

Date: **May 1, 2024**



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

Subject: Structural Analysis Report

Carrier Designation: **Verizon Wireless Co-Locate**
Site Number: 5000232014
Site Name: Coventry West CT - A

Crown Castle Designation: **BU Number:** 842856
Site Name: Andover North
JDE Job Number: 2114111
Work Order Number: 2296102
Order Number: 669083 Rev. 0

Engineering Firm Designation: **TEP Project Number:** 63435.950905

Site Data: **122 Jonathan Trumbull Highway (Route 6),**
Andover, Tolland County, CT 06232
Latitude 41° 45' 0.46", Longitude -72° 24' 9.63"
149 Foot - Monopole Tower

Tower Engineering Professionals is pleased to submit this "**Structural Analysis Report**" to determine the structural integrity of the above-mentioned tower.

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

LC7: Proposed Equipment Configuration

Sufficient Capacity – 98.1%

This analysis has been performed in accordance with the 2022 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 119 mph. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural analysis prepared by: MS / CS

Respectfully submitted by:

Aaron T. Rucker, P.E.



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05/01/2024

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

4.1) Recommendations

5) APPENDIX A

tnxTower Output

6) APPENDIX B

Base Level Drawing

7) APPENDIX C

Additional Calculations

1) INTRODUCTION

This is a 149-ft monopole tower designed by Engineered Endeavors, Inc. The tower has been modified multiple times in the past to accommodate additional loading.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	119 mph
Exposure Category:	C
Topographic Factor:	1.0
Ice Thickness:	1.50 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
130.0	130.0	6	Commscope	NHH-65B-R2B w/ Mount Pipe	2	1-5/8
		6	Commscope	NHH-65B-R2B		
		6	Samsung Telecom.	RFV01U-D2A		
		6	Samsung Telecom.	RFV01U-D1A		
		4	Kaelus	BSF0020F3V1		
		1	RFS Celwave	DB-C1-12C-24AB-0Z		
		1	Tower Mounts	T-Arm Mount [TA 702-3_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)
149.0	149.0	3	CCI Antennas	HPA65R-BU6A	1 2 6	3/8 7/8 1-1/4
		3	CCI Antennas	DMP65R-BU6D		
		3	Ericsson	RRUS 4449 B5/B12		
		3	Ericsson	RRUS 8843 B2/B66A		
		1	Raycap	DC6-48-60-18-8F		
		1	Sabre	C10855721C 12' Platform Mount		
140.0	140.0	3	Ericsson	AIR 6419 B41_TMO_CCIV2 w/ Mount Pipe	3	1-5/8
		3	RFS Celwave	APXVAARR24_43-U-NA20 w/ Mount Pipe		
		3	Ericsson	RADIO 4449 B71 B85A_T-MOBILE		
		3	Ericsson	RADIO 4460 B2/B25 B66_TMO		
		1	Site Pro 1	RMQP-496 Platform Mount		
		1	Site Pro 1	HRK12 Handrail Kit		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
120.0	120.0	3	JMA Wireless	MX08FRO665-21 w/ Mount Pipe	1	1-1/2
		3	Fujitsu	TA08025-B604		
		3	Fujitsu	TA08025-B605		
		1	Raycap	RDIDC-9181-PF-48		
		1	Tower Mounts	Sabre C10801018-32788		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
Geotechnical Report	4713186	CCISites
Tower Foundation Drawings	4529267	CCISites
Tower Manufacturer Drawings	4713188	CCISites
Tower Reinforcement Drawings	4713190	CCISites
Post-Modification Inspection	4713189	CCISites
Tower Reinforcement Drawings	5760149	CCISites
Post-Modification Inspection	6003147	CCISites
Tower Reinforcement Drawings	9631497	CCISites
Post-Modification Inspection	10135443	CCISites

3.1) Analysis Method

tnxTower (version 8.2.4.3), 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.

tnxTower was used to determine the loads on the modified structure. Additional calculations were performed to determine the stresses in the pole and in the reinforcing elements. These calculations are presented in Appendix C.

3.2) Assumptions

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

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)^{1,2}

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
149 - 144	Pole	TP22.426x21.5x0.1875	Pole	6.2%	Pass
144 - 139	Pole	TP23.352x22.426x0.1875	Pole	12.7%	Pass
139 - 134	Pole	TP24.278x23.352x0.1875	Pole	21.6%	Pass
134 - 129	Pole	TP25.204x24.278x0.1875	Pole	31.1%	Pass
129 - 127.39	Pole	TP26.202x25.204x0.1875	Pole	34.8%	Pass
127.39 - 122.39	Pole	TP26.043x25.128x0.1875	Pole	46.6%	Pass
122.39 - 117.39	Pole	TP26.958x26.043x0.1875	Pole	58.5%	Pass
117.39 - 112.39	Pole	TP27.873x26.958x0.1875	Pole	70.1%	Pass
112.39 - 107.39	Pole	TP28.788x27.873x0.1875	Pole	80.9%	Pass
107.39 - 102.39	Pole	TP29.703x28.788x0.1875	Pole	90.8%	Pass
102.39 - 98.5	Pole	TP30.415x29.703x0.1875	Pole	98.1%	Pass
98.5 - 98.25	Pole + Reinf.	TP30.46x30.415x0.3438	Reinf. 2 Tension Rupture	78.7%	Pass
98.25 - 93.25	Pole + Reinf.	TP31.375x30.46x0.3375	Reinf. 2 Tension Rupture	85.7%	Pass
93.25 - 88.25	Pole + Reinf.	TP32.29x31.375x0.3313	Reinf. 2 Tension Rupture	92.2%	Pass
88.25 - 83.87	Pole + Reinf.	TP33.96x32.29x0.3313	Reinf. 2 Tension Rupture	97.5%	Pass
83.87 - 78.13	Pole	TP33.763x32.716x0.25	Pole	88.2%	Pass
78.13 - 73.13	Pole	TP34.675x33.763x0.25	Pole	92.5%	Pass
73.13 - 70	Pole	TP35.245x34.675x0.25	Pole	95.0%	Pass
70 - 69.75	Pole + Reinf.	TP35.29x35.245x0.5	Reinf. 8 Tension Rupture	67.2%	Pass
69.75 - 64.75	Pole + Reinf.	TP36.202x35.29x0.4875	Reinf. 8 Tension Rupture	70.2%	Pass
64.75 - 59.75	Pole + Reinf.	TP37.113x36.202x0.4875	Reinf. 8 Tension Rupture	73.0%	Pass
59.75 - 57.25	Pole + Reinf.	TP37.568x37.113x0.4813	Reinf. 8 Tension Rupture	74.3%	Pass
57.25 - 57	Pole + Reinf.	TP37.614x37.568x0.65	Reinf. 1 Tension Rupture	56.2%	Pass
57 - 56.75	Pole + Reinf.	TP37.659x37.614x0.4188	Reinf. 1 Tension Rupture	86.7%	Pass
56.75 - 51.75	Pole + Reinf.	TP38.571x37.659x0.4125	Reinf. 1 Tension Rupture	89.5%	Pass
51.75 - 48.76	Pole + Reinf.	TP40.121x38.571x0.4125	Reinf. 1 Tension Rupture	91.1%	Pass
48.76 - 42.24	Pole	TP39.803x38.616x0.3125	Pole	86.0%	Pass
42.24 - 37.24	Pole	TP40.714x39.803x0.3125	Pole	88.0%	Pass
37.24 - 32.24	Pole	TP41.625x40.714x0.3125	Pole	89.9%	Pass
32.24 - 27.24	Pole	TP42.536x41.625x0.3125	Pole	91.7%	Pass
27.24 - 22.24	Pole	TP43.447x42.536x0.3125	Pole	93.4%	Pass
22.24 - 17.25	Pole	TP44.357x43.447x0.3125	Pole	95.1%	Pass
17.25 - 17	Pole + Reinf.	TP44.403x44.357x0.625	Reinf. 6 Tension Rupture	62.9%	Pass
17 - 12	Pole + Reinf.	TP45.314x44.403x0.6125	Reinf. 6 Tension Rupture	64.1%	Pass
12 - 7	Pole + Reinf.	TP46.225x45.314x0.6125	Reinf. 6 Tension Rupture	65.2%	Pass
7 - 5.25	Pole + Reinf.	TP46.543x46.225x0.6125	Reinf. 6 Tension Rupture	65.5%	Pass
5.25 - 5	Pole + Reinf.	TP46.589x46.543x0.6	Reinf. 4 Tension Yield	64.2%	Pass
5 - 0	Pole + Reinf.	TP47.5x46.589x0.5875	Reinf. 4 Tension Yield	65.1%	Pass
				Summary	
			Pole	98.1%	Pass
			Reinforcement	97.5%	Pass

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
			Overall	98.1%	Pass

Table 5 - Tower Component Stresses vs. Capacity - LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Anchor Rods	-	82.6	Pass
1,2	Base Plate	-	93.3	Pass
1,2	Base Foundation Structural	-	63.0	Pass
1,2	Base Foundation Soil Interaction	-	85.8	Pass

Structure Rating (max from all components) =	98.1%
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Notes:

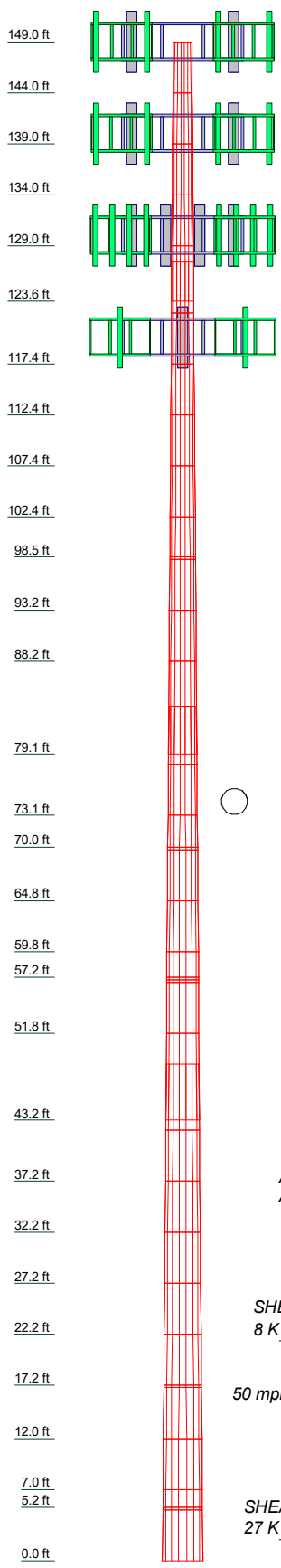
- 1) See additional documentation in "Appendix C - Additional Calculations" for calculations supporting the % capacity listed.
- 2) Rating per TIA-222-H Section 15.5

4.1) Recommendations

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

APPENDIX A
TNXTOWER OUTPUT

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	5.00	18	0.1875		149.0	149.0	A572-65	0.2
2	5.00	18	0.1875		144.0	144.0	A572-65	0.2
3	5.00	18	0.1875		139.0	139.0	A572-65	0.2
4	5.00	18	0.1875		134.0	134.0	A572-65	0.2
5	5.00	18	0.1875		129.0	129.0	A572-65	0.2
6	5.00	18	0.1875		123.6	123.6	A572-65	0.3
7	5.00	18	0.1875		117.4	117.4	A572-65	0.3
8	5.00	18	0.1875		112.4	112.4	A572-65	0.3
9	5.00	18	0.1875		107.4	107.4	A572-65	0.3
10	5.00	18	0.1875		102.4	102.4	A572-65	0.3
11	5.00	18	0.1875		98.5	98.5	A572-65	0.2
12	5.00	18	0.1875		93.2	93.2	A572-65	0.5
13	5.00	18	0.3312		88.2	88.2	A572-65	0.5
14	5.00	18	0.3312		79.1	79.1	A572-65	1.0
15	5.00	18	0.3312		79.1	79.1	A572-65	1.0
16	5.00	18	0.3312		79.1	79.1	A572-65	1.0
17	5.00	18	0.3312		73.1	73.1	A572-65	0.5
18	5.00	18	0.3312		70.0	70.0	A572-65	0.3
19	5.00	18	0.3312		64.8	64.8	A572-65	0.9
20	5.00	18	0.3312		59.8	59.8	A572-65	0.9
21	5.00	18	0.3312		57.2	57.2	A572-65	0.5
22	5.00	18	0.3312		51.8	51.8	A572-65	0.8
23	5.00	18	0.3312		51.8	51.8	A572-65	0.8
24	5.00	18	0.3312		51.8	51.8	A572-65	0.8
25	5.00	18	0.3312		51.8	51.8	A572-65	0.8
26	5.00	18	0.3312		43.2	43.2	A572-65	1.4
27	5.00	18	0.3312		43.2	43.2	A572-65	1.4
28	5.00	18	0.3312		37.2	37.2	A572-65	0.9
29	5.00	18	0.3312		32.2	32.2	A572-65	0.7
30	5.00	18	0.3312		32.2	32.2	A572-65	0.7
31	5.00	18	0.3312		27.2	27.2	A572-65	0.7
32	5.00	18	0.3312		22.2	22.2	A572-65	0.7
33	5.00	18	0.3312		22.2	22.2	A572-65	0.7
34	5.00	18	0.3312		17.2	17.2	A572-65	1.4
35	5.00	18	0.3312		12.0	12.0	A572-65	1.4
36	5.00	18	0.3312		7.0	7.0	A572-65	1.4
37	5.00	18	0.3312		5.2	5.2	A572-65	1.4
38	5.00	18	0.3312		0.0	0.0	A572-65	1.4
39	5.00	18	0.3312		0.0	0.0	A572-65	1.4
40	5.00	18	0.3312		0.0	0.0	A572-65	1.4
41	5.00	18	0.3312		0.0	0.0	A572-65	1.4
42	5.00	18	0.3312		0.0	0.0	A572-65	1.4
43	5.00	18	0.3312		0.0	0.0	A572-65	1.4
44	5.00	18	0.3312		0.0	0.0	A572-65	1.4
45	5.00	18	0.3312		0.0	0.0	A572-65	1.4
46	5.00	18	0.3312		0.0	0.0	A572-65	1.4
47	5.00	18	0.3312		0.0	0.0	A572-65	1.4
48	5.00	18	0.3312		0.0	0.0	A572-65	1.4
49	5.00	18	0.3312		0.0	0.0	A572-65	1.4
50	5.00	18	0.3312		0.0	0.0	A572-65	1.4
51	5.00	18	0.3312		0.0	0.0	A572-65	1.4
52	5.00	18	0.3312		0.0	0.0	A572-65	1.4
53	5.00	18	0.3312		0.0	0.0	A572-65	1.4
54	5.00	18	0.3312		0.0	0.0	A572-65	1.4
55	5.00	18	0.3312		0.0	0.0	A572-65	1.4
56	5.00	18	0.3312		0.0	0.0	A572-65	1.4
57	5.00	18	0.3312		0.0	0.0	A572-65	1.4
58	5.00	18	0.3312		0.0	0.0	A572-65	1.4
59	5.00	18	0.3312		0.0	0.0	A572-65	1.4
60	5.00	18	0.3312		0.0	0.0	A572-65	1.4
61	5.00	18	0.3312		0.0	0.0	A572-65	1.4
62	5.00	18	0.3312		0.0	0.0	A572-65	1.4
63	5.00	18	0.3312		0.0	0.0	A572-65	1.4
64	5.00	18	0.3312		0.0	0.0	A572-65	1.4
65	5.00	18	0.3312		0.0	0.0	A572-65	1.4
66	5.00	18	0.3312		0.0	0.0	A572-65	1.4
67	5.00	18	0.3312		0.0	0.0	A572-65	1.4
68	5.00	18	0.3312		0.0	0.0	A572-65	1.4
69	5.00	18	0.3312		0.0	0.0	A572-65	1.4
70	5.00	18	0.3312		0.0	0.0	A572-65	1.4
71	5.00	18	0.3312		0.0	0.0	A572-65	1.4
72	5.00	18	0.3312		0.0	0.0	A572-65	1.4
73	5.00	18	0.3312		0.0	0.0	A572-65	1.4
74	5.00	18	0.3312		0.0	0.0	A572-65	1.4
75	5.00	18	0.3312		0.0	0.0	A572-65	1.4
76	5.00	18	0.3312		0.0	0.0	A572-65	1.4
77	5.00	18	0.3312		0.0	0.0	A572-65	1.4
78	5.00	18	0.3312		0.0	0.0	A572-65	1.4
79	5.00	18	0.3312		0.0	0.0	A572-65	1.4
80	5.00	18	0.3312		0.0	0.0	A572-65	1.4
81	5.00	18	0.3312		0.0	0.0	A572-65	1.4
82	5.00	18	0.3312		0.0	0.0	A572-65	1.4
83	5.00	18	0.3312		0.0	0.0	A572-65	1.4
84	5.00	18	0.3312		0.0	0.0	A572-65	1.4
85	5.00	18	0.3312		0.0	0.0	A572-65	1.4
86	5.00	18	0.3312		0.0	0.0	A572-65	1.4
87	5.00	18	0.3312		0.0	0.0	A572-65	1.4
88	5.00	18	0.3312		0.0	0.0	A572-65	1.4
89	5.00	18	0.3312		0.0	0.0	A572-65	1.4
90	5.00	18	0.3312		0.0	0.0	A572-65	1.4
91	5.00	18	0.3312		0.0	0.0	A572-65	1.4
92	5.00	18	0.3312		0.0	0.0	A572-65	1.4
93	5.00	18	0.3312		0.0	0.0	A572-65	1.4
94	5.00	18	0.3312		0.0	0.0	A572-65	1.4
95	5.00	18	0.3312		0.0	0.0	A572-65	1.4
96	5.00	18	0.3312		0.0	0.0	A572-65	1.4
97	5.00	18	0.3312		0.0	0.0	A572-65	1.4
98	5.00	18	0.3312		0.0	0.0	A572-65	1.4
99	5.00	18	0.3312		0.0	0.0	A572-65	1.4
100	5.00	18	0.3312		0.0	0.0	A572-65	1.4

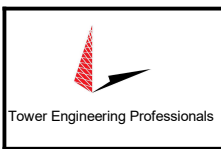
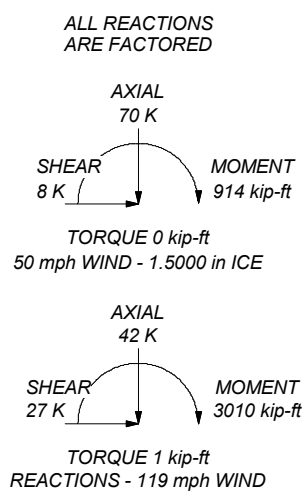


MATERIAL STRENGTH

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

TOWER DESIGN NOTES

- 1. Tower is located in Tolland County, Connecticut.
- 2. Tower designed for Exposure C to the TIA-222-H Standard.
- 3. Tower designed for a 119 mph basic wind in accordance with the TIA-222-H Standard.
- 4. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
- 5. Deflections are based upon a 60 mph wind.
- 6. Tower Risk Category II.
- 7. Topographic Category 1 with Crest Height of 0.00 ft
- 8. TOWER RATING: 98.1%



