	72.964	-0.138	-32.046
	Min. M <sub>x</sub>	14	-4181.385	-0.138	-32.046
	Min. M <sub>z</sub>	20	-4119.027	31.716	0.153
	Min. Torsion	18	-3.196	27.437	-15.916

### Tower Mast Reaction Summary

Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>z</sub> K	Overturning Moment, M <sub>x</sub> kip-ft	Overturning Moment, M <sub>z</sub> kip-ft	Torque kip-ft
Dead Only	60.803	0.000	-0.000	-2.202	-3.020	0.000
1.2 Dead+1.0 Wind 0 deg - No Ice	72.964	-0.101	-31.911	-4161.655	16.679	-1.817
0.9 Dead+1.0 Wind 0 deg - No Ice	54.723	-0.101	-31.911	-4090.126	17.269	-1.817
1.2 Dead+1.0 Wind 30 deg - No Ice	72.964	15.709	-27.684	-3612.859	-2035.895	-3.016
0.9 Dead+1.0 Wind 30 deg - No Ice	54.723	15.709	-27.684	-3550.646	-2000.442	-3.014
1.2 Dead+1.0 Wind 60 deg - No Ice	72.964	27.407	-15.984	-2086.335	-3562.417	-3.501
0.9 Dead+1.0 Wind 60 deg - No Ice	54.723	27.407	-15.984	-2050.122	-3500.957	-3.498
1.2 Dead+1.0 Wind 90 deg - No Ice	72.964	31.729	0.252	46.398	-4129.142	-2.269
0.9 Dead+1.0 Wind 90 deg - No Ice	54.723	31.729	0.252	46.150	-4058.009	-2.266
1.2 Dead+1.0 Wind 120 deg - No Ice	72.964	27.512	16.181	2120.437	-3583.539	-1.090
0.9 Dead+1.0 Wind 120 deg - No Ice	54.723	27.512	16.181	2084.922	-3521.647	-1.086
1.2 Dead+1.0 Wind 150 deg - No Ice	72.964	15.944	27.779	3626.468	-2082.746	0.325
0.9 Dead+1.0 Wind 150 deg - No Ice	54.723	15.944	27.779	3565.389	-2046.327	0.327
1.2 Dead+1.0 Wind 180 deg - No Ice	72.964	0.138	32.046	4181.385	-31.547	1.896
0.9 Dead+1.0 Wind 180 deg - No Ice	54.723	0.138	32.046	4110.885	-29.949	1.897
1.2 Dead+1.0 Wind 210 deg - No Ice	72.964	-15.641	27.782	3625.761	2015.235	3.021
0.9 Dead+1.0 Wind 210 deg - No Ice	54.723	-15.641	27.782	3564.699	1982.088	3.020

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	<p><b>Project</b></p>	<p><b>Date</b> 17:14:10 06/15/22</p>
	<p><b>Client</b> Crown Castle</p>	<p><b>Designed by</b> S. Shet</p>

Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>z</sub> K	Overturning Moment, M <sub>x</sub> kip-ft	Overturning Moment, M <sub>z</sub> kip-ft	Torque kip-ft
1.2 Dead+1.0 Wind 240 deg - No Ice	72.964	-27.437	15.916	2067.853	3560.377	3.196
0.9 Dead+1.0 Wind 240 deg - No Ice	54.723	-27.437	15.916	2033.415	3500.836	3.194
1.2 Dead+1.0 Wind 270 deg - No Ice	72.964	-31.716	-0.153	-33.295	4119.027	2.729
0.9 Dead+1.0 Wind 270 deg - No Ice	54.723	-31.715	-0.153	-31.902	4049.964	2.726
1.2 Dead+1.0 Wind 300 deg - No Ice	72.964	-27.433	-16.081	-2107.374	3561.139	1.439
0.9 Dead+1.0 Wind 300 deg - No Ice	54.723	-27.433	-16.081	-2070.697	3501.563	1.436
1.2 Dead+1.0 Wind 330 deg - No Ice	72.964	-15.888	-27.658	-3609.516	2064.596	-0.088
0.9 Dead+1.0 Wind 330 deg - No Ice	54.723	-15.888	-27.658	-3547.347	2030.417	-0.090
1.2 Dead+1.0 Ice+1.0 Temp	101.941	0.000	-0.000	-3.028	-4.022	-0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	101.941	-0.022	-9.114	-1194.777	0.428	-0.418
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	101.941	4.506	-7.903	-1036.872	-589.442	-0.836
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	101.941	7.847	-4.562	-599.751	-1026.507	-1.050
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	101.941	9.078	0.053	7.625	-1188.293	-0.820
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	101.941	7.870	4.605	602.189	-1031.305	-0.508
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	101.941	4.557	7.923	1034.730	-599.963	-0.072
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	101.941	0.030	9.142	1193.784	-10.425	0.435
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	101.941	-4.492	7.923	1034.377	578.186	0.838
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	101.941	-7.853	4.548	590.417	1019.297	0.987
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	101.941	-9.075	-0.033	-10.079	1179.321	0.916
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	101.941	-7.853	-4.584	-604.640	1019.649	0.581
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	101.941	-4.545	-7.899	-1036.327	589.240	0.121
Dead+Wind 0 deg - Service	60.803	-0.025	-8.045	-1040.090	1.949	-0.462
Dead+Wind 30 deg - Service	60.803	3.961	-6.980	-903.151	-510.245	-0.766
Dead+Wind 60 deg - Service	60.803	6.910	-4.030	-522.236	-891.147	-0.889
Dead+Wind 90 deg - Service	60.803	7.999	0.064	9.912	-1032.546	-0.576
Dead+Wind 120 deg - Service	60.803	6.936	4.079	527.465	-896.432	-0.277
Dead+Wind 150 deg - Service	60.803	4.020	7.003	903.298	-521.923	0.083
Dead+Wind 180 deg - Service	60.803	0.035	8.079	1041.757	-10.051	0.482
Dead+Wind 210 deg - Service	60.803	-3.943	7.004	903.097	500.706	0.768
Dead+Wind 240 deg - Service	60.803	-6.917	4.013	514.357	886.231	0.812
Dead+Wind 270 deg - Service	60.803	-7.996	-0.039	-9.922	1025.610	0.692
Dead+Wind 300 deg - Service	60.803	-6.916	-4.054	-527.469	886.426	0.364
Dead+Wind 330 deg - Service	60.803	-4.006	-6.973	-902.321	512.987	-0.023

