

Date: **December 28, 2022**



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

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

**Carrier Designation:** **AT&T Mobility Co-Locate**  
**Site Number:** 10091916  
**Site Name:** Fairgrounds  
**FA# Number:** 10091916

**Crown Castle Designation:** **BU Number:** 846219  
**Site Name:** Fairgrounds  
**JDE Job Number:** 737079  
**Work Order Number:** 2187111  
**Order Number:** 638846 Rev. 0

**Engineering Firm Designation:** **B+T Group Project Number:** 100061.009.01.0001

**Site Data:** **682 Southwest Commerce Drive, Lake City, Columbia County, FL**  
**Latitude 30° 10' 26.43", Longitude -82° 40' 49.87"**  
**184.818 Foot - Guyed Tower**

B+T Group is pleased to submit this "**Structural Analysis Report**" to determine the structural integrity of the above-mentioned tower.

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

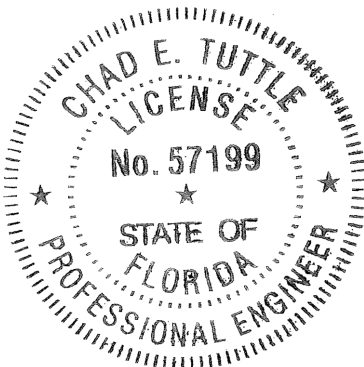
LC7: Proposed Equipment Configuration

**Sufficient Capacity**

This analysis utilizes an ultimate 3-second gust wind speed of 118 mph as required by the 2020 Florida Building Code 7th Edition. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural analysis prepared by: Dominique Jones

Respectfully submitted by: B+T Engineering, Inc.  
PE: 57199; Expires: 2/23/2023



Chad E. Tuttle, P.E.

tnxTower Report - version 8.1.1.0

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## 1) INTRODUCTION

This tower is a 184.818 ft. Guyed tower designed by Rohn.

The tower has been modified multiple times to accommodate additional loading.

## 2) ANALYSIS CRITERIA

TIA-222 Revision: TIA-222-H  
Risk Category: II  
Wind Speed: 118 mph  
Exposure Category: C  
Topographic Factor: 1  
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)       |
|---------------------|----------------------------|--------------------|----------------------|-------------------------|----------------------|---------------------------|
| 182.0               | 183.0                      | 6                  | Commscope            | 2NN2HH-33B-R4           | 12<br>18<br>6<br>3   | 3/4<br>7/8<br>3/8<br>5/16 |
|                     |                            | 12                 | Commscope            | CBC1726-DP-2X           |                      |                           |
|                     |                            | 6                  | Ericsson             | AIR 6419 B77G           |                      |                           |
|                     |                            | 6                  | Ericsson             | AIR 6449 B77D C-BAND    |                      |                           |
|                     |                            | 6                  | Ericsson             | RRUS 32                 |                      |                           |
|                     |                            | 6                  | Ericsson             | RRUS 32 B2              |                      |                           |
|                     |                            | 6                  | Ericsson             | RRUS 32 B66             |                      |                           |
|                     |                            | 6                  | Ericsson             | RRUS 4449 B5/B12        |                      |                           |
|                     |                            | 3                  | Ericsson             | RRUS 4478 B14           |                      |                           |
|                     |                            | 6                  | Ericsson             | RRUS-11                 |                      |                           |
|                     |                            | 2                  | Raycap               | DC6-48-60-18-8F         |                      |                           |
|                     |                            | 4                  | Raycap               | DC9-48-60-24-PC16-EV    |                      |                           |
|                     | 182.0                      | 1                  | --                   | Sector Mount [SM 502-3] |                      |                           |
| 174.0               | 174.0                      | 1                  | Andrew               | HSX6-59-P3A/B           | 1                    | EW52                      |
|                     |                            | 1                  | --                   | Pipe Mount [PM 601-1]   |                      |                           |
| 158.0               | 158.0                      | 1                  | Andrew               | HSX6-59A                | 1                    | EW52                      |
|                     |                            | 1                  | --                   | Pipe Mount [PM 601-1]   |                      |                           |
| 138.0               | 138.0                      | 1                  | Commscope            | HSX8-59                 | 1                    | EW52                      |
|                     |                            | 1                  | --                   | Pipe Mount [PM 601-1]   |                      |                           |
| 116.0               | 116.0                      | 1                  | Andrew               | HSX6-59-P3A/B           | 1                    | EW52                      |
|                     |                            | 1                  | --                   | Pipe Mount [PM 601-1]   |                      |                           |