Tower Engineering Professionals, Inc.
 326 Tryon Road
 Raleigh, NC 27603
 Phone: (919) 661-6351
 FAX: (919) 661-6350

Job: Andover North (BU 842856)		
Project: TEP No. 63435.950905		
Client: Crown Castle	Drawn by: adare	App'd:
Code: TIA-222-H	Date: 05/01/24	Scale: NTS
Path:		Dwg No. E-1

tnxTower Tower Engineering Professionals, Inc. 326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Job Andover North (BU 842856)	Page 1 of 24
	Project TEP No. 63435.950905	Date 08:56:41 05/01/24
	Client Crown Castle	Designed by adare

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 Tolland County, Connecticut.
- Tower base elevation above sea level: 496.00 ft.
- Basic wind speed of 119 mph.
- Risk Category II.
- Exposure Category C.
- Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- Topographic Category: 1.
- Crest Height: 0.00 ft.
- Nominal ice thickness of 1.5000 in.
- Ice thickness is considered to increase with height.
- Ice density of 56 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50 °F.
- Deflections calculated using a wind speed of 60 mph.
- A non-linear (P-delta) analysis was used.
- Pressures are calculated at each section.
- Stress ratio used in pole design is 1.
- Tower analysis based on target reliabilities in accordance with Annex S.
- Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
- Maximum demand-capacity ratio is: 1.05.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

- | | | |
|---|---|---|
| <ul style="list-style-type: none"> Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification √ Use Code Stress Ratios √ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile Include Bolts In Member Capacity Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) SR Members Have Cut Ends SR Members Are Concentric 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 Tower Engineering Professionals, Inc. 326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Job	Andover North (BU 842856)	Page	2 of 24
	Project	TEP No. 63435.950905	Date	08:56:41 05/01/24
	Client	Crown Castle	Designed by	adare

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	149.00-144.00	5.00	0.00	18	21.5000	22.4260	0.1875	0.7500	A572-65 (65 ksi)
L2	144.00-139.00	5.00	0.00	18	22.4260	23.3521	0.1875	0.7500	A572-65 (65 ksi)
L3	139.00-134.00	5.00	0.00	18	23.3521	24.2781	0.1875	0.7500	A572-65 (65 ksi)
L4	134.00-129.00	5.00	0.00	18	24.2781	25.2042	0.1875	0.7500	A572-65 (65 ksi)
L5	129.00-123.61	5.39	3.78	18	25.2042	26.2021	0.1875	0.7500	A572-65 (65 ksi)
L6	123.61-122.39	5.00	0.00	18	25.1277	26.0428	0.1875	0.7500	A572-65 (65 ksi)
L7	122.39-117.39	5.00	0.00	18	26.0428	26.9578	0.1875	0.7500	A572-65 (65 ksi)
L8	117.39-112.39	5.00	0.00	18	26.9578	27.8729	0.1875	0.7500	A572-65 (65 ksi)
L9	112.39-107.39	5.00	0.00	18	27.8729	28.7879	0.1875	0.7500	A572-65 (65 ksi)
L10	107.39-102.39	5.00	0.00	18	28.7879	29.7030	0.1875	0.7500	A572-65 (65 ksi)
L11	102.39-98.50	3.89	0.00	18	29.7030	30.4145	0.1875	0.7500	A572-65 (65 ksi)
L12	98.50-98.25	0.25	0.00	18	30.4145	30.4603	0.3438	1.3750	A572-65 (65 ksi)
L13	98.25-93.25	5.00	0.00	18	30.4603	31.3753	0.3375	1.3500	A572-65 (65 ksi)
L14	93.25-88.25	5.00	0.00	18	31.3753	32.2904	0.3312	1.3250	A572-65 (65 ksi)
L15	88.25-79.13	9.12	4.75	18	32.2904	33.9598	0.3312	1.3250	A572-65 (65 ksi)
L16	79.13-78.13	5.75	0.00	18	32.7164	33.7634	0.2500	1.0000	A572-65 (65 ksi)
L17	78.13-73.13	5.00	0.00	18	33.7634	34.6747	0.2500	1.0000	A572-65 (65 ksi)
L18	73.13-70.00	3.13	0.00	18	34.6747	35.2447	0.2500	1.0000	A572-65 (65 ksi)
L19	70.00-69.75	0.25	0.00	18	35.2447	35.2903	0.5000	2.0000	A572-65 (65 ksi)
L20	69.75-64.75	5.00	0.00	18	35.2903	36.2015	0.4875	1.9500	A572-65 (65 ksi)
L21	64.75-59.75	5.00	0.00	18	36.2015	37.1128	0.4875	1.9500	A572-65 (65 ksi)
L22	59.75-57.25	2.50	0.00	18	37.1128	37.5684	0.4813	1.9250	A572-65 (65 ksi)
L23	57.25-57.00	0.25	0.00	18	37.5684	37.6139	0.6500	2.6000	A572-65 (65 ksi)
L24	57.00-56.75	0.25	0.00	18	37.6139	37.6595	0.4188	1.6750	A572-65 (65 ksi)
L25	56.75-51.75	5.00	0.00	18	37.6595	38.5707	0.4125	1.6500	A572-65 (65 ksi)
L26	51.75-43.24	8.51	5.52	18	38.5707	40.1211	0.4125	1.6500	A572-65 (65 ksi)
L27	43.24-42.24	6.52	0.00	18	38.6156	39.8031	0.3125	1.2500	A572-65 (65 ksi)
L28	42.24-37.24	5.00	0.00	18	39.8031	40.7141	0.3125	1.2500	A572-65 (65 ksi)
L29	37.24-32.24	5.00	0.00	18	40.7141	41.6251	0.3125	1.2500	A572-65 (65 ksi)
L30	32.24-27.24	5.00	0.00	18	41.6251	42.5362	0.3125	1.2500	A572-65 (65 ksi)
L31	27.24-22.24	5.00	0.00	18	42.5362	43.4472	0.3125	1.2500	A572-65 (65 ksi)

tnxTower Tower Engineering Professionals, Inc. 326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Job	Andover North (BU 842856)	Page	3 of 24
	Project	TEP No. 63435.950905	Date	08:56:41 05/01/24
	Client	Crown Castle	Designed by	adare

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 (65 ksi)
L32	22.24-17.25	4.99	0.00	18	43.4472	44.3569	0.3125	1.2500	A572-65
L33	17.25-17.00	0.25	0.00	18	44.3569	44.4025	0.6250	2.5000	A572-65
L34	17.00-12.00	5.00	0.00	18	44.4025	45.3135	0.6125	2.4500	A572-65
L35	12.00-7.00	5.00	0.00	18	45.3135	46.2246	0.6125	2.4500	A572-65
L36	7.00-5.25	1.75	0.00	18	46.2246	46.5434	0.6125	2.4500	A572-65
L37	5.25-5.00	0.25	0.00	18	46.5434	46.5890	0.6000	2.4000	A572-65
L38	5.00-0.00	5.00		18	46.5890	47.5000	0.5875	2.3500	A572-65

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	Iu/Q in ²	w in	w/t
L1	21.8027	12.6836	727.8616	7.5659	10.9220	66.6418	1456.6810	6.3430	3.4540	18.421
	22.7431	13.2347	826.9227	7.8947	11.3924	72.5853	1654.9335	6.6186	3.6170	19.291
L2	22.7431	13.2347	826.9227	7.8947	11.3924	72.5853	1654.9335	6.6186	3.6170	19.291
	23.6834	13.7858	934.5872	8.2234	11.8629	78.7826	1870.4041	6.8942	3.7800	20.16
L3	23.6834	13.7858	934.5872	8.2234	11.8629	78.7826	1870.4041	6.8942	3.7800	20.16
	24.6237	14.3369	1051.2133	8.5522	12.3333	85.2338	2103.8097	7.1698	3.9430	21.029
L4	24.6237	14.3369	1051.2133	8.5522	12.3333	85.2338	2103.8097	7.1698	3.9430	21.029
	25.5641	14.8881	1177.1593	8.8809	12.8037	91.9388	2355.8675	7.4454	4.1059	21.898
L5	25.5641	14.8881	1177.1593	8.8809	12.8037	91.9388	2355.8675	7.4454	4.1059	21.898
	26.5774	15.4819	1323.7230	9.2352	13.3107	99.4483	2649.1877	7.7424	4.2816	22.835
L6	26.5774	15.4819	1323.7230	9.2352	13.3107	99.4483	2649.1877	7.7424	4.2816	22.835
	26.1882	14.8426	1166.4013	8.8538	12.7649	91.3757	2334.3373	7.4227	4.0925	21.827
L7	26.1882	14.8426	1166.4013	8.8538	12.7649	91.3757	2334.3373	7.4227	4.0925	21.827
	26.4156	15.3871	1299.5538	9.1786	13.2297	98.2297	2600.8176	7.6950	4.2535	22.686
L8	26.4156	15.3871	1299.5538	9.1786	13.2297	98.2297	2600.8176	7.6950	4.2535	22.686
	27.3448	15.9317	1442.4727	9.5035	13.6946	105.3316	2886.8435	7.9674	4.4146	23.544
L9	27.3448	15.9317	1442.4727	9.5035	13.6946	105.3316	2886.8435	7.9674	4.4146	23.544
	28.2740	16.4763	1595.5037	9.8283	14.1594	112.6813	3193.1069	8.2397	4.5756	24.403
L10	28.2740	16.4763	1595.5037	9.8283	14.1594	112.6813	3193.1069	8.2397	4.5756	24.403
	29.2031	17.0208	1758.9924	10.1532	14.6243	120.2789	3520.2994	8.5120	4.7367	25.262
L11	29.2031	17.0208	1758.9924	10.1532	14.6243	120.2789	3520.2994	8.5120	4.7367	25.262
	30.1323	17.5654	1933.2845	10.4780	15.0891	128.1244	3869.1128	8.7844	4.8977	26.121
L12	30.1323	17.5654	1933.2845	10.4780	15.0891	128.1244	3869.1128	8.7844	4.8977	26.121
	30.8548	17.9889	2076.5017	10.7306	15.4506	134.3963	4155.7356	8.9961	5.0230	26.789
L13	30.8548	17.9889	2076.5017	10.7306	15.4506	134.3963	4155.7356	8.9961	5.0230	26.789
	30.8307	32.8091	3748.1880	10.6751	15.4506	242.5920	7501.3080	16.4077	4.7480	13.812
L14	30.8307	32.8091	3748.1880	10.6751	15.4506	242.5920	7501.3080	16.4077	4.7480	13.812
	30.8772	32.8590	3765.3226	10.6914	15.4738	243.3349	7535.5997	16.4326	4.7560	13.836
L15	30.8772	32.8590	3765.3226	10.6914	15.4738	243.3349	7535.5997	16.4326	4.7560	13.836
	30.8781	32.2683	3699.1642	10.6936	15.4738	239.0594	7403.1959	16.1372	4.7670	14.124
L16	30.8781	32.2683	3699.1642	10.6936	15.4738	239.0594	7403.1959	16.1372	4.7670	14.124
	31.8073	33.2485	4046.6203	11.0184	15.9387	253.8869	8098.5653	16.6274	4.9281	14.602
L17	31.8073	33.2485	4046.6203	11.0184	15.9387	253.8869	8098.5653	16.6274	4.9281	14.602
	31.8083	32.6394	3974.0827	11.0207	15.9387	249.3359	7953.3945	16.3228	4.9391	14.91
L18	31.8083	32.6394	3974.0827	11.0207	15.9387	249.3359	7953.3945	16.3228	4.9391	14.91
	32.7374	33.6014	4335.9604	11.3455	16.4035	264.3312	8677.6261	16.8039	5.1001	15.397
L19	32.7374	33.6014	4335.9604	11.3455	16.4035	264.3312	8677.6261	16.8039	5.1001	15.397
	34.4326	35.3566	5051.5503	11.9381	17.2516	292.8167	10109.7476	17.6817	5.3939	16.284
L20	34.4326	35.3566	5051.5503	11.9381	17.2516	292.8167	10109.7476	17.6817	5.3939	16.284
	34.0607	25.7621	3430.7379	11.5256	16.6199	206.4230	6865.9900	12.8835	5.3181	21.272
L21	34.0607	25.7621	3430.7379	11.5256	16.6199	206.4230	6865.9900	12.8835	5.3181	21.272
	34.2457	26.5929	3773.4695	11.8973	17.1518	220.0040	7551.9043	13.2990	5.5024	22.009
L22	34.2457	26.5929	3773.4695	11.8973	17.1518	220.0040	7551.9043	13.2990	5.5024	22.009
	35.1710	27.3160	4089.7176	12.2208	17.6147	232.1760	8184.8165	13.6606	5.6627	22.651
L23	35.1710	27.3160	4089.7176	12.2208	17.6147	232.1760	8184.8165	13.6606	5.6627	22.651
	35.7499	27.7683	4296.2762	12.4231	17.9043	239.9575	8598.2055	13.8868	5.7631	23.052

<p>tnxTower</p> <p>Tower Engineering Professionals, Inc. 326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350</p>	Job Andover North (BU 842856)	Page 4 of 24
	Project TEP No. 63435.950905	Date 08:56:41 05/01/24
	Client Crown Castle	Designed by adare

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	I/Q in ²	w in	w/t
L19	35.7113	55.1399	8409.7109	12.3344	17.9043	469.7029	16830.4875	27.5752	5.3231	10.646
	35.7576	55.2122	8442.8379	12.3506	17.9275	470.9443	16896.7851	27.6113	5.3311	10.662
L20	35.7595	53.8512	8240.6431	12.3550	17.9275	459.6658	16492.1294	26.9307	5.3531	10.981
	36.6848	55.2612	8905.0273	12.6785	18.3904	484.2222	17821.7720	27.6358	5.5135	11.31
L21	36.6848	55.2612	8905.0273	12.6785	18.3904	484.2222	17821.7720	27.6358	5.5135	11.31
	37.6101	56.6712	9604.1945	13.0020	18.8533	509.4177	19221.0265	28.3410	5.6738	11.639
L22	37.6110	55.9542	9485.9184	13.0042	18.8533	503.1442	18984.3187	27.9824	5.6848	11.813
	38.0737	56.6501	9844.2920	13.1659	19.0847	515.8203	19701.5373	28.3304	5.7650	11.979
L23	38.0477	76.1663	13115.5143	13.1060	19.0847	687.2255	26248.2863	38.0904	5.4680	8.412
	38.0939	76.2603	13164.1326	13.1222	19.1079	688.9374	26345.5868	38.1374	5.4761	8.425
L24	38.1296	49.4366	8640.9061	13.2043	19.1079	452.2169	17293.1822	24.7230	5.8831	14.049
	38.1759	49.4971	8672.6987	13.2205	19.1310	453.3317	17356.8091	24.7533	5.8911	14.068
L25	38.1768	48.7666	8547.5575	13.2227	19.1310	446.7904	17106.3621	24.3879	5.9021	14.308
	39.1021	49.9596	9190.3682	13.5462	19.5939	469.0416	18392.8294	24.9846	6.0624	14.697
L26	39.1021	49.9596	9190.3682	13.5462	19.5939	469.0416	18392.8294	24.9846	6.0624	14.697
	40.6764	51.9895	10356.7156	14.0966	20.3815	508.1425	20727.0589	25.9997	6.3353	15.358
L27	40.1839	37.9919	7042.0273	13.5976	19.6167	358.9804	14093.3207	18.9996	6.2464	19.988
	40.3689	39.1697	7717.4699	14.0192	20.2200	381.6757	15445.0947	19.5886	6.4553	20.657
L28	40.3689	39.1697	7717.4699	14.0192	20.2200	381.6757	15445.0947	19.5886	6.4553	20.657
	41.2940	40.0733	8264.0016	14.3426	20.6828	399.5598	16538.8772	20.0405	6.6157	21.17
L29	41.2940	40.0733	8264.0016	14.3426	20.6828	399.5598	16538.8772	20.0405	6.6157	21.17
	42.2191	40.9770	8835.7453	14.6660	21.1456	417.8533	17683.1170	20.4924	6.7760	21.683
L30	42.2191	40.9770	8835.7453	14.6660	21.1456	417.8533	17683.1170	20.4924	6.7760	21.683
	43.1441	41.8806	9433.2697	14.9894	21.6084	436.5562	18878.9519	20.9443	6.9364	22.196
L31	43.1441	41.8806	9433.2697	14.9894	21.6084	436.5562	18878.9519	20.9443	6.9364	22.196
	44.0692	42.7842	10057.1431	15.3128	22.0712	455.6687	20127.5197	21.3962	7.0967	22.709
L32	44.0692	42.7842	10057.1431	15.3128	22.0712	455.6687	20127.5197	21.3962	7.0967	22.709
	44.9930	43.6866	10707.0040	15.6358	22.5333	475.1630	21428.0966	21.8474	7.2568	23.222
L33	44.9448	86.7533	20961.4305	15.5248	22.5333	930.2411	41950.4426	43.3849	6.7068	10.731
	44.9911	86.8436	21026.9994	15.5410	22.5565	932.1937	42081.6667	43.4301	6.7148	10.744
L34	44.9930	85.1310	20624.1160	15.5455	22.5565	914.3326	41275.3698	42.5736	6.7368	10.999
	45.9181	86.9022	21938.3049	15.8689	23.0193	953.0407	43905.4768	43.4593	6.8972	11.261
L35	45.9181	86.9022	21938.3049	15.8689	23.0193	953.0407	43905.4768	43.4593	6.8972	11.261
	46.8432	88.6733	23307.1682	16.1923	23.4821	992.5514	46645.0045	44.3451	7.0575	11.522
L36	46.8432	88.6733	23307.1682	16.1923	23.4821	992.5514	46645.0045	44.3451	7.0575	11.522
	47.1669	89.2932	23799.3933	16.3055	23.6441	1006.5698	47630.1025	44.6551	7.1136	11.614
L37	47.1689	87.4946	23332.7309	16.3099	23.6441	986.8328	46696.1636	43.7556	7.1356	11.893
	47.2151	87.5814	23402.2007	16.3261	23.6672	988.8032	46835.1947	43.7990	7.1437	11.906
L38	47.2170	85.7801	22933.3449	16.3305	23.6672	968.9928	45896.8660	42.8982	7.1657	12.197
	48.1421	87.4789	24323.0468	16.6539	24.1300	1008.0003	48678.0985	43.7478	7.3260	12.47

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A _f	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft ²	in					in	in	in
L1				1	1	1			
149.00-144.00				1	1	1			
L2				1	1	1			
144.00-139.00				1	1	1			
L3				1	1	1			
139.00-134.00				1	1	1			
L4				1	1	1			
134.00-129.00				1	1	1			
L5				1	1	1			
129.00-123.61				1	1	1			
L6				1	1	1			
123.61-122.39				1	1	1			
L7				1	1	1			
122.39-117.39				1	1	1			
L8				1	1	1			

tnxTower Tower Engineering Professionals, Inc. 326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Job	Andover North (BU 842856)	Page	5 of 24
	Project	TEP No. 63435.950905	Date	08:56:41 05/01/24
	Client	Crown Castle	Designed by	adare