## Solution Summary

<p><b>tnxTower</b></p> <p><b>B+T Group</b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265</p>	<p><b>Job</b></p> <p>137170.009.01 - CT364/Chapel St. Monopole, CT (BU# 823530)</p>	<p><b>Page</b></p> <p>17 of 21</p>
	<p><b>Project</b></p>	<p><b>Date</b></p> <p>17:14:10 06/15/22</p>
	<p><b>Client</b></p> <p>Crown Castle</p>	<p><b>Designed by</b></p> <p>S. Shet</p>

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	-60.803	0.000	-0.000	60.803	0.000	0.000%
2	-0.101	-72.964	-31.911	0.101	72.964	31.911	0.000%
3	-0.101	-54.723	-31.911	0.101	54.723	31.911	0.000%
4	15.709	-72.964	-27.684	-15.709	72.964	27.684	0.000%
5	15.709	-54.723	-27.684	-15.709	54.723	27.684	0.000%
6	27.407	-72.964	-15.984	-27.407	72.964	15.984	0.000%
7	27.407	-54.723	-15.984	-27.407	54.723	15.984	0.000%
8	31.729	-72.964	0.252	-31.729	72.964	-0.252	0.000%
9	31.729	-54.723	0.252	-31.729	54.723	-0.252	0.000%
10	27.512	-72.964	16.181	-27.512	72.964	-16.181	0.000%
11	27.512	-54.723	16.181	-27.512	54.723	-16.181	0.000%
12	15.944	-72.964	27.779	-15.944	72.964	-27.779	0.000%
13	15.944	-54.723	27.779	-15.944	54.723	-27.779	0.000%
14	0.138	-72.964	32.046	-0.138	72.964	-32.046	0.000%
15	0.138	-54.723	32.046	-0.138	54.723	-32.046	0.000%
16	-15.641	-72.964	27.782	15.641	72.964	-27.782	0.000%
17	-15.641	-54.723	27.782	15.641	54.723	-27.782	0.000%
18	-27.437	-72.964	15.916	27.437	72.964	-15.916	0.000%
19	-27.437	-54.723	15.916	27.437	54.723	-15.916	0.000%
20	-31.715	-72.964	-0.153	31.715	72.964	0.153	0.000%
21	-31.715	-54.723	-0.153	31.715	54.723	0.153	0.000%
22	-27.433	-72.964	-16.081	27.433	72.964	16.081	0.000%
23	-27.433	-54.723	-16.081	27.433	54.723	16.081	0.000%
24	-15.888	-72.964	-27.658	15.888	72.964	27.658	0.000%
25	-15.888	-54.723	-27.658	15.888	54.723	27.658	0.000%
26	0.000	-101.941	0.000	-0.000	101.941	0.000	0.000%
27	-0.022	-101.941	-9.114	0.022	101.941	9.114	0.000%
28	4.506	-101.941	-7.903	-4.506	101.941	7.903	0.000%
29	7.847	-101.941	-4.562	-7.847	101.941	4.562	0.000%
30	9.078	-101.941	0.053	-9.078	101.941	-0.053	0.000%
31	7.869	-101.941	4.605	-7.870	101.941	-4.605	0.000%
32	4.556	-101.941	7.923	-4.557	101.941	-7.923	0.000%
33	0.030	-101.941	9.142	-0.030	101.941	-9.142	0.000%
34	-4.492	-101.941	7.923	4.492	101.941	-7.923	0.000%
35	-7.853	-101.941	4.548	7.853	101.941	-4.548	0.000%
36	-9.075	-101.941	-0.033	9.075	101.941	0.033	0.000%
37	-7.853	-101.941	-4.584	7.853	101.941	4.584	0.000%
38	-4.545	-101.941	-7.898	4.545	101.941	7.899	0.000%
39	-0.025	-60.803	-8.045	0.025	60.803	8.045	0.000%
40	3.961	-60.803	-6.980	-3.961	60.803	6.980	0.000%
41	6.910	-60.803	-4.030	-6.910	60.803	4.030	0.000%
42	7.999	-60.803	0.064	-7.999	60.803	-0.064	0.000%
43	6.936	-60.803	4.079	-6.936	60.803	-4.079	0.000%
44	4.020	-60.803	7.003	-4.020	60.803	-7.003	0.000%
45	0.035	-60.803	8.079	-0.035	60.803	-8.079	0.000%
46	-3.943	-60.803	7.004	3.943	60.803	-7.004	0.000%
47	-6.917	-60.803	4.013	6.917	60.803	-4.013	0.000%
48	-7.996	-60.803	-0.039	7.996	60.803	0.039	0.000%
49	-6.916	-60.803	-4.054	6.916	60.803	4.054	0.000%
50	-4.006	-60.803	-6.973	4.006	60.803	6.973	0.000%

### Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.0000001	0.0000001

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	<b>Project</b>	<b>Date</b> 17:14:10 06/15/22
	<b>Client</b> Crown Castle	<b>Designed by</b> S. Shet

2	Yes	5	0.00000001	0.00033807
3	Yes	5	0.00000001	0.00017174
4	Yes	6	0.00000001	0.00039414
5	Yes	6	0.00000001	0.00014051
6	Yes	6	0.00000001	0.00043512
7	Yes	6	0.00000001	0.00015652
8	Yes	5	0.00000001	0.00018105
9	Yes	5	0.00000001	0.00008915
10	Yes	6	0.00000001	0.00042130
11	Yes	6	0.00000001	0.00015036
12	Yes	6	0.00000001	0.00042321
13	Yes	6	0.00000001	0.00015107
14	Yes	5	0.00000001	0.00019772
15	Yes	5	0.00000001	0.00010006
16	Yes	6	0.00000001	0.00042846
17	Yes	6	0.00000001	0.00015442
18	Yes	6	0.00000001	0.00039162
19	Yes	6	0.00000001	0.00014005
20	Yes	5	0.00000001	0.00049412
21	Yes	5	0.00000001	0.00024958
22	Yes	6	0.00000001	0.00042708
23	Yes	6	0.00000001	0.00015307
24	Yes	6	0.00000001	0.00041957
25	Yes	6	0.00000001	0.00015014
26	Yes	4	0.00000001	0.00007584
27	Yes	6	0.00000001	0.00015514
28	Yes	6	0.00000001	0.00018886
29	Yes	6	0.00000001	0.00019259
30	Yes	6	0.00000001	0.00015366
31	Yes	6	0.00000001	0.00018940
32	Yes	6	0.00000001	0.00019042
33	Yes	6	0.00000001	0.00015373
34	Yes	6	0.00000001	0.00018818
35	Yes	6	0.00000001	0.00018453
36	Yes	6	0.00000001	0.00015292
37	Yes	6	0.00000001	0.00019143
38	Yes	6	0.00000001	0.00019028
39	Yes	4	0.00000001	0.00033952
40	Yes	5	0.00000001	0.00007608
41	Yes	5	0.00000001	0.00009777
42	Yes	4	0.00000001	0.00033669
43	Yes	5	0.00000001	0.00008298
44	Yes	5	0.00000001	0.00008439
45	Yes	4	0.00000001	0.00032653
46	Yes	5	0.00000001	0.00009370
47	Yes	5	0.00000001	0.00007427
48	Yes	4	0.00000001	0.00040617
49	Yes	5	0.00000001	0.00008895
50	Yes	5	0.00000001	0.00008466

### Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	175 - 164.25	26.040	44	1.249	0.006
L2	167.17 - 129.67	23.996	44	1.245	0.005
L3	133.5 - 96	15.604	44	1.099	0.003
L4	100.67 - 63.17	8.847	44	0.843	0.001
L5	68.67 - 31.17	4.081	44	0.561	0.001

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	<b>Project</b>	<b>Date</b> 17:14:10 06/15/22
	<b>Client</b> Crown Castle	<b>Designed by</b> S. Shet