**Table 2 - Other Considered Equipment**

| Mounting Level (ft) | Center Line Elevation (ft) | Number of Antennas | Antenna Manufacturer | Antenna Model           | Number of Feed Lines | Feed Line Size (in) |
|---------------------|----------------------------|--------------------|----------------------|-------------------------|----------------------|---------------------|
| 153.0               | 153.0                      | 1                  | --                   | Sector Mount [SM 502-3] | 19                   | 1-5/8               |
|                     | 150.0                      | 1                  | Commscope            | VHLPX3-11W              | 1                    | 1-1/4               |
|                     |                            | 2                  | Aviat Networks       | ODU600                  | 2                    | 3/8                 |

| Mounting Level (ft) | Center Line Elevation (ft) | Number of Antennas | Antenna Manufacturer | Antenna Model          | Number of Feed Lines | Feed Line Size (in) |
|---------------------|----------------------------|--------------------|----------------------|------------------------|----------------------|---------------------|
|                     |                            | 3                  | Css                  | X7CQAP-665-VR0         |                      |                     |
|                     |                            | 3                  | Ericsson             | 4449 B5 B13 VZ         |                      |                     |
|                     |                            | 3                  | Ericsson             | 8843 B2 B66A VZ        |                      |                     |
|                     |                            | 3                  | Ericsson             | AIR 6449               |                      |                     |
|                     |                            | 6                  | Jma Wireless         | MX06FIT665-02          |                      |                     |
|                     |                            | 1                  | Raycap               | RHSDC-3315-PF-48       |                      |                     |
|                     |                            | 1                  | Raycap               | RVZDC-6627-PF-48_CCIV2 |                      |                     |

### 3) ANALYSIS PROCEDURE

**Table 3 - Documents Provided**

| Document                            | Reference        | Source    |
|-------------------------------------|------------------|-----------|
| Tower Mapping                       | 5016030          | CCI Sites |
| Tower Modification Drawing          | 5813652          | CCI Sites |
| Legacy Post Modification Inspection | 5921972          | CCI Sites |
| Tower Modification Drawing          | 5989136          | CCI Sites |
| Post Modification Inspection        | 6088592          | CCI Sites |
| Foundation Drawing                  | 4552442          | CCI Sites |
| Geotech Report                      | 4552447          | CCI Sites |
| Crown CAD Package                   | Date: 12/20/2022 | CCI Sites |

#### 3.1) Analysis Method

tnxTower (version 8.1.1.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A. When applicable, Crown Castle has calculated and provided the effective area for panel antennas using approved methods following the intent of the TIA-222 standard.

#### 3.2) Assumptions

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

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

### 4) ANALYSIS RESULTS

**Table 4 - Section Capacity (Summary)**

| Section No. | Elevation (ft)    | Component Type | Size         | Critical Element | P (K)   | SF*P_allow (K) | % Capacity | Pass / Fail |
|-------------|-------------------|----------------|--------------|------------------|---------|----------------|------------|-------------|
| T1          | 184.818 - 164.818 | Leg            | ROHN 2.5 EH  | 3                | -43.744 | 99.127         | 44.1       | Pass        |
| T2          | 164.818 - 144.818 | Leg            | ROHN 2.5 STD | 60               | -40.914 | 75.218         | 54.4       | Pass        |
| T3          | 144.818 - 124.818 | Leg            | ROHN 2.5 STD | 116              | -39.323 | 61.326         | 64.1       | Pass        |
| T4          | 124.818 - 104.818 | Leg            | ROHN 2.5 STD | 150              | -40.557 | 61.326         | 66.1       | Pass        |