Tower Elevation	Gusset Area (per face)	Gusset Thickness	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
ft	ft ²	in							
117.39-112.39									
L9				1	1	1			
112.39-107.39									
L10				1	1	1			
107.39-102.39									
L11				1	1	1			
102.39-98.50									
L12				1	1	0.959145			
98.50-98.25									
L13				1	1	0.964288			
98.25-93.25									
L14				1	1	0.970367			
93.25-88.25									
L15				1	1	0.96048			
88.25-79.13									
L16				1	1	1			
79.13-78.13									
L17				1	1	1			
78.13-73.13									
L18				1	1	1			
73.13-70.00									
L19				1	1	0.945087			
70.00-69.75									
L20				1	1	0.957334			
69.75-64.75									
L21				1	1	0.946274			
64.75-59.75									
L22				1	1	0.953008			
59.75-57.25									
L23				1	1	0.94446			
57.25-57.00									
L24				1	1	0.963391			
57.00-56.75									
L25				1	1	0.968946			
56.75-51.75									
L26				1	1	0.963836			
51.75-43.24									
L27				1	1	1			
43.24-42.24									
L28				1	1	1			
42.24-37.24									
L29				1	1	1			
37.24-32.24									
L30				1	1	1			
32.24-27.24									
L31				1	1	1			
27.24-22.24									
L32				1	1	1			
22.24-17.25									
L33				1	1	0.964184			
17.25-17.00									
L34				1	1	0.973933			
17.00-12.00									
L35 12.00-7.00				1	1	0.96467			
L36 7.00-5.25				1	1	0.961515			
L37 5.25-5.00				1	1	0.922305			
L38 5.00-0.00				1	1	0.933715			

tnxTower Tower Engineering Professionals, Inc. 326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Job	Andover North (BU 842856)	Page	6 of 24
	Project	TEP No. 63435.950905	Date	08:56:41 05/01/24
	Client	Crown Castle	Designed by	adare

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf

Mods										
(Area) CCI-65FP-060100 (H)	A	No	Surface Af (CaAa)	59.75 - 44.75	1	1	0.167 0.167	6.0000	14.0000	0.00
(Area) CCI-65FP-060100 (H)	C	No	Surface Af (CaAa)	59.75 - 44.75	1	1	0.167 0.167	6.0000	14.0000	0.00
(Area) CCI-65FP-060100 (H)	B	No	Surface Af (CaAa)	59.75 - 44.75	1	1	0.167 0.167	6.0000	14.0000	0.00

(Area) CCI-65FP-045100 (H)	A	No	Surface Af (CaAa)	100.50 - 80.50	1	1	0.333 0.333	4.5000	11.0000	0.00
(Area) CCI-65FP-045100 (H)	C	No	Surface Af (CaAa)	100.50 - 80.50	1	1	0.333 0.333	4.5000	11.0000	0.00
(Area) CCI-65FP-045100 (H)	B	No	Surface Af (CaAa)	100.50 - 80.50	1	1	0.333 0.333	4.5000	11.0000	0.00

CFP-080125	A	No	Surface Af (CaAa)	21.25 - 0.00	1	1	0.333 0.333	8.0000	18.5000	0.00
CFP-080125	C	No	Surface Af (CaAa)	21.25 - 0.00	1	1	-0.167 -0.167	8.0000	18.5000	0.00
WSCFP-080125	C	No	Surface Af (CaAa)	21.25 - 0.00	1	1	0.500 0.500	8.0000	18.5000	0.00
WSCFP-080125	B	No	Surface Af (CaAa)	21.25 - 0.00	1	1	0.000 0.000	8.0000	18.5000	0.00

(Area) CCI-65FP-065125 (H)	C	No	Surface Af (CaAa)	73.42 - 53.42	1	1	0.000 0.000	6.5000	15.5000	0.00
(Area) CCI-65FP-065125 (H)	B	No	Surface Af (CaAa)	73.42 - 53.42	1	1	0.000 0.000	6.5000	15.5000	0.00
(Area) CCI-65FP-065125 (H)	A	No	Surface Af (CaAa)	73.42 - 53.42	1	1	0.000 0.000	6.5000	15.5000	0.00

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C _A A _A ft ² /ft	Weight plf

FB-L98B-034-XXX(3/8)	C	No	No	Inside Pole	149.00 - 0.00	1	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.06 0.06 0.06 0.06
WR-VG66ST-BRD_CCIIV2(7/8)	C	No	No	Inside Pole	149.00 - 0.00	2	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	0.88 0.88 0.88 0.88
LDF6-50A(1-1/4)	C	No	No	Inside Pole	149.00 - 0.00	6	No Ice 1/2" Ice	0.00 0.00	0.60 0.60

tnxTower Tower Engineering Professionals, Inc. 326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Job	Andover North (BU 842856)	Page	7 of 24
	Project	TEP No. 63435.950905	Date	08:56:41 05/01/24
	Client	Crown Castle	Designed by	adare

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C _{AA} ft ² /ft	Weight plf
							1" Ice	0.00	0.60
							2" Ice	0.00	0.60

HB158-21U6S24-xx M_TMO(1-5/8)	C	No	No	Inside Pole	140.00 - 0.00	3	No Ice	0.00	2.50
							1/2" Ice	0.00	2.50
							1" Ice	0.00	2.50
							2" Ice	0.00	2.50

HB158-1-13U6-S6F 18(1-5/8)	C	No	No	Inside Pole	130.00 - 0.00	2	No Ice	0.00	1.90
							1/2" Ice	0.00	1.90
							1" Ice	0.00	1.90
							2" Ice	0.00	1.90

CU12PSM9P6XXX(1-1/2)	C	No	No	Inside Pole	120.00 - 0.00	1	No Ice	0.00	2.35
							1/2" Ice	0.00	2.35
							1" Ice	0.00	2.35
							2" Ice	0.00	2.35

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	149.00-144.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.03
L2	144.00-139.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.03
L3	139.00-134.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.06
L4	134.00-129.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.07
L5	129.00-123.61	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.09
L6	123.61-122.39	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.02
L7	122.39-117.39	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.09
L8	117.39-112.39	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.10
L9	112.39-107.39	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.10
L10	107.39-102.39	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00

tnxTower Tower Engineering Professionals, Inc. 326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Job Andover North (BU 842856)	Page 8 of 24
	Project TEP No. 63435.950905	Date 08:56:41 05/01/24
	Client Crown Castle	Designed by adare

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
L11	102.39-98.50	C	0.000	0.000	0.000	0.000	0.10
		A	0.000	0.000	1.500	0.000	0.00
		B	0.000	0.000	1.500	0.000	0.00
L12	98.50-98.25	C	0.000	0.000	1.500	0.000	0.07
		A	0.000	0.000	0.188	0.000	0.00
		B	0.000	0.000	0.188	0.000	0.00
L13	98.25-93.25	C	0.000	0.000	0.188	0.000	0.00
		A	0.000	0.000	3.750	0.000	0.00
		B	0.000	0.000	3.750	0.000	0.00
L14	93.25-88.25	C	0.000	0.000	3.750	0.000	0.10
		A	0.000	0.000	3.750	0.000	0.00
		B	0.000	0.000	3.750	0.000	0.00
L15	88.25-79.13	C	0.000	0.000	3.750	0.000	0.10
		A	0.000	0.000	5.812	0.000	0.00
		B	0.000	0.000	5.812	0.000	0.00
L16	79.13-78.13	C	0.000	0.000	5.812	0.000	0.17
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
L17	78.13-73.13	C	0.000	0.000	0.000	0.000	0.02
		A	0.000	0.000	0.316	0.000	0.00
		B	0.000	0.000	0.316	0.000	0.00
L18	73.13-70.00	C	0.000	0.000	0.316	0.000	0.10
		A	0.000	0.000	3.389	0.000	0.00
		B	0.000	0.000	3.389	0.000	0.00
L19	70.00-69.75	C	0.000	0.000	3.389	0.000	0.06
		A	0.000	0.000	0.271	0.000	0.00
		B	0.000	0.000	0.271	0.000	0.00
L20	69.75-64.75	C	0.000	0.000	0.271	0.000	0.00
		A	0.000	0.000	5.417	0.000	0.00
		B	0.000	0.000	5.417	0.000	0.00
L21	64.75-59.75	C	0.000	0.000	5.417	0.000	0.10
		A	0.000	0.000	5.417	0.000	0.00
		B	0.000	0.000	5.417	0.000	0.00
L22	59.75-57.25	C	0.000	0.000	5.417	0.000	0.10
		A	0.000	0.000	5.208	0.000	0.00
		B	0.000	0.000	5.208	0.000	0.00
L23	57.25-57.00	C	0.000	0.000	5.208	0.000	0.05
		A	0.000	0.000	0.521	0.000	0.00
		B	0.000	0.000	0.521	0.000	0.00
L24	57.00-56.75	C	0.000	0.000	0.521	0.000	0.00
		A	0.000	0.000	0.521	0.000	0.00
		B	0.000	0.000	0.521	0.000	0.00
L25	56.75-51.75	C	0.000	0.000	0.521	0.000	0.00
		A	0.000	0.000	8.607	0.000	0.00
		B	0.000	0.000	8.607	0.000	0.00
L26	51.75-43.24	C	0.000	0.000	8.607	0.000	0.10
		A	0.000	0.000	7.000	0.000	0.00
		B	0.000	0.000	7.000	0.000	0.00
L27	43.24-42.24	C	0.000	0.000	7.000	0.000	0.16
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
L28	42.24-37.24	C	0.000	0.000	0.000	0.000	0.02
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
L29	37.24-32.24	C	0.000	0.000	0.000	0.000	0.10
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
L30	32.24-27.24	C	0.000	0.000	0.000	0.000	0.10
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00

tnxTower Tower Engineering Professionals, Inc. 326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Job	Andover North (BU 842856)	Page	9 of 24
	Project	TEP No. 63435.950905	Date	08:56:41 05/01/24
	Client	Crown Castle	Designed by	adare

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
L31	27.24-22.24	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.10
L32	22.24-17.25	A	0.000	0.000	5.333	0.000	0.00
		B	0.000	0.000	5.333	0.000	0.00
		C	0.000	0.000	10.667	0.000	0.10
L33	17.25-17.00	A	0.000	0.000	0.333	0.000	0.00
		B	0.000	0.000	0.333	0.000	0.00
		C	0.000	0.000	0.667	0.000	0.00
L34	17.00-12.00	A	0.000	0.000	6.667	0.000	0.00
		B	0.000	0.000	6.667	0.000	0.00
		C	0.000	0.000	13.333	0.000	0.10
L35	12.00-7.00	A	0.000	0.000	6.667	0.000	0.00
		B	0.000	0.000	6.667	0.000	0.00
		C	0.000	0.000	13.333	0.000	0.10
L36	7.00-5.25	A	0.000	0.000	2.333	0.000	0.00
		B	0.000	0.000	2.333	0.000	0.00
		C	0.000	0.000	4.667	0.000	0.03
L37	5.25-5.00	A	0.000	0.000	0.333	0.000	0.00
		B	0.000	0.000	0.333	0.000	0.00
		C	0.000	0.000	0.667	0.000	0.00
L38	5.00-0.00	A	0.000	0.000	6.667	0.000	0.00
		B	0.000	0.000	6.667	0.000	0.00
		C	0.000	0.000	13.333	0.000	0.10

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	149.00-144.00	A	1.480	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.03
L2	144.00-139.00	A	1.475	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.03
L3	139.00-134.00	A	1.469	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.06
L4	134.00-129.00	A	1.464	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.07
L5	129.00-123.61	A	1.458	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.09
L6	123.61-122.39	A	1.454	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.02
L7	122.39-117.39	A	1.451	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.09
L8	117.39-112.39	A	1.444	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.10
L9	112.39-107.39	A	1.438	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.10
L10	107.39-102.39	A	1.431	0.000	0.000	0.000	0.000	0.00

tnxTower Tower Engineering Professionals, Inc. 326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Job	Andover North (BU 842856)	Page	10 of 24
	Project	TEP No. 63435.950905	Date	08:56:41 05/01/24
	Client	Crown Castle	Designed by	adare

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
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.10
L11	102.39-98.50	A	1.425	0.000	0.000	2.070	0.000	0.02
		B		0.000	0.000	2.070	0.000	0.02
		C		0.000	0.000	2.070	0.000	0.09
L12	98.50-98.25	A	1.422	0.000	0.000	0.259	0.000	0.00
		B		0.000	0.000	0.259	0.000	0.00
		C		0.000	0.000	0.259	0.000	0.01
L13	98.25-93.25	A	1.418	0.000	0.000	5.168	0.000	0.05
		B		0.000	0.000	5.168	0.000	0.05
		C		0.000	0.000	5.168	0.000	0.14
L14	93.25-88.25	A	1.411	0.000	0.000	5.161	0.000	0.04
		B		0.000	0.000	5.161	0.000	0.04
		C		0.000	0.000	5.161	0.000	0.14
L15	88.25-79.13	A	1.399	0.000	0.000	7.981	0.000	0.07
		B		0.000	0.000	7.981	0.000	0.07
		C		0.000	0.000	7.981	0.000	0.24
L16	79.13-78.13	A	1.391	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.02
L17	78.13-73.13	A	1.385	0.000	0.000	0.397	0.000	0.00
		B		0.000	0.000	0.397	0.000	0.00
		C		0.000	0.000	0.397	0.000	0.10
L18	73.13-70.00	A	1.378	0.000	0.000	4.250	0.000	0.03
		B		0.000	0.000	4.250	0.000	0.03
		C		0.000	0.000	4.250	0.000	0.09
L19	70.00-69.75	A	1.374	0.000	0.000	0.340	0.000	0.00
		B		0.000	0.000	0.340	0.000	0.00
		C		0.000	0.000	0.340	0.000	0.01
L20	69.75-64.75	A	1.369	0.000	0.000	6.786	0.000	0.06
		B		0.000	0.000	6.786	0.000	0.06
		C		0.000	0.000	6.786	0.000	0.15
L21	64.75-59.75	A	1.359	0.000	0.000	6.775	0.000	0.05
		B		0.000	0.000	6.775	0.000	0.05
		C		0.000	0.000	6.775	0.000	0.15
L22	59.75-57.25	A	1.350	0.000	0.000	6.425	0.000	0.05
		B		0.000	0.000	6.425	0.000	0.05
		C		0.000	0.000	6.425	0.000	0.10
L23	57.25-57.00	A	1.347	0.000	0.000	0.642	0.000	0.01
		B		0.000	0.000	0.642	0.000	0.01
		C		0.000	0.000	0.642	0.000	0.01
L24	57.00-56.75	A	1.346	0.000	0.000	0.642	0.000	0.01
		B		0.000	0.000	0.642	0.000	0.01
		C		0.000	0.000	0.642	0.000	0.01
L25	56.75-51.75	A	1.340	0.000	0.000	10.579	0.000	0.09
		B		0.000	0.000	10.579	0.000	0.09
		C		0.000	0.000	10.579	0.000	0.18
L26	51.75-43.24	A	1.322	0.000	0.000	8.498	0.000	0.07
		B		0.000	0.000	8.498	0.000	0.07
		C		0.000	0.000	8.498	0.000	0.23
L27	43.24-42.24	A	1.308	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.02
L28	42.24-37.24	A	1.299	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.10
L29	37.24-32.24	A	1.282	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.10
L30	32.24-27.24	A	1.262	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00

tnxTower Tower Engineering Professionals, Inc. 326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Job	Andover North (BU 842856)	Page	11 of 24
	Project	TEP No. 63435.950905	Date	08:56:41 05/01/24
	Client	Crown Castle	Designed by	adare

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
L31	27.24-22.24	C		0.000	0.000	0.000	0.000	0.10
		A	1.239	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.10
L32	22.24-17.25	A	1.211	0.000	0.000	6.293	0.000	0.04
		B		0.000	0.000	6.293	0.000	0.04
		C		0.000	0.000	12.585	0.000	0.18
L33	17.25-17.00	A	1.194	0.000	0.000	0.393	0.000	0.00
		B		0.000	0.000	0.393	0.000	0.00
		C		0.000	0.000	0.785	0.000	0.01
L34	17.00-12.00	A	1.174	0.000	0.000	7.833	0.000	0.05
		B		0.000	0.000	7.833	0.000	0.05
		C		0.000	0.000	15.666	0.000	0.20
L35	12.00-7.00	A	1.126	0.000	0.000	7.789	0.000	0.05
		B		0.000	0.000	7.789	0.000	0.05
		C		0.000	0.000	15.579	0.000	0.19
L36	7.00-5.25	A	1.077	0.000	0.000	2.710	0.000	0.02
		B		0.000	0.000	2.710	0.000	0.02
		C		0.000	0.000	5.421	0.000	0.07
L37	5.25-5.00	A	1.058	0.000	0.000	0.386	0.000	0.00
		B		0.000	0.000	0.386	0.000	0.00
		C		0.000	0.000	0.773	0.000	0.01
L38	5.00-0.00	A	0.985	0.000	0.000	7.651	0.000	0.04
		B		0.000	0.000	7.651	0.000	0.04
		C		0.000	0.000	15.303	0.000	0.18

Feed Line Center of Pressure

Section	Elevation ft	CP _X in	CP _Z in	CP _X Ice in	CP _Z Ice in
L1	149.00-144.00	0.0000	0.0000	0.0000	0.0000
L2	144.00-139.00	0.0000	0.0000	0.0000	0.0000
L3	139.00-134.00	0.0000	0.0000	0.0000	0.0000
L4	134.00-129.00	0.0000	0.0000	0.0000	0.0000
L5	129.00-123.61	0.0000	0.0000	0.0000	0.0000
L6	123.61-122.39	0.0000	0.0000	0.0000	0.0000
L7	122.39-117.39	0.0000	0.0000	0.0000	0.0000
L8	117.39-112.39	0.0000	0.0000	0.0000	0.0000
L9	112.39-107.39	0.0000	0.0000	0.0000	0.0000
L10	107.39-102.39	0.0000	0.0000	0.0000	0.0000
L11	102.39-98.50	0.0000	0.0000	0.0000	0.0000
L12	98.50-98.25	0.0000	0.0000	0.0000	0.0000
L13	98.25-93.25	0.0000	0.0000	0.0000	0.0000
L14	93.25-88.25	0.0000	0.0000	0.0000	0.0000
L15	88.25-79.13	0.0000	0.0000	0.0000	0.0000
L16	79.13-78.13	0.0000	0.0000	0.0000	0.0000
L17	78.13-73.13	0.0000	0.0000	0.0000	0.0000
L18	73.13-70.00	0.0000	0.0000	0.0000	0.0000
L19	70.00-69.75	0.0000	0.0000	0.0000	0.0000
L20	69.75-64.75	0.0000	0.0000	0.0000	0.0000
L21	64.75-59.75	0.0000	0.0000	0.0000	0.0000
L22	59.75-57.25	0.0000	0.0000	0.0000	0.0000
L23	57.25-57.00	0.0000	0.0000	0.0000	0.0000
L24	57.00-56.75	0.0000	0.0000	0.0000	0.0000
L25	56.75-51.75	0.0000	0.0000	0.0000	0.0000
L26	51.75-43.24	0.0000	0.0000	0.0000	0.0000

tnxTower Tower Engineering Professionals, Inc. 326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Job	Andover North (BU 842856)	Page	12 of 24
	Project	TEP No. 63435.950905	Date	08:56:41 05/01/24
	Client	Crown Castle	Designed by	adare