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L6	37.42 - 0	1.222	44	0.295	0.000

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

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
175.000	VHLP2.6	44	26.040	1.249	0.007	62521
174.000	Lightning Rod 5/8" x 6'	44	25.779	1.249	0.007	62521
172.000	LS-230C	44	25.256	1.248	0.006	62521
168.000	LS-230C	44	24.213	1.246	0.006	44970
162.000	APXVSPP18-C-A20 w/ Mount Pipe	44	22.655	1.235	0.005	25262
152.000	(2) LPA-80080/4CF w/ Mount Pipe	44	20.098	1.202	0.004	14787
140.000	80010965 w/ Mount Pipe	44	17.138	1.140	0.003	9850
130.000	MX08FRO665-21 w/ Mount Pipe	44	14.802	1.075	0.003	8098
115.000	APXV18-206517S-C w/ Mount Pipe	44	11.578	0.962	0.002	7195
50.000	GPS-TMG-HR-26NCM	44	2.143	0.400	0.001	6020

### Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	175 - 164.25	104.683	12	5.032	0.026
L2	167.17 - 129.67	96.456	12	5.017	0.022
L3	133.5 - 96	62.700	14	4.425	0.011
L4	100.67 - 63.17	35.535	12	3.391	0.006
L5	68.67 - 31.17	16.386	12	2.253	0.003
L6	37.42 - 0	4.904	12	1.184	0.001

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

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
175.000	VHLP2.6	12	104.683	5.032	0.027	16633
174.000	Lightning Rod 5/8" x 6'	12	103.631	5.031	0.026	16633
172.000	LS-230C	12	101.527	5.029	0.025	16633
168.000	LS-230C	12	97.326	5.020	0.023	11925
162.000	APXVSPP18-C-A20 w/ Mount Pipe	12	91.057	4.980	0.020	6554
152.000	(2) LPA-80080/4CF w/ Mount Pipe	12	80.772	4.845	0.017	3755
140.000	80010965 w/ Mount Pipe	14	68.869	4.592	0.013	2481
130.000	MX08FRO665-21 w/ Mount Pipe	14	59.476	4.328	0.011	2033
115.000	APXV18-206517S-C w/ Mount Pipe	14	46.512	3.873	0.008	1801
50.000	GPS-TMG-HR-26NCM	12	8.599	1.605	0.002	1500

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	<b>Project</b>	<b>Date</b> 17:14:10 06/15/22
	<b>Client</b> Crown Castle	<b>Designed by</b> S. Shet

## Compression Checks

## Pole Design Data

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	A in <sup>2</sup>	P <sub>u</sub> K	φP <sub>n</sub> K	Ratio $\frac{P_u}{\phi P_n}$
L1	175 - 164.25 (1)	TP26x22x0.25	10.750	0.000	0.0	19.570	-6.042	1144.870	0.005
L2	164.25 - 129.67 (2)	TP34.063x24.413x0.313	37.500	0.000	0.0	32.498	-24.734	1901.150	0.013
L3	129.67 - 96 (3)	TP41.75x32.452x0.375	37.500	0.000	0.0	47.868	-36.325	2800.300	0.013
L4	96 - 63.17 (4)	TP49.063x39.842x0.375	37.500	0.000	0.0	56.341	-46.365	3295.930	0.014
L5	63.17 - 31.17 (5)	TP56.125x46.96x0.375	37.500	0.000	0.0	64.538	-57.785	3775.490	0.015
L6	31.17 - 0 (6)	TP62.938x53.848x0.375	37.420	0.000	0.0	74.465	-72.949	4356.200	0.017

## Pole Bending Design Data

Section No.	Elevation ft	Size	M <sub>ux</sub> kip-ft	φM <sub>ux</sub> kip-ft	Ratio $\frac{M_{ux}}{\phi M_{ux}}$	M <sub>uy</sub> kip-ft	φM <sub>uy</sub> kip-ft	Ratio $\frac{M_{uy}}{\phi M_{uy}}$
L1	175 - 164.25 (1)	TP26x22x0.25	29.909	729.119	0.041	0.000	729.119	0.000
L2	164.25 - 129.67 (2)	TP34.063x24.413x0.313	467.792	1584.183	0.295	0.000	1584.183	0.000
L3	129.67 - 96 (3)	TP41.75x32.452x0.375	1251.458	2847.117	0.440	0.000	2847.117	0.000
L4	96 - 63.17 (4)	TP49.063x39.842x0.375	2109.542	3755.708	0.562	0.000	3755.708	0.000
L5	63.17 - 31.17 (5)	TP56.125x46.96x0.375	3017.967	4686.617	0.644	0.000	4686.617	0.000
L6	31.17 - 0 (6)	TP62.938x53.848x0.375	4182.000	5847.241	0.715	0.000	5847.241	0.000

## Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V <sub>u</sub> K	φV <sub>n</sub> K	Ratio $\frac{V_u}{\phi V_n}$	Actual T <sub>u</sub> kip-ft	φT <sub>n</sub> kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	175 - 164.25 (1)	TP26x22x0.25	6.038	343.462	0.018	0.345	741.845	0.000
L2	164.25 - 129.67 (2)	TP34.063x24.413x0.313	20.114	570.345	0.035	0.519	1636.525	0.000
L3	129.67 - 96 (3)	TP41.75x32.452x0.375	25.581	840.090	0.030	0.425	2958.808	0.000
L4	96 - 63.17 (4)	TP49.063x39.842x0.375	27.963	988.779	0.028	0.425	4098.858	0.000
L5	63.17 - 31.17 (5)	TP56.125x46.96x0.375	30.050	1132.650	0.027	0.325	5378.425	0.000
L6	31.17 - 0 (6)	TP62.938x53.848x0.375	32.063	1306.860	0.025	0.325	7160.175	0.000



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	<b>Project</b>	<b>Date</b> 17:14:10 06/15/22
	<b>Client</b> Crown Castle	<b>Designed by</b> S. Shet

### Pole Interaction Design Data

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	175 - 164.25 (1)	0.005	0.041	0.000	0.018	0.000	0.047	1.050	4.8.2 ✓
L2	164.25 - 129.67 (2)	0.013	0.295	0.000	0.035	0.000	0.310	1.050	4.8.2 ✓
L3	129.67 - 96 (3)	0.013	0.440	0.000	0.030	0.000	0.453	1.050	4.8.2 ✓
L4	96 - 63.17 (4)	0.014	0.562	0.000	0.028	0.000	0.577	1.050	4.8.2 ✓
L5	63.17 - 31.17 (5)	0.015	0.644	0.000	0.027	0.000	0.660	1.050	4.8.2 ✓
L6	31.17 - 0 (6)	0.017	0.715	0.000	0.025	0.000	0.733	1.050	4.8.2 ✓

### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$\phi P_{allow}$ K	% Capacity	Pass Fail
L1	175 - 164.25	Pole	TP26x22x0.25	1	-6.042	1202.113	4.4	Pass
L2	164.25 - 129.67	Pole	TP34.063x24.413x0.313	2	-24.734	1996.207	29.5	Pass
L3	129.67 - 96	Pole	TP41.75x32.452x0.375	3	-36.325	2940.315	43.2	Pass
L4	96 - 63.17	Pole	TP49.063x39.842x0.375	4	-46.365	3460.726	54.9	Pass
L5	63.17 - 31.17	Pole	TP56.125x46.96x0.375	5	-57.785	3964.264	62.9	Pass
L6	31.17 - 0	Pole	TP62.938x53.848x0.375	6	-72.949	4574.010	69.8	Pass
Summary								
Pole (L6)							69.8	Pass
<b>RATING =</b>							<b>69.8</b>	<b>Pass</b>

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

(OTHER CONSIDERED EQUIPMENT)  
(3) 7/8" TO 172 FT LEVEL  
(OTHER CONSIDERED EQUIPMENT)  
(2) 1-5/8" TO 172 FT LEVEL

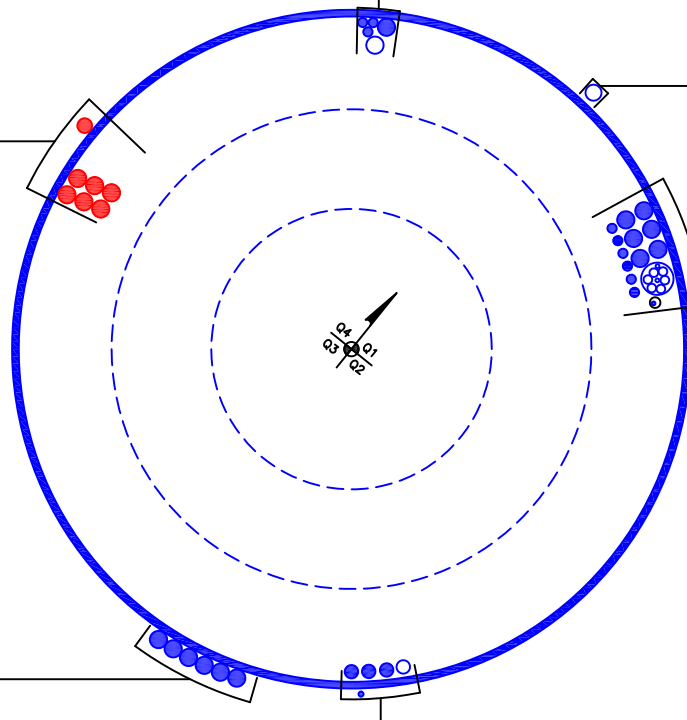
(PROPOSED EQUIPMENT CONFIGURATION)  
(1) 1-3/8" TO 152 FT LEVEL  
(6) 1-5/8" TO 152 FT LEVEL