| Section No. | Elevation (ft)    | Component Type | Size            | Critical Element | P (K)   | SF*P_allow (K) | % Capacity | Pass / Fail |
|-------------|-------------------|----------------|-----------------|------------------|---------|----------------|------------|-------------|
| T5          | 104.818 - 84.8177 | Leg            | ROHN 2.5 EH     | 183              | -46.687 | 79.978         | 58.4       | Pass        |
| T6          | 84.8177 - 64.8177 | Leg            | ROHN 2.5 EH     | 214              | -57.336 | 79.978         | 71.7       | Pass        |
| T7          | 64.8177 - 44.8177 | Leg            | ROHN 2.5 EH     | 249              | -75.394 | 79.978         | 94.3       | Pass        |
| T8          | 44.8177 - 24.8177 | Leg            | ROHN 2.5 EH     | 282              | -76.448 | 79.978         | 95.6       | Pass        |
| T9          | 24.8177 - 4.81771 | Leg            | ROHN 2.5 EH     | 315              | -67.840 | 79.978         | 84.8       | Pass        |
| T10         | 4.81771 - 0       | Leg            | ROHN 2.5 EH     | 346              | -50.237 | 104.279        | 48.2       | Pass        |
| T1          | 184.818 - 164.818 | Diagonal       | ROHN 1.5 x 11GA | 10               | -5.560  | 11.431         | 48.6       | Pass        |
| T2          | 164.818 - 144.818 | Diagonal       | ROHN 1.5 x 16GA | 109              | -3.916  | 6.519          | 60.1       | Pass        |
| T3          | 144.818 - 124.818 | Diagonal       | ROHN 1.5 x 16GA | 126              | -5.748  | 6.519          | 88.2       | Pass        |
| T4          | 124.818 - 104.818 | Diagonal       | ROHN 1.5 x 16GA | 176              | -3.527  | 6.519          | 54.1       | Pass        |
| T5          | 104.818 - 84.8177 | Diagonal       | ROHN 1.5 x 16GA | 190              | -3.762  | 6.519          | 57.7       | Pass        |
| T6          | 84.8177 - 64.8177 | Diagonal       | ROHN 1.5 x 16GA | 242              | -5.178  | 6.519          | 79.4       | Pass        |
| T7          | 64.8177 - 44.8177 | Diagonal       | ROHN 1.5 x 16GA | 278              | -3.708  | 6.519          | 56.9       | Pass        |
| T8          | 44.8177 - 24.8177 | Diagonal       | ROHN 1.5 x 16GA | 291              | -2.615  | 6.519          | 40.1       | Pass        |
| T9          | 24.8177 - 4.81771 | Diagonal       | ROHN 1.5 x 16GA | 330              | -3.770  | 6.519          | 57.8       | Pass        |
| T10         | 4.81771 - 0       | Horizontal     | L4x4x1/4        | 354              | -0.921  | 61.857         | 9.4        | Pass        |
| T1          | 184.818 - 164.818 | Top Girt       | ROHN 1.5 x 16GA | 4                | -0.542  | 7.401          | 7.3        | Pass        |
| T2          | 164.818 - 144.818 | Top Girt       | ROHN 1.5 x 16GA | 63               | 1.121   | 10.429         | 10.8       | Pass        |
| T3          | 144.818 - 124.818 | Top Girt       | ROHN 1.5 x 16GA | 120              | -0.705  | 7.401          | 9.5        | Pass        |
| T4          | 124.818 - 104.818 | Top Girt       | ROHN 1.5 x 16GA | 153              | -0.705  | 7.401          | 9.5        | Pass        |
| T5          | 104.818 - 84.8177 | Top Girt       | ROHN 1.5 x 16GA | 185              | -0.847  | 7.401          | 11.4       | Pass        |