Section	Elevation	CP _x	CP _z	CP _x	CP _z
	ft	in	in	Ice in	Ice in
L27	43.24-42.24	0.0000	0.0000	0.0000	0.0000
L28	42.24-37.24	0.0000	0.0000	0.0000	0.0000
L29	37.24-32.24	0.0000	0.0000	0.0000	0.0000
L30	32.24-27.24	0.0000	0.0000	0.0000	0.0000
L31	27.24-22.24	0.0000	0.0000	0.0000	0.0000
L32	22.24-17.25	1.4789	-4.0677	1.2512	-3.4414
L33	17.25-17.00	1.6114	-4.4320	1.3899	-3.8228
L34	17.00-12.00	1.6228	-4.4633	1.3978	-3.8446
L35	12.00-7.00	1.6443	-4.5226	1.4121	-3.8840
L36	7.00-5.25	1.6587	-4.5621	1.4207	-3.9074
L37	5.25-5.00	1.6629	-4.5737	1.4228	-3.9133
L38	5.00-0.00	1.6739	-4.6040	1.4269	-3.9246

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
L11	17	(Area) CCI-65FP-045100 (H)	98.50 - 100.50	1.0000	1.0000
L11	18	(Area) CCI-65FP-045100 (H)	98.50 - 100.50	1.0000	1.0000
L11	19	(Area) CCI-65FP-045100 (H)	98.50 - 100.50	1.0000	1.0000
L12	17	(Area) CCI-65FP-045100 (H)	98.25 - 98.50	1.0000	1.0000
L12	18	(Area) CCI-65FP-045100 (H)	98.25 - 98.50	1.0000	1.0000
L12	19	(Area) CCI-65FP-045100 (H)	98.25 - 98.50	1.0000	1.0000
L13	17	(Area) CCI-65FP-045100 (H)	93.25 - 98.25	1.0000	1.0000
L13	18	(Area) CCI-65FP-045100 (H)	93.25 - 98.25	1.0000	1.0000
L13	19	(Area) CCI-65FP-045100 (H)	93.25 - 98.25	1.0000	1.0000
L14	17	(Area) CCI-65FP-045100 (H)	88.25 - 93.25	1.0000	1.0000
L14	18	(Area) CCI-65FP-045100 (H)	88.25 - 93.25	1.0000	1.0000
L14	19	(Area) CCI-65FP-045100 (H)	88.25 - 93.25	1.0000	1.0000
L15	17	(Area) CCI-65FP-045100 (H)	80.50 - 88.25	1.0000	1.0000
L15	18	(Area) CCI-65FP-045100 (H)	80.50 - 88.25	1.0000	1.0000
L15	19	(Area) CCI-65FP-045100 (H)	80.50 - 88.25	1.0000	1.0000
L17	37	(Area) CCI-65FP-065125 (H)	73.13 - 73.42	1.0000	1.0000
L17	38	(Area) CCI-65FP-065125 (H)	73.13 - 73.42	1.0000	1.0000
L17	39	(Area) CCI-65FP-065125 (H)	73.13 - 73.42	1.0000	1.0000
L18	37	(Area) CCI-65FP-065125 (H)	70.00 - 73.13	1.0000	1.0000
L18	38	(Area) CCI-65FP-065125 (H)	70.00 - 73.13	1.0000	1.0000
L18	39	(Area) CCI-65FP-065125 (H)	70.00 - 73.13	1.0000	1.0000
L19	37	(Area) CCI-65FP-065125 (H)	69.75 - 70.00	1.0000	1.0000
L19	38	(Area) CCI-65FP-065125 (H)	69.75 - 70.00	1.0000	1.0000
L19	39	(Area) CCI-65FP-065125 (H)	69.75 - 70.00	1.0000	1.0000
L20	37	(Area) CCI-65FP-065125 (H)	64.75 - 69.75	1.0000	1.0000
L20	38	(Area) CCI-65FP-065125 (H)	64.75 - 69.75	1.0000	1.0000
L20	39	(Area) CCI-65FP-065125 (H)	64.75 - 69.75	1.0000	1.0000
L21	37	(Area) CCI-65FP-065125 (H)	59.75 - 64.75	1.0000	1.0000
L21	38	(Area) CCI-65FP-065125 (H)	59.75 - 64.75	1.0000	1.0000
L21	39	(Area) CCI-65FP-065125 (H)	59.75 - 64.75	1.0000	1.0000
L22	13	(Area) CCI-65FP-060100 (H)	57.25 - 59.75	1.0000	1.0000
L22	14	(Area) CCI-65FP-060100 (H)	57.25 - 59.75	1.0000	1.0000
L22	15	(Area) CCI-65FP-060100 (H)	57.25 - 59.75	1.0000	1.0000
L22	37	(Area) CCI-65FP-065125 (H)	57.25 - 59.75	1.0000	1.0000
L22	38	(Area) CCI-65FP-065125 (H)	57.25 - 59.75	1.0000	1.0000

tnxTower Tower Engineering Professionals, Inc. 326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Job Andover North (BU 842856)	Page 13 of 24
	Project TEP No. 63435.950905	Date 08:56:41 05/01/24
	Client Crown Castle	Designed by adare

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L22	39	(Area) CCI-65FP-065125 (H)	57.25 - 59.75	1.0000	1.0000
L23	13	(Area) CCI-65FP-060100 (H)	57.00 - 57.25	1.0000	1.0000
L23	14	(Area) CCI-65FP-060100 (H)	57.00 - 57.25	1.0000	1.0000
L23	15	(Area) CCI-65FP-060100 (H)	57.00 - 57.25	1.0000	1.0000
L23	37	(Area) CCI-65FP-065125 (H)	57.00 - 57.25	1.0000	1.0000
L23	38	(Area) CCI-65FP-065125 (H)	57.00 - 57.25	1.0000	1.0000
L23	39	(Area) CCI-65FP-065125 (H)	57.00 - 57.25	1.0000	1.0000
L24	13	(Area) CCI-65FP-060100 (H)	56.75 - 57.00	1.0000	1.0000
L24	14	(Area) CCI-65FP-060100 (H)	56.75 - 57.00	1.0000	1.0000
L24	15	(Area) CCI-65FP-060100 (H)	56.75 - 57.00	1.0000	1.0000
L24	37	(Area) CCI-65FP-065125 (H)	56.75 - 57.00	1.0000	1.0000
L24	38	(Area) CCI-65FP-065125 (H)	56.75 - 57.00	1.0000	1.0000
L24	39	(Area) CCI-65FP-065125 (H)	56.75 - 57.00	1.0000	1.0000
L25	13	(Area) CCI-65FP-060100 (H)	51.75 - 56.75	1.0000	1.0000
L25	14	(Area) CCI-65FP-060100 (H)	51.75 - 56.75	1.0000	1.0000
L25	15	(Area) CCI-65FP-060100 (H)	51.75 - 56.75	1.0000	1.0000
L25	37	(Area) CCI-65FP-065125 (H)	53.42 - 56.75	1.0000	1.0000
L25	38	(Area) CCI-65FP-065125 (H)	53.42 - 56.75	1.0000	1.0000
L25	39	(Area) CCI-65FP-065125 (H)	53.42 - 56.75	1.0000	1.0000
L26	13	(Area) CCI-65FP-060100 (H)	44.75 - 51.75	1.0000	1.0000
L26	14	(Area) CCI-65FP-060100 (H)	44.75 - 51.75	1.0000	1.0000
L26	15	(Area) CCI-65FP-060100 (H)	44.75 - 51.75	1.0000	1.0000
L32	32	CFP-080125	17.25 - 21.25	1.0000	1.0000
L32	33	CFP-080125	17.25 - 21.25	1.0000	1.0000
L32	34	WSCFP-080125	17.25 - 21.25	1.0000	1.0000
L32	35	WSCFP-080125	17.25 - 21.25	1.0000	1.0000
L33	32	CFP-080125	17.00 - 17.25	1.0000	1.0000
L33	33	CFP-080125	17.00 - 17.25	1.0000	1.0000
L33	34	WSCFP-080125	17.00 - 17.25	1.0000	1.0000
L33	35	WSCFP-080125	17.00 - 17.25	1.0000	1.0000
L34	32	CFP-080125	12.00 - 17.00	1.0000	1.0000
L34	33	CFP-080125	12.00 - 17.00	1.0000	1.0000
L34	34	WSCFP-080125	12.00 - 17.00	1.0000	1.0000
L34	35	WSCFP-080125	12.00 - 17.00	1.0000	1.0000
L35	32	CFP-080125	7.00 - 12.00	1.0000	1.0000
L35	33	CFP-080125	7.00 - 12.00	1.0000	1.0000
L35	34	WSCFP-080125	7.00 - 12.00	1.0000	1.0000
L35	35	WSCFP-080125	7.00 - 12.00	1.0000	1.0000
L36	32	CFP-080125	5.25 - 7.00	1.0000	1.0000
L36	33	CFP-080125	5.25 - 7.00	1.0000	1.0000
L36	34	WSCFP-080125	5.25 - 7.00	1.0000	1.0000
L36	35	WSCFP-080125	5.25 - 7.00	1.0000	1.0000
L37	32	CFP-080125	5.00 - 5.25	1.0000	1.0000
L37	33	CFP-080125	5.00 - 5.25	1.0000	1.0000
L37	34	WSCFP-080125	5.00 - 5.25	1.0000	1.0000
L37	35	WSCFP-080125	5.00 - 5.25	1.0000	1.0000
L38	32	CFP-080125	0.00 - 5.00	1.0000	1.0000
L38	33	CFP-080125	0.00 - 5.00	1.0000	1.0000
L38	34	WSCFP-080125	0.00 - 5.00	1.0000	1.0000
L38	35	WSCFP-080125	0.00 - 5.00	1.0000	1.0000

Effective Width of Flat Linear Attachments / Feed Lines

tnxTower Tower Engineering Professionals, Inc. 326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Job	Andover North (BU 842856)	Page	14 of 24
	Project	TEP No. 63435.950905	Date	08:56:41 05/01/24
	Client	Crown Castle	Designed by	adare

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L11	17	(Area) CCI-65FP-045100 (H)	98.50 - 100.50	Auto	0.0000
L11	18	(Area) CCI-65FP-045100 (H)	98.50 - 100.50	Auto	0.0000
L11	19	(Area) CCI-65FP-045100 (H)	98.50 - 100.50	Auto	0.0000
L12	17	(Area) CCI-65FP-045100 (H)	98.25 - 98.50	Auto	0.0000
L12	18	(Area) CCI-65FP-045100 (H)	98.25 - 98.50	Auto	0.0000
L12	19	(Area) CCI-65FP-045100 (H)	98.25 - 98.50	Auto	0.0000
L13	17	(Area) CCI-65FP-045100 (H)	93.25 - 98.25	Auto	0.0000
L13	18	(Area) CCI-65FP-045100 (H)	93.25 - 98.25	Auto	0.0000
L13	19	(Area) CCI-65FP-045100 (H)	93.25 - 98.25	Auto	0.0000
L14	17	(Area) CCI-65FP-045100 (H)	88.25 - 93.25	Auto	0.0000
L14	18	(Area) CCI-65FP-045100 (H)	88.25 - 93.25	Auto	0.0000
L14	19	(Area) CCI-65FP-045100 (H)	88.25 - 93.25	Auto	0.0000
L15	17	(Area) CCI-65FP-045100 (H)	80.50 - 88.25	Auto	0.0000
L15	18	(Area) CCI-65FP-045100 (H)	80.50 - 88.25	Auto	0.0000
L15	19	(Area) CCI-65FP-045100 (H)	80.50 - 88.25	Auto	0.0000
L17	37	(Area) CCI-65FP-065125 (H)	73.13 - 73.42	Auto	0.1295
L17	38	(Area) CCI-65FP-065125 (H)	73.13 - 73.42	Auto	0.1295
L17	39	(Area) CCI-65FP-065125 (H)	73.13 - 73.42	Auto	0.1295
L18	37	(Area) CCI-65FP-065125 (H)	70.00 - 73.13	Auto	0.1211
L18	38	(Area) CCI-65FP-065125 (H)	70.00 - 73.13	Auto	0.1211
L18	39	(Area) CCI-65FP-065125 (H)	70.00 - 73.13	Auto	0.1211
L19	37	(Area) CCI-65FP-065125 (H)	69.75 - 70.00	Auto	0.1804
L19	38	(Area) CCI-65FP-065125 (H)	69.75 - 70.00	Auto	0.1804
L19	39	(Area) CCI-65FP-065125 (H)	69.75 - 70.00	Auto	0.1804
L20	37	(Area) CCI-65FP-065125 (H)	64.75 - 69.75	Auto	0.1641
L20	38	(Area) CCI-65FP-065125 (H)	64.75 - 69.75	Auto	0.1641
L20	39	(Area) CCI-65FP-065125 (H)	64.75 - 69.75	Auto	0.1641
L21	37	(Area) CCI-65FP-065125 (H)	59.75 - 64.75	Auto	0.1394
L21	38	(Area) CCI-65FP-065125 (H)	59.75 - 64.75	Auto	0.1394
L21	39	(Area) CCI-65FP-065125 (H)	59.75 - 64.75	Auto	0.1394
L22	13	(Area) CCI-65FP-060100 (H)	57.25 - 59.75	Auto	0.0458
L22	14	(Area) CCI-65FP-060100 (H)	57.25 - 59.75	Auto	0.0458
L22	15	(Area) CCI-65FP-060100 (H)	57.25 - 59.75	Auto	0.0458
L22	37	(Area) CCI-65FP-065125 (H)	57.25 - 59.75	Auto	0.1192
L22	38	(Area) CCI-65FP-065125 (H)	57.25 - 59.75	Auto	0.1192
L22	39	(Area) CCI-65FP-065125 (H)	57.25 - 59.75	Auto	0.1192
L23	13	(Area) CCI-65FP-060100 (H)	57.00 - 57.25	Auto	0.0880
L23	14	(Area) CCI-65FP-060100 (H)	57.00 - 57.25	Auto	0.0880
L23	15	(Area) CCI-65FP-060100 (H)	57.00 - 57.25	Auto	0.0880
L23	37	(Area) CCI-65FP-065125 (H)	57.00 - 57.25	Auto	0.1581
L23	38	(Area) CCI-65FP-065125 (H)	57.00 - 57.25	Auto	0.1581
L23	39	(Area) CCI-65FP-065125 (H)	57.00 - 57.25	Auto	0.1581
L24	13	(Area) CCI-65FP-060100 (H)	56.75 - 57.00	Auto	0.0188
L24	14	(Area) CCI-65FP-060100 (H)	56.75 - 57.00	Auto	0.0188
L24	15	(Area) CCI-65FP-060100 (H)	56.75 - 57.00	Auto	0.0188
L24	37	(Area) CCI-65FP-065125 (H)	56.75 - 57.00	Auto	0.0943
L24	38	(Area) CCI-65FP-065125 (H)	56.75 - 57.00	Auto	0.0943
L24	39	(Area) CCI-65FP-065125 (H)	56.75 - 57.00	Auto	0.0943
L25	13	(Area) CCI-65FP-060100 (H)	51.75 - 56.75	Auto	0.0050
L25	14	(Area) CCI-65FP-060100 (H)	51.75 - 56.75	Auto	0.0050
L25	15	(Area) CCI-65FP-060100 (H)	51.75 - 56.75	Auto	0.0050
L25	37	(Area) CCI-65FP-065125 (H)	53.42 - 56.75	Auto	0.0838
L25	38	(Area) CCI-65FP-065125 (H)	53.42 - 56.75	Auto	0.0838
L25	39	(Area) CCI-65FP-065125 (H)	53.42 - 56.75	Auto	0.0838
L26	13	(Area) CCI-65FP-060100 (H)	44.75 - 51.75	Auto	0.0000
L26	14	(Area) CCI-65FP-060100 (H)	44.75 - 51.75	Auto	0.0000
L26	15	(Area) CCI-65FP-060100 (H)	44.75 - 51.75	Auto	0.0000
L32	32	CFP-080125	17.25 - 21.25	Auto	0.1009
L32	33	CFP-080125	17.25 - 21.25	Auto	0.1009
L32	34	WSCFP-080125	17.25 - 21.25	Auto	0.1009
L32	35	WSCFP-080125	17.25 - 21.25	Auto	0.1009

tnxTower Tower Engineering Professionals, Inc. 326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Job Andover North (BU 842856)	Page 15 of 24
	Project TEP No. 63435.950905	Date 08:56:41 05/01/24
	Client Crown Castle	Designed by adare

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L33	32	CFP-080125	17.00 - 17.25	Auto	0.1611
L33	33	CFP-080125	17.00 - 17.25	Auto	0.1611
L33	34	WSCFP-080125	17.00 - 17.25	Auto	0.1611
L33	35	WSCFP-080125	17.00 - 17.25	Auto	0.1611
L34	32	CFP-080125	12.00 - 17.00	Auto	0.1479
L34	33	CFP-080125	12.00 - 17.00	Auto	0.1479
L34	34	WSCFP-080125	12.00 - 17.00	Auto	0.1479
L34	35	WSCFP-080125	12.00 - 17.00	Auto	0.1479
L35	32	CFP-080125	7.00 - 12.00	Auto	0.1278
L35	33	CFP-080125	7.00 - 12.00	Auto	0.1278
L35	34	WSCFP-080125	7.00 - 12.00	Auto	0.1278
L35	35	WSCFP-080125	7.00 - 12.00	Auto	0.1278
L36	32	CFP-080125	5.25 - 7.00	Auto	0.1143
L36	33	CFP-080125	5.25 - 7.00	Auto	0.1143
L36	34	WSCFP-080125	5.25 - 7.00	Auto	0.1143
L36	35	WSCFP-080125	5.25 - 7.00	Auto	0.1143
L37	32	CFP-080125	5.00 - 5.25	Auto	0.1075
L37	33	CFP-080125	5.00 - 5.25	Auto	0.1075
L37	34	WSCFP-080125	5.00 - 5.25	Auto	0.1075
L37	35	WSCFP-080125	5.00 - 5.25	Auto	0.1075
L38	32	CFP-080125	0.00 - 5.00	Auto	0.0943
L38	33	CFP-080125	0.00 - 5.00	Auto	0.0943
L38	34	WSCFP-080125	0.00 - 5.00	Auto	0.0943
L38	35	WSCFP-080125	0.00 - 5.00	Auto	0.0943