(OTHER CONSIDERED EQUIPMENT)  
(1) 1-1/2" TO 130 FT LEVEL

(OTHER CONSIDERED EQUIPMENT—IN CONDUIT)  
(3) 3/8" TO 140 FT LEVEL  
(6) 13/16" TO 140 FT LEVEL  
(OTHER CONSIDERED EQUIPMENT)  
(6) 1-5/8" TO 140 FT LEVEL  
(OTHER CONSIDERED EQUIPMENT)  
(6) 7/8" TO 168 FT LEVEL

(OTHER CONSIDERED EQUIPMENT)  
(6) 1-5/8" TO 115 FT LEVEL

(OTHER CONSIDERED EQUIPMENT)  
(4) 1-1/4" TO 162 FT LEVEL  
(OTHER CONSIDERED EQUIPMENT)  
(1) 1/2" TO 50 FT LEVEL



BUSINESS UNIT: 823530

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

# Monopole Base Plate Connection

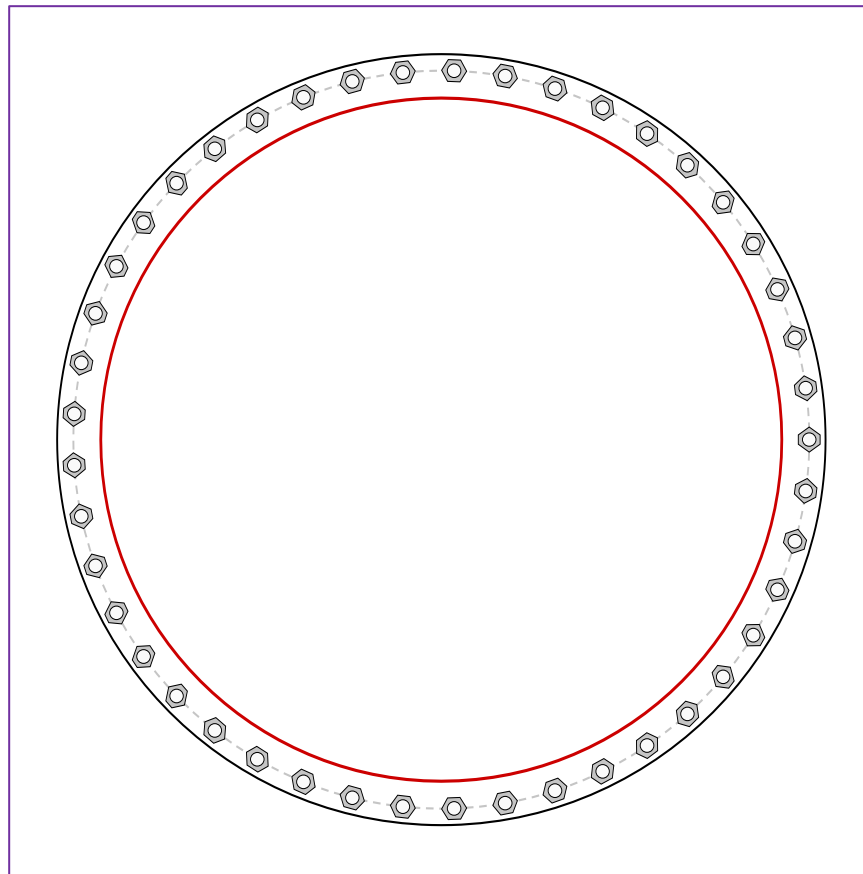


Site Info	
BU #	823530
Site Name	4/Chapel St. Monopol
Order #	621898, Rev# 0

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

Applied Loads	
Moment (kip-ft)	4182.00
Axial Force (kips)	72.95
Shear Force (kips)	32.06

\*TIA-222-H Section 15.5 Applied



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

Anchor Rod Data
(45) 1-1/4" $\phi$ bolts (A687 N; Fy=105 ksi, Fu=125 ksi) on 68" BC
Base Plate Data
71" OD x 1.5" Plate (A572-50; Fy=50 ksi, Fu=65 ksi)
Stiffener Data
N/A
Pole Data
62.9375" x 0.375" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Anchor Rod Summary			<i>(units of kips, kip-in)</i>
Pu_t = 63.97	$\phi Pn_t = 90.84$		<b>Stress Rating</b>
Vu = 0.71	$\phi Vn = 57.52$		<b>67.1%</b>
Mu = n/a	$\phi Mn = n/a$		<b>Pass</b>
Base Plate Summary			
Max Stress (ksi):	-		
Allowable Stress (ksi):	-		
Stress Rating:			<b>Pi rod OK</b>