| T6          | 84.8177 - 64.8177 | Top Girt       | ROHN 1.5 x 16GA | 218              | -1.014  | 7.401          | 13.7       | Pass        |
| T7          | 64.8177 - 44.8177 | Top Girt       | ROHN 1.5 x 16GA | 251              | -1.316  | 7.401          | 17.8       | Pass        |
| T8          | 44.8177 - 24.8177 | Top Girt       | ROHN 1.5 x 16GA | 284              | -1.324  | 7.401          | 17.9       | Pass        |
| T9          | 24.8177 - 4.81771 | Top Girt       | ROHN 1.5 x 16GA | 317              | -1.200  | 7.401          | 16.2       | Pass        |
| T10         | 4.81771 - 0       | Top Girt       | L4x4x1/4        | 349              | 9.933   | 65.999         | 15.1       | Pass        |
| T1          | 184.818 - 164.818 | Bottom Girt    | ROHN 1.5 x 16GA | 9                | 1.102   | 10.429         | 10.6       | Pass        |
| T2          | 164.818 - 144.818 | Bottom Girt    | ROHN 1.5 x 16GA | 65               | -0.751  | 7.401          | 10.1       | Pass        |
| T3          | 144.818 - 124.818 | Bottom Girt    | ROHN 1.5 x 16GA | 123              | -1.501  | 7.401          | 20.3       | Pass        |
| T4          | 124.818 - 104.818 | Bottom Girt    | ROHN 1.5 x 16GA | 156              | -0.705  | 7.401          | 9.5        | Pass        |
| T5          | 104.818 - 84.8177 | Bottom Girt    | ROHN 1.5 x 16GA | 189              | -1.232  | 7.401          | 16.6       | Pass        |
| T6          | 84.8177 - 64.8177 | Bottom Girt    | ROHN 1.5 x 16GA | 221              | -1.014  | 7.401          | 13.7       | Pass        |
| T7          | 64.8177 - 44.8177 | Bottom Girt    | ROHN 1.5 x 16GA | 254              | -1.316  | 7.401          | 17.8       | Pass        |
| T8          | 44.8177 - 24.8177 | Bottom Girt    | ROHN 1.5 x 16GA | 287              | -1.324  | 7.401          | 17.9       | Pass        |
| T9          | 24.8177 - 4.81771 | Bottom Girt    | ROHN 1.5 x 16GA | 320              | -1.200  | 7.401          | 16.2       | Pass        |
| T1          | 184.818 - 164.818 | Guy A@167.341  | 3/4             | 373              | 21.398  | 36.729         | 58.3       | Pass        |
| T4          | 124.818 - 104.818 | Guy A@124.203  | 5/8             | 381              | 15.062  | 26.712         | 56.4       | Pass        |
| T6          | 84.8177 - 64.8177 | Guy A@84.2031  | 9/16            | 387              | 16.602  | 22.050         | 75.3       | Pass        |
| T1          | 184.818 - 164.818 | Guy B@167.341  | 3/4             | 368              | 22.167  | 36.729         | 60.4       | Pass        |
| T4          | 124.818 - 104.818 | Guy B@124.203  | 5/8             | 380              | 15.315  | 26.712         | 57.3       | Pass        |
| T6          | 84.8177 - 64.8177 | Guy B@84.2031  | 9/16            | 386              | 16.739  | 22.050         | 75.9       | Pass        |
| T1          | 184.818 - 164.818 | Guy C@167.341  | 3/4             | 362              | 20.308  | 36.729         | 55.3       | Pass        |
| T4          | 124.818 - 104.818 | Guy C@124.203  | 5/8             | 376              | 14.064  | 26.712         | 52.7       | Pass        |
| T6          | 84.8177 - 64.8177 | Guy C@84.2031  | 9/16            | 382              | 16.102  | 22.050         | 73.0       | Pass        |