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral	Azimuth Adjustment	Placement	C _A A ₁ Front	C _A A ₂ Side	Weight	
			Vert	°	ft	ft ²	ft ²	K	
			ft						
			ft						
149									
HPA65R-BU6A w/ Mount Pipe	A	From Centroid-Face	4.00	-10.0000	149.00	No Ice	5.83	5.00	0.08
			-6.00			1/2" Ice	6.40	5.56	0.14
			0.00			1" Ice	6.99	6.13	0.22
						2" Ice	8.19	7.32	0.40
HPA65R-BU6A w/ Mount Pipe	B	From Centroid-Face	4.00	-20.0000	149.00	No Ice	5.83	5.00	0.08
			-6.00			1/2" Ice	6.40	5.56	0.14
			0.00			1" Ice	6.99	6.13	0.22
						2" Ice	8.19	7.32	0.40
HPA65R-BU6A w/ Mount Pipe	C	From Centroid-Face	4.00	-10.0000	149.00	No Ice	5.83	5.00	0.08
			-6.00			1/2" Ice	6.40	5.56	0.14
			0.00			1" Ice	6.99	6.13	0.22
						2" Ice	8.19	7.32	0.40
DMP65R-BU6D w/ Mount Pipe	A	From Centroid-Face	4.00	-10.0000	149.00	No Ice	11.96	5.97	0.11
			-2.00			1/2" Ice	12.70	6.63	0.20
			0.00			1" Ice	13.46	7.30	0.30
						2" Ice	15.02	8.69	0.53
DMP65R-BU6D w/ Mount Pipe	B	From Centroid-Face	4.00	-20.0000	149.00	No Ice	11.96	5.97	0.11
			-2.00			1/2" Ice	12.70	6.63	0.20
			0.00			1" Ice	13.46	7.30	0.30
						2" Ice	15.02	8.69	0.53

tnxTower Tower Engineering Professionals, Inc. 326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Job	Andover North (BU 842856)	Page	16 of 24
	Project	TEP No. 63435.950905	Date	08:56:41 05/01/24
	Client	Crown Castle	Designed by	adare

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
DMP65R-BU6D w/ Mount Pipe	C	From Centroid-Fa ce	4.00	-10.0000	149.00	2" Ice	15.02	8.69	0.53
			-2.00	-10.0000		No Ice	11.96	5.97	0.11
			0.00	-10.0000		1/2" Ice	12.70	6.63	0.20
				-10.0000		1" Ice	13.46	7.30	0.30
				-10.0000		2" Ice	15.02	8.69	0.53
RRUS 4449 B5/B12	A	From Centroid-Fa ce	4.00	-10.0000	149.00	No Ice	1.97	1.41	0.07
			-6.00	-10.0000		1/2" Ice	2.14	1.56	0.09
			0.00	-10.0000		1" Ice	2.33	1.73	0.11
				-10.0000		2" Ice	2.72	2.07	0.16
				-10.0000		No Ice	1.97	1.41	0.07
RRUS 4449 B5/B12	B	From Centroid-Fa ce	4.00	-20.0000	149.00	1/2" Ice	2.14	1.56	0.09
			-6.00	-20.0000		1" Ice	2.33	1.73	0.11
			0.00	-20.0000		2" Ice	2.72	2.07	0.16
				-20.0000		No Ice	1.97	1.41	0.07
				-20.0000		1/2" Ice	2.14	1.56	0.09
RRUS 4449 B5/B12	C	From Centroid-Fa ce	4.00	-10.0000	149.00	1" Ice	2.33	1.73	0.11
			-6.00	-10.0000		2" Ice	2.72	2.07	0.16
			0.00	-10.0000		No Ice	1.97	1.41	0.07
				-10.0000		1/2" Ice	2.14	1.56	0.09
				-10.0000		1" Ice	2.33	1.73	0.11
RRUS 8843 B2/B66A	A	From Centroid-Fa ce	4.00	-10.0000	149.00	2" Ice	2.72	2.07	0.16
			-6.00	-10.0000		No Ice	1.64	1.35	0.07
			0.00	-10.0000		1/2" Ice	1.80	1.50	0.09
				-10.0000		1" Ice	1.97	1.65	0.11
				-10.0000		2" Ice	2.32	1.99	0.16
RRUS 8843 B2/B66A	B	From Centroid-Fa ce	4.00	-20.0000	149.00	No Ice	1.64	1.35	0.07
			-6.00	-20.0000		1/2" Ice	1.80	1.50	0.09
			0.00	-20.0000		1" Ice	1.97	1.65	0.11
				-20.0000		2" Ice	2.32	1.99	0.16
				-20.0000		No Ice	1.64	1.35	0.07
RRUS 8843 B2/B66A	C	From Centroid-Fa ce	4.00	-10.0000	149.00	1/2" Ice	1.80	1.50	0.09
			-6.00	-10.0000		1" Ice	1.97	1.65	0.11
			0.00	-10.0000		2" Ice	2.32	1.99	0.16
				-10.0000		No Ice	1.64	1.35	0.07
				-10.0000		1/2" Ice	1.80	1.50	0.09
DC6-48-60-18-8F	B	From Centroid-Fa ce	4.00	-20.0000	149.00	1" Ice	1.97	1.65	0.11
			-2.00	-20.0000		2" Ice	2.32	1.99	0.16
			0.00	-20.0000		No Ice	0.85	0.85	0.02
				-20.0000		1/2" Ice	1.36	1.36	0.04
				-20.0000		1" Ice	1.53	1.53	0.05
(2) 2.4" Dia x 8-ft Mount Pipe	A	From Centroid-Fa ce	4.00	0.0000	149.00	2" Ice	1.91	1.91	0.10
			0.00	0.0000		No Ice	1.90	1.90	0.03
			0.00	0.0000		1/2" Ice	2.73	2.73	0.04
				0.0000		1" Ice	3.40	3.40	0.06
				0.0000		2" Ice	4.40	4.40	0.12
(2) 2.4" Dia x 8-ft Mount Pipe	B	From Centroid-Fa ce	4.00	0.0000	149.00	No Ice	1.90	1.90	0.03
			0.00	0.0000		1/2" Ice	2.73	2.73	0.04
			0.00	0.0000		1" Ice	3.40	3.40	0.06
				0.0000		2" Ice	4.40	4.40	0.12
				0.0000		No Ice	1.90	1.90	0.03
(2) 2.4" Dia x 8-ft Mount Pipe	C	From Centroid-Fa ce	4.00	0.0000	149.00	1/2" Ice	2.73	2.73	0.04
			0.00	0.0000		1" Ice	3.40	3.40	0.06
			0.00	0.0000		2" Ice	4.40	4.40	0.12
				0.0000		No Ice	1.90	1.90	0.03
				0.0000		1/2" Ice	2.73	2.73	0.04
Sabre C10855721C 12' Platform Mount	C	None		0.0000	149.00	1" Ice	3.40	3.40	0.06
				0.0000		2" Ice	4.40	4.40	0.12
				0.0000		No Ice	24.66	24.66	2.96
				0.0000		1/2" Ice	32.58	32.58	3.77
				0.0000		1" Ice	40.50	40.50	4.58
140						2" Ice	56.34	56.34	6.19
AIR 6419 B41_TMO_CCIV2 w/ Mount Pipe	A	From Centroid-Le g	4.00	0.0000	140.00	No Ice	5.79	2.97	0.10
			-5.00	0.0000		1/2" Ice	6.24	3.34	0.14
			0.00	0.0000		1" Ice	6.71	3.73	0.19
				0.0000		2" Ice	7.71	4.56	0.32
				0.0000		No Ice	5.79	2.97	0.10
AIR 6419 B41_TMO_CCIV2 w/ Mount Pipe	B	From Centroid-Le g	4.00	0.0000	140.00	1/2" Ice	6.24	3.34	0.14
			-5.00	0.0000		1" Ice	6.71	3.73	0.19
			0.00	0.0000		2" Ice	7.71	4.56	0.32
				0.0000		No Ice	5.79	2.97	0.10
				0.0000		1" Ice	6.71	3.73	0.19

tnxTower Tower Engineering Professionals, Inc. 326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Job		Andover North (BU 842856)		Page		17 of 24	
	Project		TEP No. 63435.950905		Date		08:56:41 05/01/24	
	Client		Crown Castle		Designed by		adare	

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
AIR 6419 B41_TMO_CCIV2 w/ Mount Pipe	C	From Centroid-Le g	4.00	0.0000	140.00	2" Ice	7.71	4.56	0.32
			-5.00	0.0000		No Ice	5.79	2.97	0.10
			0.00	0.0000		1/2" Ice	6.24	3.34	0.14
				0.0000		1" Ice	6.71	3.73	0.19
				0.0000		2" Ice	7.71	4.56	0.32
APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Centroid-Le g	4.00	0.0000	140.00	No Ice	14.69	6.87	0.19
			5.00	0.0000		1/2" Ice	15.46	7.55	0.31
			0.00	0.0000		1" Ice	16.23	8.25	0.46
				0.0000		2" Ice	17.82	9.67	0.79
				0.0000		No Ice	14.69	6.87	0.19
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Centroid-Le g	4.00	0.0000	140.00	1/2" Ice	15.46	7.55	0.31
			5.00	0.0000		1" Ice	16.23	8.25	0.46
			0.00	0.0000		2" Ice	17.82	9.67	0.79
				0.0000		No Ice	14.69	6.87	0.19
				0.0000		1/2" Ice	15.46	7.55	0.31
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Centroid-Le g	4.00	0.0000	140.00	1" Ice	16.23	8.25	0.46
			5.00	0.0000		2" Ice	17.82	9.67	0.79
			0.00	0.0000		No Ice	14.69	6.87	0.19
				0.0000		1/2" Ice	15.46	7.55	0.31
				0.0000		1" Ice	16.23	8.25	0.46
RADIO 4449 B71 B85A_T-MOBILE	A	From Centroid-Le g	4.00	0.0000	140.00	2" Ice	17.82	9.67	0.79
			-5.00	0.0000		No Ice	1.97	1.59	0.07
			0.00	0.0000		1/2" Ice	2.15	1.75	0.09
				0.0000		1" Ice	2.33	1.92	0.12
				0.0000		2" Ice	2.72	2.28	0.17
RADIO 4449 B71 B85A_T-MOBILE	B	From Centroid-Le g	4.00	0.0000	140.00	No Ice	1.97	1.59	0.07
			-5.00	0.0000		1/2" Ice	2.15	1.75	0.09
			0.00	0.0000		1" Ice	2.33	1.92	0.12
				0.0000		2" Ice	2.72	2.28	0.17
				0.0000		No Ice	1.97	1.59	0.07
RADIO 4449 B71 B85A_T-MOBILE	C	From Centroid-Le g	4.00	0.0000	140.00	1/2" Ice	2.15	1.75	0.09
			-5.00	0.0000		1" Ice	2.33	1.92	0.12
			0.00	0.0000		2" Ice	2.72	2.28	0.17
				0.0000		No Ice	1.97	1.59	0.07
				0.0000		1/2" Ice	2.15	1.75	0.09
RADIO 4460 B2/B25 B66_TMO	A	From Centroid-Le g	4.00	0.0000	140.00	1" Ice	2.51	2.02	0.16
			5.00	0.0000		2" Ice	2.91	2.39	0.22
			0.00	0.0000		No Ice	2.14	1.69	0.11
				0.0000		1/2" Ice	2.32	1.85	0.13
				0.0000		1" Ice	2.51	2.02	0.16
RADIO 4460 B2/B25 B66_TMO	B	From Centroid-Le g	4.00	0.0000	140.00	2" Ice	2.91	2.39	0.22
			5.00	0.0000		No Ice	2.14	1.69	0.11
			0.00	0.0000		1/2" Ice	2.32	1.85	0.13
				0.0000		1" Ice	2.51	2.02	0.16
				0.0000		2" Ice	2.91	2.39	0.22
RADIO 4460 B2/B25 B66_TMO	C	From Centroid-Le g	4.00	0.0000	140.00	No Ice	2.14	1.69	0.11
			5.00	0.0000		1/2" Ice	2.32	1.85	0.13
			0.00	0.0000		1" Ice	2.51	2.02	0.16
				0.0000		2" Ice	2.91	2.39	0.22
				0.0000		No Ice	2.14	1.69	0.11
(2) 2.4" Dia x 8-ft Mount Pipe	A	From Centroid-Le g	4.00	0.0000	140.00	1/2" Ice	2.73	2.73	0.04
			0.00	0.0000		1" Ice	3.40	3.40	0.06
			0.00	0.0000		2" Ice	4.40	4.40	0.12
				0.0000		No Ice	1.90	1.90	0.03
				0.0000		1/2" Ice	2.73	2.73	0.04
(2) 2.4" Dia x 8-ft Mount Pipe	B	From Centroid-Le g	4.00	0.0000	140.00	1" Ice	3.40	3.40	0.06
			0.00	0.0000		2" Ice	4.40	4.40	0.12
			0.00	0.0000		No Ice	1.90	1.90	0.03
				0.0000		1/2" Ice	2.73	2.73	0.04
				0.0000		1" Ice	3.40	3.40	0.06
(2) 2.4" Dia x 8-ft Mount Pipe	C	From Centroid-Le g	4.00	0.0000	140.00	2" Ice	4.40	4.40	0.12
			0.00	0.0000		No Ice	1.90	1.90	0.03
			0.00	0.0000		1/2" Ice	2.73	2.73	0.04
			0.00	0.0000		1" Ice	3.40	3.40	0.06
				0.0000		2" Ice	4.40	4.40	0.12
Site Pro 1 RMQP-496 + HRK12	C	None		0.0000	140.00	No Ice	21.17	19.65	1.49
				0.0000		1/2" Ice	25.84	24.18	1.82
				0.0000		1" Ice	30.51	28.79	2.29
				0.0000		2" Ice	39.85	38.01	3.21
				0.0000		No Ice	21.17	19.65	1.49

tnxTower Tower Engineering Professionals, Inc. 326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Job		Andover North (BU 842856)					Page	
	Project		TEP No. 63435.950905					Date	
	Client		Crown Castle					Designed by	
							18 of 24		
							08:56:41 05/01/24		
							adare		

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
130									
(2) NHH-65B-R2B w/ Mount Pipe	A	From Leg	4.00	0.0000	130.00	No Ice	4.09	3.29	0.07
			0.00			1/2" Ice	4.48	3.67	0.13
			0.00			1" Ice	4.88	4.06	0.21
						2" Ice	5.70	4.86	0.39
(2) NHH-65B-R2B w/ Mount Pipe	B	From Leg	4.00	-30.0000	130.00	No Ice	4.09	3.29	0.07
			0.00			1/2" Ice	4.48	3.67	0.13
			0.00			1" Ice	4.88	4.06	0.21
						2" Ice	5.70	4.86	0.39
(2) NHH-65B-R2B w/ Mount Pipe	C	From Leg	4.00	-30.0000	130.00	No Ice	4.09	3.29	0.07
			0.00			1/2" Ice	4.48	3.67	0.13
			0.00			1" Ice	4.88	4.06	0.21
						2" Ice	5.70	4.86	0.39
(2) NHH-65B-R2B	A	From Leg	4.00	0.0000	130.00	No Ice	4.16	2.49	0.04
			0.00			1/2" Ice	4.56	2.88	0.09
			0.00			1" Ice	4.98	3.27	0.15
						2" Ice	5.84	4.08	0.28
(2) NHH-65B-R2B	B	From Leg	4.00	-30.0000	130.00	No Ice	4.16	2.49	0.04
			0.00			1/2" Ice	4.56	2.88	0.09
			0.00			1" Ice	4.98	3.27	0.15
						2" Ice	5.84	4.08	0.28
(2) NHH-65B-R2B	C	From Leg	4.00	-30.0000	130.00	No Ice	4.16	2.49	0.04
			0.00			1/2" Ice	4.56	2.88	0.09
			0.00			1" Ice	4.98	3.27	0.15
						2" Ice	5.84	4.08	0.28
(2) RFV01U-D2A	A	From Leg	4.00	0.0000	130.00	No Ice	1.88	1.01	0.07
			-6.00			1/2" Ice	2.05	1.14	0.09
			0.00			1" Ice	2.22	1.28	0.11
						2" Ice	2.60	1.59	0.15
(2) RFV01U-D2A	B	From Leg	4.00	-30.0000	130.00	No Ice	1.88	1.01	0.07
			6.00			1/2" Ice	2.05	1.14	0.09
			0.00			1" Ice	2.22	1.28	0.11
						2" Ice	2.60	1.59	0.15
(2) RFV01U-D2A	C	From Leg	4.00	-30.0000	130.00	No Ice	1.88	1.01	0.07
			-6.00			1/2" Ice	2.05	1.14	0.09
			0.00			1" Ice	2.22	1.28	0.11
						2" Ice	2.60	1.59	0.15
(2) RFV01U-D1A	A	From Leg	4.00	0.0000	130.00	No Ice	1.88	1.25	0.08
			6.00			1/2" Ice	2.05	1.39	0.10
			0.00			1" Ice	2.22	1.54	0.12
						2" Ice	2.60	1.86	0.18
(2) RFV01U-D1A	B	From Leg	4.00	-30.0000	130.00	No Ice	1.88	1.25	0.08
			-6.00			1/2" Ice	2.05	1.39	0.10
			0.00			1" Ice	2.22	1.54	0.12
						2" Ice	2.60	1.86	0.18
(2) RFV01U-D1A	C	From Leg	4.00	-30.0000	130.00	No Ice	1.88	1.25	0.08
			6.00			1/2" Ice	2.05	1.39	0.10
			0.00			1" Ice	2.22	1.54	0.12
						2" Ice	2.60	1.86	0.18
(2) BSF0020F3V1	A	From Leg	4.00	0.0000	130.00	No Ice	0.96	0.29	0.02
			-6.00			1/2" Ice	1.09	0.36	0.02
			0.00			1" Ice	1.22	0.45	0.03
						2" Ice	1.50	0.64	0.06
(2) BSF0020F3V1	B	From Leg	4.00	-30.0000	130.00	No Ice	0.96	0.29	0.02
			-6.00			1/2" Ice	1.09	0.36	0.02
			0.00			1" Ice	1.22	0.45	0.03
						2" Ice	1.50	0.64	0.06

tnxTower Tower Engineering Professionals, Inc. 326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Job	Andover North (BU 842856)	Page	19 of 24
	Project	TEP No. 63435.950905	Date	08:56:41 05/01/24
	Client	Crown Castle	Designed by	adare