# Pier and Pad Foundation



BU #: 823530  
 Site Name: CT364/Chapel St. I  
 App. Number: 621898, Rev# 0

TIA-222 Revision: H  
 Tower Type: Monopole

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

Superstructure Analysis Reactions		
Compression, $P_{comp}$ :	73	kips
Base Shear, $V_{u\_comp}$ :	32	kips
Moment, $M_u$ :	4182	ft-kips
Tower Height, $H$ :	175	ft
BP Dist. Above Fdn, $bp_{dist}$ :	2.5	in

Foundation Analysis Checks				
	Capacity	Demand	Rating*	Check
<i>Lateral (Sliding) (kips)</i>	279.78	32.00	10.9%	Pass
<i>Bearing Pressure (ksf)</i>	23.16	3.97	17.1%	Pass
<i>Overtuning (kip*ft)</i>	6208.40	4460.67	71.8%	Pass
<i>Pier Flexure (Comp.) (kip*ft)</i>	6254.25	4366.00	66.5%	Pass
<i>Pier Compression (kip)</i>	21089.12	118.72	0.5%	Pass
<i>Pad Flexure (kip*ft)</i>	2826.15	1957.66	66.0%	Pass
<i>Pad Shear - 1-way (kips)</i>	627.95	351.80	53.4%	Pass
<i>Pad Shear - 2-way (Comp) (ksi)</i>	0.164	0.000	0.0%	Pass
<i>Flexural 2-way (Comp) (kip*ft)</i>	3889.71	2619.60	64.1%	Pass

Pier Properties		
Pier Shape:	Circular	
Pier Diameter, $dpier$ :	7.5	ft
Ext. Above Grade, $E$ :	0.5	ft
Pier Rebar Size, $Sc$ :	9	
Pier Rebar Quantity, $mc$ :	36	
Pier Tie/Spiral Size, $St$ :	4	
Pier Tie/Spiral Quantity, $mt$ :	10	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, $cc_{pier}$ :	3	in

\*Rating per TIA-222-H Section 15.5

Structural Rating*:	66.5%
Soil Rating*:	71.8%

Pad Properties		
Depth, $D$ :	8	ft
Pad Width, $W_1$ :	22.5	ft
Pad Thickness, $T$ :	2.75	ft
Pad Rebar Size (Bottom dir. 2), $Sp_2$ :	9	
Pad Rebar Quantity (Bottom dir. 2), $mp_2$ :	23	
Pad Clear Cover, $cc_{pad}$ :	3	in

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

Soil Properties		
Total Soil Unit Weight, $\gamma$ :	110	pcf
Ultimate Net Bearing, $Q_{net}$ :	30.000	ksf
Cohesion, $C_u$ :	0.000	ksf
Friction Angle, $\phi$ :	28	degrees
SPT Blow Count, $N_{blows}$ :	56	
Base Friction, $\mu$ :	0.45	
Neglected Depth, $N$ :	3.75	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, $gw$ :	12	ft

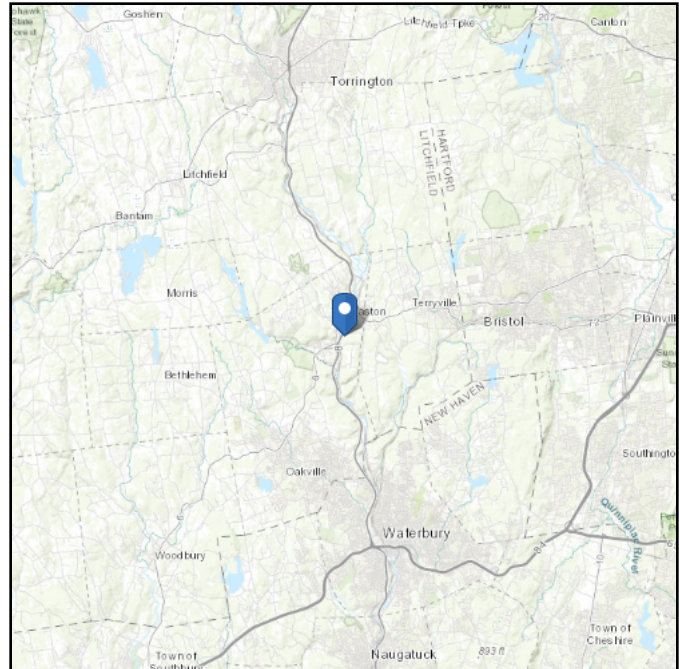
<--Toggle between Gross and Net

# 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)

**Elevation:** 543 ft (NAVD 88)  
**Latitude:** 41.663467  
**Longitude:** -73.074281



## Wind

### Results:

Wind Speed	116 Vmph
10-year MRI	75 Vmph
25-year MRI	84 Vmph
50-year MRI	89 Vmph
100-year MRI	96 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: Sat Feb 26 2022

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).