| Section No. | Elevation (ft)    | Component Type           | Size          | Critical Element | P (K)  | SF*P_allow (K)        | % Capacity | Pass / Fail |
|-------------|-------------------|--------------------------|---------------|------------------|--------|-----------------------|------------|-------------|
| T1          | 184.818 - 164.818 | Top Guy Pull-Off@167.341 | 2L2x2x1/4x3/8 | 367              | 10.883 | 51.556                | 21.1       | Pass        |
| T4          | 124.818 - 104.818 | Top Guy Pull-Off@124.203 | 4 1/2x3/8     | 377              | 4.981  | 57.409                | 8.7        | Pass        |
| T6          | 84.8177 - 64.8177 | Top Guy Pull-Off@84.2031 | 4 1/2x3/8     | 383              | 6.623  | 57.409                | 11.5       | Pass        |
| T1          | 184.818 - 164.818 | Torque Arm Top@167.341   | C15x33.9      | 370              | -4.624 | 306.341               | 42.0       | Pass        |
|             |                   |                          |               |                  |        |                       | Summary    |             |
|             |                   |                          |               |                  |        | Leg (T8)              | 95.6       | Pass        |
|             |                   |                          |               |                  |        | Diagonal (T3)         | 88.2       | Pass        |
|             |                   |                          |               |                  |        | Horizontal (T10)      | 9.4        | Pass        |
|             |                   |                          |               |                  |        | Top Girt (T8)         | 17.9       | Pass        |
|             |                   |                          |               |                  |        | Bottom Girt (T3)      | 20.3       | Pass        |
|             |                   |                          |               |                  |        | Guy A (T6)            | 75.3       | Pass        |
|             |                   |                          |               |                  |        | Guy B (T6)            | 75.9       | Pass        |
|             |                   |                          |               |                  |        | Guy C (T6)            | 73.0       | Pass        |
|             |                   |                          |               |                  |        | Top Guy Pull-Off (T1) | 21.1       | Pass        |
|             |                   |                          |               |                  |        | Torque Arm Top (T1)   | 42.0       | Pass        |
|             |                   |                          |               |                  |        | Bolt Checks           | 85.7       | Pass        |
|             |                   |                          |               |                  |        | Rating =              | 95.6       | Pass        |