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
DB-C1-12C-24AB-0Z	A	From Leg	4.00	0.0000	130.00	No Ice	4.06	3.10	0.03
			6.00			1/2" Ice	4.32	3.34	0.07
			0.00			1" Ice	4.58	3.58	0.11
						2" Ice	5.14	4.09	0.20
2.4" x 6' Stabilizer	A	From Leg	4.00	0.0000	130.00	No Ice	1.44	1.44	0.02
			0.00			1/2" Ice	1.93	1.93	0.03
			0.00			1" Ice	2.30	2.30	0.05
						2" Ice	3.07	3.07	0.09
2.4" x 6' Stabilizer	B	From Leg	4.00	0.0000	130.00	No Ice	1.44	1.44	0.02
			0.00			1/2" Ice	1.93	1.93	0.03
			0.00			1" Ice	2.30	2.30	0.05
						2" Ice	3.07	3.07	0.09
2.4" x 6' Stabilizer	C	From Leg	4.00	0.0000	130.00	No Ice	1.44	1.44	0.02
			0.00			1/2" Ice	1.93	1.93	0.03
			0.00			1" Ice	2.30	2.30	0.05
						2" Ice	3.07	3.07	0.09
Miscellaneous [NA 507-1]	C	None		0.0000	130.00	No Ice	4.56	4.56	0.24
						1/2" Ice	6.39	6.39	0.31
						1" Ice	8.18	8.18	0.40
						2" Ice	11.66	11.66	0.66
T-Arm Mount [TA 702-3_KCKR]	C	None		0.0000	130.00	No Ice	14.77	14.77	0.61
						1/2" Ice	18.10	18.10	0.85
						1" Ice	21.77	21.77	1.16
						2" Ice	30.35	30.35	2.03
120									
MX08FRO665-21 w/ Mount Pipe	A	From Centroid-Le g	4.00	0.0000	120.00	No Ice	8.01	4.23	0.11
			0.00			1/2" Ice	8.52	4.69	0.19
			0.00			1" Ice	9.04	5.16	0.29
						2" Ice	10.11	6.12	0.52
MX08FRO665-21 w/ Mount Pipe	B	From Centroid-Le g	4.00	0.0000	120.00	No Ice	8.01	4.23	0.11
			0.00			1/2" Ice	8.52	4.69	0.19
			0.00			1" Ice	9.04	5.16	0.29
						2" Ice	10.11	6.12	0.52
MX08FRO665-21 w/ Mount Pipe	C	From Centroid-Le g	4.00	0.0000	120.00	No Ice	8.01	4.23	0.11
			0.00			1/2" Ice	8.52	4.69	0.19
			0.00			1" Ice	9.04	5.16	0.29
						2" Ice	10.11	6.12	0.52
TA08025-B604	A	From Centroid-Le g	4.00	0.0000	120.00	No Ice	1.96	0.98	0.06
			0.00			1/2" Ice	2.14	1.11	0.08
			0.00			1" Ice	2.32	1.25	0.10
						2" Ice	2.71	1.55	0.15
TA08025-B604	B	From Centroid-Le g	4.00	0.0000	120.00	No Ice	1.96	0.98	0.06
			0.00			1/2" Ice	2.14	1.11	0.08
			0.00			1" Ice	2.32	1.25	0.10
						2" Ice	2.71	1.55	0.15
TA08025-B604	C	From Centroid-Le g	4.00	0.0000	120.00	No Ice	1.96	0.98	0.06
			0.00			1/2" Ice	2.14	1.11	0.08
			0.00			1" Ice	2.32	1.25	0.10
						2" Ice	2.71	1.55	0.15
TA08025-B605	A	From Centroid-Le g	4.00	0.0000	120.00	No Ice	1.96	1.13	0.08
			0.00			1/2" Ice	2.14	1.27	0.09
			0.00			1" Ice	2.32	1.41	0.11
						2" Ice	2.71	1.72	0.16
TA08025-B605	B	From Centroid-Le g	4.00	0.0000	120.00	No Ice	1.96	1.13	0.08
			0.00			1/2" Ice	2.14	1.27	0.09
			0.00			1" Ice	2.32	1.41	0.11
						2" Ice	2.71	1.72	0.16

tnxTower Tower Engineering Professionals, Inc. 326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Job	Andover North (BU 842856)	Page	20 of 24
	Project	TEP No. 63435.950905	Date	08:56:41 05/01/24
	Client	Crown Castle	Designed by	adare

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	
TA08025-B605	C	From Centroid-Log	4.00	0.00	0.0000	120.00	No Ice	1.96	1.13	0.08
			0.00	0.00			1/2" Ice	2.14	1.27	0.09
			0.00	0.00			1" Ice	2.32	1.41	0.11
							2" Ice	2.71	1.72	0.16
RDIDC-9181-PF-48	A	From Centroid-Log	4.00	0.00	0.0000	120.00	No Ice	2.01	1.17	0.02
			4.00	0.00			1/2" Ice	2.19	1.31	0.04
			0.00	0.00			1" Ice	2.37	1.46	0.06
							2" Ice	2.76	1.78	0.11
(2) 2.4" Dia x 8-ft Mount Pipe	A	From Centroid-Log	4.00	0.00	0.0000	120.00	No Ice	1.90	1.90	0.03
			0.00	0.00			1/2" Ice	2.73	2.73	0.04
			0.00	0.00			1" Ice	3.40	3.40	0.06
							2" Ice	4.40	4.40	0.12
(2) 2.4" Dia x 8-ft Mount Pipe	B	From Centroid-Log	4.00	0.00	0.0000	120.00	No Ice	1.90	1.90	0.03
			0.00	0.00			1/2" Ice	2.73	2.73	0.04
			0.00	0.00			1" Ice	3.40	3.40	0.06
							2" Ice	4.40	4.40	0.12
(2) 2.4" Dia x 8-ft Mount Pipe	C	From Centroid-Log	4.00	0.00	0.0000	120.00	No Ice	1.90	1.90	0.03
			0.00	0.00			1/2" Ice	2.73	2.73	0.04
			0.00	0.00			1" Ice	3.40	3.40	0.06
							2" Ice	4.40	4.40	0.12
Sabre C10801018-32788	C	None			0.0000	120.00	No Ice	26.80	26.80	1.51
							1/2" Ice	32.20	32.20	1.81
							1" Ice	37.60	37.60	2.11
							2" Ice	48.40	48.40	2.72

**

Compression Checks

Pole Design Data

Section No.	Elevation	Size	L	L _u	Kl/r	A	P _u	φP _n	Ratio
			ft	ft		in ²	K	K	$\frac{P_u}{\phi P_n}$
L1	149 - 144 (1)	TP22.426x21.5x0.1875	5.00	0.00	0.0	13.2347	-4.64	774.23	0.006
L2	144 - 139 (2)	TP23.3521x22.426x0.1875	5.00	0.00	0.0	13.7858	-8.05	806.47	0.010
L3	139 - 134 (3)	TP24.2781x23.3521x0.1875	5.00	0.00	0.0	14.3369	-8.38	838.71	0.010
L4	134 - 129 (4)	TP25.2042x24.2781x0.1875	5.00	0.00	0.0	14.8881	-11.36	870.95	0.013
L5	129 - 123.612 (5)	TP26.2021x25.2042x0.1875	5.39	0.00	0.0	15.0657	-11.49	881.35	0.013
L6	123.612 - 122.388 (6)	TP26.0428x25.1277x0.1875	5.00	0.00	0.0	15.3871	-12.12	900.15	0.013
L7	122.388 - 117.388 (7)	TP26.9578x26.0428x0.1875	5.00	0.00	0.0	15.9317	-15.16	932.00	0.016
L8	117.388 - 112.388 (8)	TP27.8729x26.9578x0.1875	5.00	0.00	0.0	16.4763	-15.67	963.86	0.016
L9	112.388 - 107.388 (9)	TP28.7879x27.8729x0.1875	5.00	0.00	0.0	17.0208	-16.21	995.72	0.016

tnxTower Tower Engineering Professionals, Inc. 326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Job	Andover North (BU 842856)	Page	21 of 24
	Project	TEP No. 63435.950905	Date	08:56:41 05/01/24
	Client	Crown Castle	Designed by	adare

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
L10	107.388 - 102.388 (10)	TP29.703x28.7879x0.1875	5.00	0.00	0.0	17.5654	-16.78	1027.58	0.016
L11	102.388 - 98.5 (11)	TP30.4145x29.703x0.1875	3.89	0.00	0.0	17.9889	-17.24	1052.35	0.016
L12	98.5 - 98.25 (12)	TP30.4603x30.4145x0.3438	0.25	0.00	0.0	32.8590	-17.30	1922.25	0.009
L13	98.25 - 93.25 (13)	TP31.3753x30.4603x0.3375	5.00	0.00	0.0	33.2485	-18.10	1945.04	0.009
L14	93.25 - 88.25 (14)	TP32.2904x31.3753x0.3313	5.00	0.00	0.0	33.6014	-18.94	1965.68	0.010
L15	88.25 - 79.128 (15)	TP33.9598x32.2904x0.3313	9.12	0.00	0.0	34.4436	-19.68	2014.95	0.010
L16	79.128 - 78.128 (16)	TP33.7634x32.7164x0.25	5.75	0.00	0.0	26.5929	-21.12	1555.68	0.014
L17	78.128 - 73.128 (17)	TP34.6747x33.7634x0.25	5.00	0.00	0.0	27.3160	-21.91	1597.98	0.014
L18	73.128 - 70 (18)	TP35.2447x34.6747x0.25	3.13	0.00	0.0	27.7683	-22.42	1624.45	0.014
L19	70 - 69.75 (19)	TP35.2903x35.2447x0.5	0.25	0.00	0.0	55.2122	-22.49	3229.91	0.007
L20	69.75 - 64.75 (20)	TP36.2015x35.2903x0.4875	5.00	0.00	0.0	55.2612	-23.72	3232.78	0.007
L21	64.75 - 59.75 (21)	TP37.1128x36.2015x0.4875	5.00	0.00	0.0	56.6712	-24.98	3315.26	0.008
L22	59.75 - 57.25 (22)	TP37.5684x37.1128x0.4813	2.50	0.00	0.0	56.6501	-25.61	3314.03	0.008
L23	57.25 - 57 (23)	TP37.6139x37.5684x0.65	0.25	0.00	0.0	76.2603	-25.71	4461.23	0.006
L24	57 - 56.75 (24)	TP37.6595x37.6139x0.4188	0.25	0.00	0.0	49.4971	-25.76	2895.58	0.009
L25	56.75 - 51.75 (25)	TP38.5707x37.6595x0.4125	5.00	0.00	0.0	49.9596	-26.93	2922.64	0.009
L26	51.75 - 43.243 (26)	TP40.1211x38.5707x0.4125	8.51	0.00	0.0	50.6731	-27.64	2964.37	0.009
L27	43.243 - 42.243 (27)	TP39.8031x38.6156x0.3125	6.52	0.00	0.0	39.1697	-30.00	2291.43	0.013
L28	42.243 - 37.243 (28)	TP40.7141x39.8031x0.3125	5.00	0.00	0.0	40.0733	-31.06	2344.29	0.013
L29	37.243 - 32.243 (29)	TP41.6251x40.7141x0.3125	5.00	0.00	0.0	40.9770	-32.13	2397.15	0.013
L30	32.243 - 27.243 (30)	TP42.5362x41.6251x0.3125	5.00	0.00	0.0	41.8806	-33.23	2450.02	0.014
L31	27.243 - 22.243 (31)	TP43.4472x42.5362x0.3125	5.00	0.00	0.0	42.7842	-34.36	2502.88	0.014
L32	22.243 - 17.25 (32)	TP44.3569x43.4472x0.3125	4.99	0.00	0.0	43.6866	-35.50	2555.67	0.014
L33	17.25 - 17 (33)	TP44.4025x44.3569x0.625	0.25	0.00	0.0	86.8436	-35.61	5080.35	0.007
L34	17 - 12 (34)	TP45.3135x44.4025x0.6125	5.00	0.00	0.0	86.9022	-37.50	5083.78	0.007
L35	12 - 7 (35)	TP46.2246x45.3135x0.6125	5.00	0.00	0.0	88.6733	-39.42	5187.39	0.008
L36	7 - 5.25 (36)	TP46.5434x46.2246x0.6125	1.75	0.00	0.0	89.2932	-40.09	5223.65	0.008
L37	5.25 - 5 (37)	TP46.589x46.5434x0.6	0.25	0.00	0.0	87.5814	-40.20	5123.51	0.008
L38	5 - 0 (38)	TP47.5x46.589x0.5875	5.00	0.00	0.0	87.4789	-42.04	5117.52	0.008

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	149 - 144 (1)	TP22.426x21.5x0.1875	24.73	422.86	0.058	0.00	422.86	0.000

tnxTower Tower Engineering Professionals, Inc. 326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Job	Andover North (BU 842856)	Page	22 of 24
	Project	TEP No. 63435.950905	Date	08:56:41 05/01/24
	Client	Crown Castle	Designed by	adare

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{rx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{rx}}$	M_{uy} kip-ft	ϕM_{ry} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ry}}$
L2	144 - 139 (2)	TP23.3521x22.426x0.1875	55.31	452.93	0.122	0.00	452.93	0.000
L3	139 - 134 (3)	TP24.2781x23.3521x0.1875	104.14	483.48	0.215	0.00	483.48	0.000
L4	134 - 129 (4)	TP25.2042x24.2781x0.1875	159.73	514.46	0.310	0.00	514.46	0.000
L5	129 - 123.612 (5)	TP26.2021x25.2042x0.1875	183.01	524.53	0.349	0.00	524.53	0.000
L6	123.612 - 122.388 (6)	TP26.0428x25.1277x0.1875	256.62	542.84	0.473	0.00	542.84	0.000
L7	122.388 - 117.388 (7)	TP26.9578x26.0428x0.1875	340.44	574.11	0.593	0.00	574.11	0.000
L8	117.388 - 112.388 (8)	TP27.8729x26.9578x0.1875	433.41	605.63	0.716	0.00	605.63	0.000
L9	112.388 - 107.388 (9)	TP28.7879x27.8729x0.1875	528.06	637.35	0.829	0.00	637.35	0.000
L10	107.388 - 102.388 (10)	TP29.703x28.7879x0.1875	624.36	669.22	0.933	0.00	669.22	0.000
L11	102.388 - 98.5 (11)	TP30.4145x29.703x0.1875	700.37	694.06	1.009	0.00	694.06	0.000
L12	98.5 - 98.25 (12)	TP30.4603x30.4145x0.3438	705.29	1506.55	0.468	0.00	1506.55	0.000
L13	98.25 - 93.25 (13)	TP31.3753x30.4603x0.3375	804.76	1571.88	0.512	0.00	1571.88	0.000
L14	93.25 - 88.25 (14)	TP32.2904x31.3753x0.3313	906.25	1630.72	0.556	0.00	1630.72	0.000
L15	88.25 - 79.128 (15)	TP33.9598x32.2904x0.3313	996.73	1703.49	0.585	0.00	1703.49	0.000
L16	79.128 - 78.128 (16)	TP33.7634x32.7164x0.25	1118.07	1228.92	0.910	0.00	1228.92	0.000
L17	78.128 - 73.128 (17)	TP34.6747x33.7634x0.25	1225.75	1283.78	0.955	0.00	1283.78	0.000
L18	73.128 - 70 (18)	TP35.2447x34.6747x0.25	1293.97	1318.31	0.982	0.00	1318.31	0.000
L19	70 - 69.75 (19)	TP35.2903x35.2447x0.5	1299.44	2915.73	0.446	0.00	2915.73	0.000
L20	69.75 - 64.75 (20)	TP36.2015x35.2903x0.4875	1410.17	2997.94	0.470	0.00	2997.94	0.000
L21	64.75 - 59.75 (21)	TP37.1128x36.2015x0.4875	1523.07	3153.93	0.483	0.00	3153.93	0.000
L22	59.75 - 57.25 (22)	TP37.5684x37.1128x0.4813	1580.32	3193.57	0.495	0.00	3193.57	0.000
L23	57.25 - 57 (23)	TP37.6139x37.5684x0.65	1586.08	4265.38	0.372	0.00	4265.38	0.000
L24	57 - 56.75 (24)	TP37.6595x37.6139x0.4188	1591.83	2806.69	0.567	0.00	2806.69	0.000
L25	56.75 - 51.75 (25)	TP38.5707x37.6595x0.4125	1708.06	2903.95	0.588	0.00	2903.95	0.000
L26	51.75 - 43.243 (26)	TP40.1211x38.5707x0.4125	1778.49	2987.93	0.595	0.00	2987.93	0.000
L27	43.243 - 42.243 (27)	TP39.8031x38.6156x0.3125	1934.77	2177.53	0.889	0.00	2177.53	0.000
L28	42.243 - 37.243 (28)	TP40.7141x39.8031x0.3125	2056.81	2261.48	0.909	0.00	2261.48	0.000
L29	37.243 - 32.243 (29)	TP41.6251x40.7141x0.3125	2180.33	2346.11	0.929	0.00	2346.11	0.000
L30	32.243 - 27.243 (30)	TP42.5362x41.6251x0.3125	2305.27	2431.36	0.948	0.00	2431.36	0.000
L31	27.243 - 22.243 (31)	TP43.4472x42.5362x0.3125	2431.53	2517.18	0.966	0.00	2517.18	0.000
L32	22.243 - 17.25 (32)	TP44.3569x43.4472x0.3125	2558.86	2603.39	0.983	0.00	2603.39	0.000
L33	17.25 - 17 (33)	TP44.4025x44.3569x0.625	2565.26	5771.44	0.444	0.00	5771.44	0.000
L34	17 - 12 (34)	TP45.3135x44.4025x0.6125	2694.22	5900.52	0.457	0.00	5900.52	0.000
L35	12 - 7 (35)	TP46.2246x45.3135x0.6125	2824.79	6145.13	0.460	0.00	6145.13	0.000
L36	7 - 5.25 (36)	TP46.5434x46.2246x0.6125	2870.86	6231.93	0.461	0.00	6231.93	0.000

tnxTower Tower Engineering Professionals, Inc. 326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Job	Andover North (BU 842856)	Page	23 of 24
	Project	TEP No. 63435.950905	Date	08:56:41 05/01/24
	Client	Crown Castle	Designed by	adare

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{rx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{rx}}$	M_{uy} kip-ft	ϕM_{ry} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ry}}$
L37	5.25 - 5 (37)	TP46.589x46.5434x0.6	2877.46	6121.93	0.470	0.00	6121.93	0.000
L38	5 - 0 (38)	TP47.5x46.589x0.5875	3010.23	6240.78	0.482	0.00	6240.78	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	149 - 144 (1)	TP22.426x21.5x0.1875	5.11	232.27	0.022	0.22	452.35	0.000
L2	144 - 139 (2)	TP23.3521x22.426x0.1875	9.58	241.94	0.040	0.22	490.81	0.000
L3	139 - 134 (3)	TP24.2781x23.3521x0.1875	9.96	251.61	0.040	0.22	530.84	0.000
L4	134 - 129 (4)	TP25.2042x24.2781x0.1875	14.39	261.29	0.055	0.34	572.43	0.001
L5	129 - 123.612 (5)	TP26.2021x25.2042x0.1875	14.51	264.40	0.055	0.34	586.18	0.001
L6	123.612 - 122.388 (6)	TP26.0428x25.1277x0.1875	14.93	270.04	0.055	0.34	611.46	0.001
L7	122.388 - 117.388 (7)	TP26.9578x26.0428x0.1875	18.43	279.60	0.066	0.19	655.50	0.000
L8	117.388 - 112.388 (8)	TP27.8729x26.9578x0.1875	18.77	289.16	0.065	0.19	701.08	0.000
L9	112.388 - 107.388 (9)	TP28.7879x27.8729x0.1875	19.11	298.72	0.064	0.19	748.19	0.000
L10	107.388 - 102.388 (10)	TP29.703x28.7879x0.1875	19.44	308.27	0.063	0.19	796.83	0.000
L11	102.388 - 98.5 (11)	TP30.4145x29.703x0.1875	19.69	315.70	0.062	0.19	835.71	0.000
L12	98.5 - 98.25 (12)	TP30.4603x30.4145x0.3438	19.71	576.68	0.034	0.19	1520.96	0.000
L13	98.25 - 93.25 (13)	TP31.3753x30.4603x0.3375	20.11	583.51	0.034	0.19	1586.07	0.000
L14	93.25 - 88.25 (14)	TP32.2904x31.3753x0.3313	20.51	589.71	0.035	0.19	1650.47	0.000
L15	88.25 - 79.128 (15)	TP33.9598x32.2904x0.3313	20.86	604.49	0.035	0.19	1734.25	0.000
L16	79.128 - 78.128 (16)	TP33.7634x32.7164x0.25	21.39	466.70	0.046	0.19	1369.75	0.000
L17	78.128 - 73.128 (17)	TP34.6747x33.7634x0.25	21.72	479.39	0.045	0.19	1445.25	0.000
L18	73.128 - 70 (18)	TP35.2447x34.6747x0.25	21.93	487.33	0.045	0.19	1493.52	0.000
L19	70 - 69.75 (19)	TP35.2903x35.2447x0.5	21.94	968.97	0.023	0.19	2952.23	0.000
L20	69.75 - 64.75 (20)	TP36.2015x35.2903x0.4875	22.37	969.83	0.023	0.19	3033.31	0.000
L21	64.75 - 59.75 (21)	TP37.1128x36.2015x0.4875	22.80	994.58	0.023	0.19	3190.07	0.000
L22	59.75 - 57.25 (22)	TP37.5684x37.1128x0.4813	23.02	994.21	0.023	0.19	3229.10	0.000
L23	57.25 - 57 (23)	TP37.6139x37.5684x0.65	23.04	1338.37	0.017	0.19	4332.45	0.000
L24	57 - 56.75 (24)	TP37.6595x37.6139x0.4188	23.05	868.67	0.027	0.19	2833.06	0.000
L25	56.75 - 51.75 (25)	TP38.5707x37.6595x0.4125	23.46	876.79	0.027	0.19	2929.97	0.000
L26	51.75 - 43.243 (26)	TP40.1211x38.5707x0.4125	23.69	889.31	0.027	0.19	3014.26	0.000
L27	43.243 - 42.243 (27)	TP39.8031x38.6156x0.3125	24.28	687.43	0.035	0.19	2377.39	0.000
L28	42.243 -	TP40.7141x39.8031x0.3125	24.58	703.29	0.035	0.19	2488.35	0.000