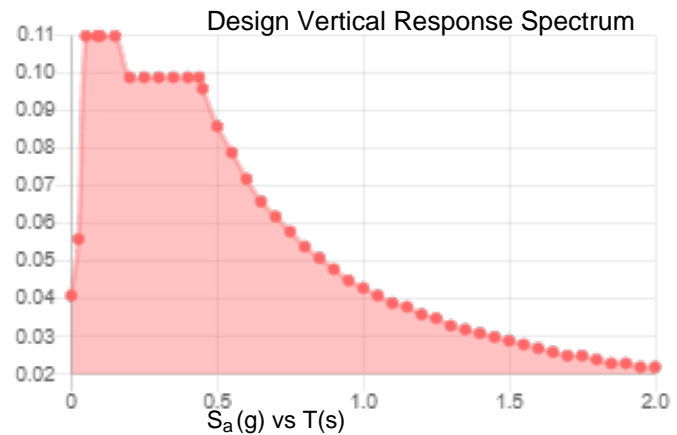
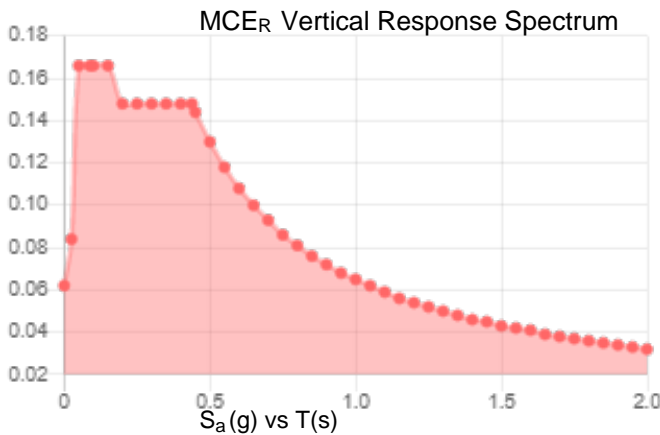
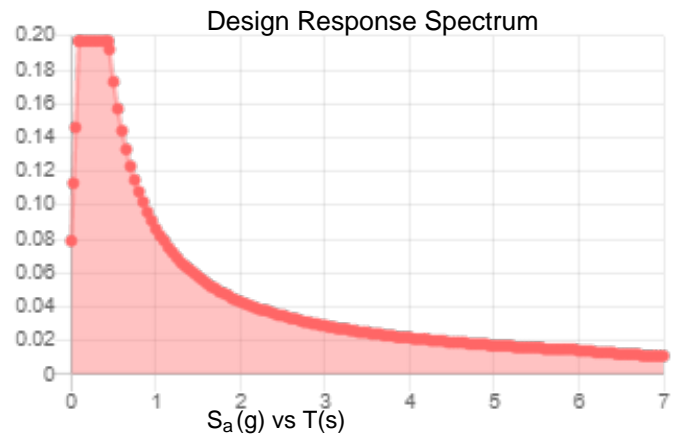
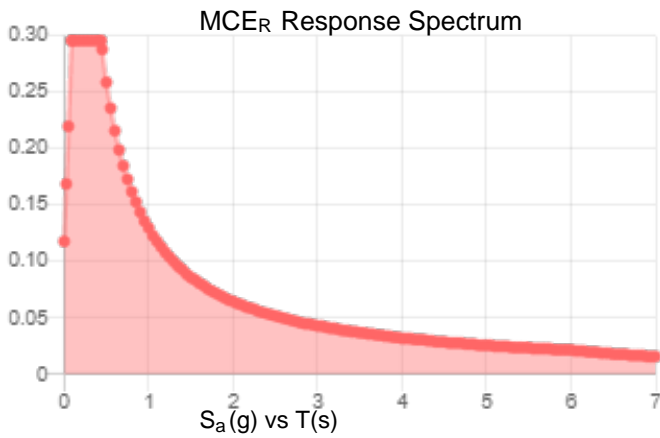
Site is in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

**Site Soil Class:** D - Default (see Section 11.4.3)

**Results:**

$S_s$ :	0.185	$S_{D1}$ :	0.086
$S_1$ :	0.054	$T_L$ :	6
$F_a$ :	1.6	PGA :	0.1
$F_v$ :	2.4	PGA <sub>M</sub> :	0.16
$S_{MS}$ :	0.296	$F_{PGA}$ :	1.6
$S_{M1}$ :	0.13	$I_e$ :	1
$S_{DS}$ :	0.197	$C_v$ :	0.7

**Seismic Design Category** B



**Data Accessed:** Sat Feb 26 2022

**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: 1.00 in.  
Concurrent Temperature: 15 F  
Gust Speed 50 mph

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

**Date Accessed:** Sat Feb 26 2022

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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