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

| Notes | Component                                | Elevation (ft) | % Capacity | Pass / Fail |
|-------|------------------------------------------|----------------|------------|-------------|
| 1,2   | Base Foundation (Structure)              | Base           | 42.7       | Pass        |
| 1,2   | Base Foundation (Soil Interaction)       | Base           | 33.1       | Pass        |
| 1,2   | Guy Anchor Shaft                         | Base           | 70.2       | Pass        |
| 1,2   | Guy Anchor Foundation (Structure)        | Base           | 21.5       | Pass        |
| 1,2   | Guy Anchor Foundation (Soil Interaction) | Base           | 24.7       | Pass        |

|                                                     |              |
|-----------------------------------------------------|--------------|
| <b>Structure Rating (max from all components) =</b> | <b>95.6%</b> |
|-----------------------------------------------------|--------------|

Notes:

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

#### 4.1) Recommendations

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

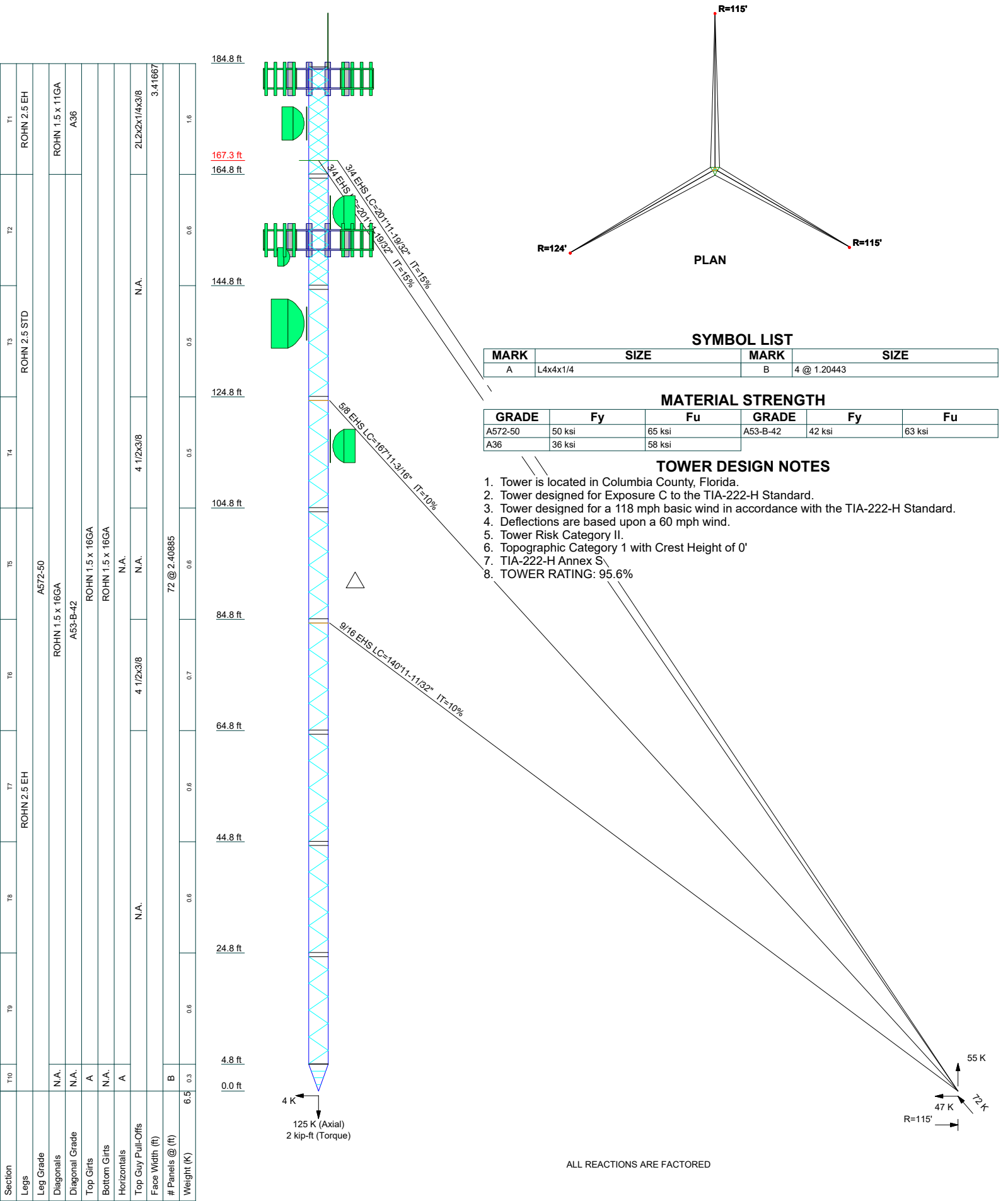
The results of the tilt and twist values for a 60 mph 3-second gust service wind speed per the TIA-222-H Standard are given below:

**Table 6 – Proposed Equipment Tilt-Sway Results for 60 mph Service Wind**

| <b><i>Elevation<br/>(ft)</i></b> | <b><i>Dish Model</i></b> | <b><i>Diameter<br/>(ft)</i></b> | <b><i>Tilt<br/>(°)</i></b> | <b><i>Twist<br/>(°)</i></b> |
|----------------------------------|--------------------------|---------------------------------|----------------------------|-----------------------------|
| 174.0                            | HSX6-59-P3A/B            | 6.4583                          | 0.054                      | 0.155                       |
| 158.0                            | HSX6-59A                 | 6.0                             | 0.033                      | 0.201                       |
| 138.0                            | HSX8-59                  | 8.875                           | 0.036                      | 0.316                       |
| 116.0                            | HSX6-59-P3A/B            | 6.4583                          | 0.022                      | 0.336                       |

## **APPENDIX A**

### **TNXTOWER OUTPUT**





**B+T Group**

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Phone: (918) 587-4630  
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Job: 100061.009.01.0001 - FAIRGROUNDS, FL (BU# 846219)

Project: Crown Castle

Client: Crown Castle

Code: TIA-222-H

Path: C:\Users\VINAYAK\Documents\100061\_846219\_Fairgrounds-Vinayak-PT.m 909 01 0001\100061\_009\_01\_0001 FAIRGROUNDS FL.dwg