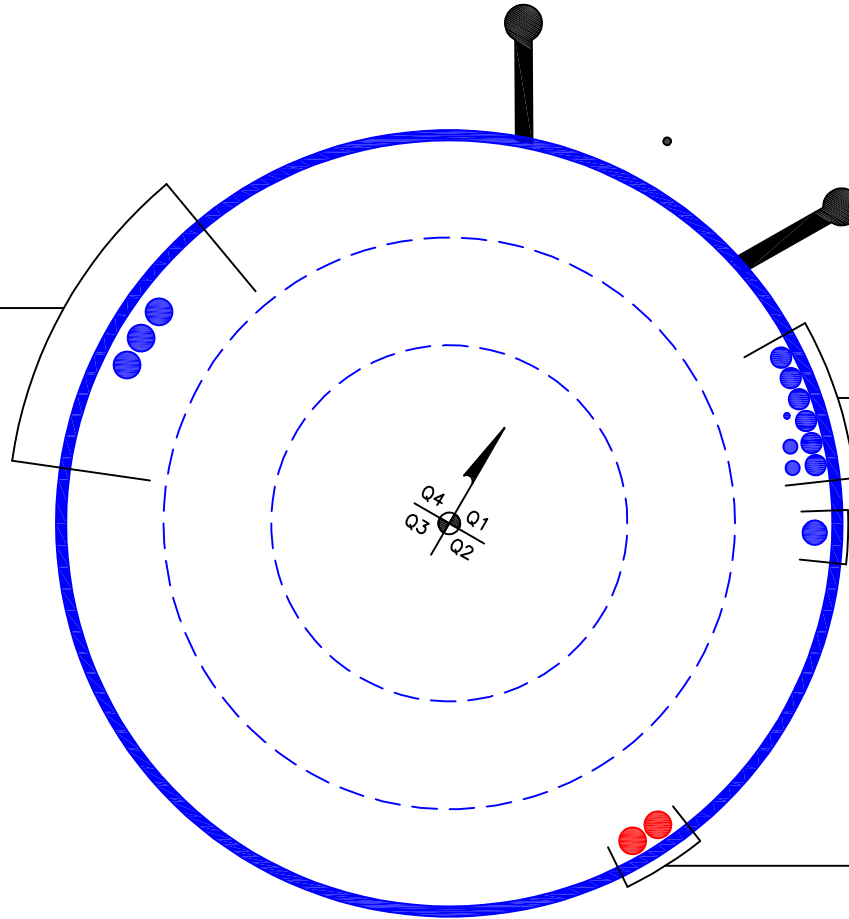
tnxTower Tower Engineering Professionals, Inc. 326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (919) 661-6350	Job	Andover North (BU 842856)	Page	24 of 24
	Project	TEP No. 63435.950905	Date	08:56:41 05/01/24
	Client	Crown Castle	Designed by	adare

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 $\frac{T_u}{\phi T_n}$
L29	37.243 (28) 37.243 - 32.243 (29)	TP41.6251x40.7141x0.3125	24.87	719.15	0.035	0.19	2601.83	0.000
L30	32.243 - 27.243 (30)	TP42.5362x41.6251x0.3125	25.14	735.00	0.034	0.19	2717.85	0.000
L31	27.243 - 22.243 (31)	TP43.4472x42.5362x0.3125	25.40	750.86	0.034	0.19	2836.40	0.000
L32	22.243 - 17.25 (32)	TP44.3569x43.4472x0.3125	25.64	766.70	0.033	0.19	2957.31	0.000
L33	17.25 - 17 (33)	TP44.4025x44.3569x0.625	25.64	1524.11	0.017	0.19	5843.13	0.000
L34	17 - 12 (34)	TP45.3135x44.4025x0.6125	25.96	1525.13	0.017	0.19	5970.43	0.000
L35	12 - 7 (35)	TP46.2246x45.3135x0.6125	26.28	1556.22	0.017	0.19	6216.27	0.000
L36	7 - 5.25 (36)	TP46.5434x46.2246x0.6125	26.40	1567.09	0.017	0.19	6303.48	0.000
L37	5.25 - 5 (37)	TP46.589x46.5434x0.6	26.40	1537.05	0.017	0.19	6190.46	0.000
L38	5 - 0 (38)	TP47.5x46.589x0.5875	26.72	1535.25	0.017	0.19	6307.38	0.000

APPENDIX B
BASE LEVEL DRAWING



(OTHER CONSIDERED EQUIPMENT)
(3) 1-5/8" TO 140 FT LEVEL



CLIMBING PEGS
W/ SAFETY CLIMB

(OTHER CONSIDERED EQUIPMENT)
(1) 3/8" TO 149 FT LEVEL
(2) 7/8" TO 149 FT LEVEL
(6) 1-1/4" TO 149 FT LEVEL

(OTHER CONSIDERED EQUIPMENT)
(1) 1-1/2" TO 120 FT LEVEL

(PROPOSED EQUIPMENT CONFIGURATION)
(2) 1-5/8" TO 130 FT LEVEL

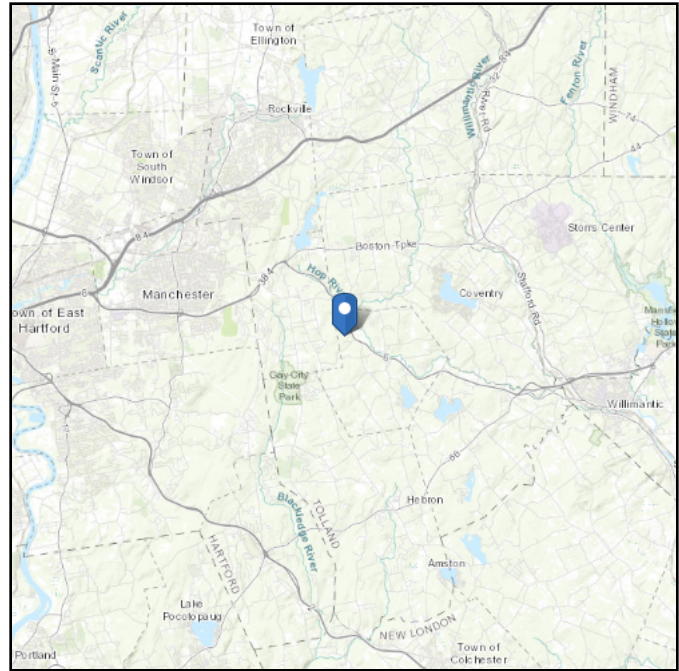
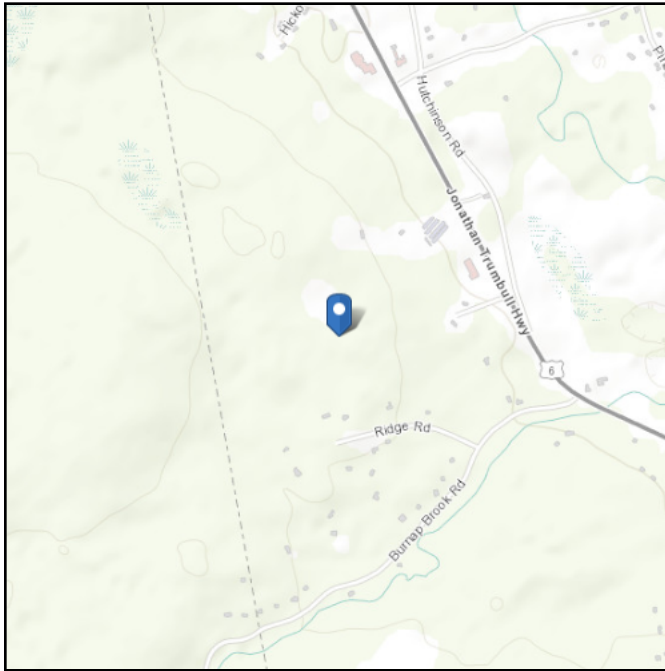
APPENDIX C
ADDITIONAL CALCULATIONS

ASCE 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: 41.750128
Longitude: -72.402675
Elevation: 495.7566207165736 ft (NAVD 88)



Wind

Results:

Wind Speed	119 Vmph
10-year MRI	75 Vmph
25-year MRI	84 Vmph
50-year MRI	91 Vmph
100-year MRI	98 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: Mon Apr 22 2024

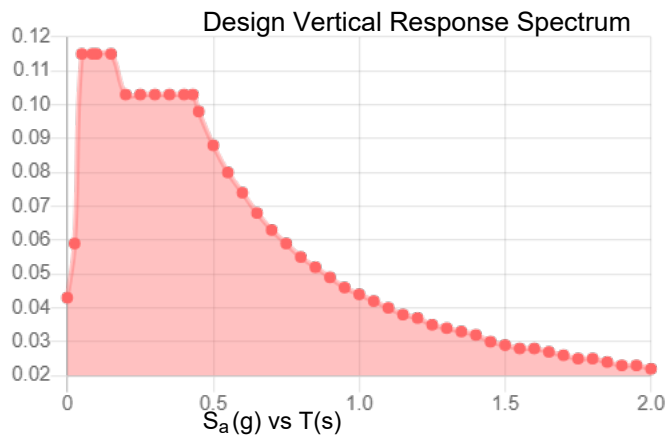
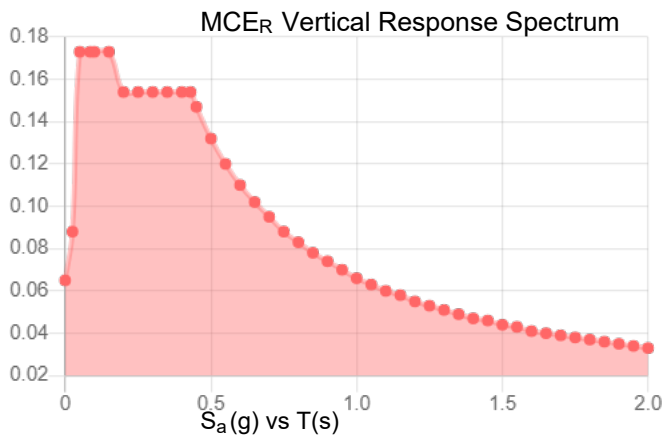
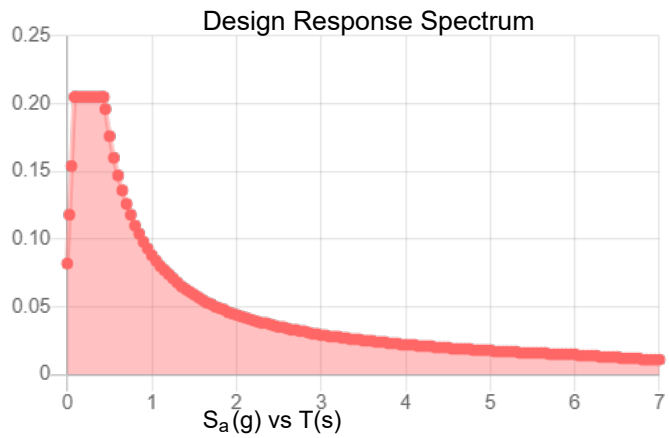
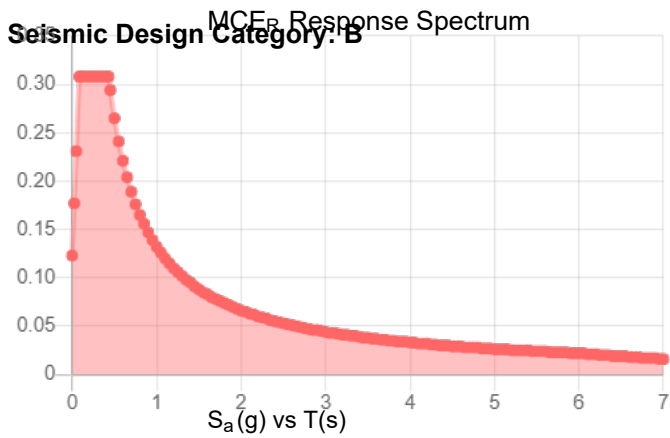
Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance 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 :	0.193	S_{D1} :	0.088
S_1 :	0.055	T_L :	6
F_a :	1.6	PGA :	0.104
F_v :	2.4	PGA _M :	0.166
S_{MS} :	0.308	F_{PGA} :	1.591
S_{M1} :	0.132	I_e :	1
S_{DS} :	0.205	C_v :	0.7



Data Accessed: Mon Apr 22 2024

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: Mon Apr 22 2024

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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Site BU: 842856
Work Order: 2296102



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Pole Geometry

	Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material
1	149	25.388	3.776	18	21.5	26.2021	0.1875	Auto	A572-65
2	127.388	48.26	4.745	18	25.13	33.9598	0.1875	Auto	A572-65
3	83.873	40.63	5.517	18	32.72	40.1211	0.25	Auto	A572-65
4	48.76	48.76	0	18	38.62	47.5	0.3125	Auto	A572-65

Reinforcement Configuration

	Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	47.25	57.25	plate	CCI-AFP-060100	3			x						x						x			
2	82.5	98.5	plate	CCI-AFP-045100	3		x						x						x				
3	0	5.25	plate	(TS) 0.75x6.50 (65 ksi)	4	-3.1		1.8							-3.1		1.8						
4	0	5.25	plate	(TS) 0.75x5.125 (65 ksi)	2							3.1									3.1		
5	0	5.25	plate	(TS) 0.75x5.125 (65 ksi)	2							-3.1									-3.1		
6	5.25	17.25	plate	CFP-080125	2		x									x							
7	5.25	17.25	plate	WSCFP-080125	2							x										x	
8	57	70	plate	CCI-AFP-065125	3				x						x							x	
9																							
10																							

Reinforcement Details

	B (in)	H (in)	Gross Area (in ²)	Pole Face to Centroid (in)	Bottom Termination Type	Bottom Termination Length (in)	Top Termination Type	Top Termination Length (in)	Lu (in)	Net Area (in ²)	Bolt Hole Size (in)	Reinforcement Material
1	6	1	6	0.5	PC 8.8 - M20 (100)	30	PC 8.8 - M20 (100)	30.000	16.000	4.750	1.1875	A572-65
2	4.5	1	4.5	0.5	PC 8.8 - M20 (100)	24	PC 8.8 - M20 (100)	24.000	20.000	3.250	1.1875	A572-65
3	0.75	6.5	4.875	3.625	Welded	n/a	Welded	n/a	0.000	4.875	0.0000	A572-65
4	0.75	5.125	3.84375	2.9375	Welded	n/a	Welded	n/a	0.000	3.844	0.0000	A572-65
5	0.75	5.125	3.84375	2.9375	Welded	n/a	Welded	n/a	0.000	3.844	0.0000	A572-65
6	8	1.25	10	0.625	PC 8.8 - M20 (100)	48	PC 8.8 - M20 (100)	48.000	17.000	8.438	1.1875	A572-65
7	8	1.25	10	0.625	Welded	n/a	PC 8.8 - M20 (100)	48.000	17.000	8.438	1.1875	A572-65
8	6.5	1.25	8.125	0.625	PC 8.8 - M20 (100)	42	PC 8.8 - M20 (100)	42.000	19.000	6.563	1.1875	A572-65

Connection Details for Custom Reinforcements

Reinforcement	End	# Bolts	N or X	Bolt Spacing (in)	Edge Dist (in)	Weld Grade (ksi)	Transverse (Horiz.) Weld Type	Horiz. Weld Length (in)	Horiz. Groove Depth (in)	Horiz. Groove Angle (deg)	Horiz. Fillet Size (in)	Vertical Weld Length (in)	Vertical Fillet Size (in)	Rev H Connection Capacity (kip)
(TS) 0.75x6.50 (65 ksi)	Top	-	-	-	-	80	None	-	-	-	-	60	0.313	-
	Bottom	-	-	-	-	80	CJP Groove	11.5	0.375	45	0.25	-	-	-
(TS) 0.75x5.125 (65 ksi)	Top	-	-	-	-	80	None	-	-	-	-	60	0.313	-
	Bottom	-	-	-	-	80	CJP Groove	10.5	0.375	45	0.25	-	-	-
CFP-080125	Top	16	N	3	3	-	-	-	-	-	-	-	-	-
	Bottom	16	N	3	3	-	-	-	-	-	-	-	-	-
WSCFP-080125	Top	16	N	3	3	-	-	-	-	-	-	-	-	-
	Bottom	-	-	-	-	80	None	-	-	-	-	59.5	0.313	-

TNX Geometry Input

Increment (ft): [Export to TNX](#)

	Section Height (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Tapered Pole Grade	Weight Multiplier
1	149 - 144	5		18	21.500	22.426	0.1875	A572-65	1.000
2	144 - 139	5		18	22.426	23.352	0.1875	A572-65	1.000
3	139 - 134	5		18	23.352	24.278	0.1875	A572-65	1.000
4	134 - 129	5		18	24.278	25.204	0.1875	A572-65	1.000
5	129 - 127.388	5.388	3.776	18	25.204	26.202	0.1875	A572-65	1.000
6	127.388 - 122.388	5		18	25.128	26.043	0.1875	A572-65	1.000
7	122.388 - 117.388	5		18	26.043	26.958	0.1875	A572-65	1.000
8	117.388 - 112.388	5		18	26.958	27.873	0.1875	A572-65	1.000
9	112.388 - 107.388	5		18	27.873	28.788	0.1875	A572-65	1.000
10	107.388 - 102.388	5		18	28.788	29.703	0.1875	A572-65	1.000
11	102.388 - 98.5	3.888		18	29.703	30.415	0.1875	A572-65	1.000
12	98.5 - 98.25	0.25		18	30.415	30.460	0.34375	A572-65	0.959
13	98.25 - 93.25	5		18	30.460	31.375	0.3375	A572-65	0.964
14	93.25 - 88.25	5		18	31.375	32.290	0.33125	A572-65	0.970
15	88.25 - 83.873	9.122	4.745	18	32.290	33.960	0.33125	A572-65	0.960
16	83.873 - 78.128	5.745		18	32.716	33.763	0.25	A572-65	1.000
17	78.128 - 73.128	5		18	33.763	34.675	0.25	A572-65	1.000
18	73.128 - 70	3.128		18	34.675	35.245	0.25	A572-65	1.000
19	70 - 69.75	0.25		18	35.245	35.290	0.5	A572-65	0.945
20	69.75 - 64.75	5		18	35.290	36.202	0.4875	A572-65	0.957
21	64.75 - 59.75	5		18	36.202	37.113	0.4875	A572-65	0.946
22	59.75 - 57.25	2.5		18	37.113	37.568	0.48125	A572-65	0.953
23	57.25 - 57	0.25		18	37.568	37.614	0.65	A572-65	0.944
24	57 - 56.75	0.25		18	37.614	37.659	0.41875	A572-65	0.963
25	56.75 - 51.75	5		18	37.659	38.571	0.4125	A572-65	0.969
26	51.75 - 48.76	8.507	5.517	18	38.571	40.121	0.4125	A572-65	0.964
27	48.76 - 42.243	6.517		18	38.616	39.803	0.3125	A572-65	1.000
28	42.243 - 37.243	5		18	39.803	40.714	0.3125	A572-65	1.000
29	37.243 - 32.243	5		18	40.714	41.625	0.3125	A572-65	1.000
30	32.243 - 27.243	5		18	41.625	42.536	0.3125	A572-65	1.000
31	27.243 - 22.243	5		18	42.536	43.447	0.3125	A572-65	1.000
32	22.243 - 17.25	4.993		18	43.447	44.357	0.3125	A572-65	1.000
33	17.25 - 17	0.25		18	44.357	44.403	0.625	A572-65	0.964
34	17 - 12	5		18	44.403	45.314	0.6125	A572-65	0.974
35	12 - 7	5		18	45.314	46.225	0.6125	A572-65	0.965
36	7 - 5.25	1.75		18	46.225	46.543	0.6125	A572-65	0.962
37	5.25 - 5	0.25		18	46.543	46.589	0.6	A572-65	0.922
38	5 - 0	5		18	46.589	47.500	0.5875	A572-65	0.934

TNX Section Forces

Increment (ft):		TNX Output			
	5	Section Height (ft)	P _u (K)	M _{ux} (kip-ft)	V _u (K)
1	149 - 144		4.64	24.73	5.11
2	144 - 139		8.05	55.31	9.58
3	139 - 134		8.38	104.14	9.96
4	134 - 129		11.36	159.73	14.39
5	129 - 127.388		11.49	183.01	14.51
6	127.388 - 122.388		12.12	256.62	14.93
7	122.388 - 117.388		15.16	340.44	18.43
8	117.388 - 112.388		15.67	433.41	18.77
9	112.388 - 107.388		16.21	528.06	19.11
10	107.388 - 102.388		16.78	624.36	19.44
11	102.388 - 98.5		17.24	700.37	19.69
12	98.5 - 98.25		17.30	705.29	19.71
13	98.25 - 93.25		18.10	804.76	20.11
14	93.25 - 88.25		18.94	906.25	20.51
15	88.25 - 83.873		19.68	996.73	20.86
16	83.873 - 78.128		21.12	1118.06	21.39
17	78.128 - 73.128		21.91	1225.75	21.72
18	73.128 - 70		22.42	1293.96	21.93
19	70 - 69.75		22.49	1299.44	21.94
20	69.75 - 64.75		23.72	1410.18	22.37
21	64.75 - 59.75		24.98	1523.07	22.80
22	59.75 - 57.25		25.61	1580.32	23.02
23	57.25 - 57		25.71	1586.07	23.04
24	57 - 56.75		25.76	1591.83	23.05
25	56.75 - 51.75		26.93	1708.06	23.46
26	51.75 - 48.76		27.64	1778.49	23.69
27	48.76 - 42.243		30.00	1934.77	24.28
28	42.243 - 37.243		31.06	2056.81	24.58
29	37.243 - 32.243		32.13	2180.33	24.87
30	32.243 - 27.243		33.23	2305.27	25.14
31	27.243 - 22.243		34.36	2431.54	25.40
32	22.243 - 17.25		35.50	2558.85	25.64
33	17.25 - 17		35.61	2565.26	25.64
34	17 - 12		37.50	2694.23	25.96
35	12 - 7		39.42	2824.79	26.28
36	7 - 5.25		40.09	2870.86	26.40
37	5.25 - 5		40.20	2877.46	26.40
38	5 - 0		42.04	3010.23	26.72

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
149 - 144	Pole	TP22.426x21.5x0.1875	Pole	6.2%	Pass
144 - 139	Pole	TP23.352x22.426x0.1875	Pole	12.7%	Pass
139 - 134	Pole	TP24.278x23.352x0.1875	Pole	21.6%	Pass
134 - 129	Pole	TP25.204x24.278x0.1875	Pole	31.1%	Pass
129 - 127.39	Pole	TP26.202x25.204x0.1875	Pole	34.8%	Pass
127.39 - 122.39	Pole	TP26.043x25.128x0.1875	Pole	46.6%	Pass
122.39 - 117.39	Pole	TP26.958x26.043x0.1875	Pole	58.5%	Pass
117.39 - 112.39	Pole	TP27.873x26.958x0.1875	Pole	70.1%	Pass
112.39 - 107.39	Pole	TP28.788x27.873x0.1875	Pole	80.9%	Pass
107.39 - 102.39	Pole	TP29.703x28.788x0.1875	Pole	90.8%	Pass
102.39 - 98.5	Pole	TP30.415x29.703x0.1875	Pole	98.1%	Pass
98.5 - 98.25	Pole + Reinf.	TP30.46x30.415x0.3438	Reinf. 2 Tension Rupture	78.7%	Pass
98.25 - 93.25	Pole + Reinf.	TP31.375x30.46x0.3375	Reinf. 2 Tension Rupture	85.7%	Pass
93.25 - 88.25	Pole + Reinf.	TP32.29x31.375x0.3313	Reinf. 2 Tension Rupture	92.2%	Pass
88.25 - 83.87	Pole + Reinf.	TP33.96x32.29x0.3313	Reinf. 2 Tension Rupture	97.5%	Pass
83.87 - 78.13	Pole	TP33.763x32.716x0.25	Pole	88.2%	Pass
78.13 - 73.13	Pole	TP34.675x33.763x0.25	Pole	92.5%	Pass
73.13 - 70	Pole	TP35.245x34.675x0.25	Pole	95.0%	Pass
70 - 69.75	Pole + Reinf.	TP35.29x35.245x0.5	Reinf. 8 Tension Rupture	67.2%	Pass
69.75 - 64.75	Pole + Reinf.	TP36.202x35.29x0.4875	Reinf. 8 Tension Rupture	70.2%	Pass
64.75 - 59.75	Pole + Reinf.	TP37.113x36.202x0.4875	Reinf. 8 Tension Rupture	73.0%	Pass
59.75 - 57.25	Pole + Reinf.	TP37.568x37.113x0.4813	Reinf. 8 Tension Rupture	74.3%	Pass
57.25 - 57	Pole + Reinf.	TP37.614x37.568x0.65	Reinf. 1 Tension Rupture	56.2%	Pass
57 - 56.75	Pole + Reinf.	TP37.659x37.614x0.4188	Reinf. 1 Tension Rupture	86.7%	Pass
56.75 - 51.75	Pole + Reinf.	TP38.571x37.659x0.4125	Reinf. 1 Tension Rupture	89.5%	Pass
51.75 - 48.76	Pole + Reinf.	TP40.121x38.571x0.4125	Reinf. 1 Tension Rupture	91.1%	Pass
48.76 - 42.24	Pole	TP39.803x38.616x0.3125	Pole	86.0%	Pass
42.24 - 37.24	Pole	TP40.714x39.803x0.3125	Pole	88.0%	Pass
37.24 - 32.24	Pole	TP41.625x40.714x0.3125	Pole	89.9%	Pass
32.24 - 27.24	Pole	TP42.536x41.625x0.3125	Pole	91.7%	Pass
27.24 - 22.24	Pole	TP43.447x42.536x0.3125	Pole	93.4%	Pass
22.24 - 17.25	Pole	TP44.357x43.447x0.3125	Pole	95.1%	Pass
17.25 - 17	Pole + Reinf.	TP44.403x44.357x0.625	Reinf. 6 Tension Rupture	62.9%	Pass
17 - 12	Pole + Reinf.	TP45.314x44.403x0.6125	Reinf. 6 Tension Rupture	64.1%	Pass
12 - 7	Pole + Reinf.	TP46.225x45.314x0.6125	Reinf. 6 Tension Rupture	65.2%	Pass
7 - 5.25	Pole + Reinf.	TP46.543x46.225x0.6125	Reinf. 6 Tension Rupture	65.5%	Pass
5.25 - 5	Pole + Reinf.	TP46.589x46.543x0.6	Reinf. 4 Tension Yield	64.2%	Pass
5 - 0	Pole + Reinf.	TP47.5x46.589x0.5875	Reinf. 4 Tension Yield	65.1%	Pass
				Summary	
			Pole	98.1%	Pass
			Reinforcement	97.5%	Pass
			Overall	98.1%	Pass

Additional Calculations

Section Elevation (ft)	Moment of Inertia (in ⁴)			Area (in ²)			% Capacity*								
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2	R3	R4	R5	R6	R7	R8
149 - 144	827	n/a	827	13.23	n/a	13.23	6.2%								
144 - 139	934	n/a	934	13.79	n/a	13.79	12.7%								
139 - 134	1051	n/a	1051	14.34	n/a	14.34	21.6%								
134 - 129	1177	n/a	1177	14.89	n/a	14.89	31.1%								
129 - 127.39	1219	n/a	1219	15.07	n/a	15.07	34.8%								
127.39 - 122.39	1299	n/a	1299	15.39	n/a	15.39	46.6%								
122.39 - 117.39	1442	n/a	1442	15.93	n/a	15.93	58.5%								
117.39 - 112.39	1595	n/a	1595	16.48	n/a	16.48	70.1%								
112.39 - 107.39	1758	n/a	1758	17.02	n/a	17.02	80.9%								
107.39 - 102.39	1933	n/a	1933	17.56	n/a	17.56	90.8%								
102.39 - 98.5	2076	n/a	2076	17.99	n/a	17.99	98.1%								
98.5 - 98.25	2085	1682	3767	18.02	13.50	31.52	53.7%		78.7%						
98.25 - 93.25	2280	1781	4061	18.56	13.50	32.06	59.4%		85.7%						
93.25 - 88.25	2487	1882	4369	19.10	13.50	32.60	64.9%		92.2%						
88.25 - 83.87	2677	1973	4651	19.58	13.50	33.08	69.6%		97.5%						
83.87 - 78.13	3772	n/a	3772	26.59	n/a	26.59	88.2%								
78.13 - 73.13	4088	n/a	4088	27.31	n/a	27.31	92.5%								
73.13 - 70	4295	n/a	4295	27.77	n/a	27.77	95.0%								
70 - 69.75	4312	4113	8424	27.80	24.38	52.18	48.0%								67.2%
69.75 - 64.75	4657	4318	8975	28.53	24.38	52.90	50.7%								70.2%
64.75 - 59.75	5020	4529	9548	29.25	24.38	53.62	53.3%								73.0%
59.75 - 57.25	5208	4636	9844	29.61	24.38	53.99	54.6%								74.3%
57.25 - 57	5227	8029	13256	29.65	42.38	72.02	40.8%	56.2%							55.5%
57 - 56.75	5247	3391	8637	29.68	18.00	47.68	62.9%	86.7%							
56.75 - 51.75	5639	3551	9190	30.41	18.00	48.41	65.6%	89.5%							
51.75 - 48.76	5883	3649	9532	30.84	18.00	48.84	67.2%	91.1%							
48.76 - 42.24	7715	n/a	7715	39.17	n/a	39.17	86.0%								
42.24 - 37.24	8261	n/a	8261	40.07	n/a	40.07	88.0%								
37.24 - 32.24	8833	n/a	8833	40.98	n/a	40.98	89.9%								
32.24 - 27.24	9430	n/a	9430	41.88	n/a	41.88	91.7%								
27.24 - 22.24	10053	n/a	10053	42.78	n/a	42.78	93.4%								
22.24 - 17.25	10703	n/a	10703	43.69	n/a	43.69	95.1%								
17.25 - 17	10736	10219	20955	43.73	40.00	83.73	48.8%						62.9%	62.9%	
17 - 12	11416	10626	22042	44.63	40.00	84.63	50.1%						64.1%	64.1%	
12 - 7	12123	11042	23165	45.54	40.00	85.54	51.4%						65.2%	65.2%	
7 - 5.25	12378	11189	23567	45.85	40.00	85.85	51.9%						65.5%	65.5%	
5.25 - 5	12414	11002	23416	45.90	34.88	80.77	52.9%			62.3%	64.2%	62.2%			
5 - 0	13162	11394	24555	46.80	34.88	81.68	54.2%			63.3%	65.1%	63.2%			

Note: Section capacity checked using 5 degree increments.
Rating per TIA-222-H Section 15.5.

Monopole Base Plate Connection

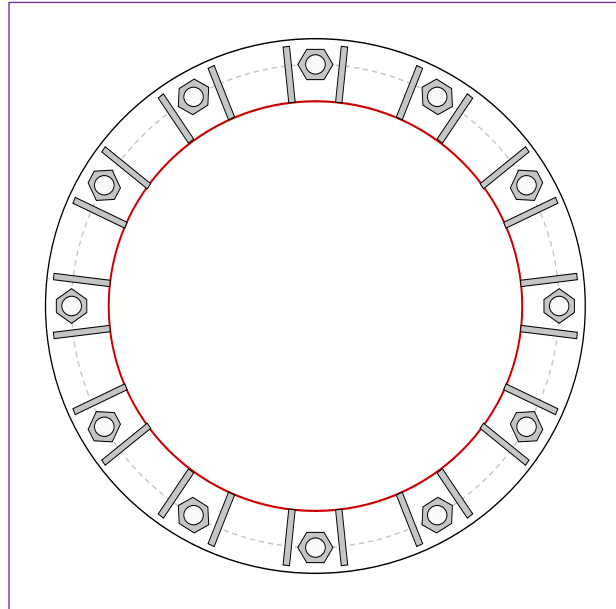


Site Info	
BU #	842856
Site Name	Andover North
Order #	669083 Rev. 0

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	1.875

Applied Loads	
Moment (kip-ft)	3010.00
Axial Force (kips)	42.00
Shear Force (kips)	27.00

*TIA-222-H Section 15.5 Applied



Connection Properties	Analysis Results
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Anchor Rod Data
 (12) 2-1/4" ϕ bolts (A615-75 N; $F_y=75$ ksi, $F_u=100$ ksi) on 56" BC

Base Plate Data
 62" OD x 1.5" Plate (A572-60; $F_y=60$ ksi, $F_u=75$ ksi)

Stiffener Data
 (24) 13"H x 6.5"W x 0.75"T, Notch: 0.75"
 plate: $F_y= 50$ ksi ; weld: $F_y= 80$ ksi
 horiz. weld: 0.375" groove, 45° dbl bevel, 0.25" fillet
 vert. weld: 0.3125" fillet

Pole Data
 47.5" 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>	
$Pu_t = 211.36$	$\phi Pn_t = 243.75$		Stress Rating
$Vu = 2.25$	$\phi Vn = 149.1$		82.6%
$Mu = n/a$	$\phi Mn = n/a$		Pass

Base Plate Summary		
Max Stress (ksi):	52.88	(Roark's Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	93.3%	Pass

Stiffener Summary		
Horizontal Weld:	45.5%	Pass
Vertical Weld:	51.7%	Pass
Plate Flexure+Shear:	23.7%	Pass
Plate Tension+Shear:	47.6%	Pass
Plate Compression:	62.6%	Pass

Pole Summary		
Punching Shear:	20.9%	Pass

Pier and Pad Foundation



BU # :	842856
Site Name:	Andover North
App. Number:	669083 Rev. 0

TIA-222 Revision:	H
Tower Type:	Monopole

Top & Bot. Pad Rein. Different?:	<input checked="" type="checkbox"/>
Block Foundation?:	<input type="checkbox"/>
Rectangular Pad?:	<input type="checkbox"/>

Superstructure Analysis Reactions		
Compression, P_{comp} :	42	kips
Base Shear, V_{u_comp} :	27	kips
Moment, M_u :	3010	ft-kips
Tower Height, H :	149	ft
BP Dist. Above Fdn, bp_{dist} :	4.125	in

Foundation Analysis Checks				
	Capacity	Demand	Rating*	Check
<i>Lateral (Sliding) (kips)</i>	179.38	27.00	14.3%	Pass
<i>Bearing Pressure (ksf)</i>	13.50	4.76	35.3%	Pass
<i>Overturing (kip*ft)</i>	3755.75	3221.78	85.8%	Pass
<i>Pier Flexure (Comp.) (kip*ft)</i>	4735.95	3131.50	63.0%	Pass
<i>Pier Compression (kip)</i>	21120.36	68.88	0.3%	Pass
<i>Pad Flexure (kip*ft)</i>	2736.60	1659.69	57.8%	Pass
<i>Pad Shear - 1-way (kips)</i>	735.13	293.26	38.0%	Pass
<i>Pad Shear - 2-way (Comp) (ksi)</i>	0.190	0.000	0.0%	Pass
<i>Flexural 2-way (Comp) (kip*ft)</i>	3755.83	1878.90	47.6%	Pass

Pier Properties		
Pier Shape:	Circular	
Pier Diameter, $dpier$:	6.5	ft
Ext. Above Grade, E :	1	ft
Pier Rebar Size, Sc :	8	
Pier Rebar Quantity, mc :	40	
Pier Tie/Spiral Size, St :	4	
Pier Tie/Spiral Quantity, mt :	5	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier} :	3	in

*Rating per TIA-222-H Section 15.5

Structural Rating*:	63.0%
Soil Rating*:	85.8%

Pad Properties		
Depth, D :	6.5	ft
Pad Width, W_1 :	20.5	ft
Pad Thickness, T :	3	ft
Pad Rebar Size (Top dir. 2), Sp_{top2} :	8	
Pad Rebar Quantity (Top dir. 2), mp_{top2} :	21	
Pad Rebar Size (Bottom dir. 2), Sp_2 :	8	
Pad Rebar Quantity (Bottom dir. 2), mp_2 :	25	
Pad Clear Cover, cc_{pad} :	3	in

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

Soil Properties		
Total Soil Unit Weight, γ :	115	pcf
Ultimate Gross Bearing, Q_{ult} :	18.000	ksf
Cohesion, C_u :		ksf
Friction Angle, ϕ :	30	degrees
SPT Blow Count, N_{blows} :	40	
Base Friction, μ :		
Neglected Depth, N :	3.33	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, gw :	N/A	ft

--Toggle between Gross and Net