Drawn by: Vinayak

Date: 12/28/22

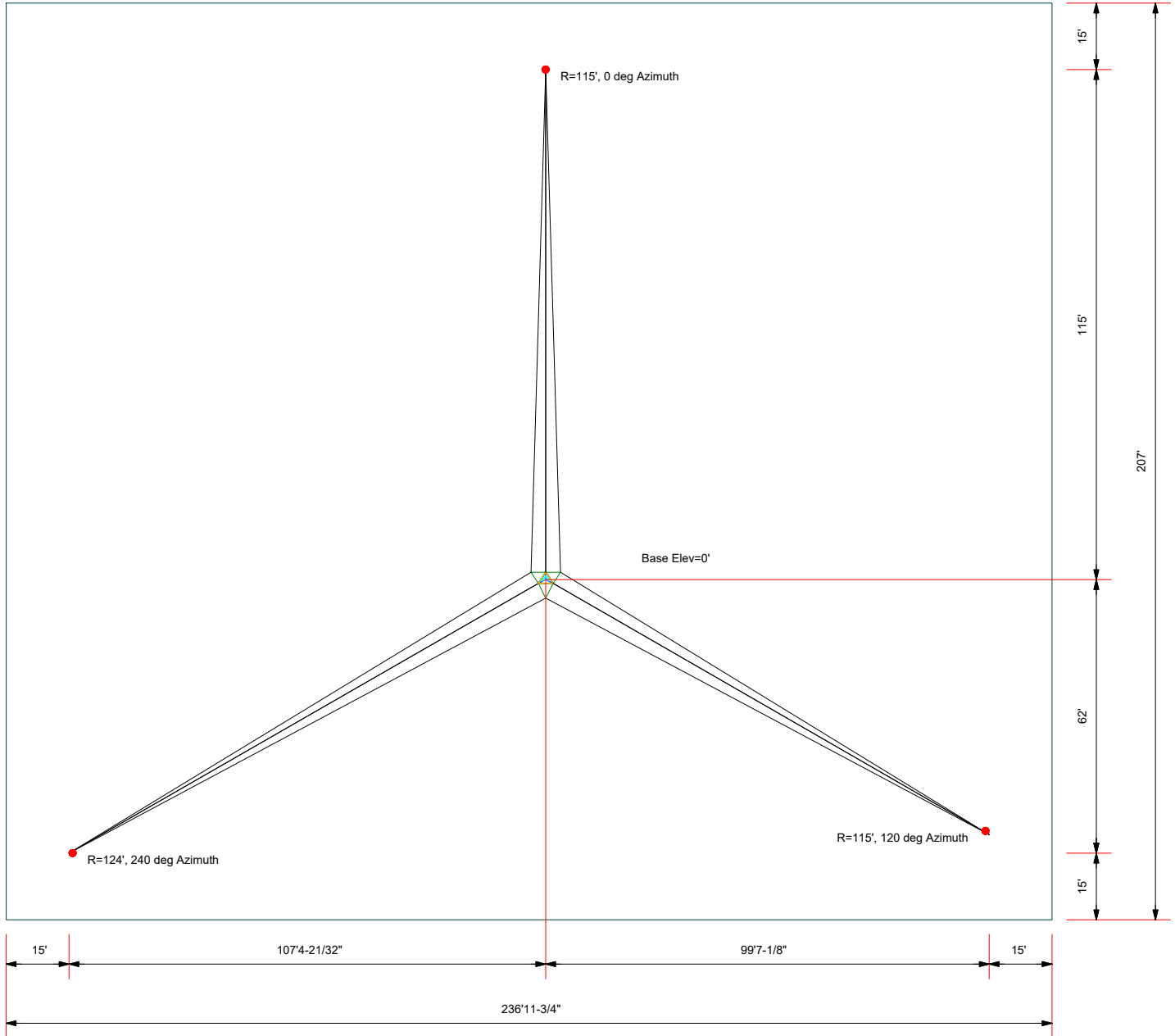
App'd:

Scale: NTS

Dwg No. E-1

# Plot Plan

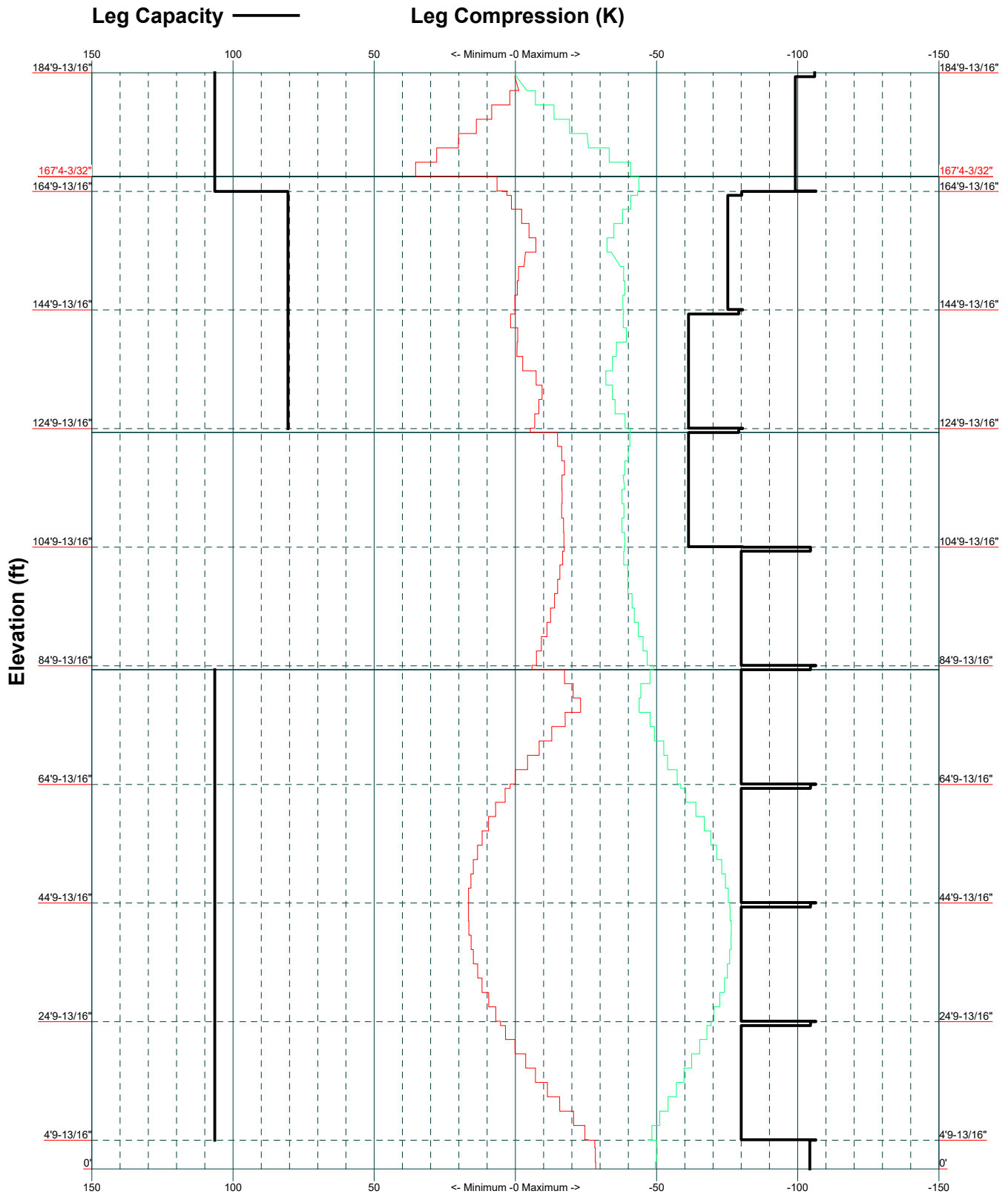
Total Area - 1.13 Acres



|                                                                                                                                                                                                       |  |                                                               |                   |            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---------------------------------------------------------------|-------------------|------------|
|  <b>B+T Group</b><br>1717 S. Boulder, Suite 300<br>Tulsa, OK 74119<br>Phone: (918) 587-4630<br>FAX: (918) 587-4630 |  | Job: <b>100061.009.01.0001 - FAIRGROUNDS, FL (BU# 846219)</b> |                   |            |
|                                                                                                                                                                                                       |  | Project:                                                      |                   |            |
|                                                                                                                                                                                                       |  | Client: Crown Castle                                          | Drawn by: Vinayak | App'd:     |
|                                                                                                                                                                                                       |  | Code: TIA-222-H                                               | Date: 12/28/22    | Scale: NTS |
|                                                                                                                                                                                                       |  | Path:                                                         | Dwg No. E-2       |            |

C:\Users\VINAYAK\Desktop\100061\_846219 Fairgrounds--Vinayak--PITm 009 01 0001\100061\_009 01 0001 FAIRGROUNDS.dwg

# TIA-222-H - 118 mph Exposure C



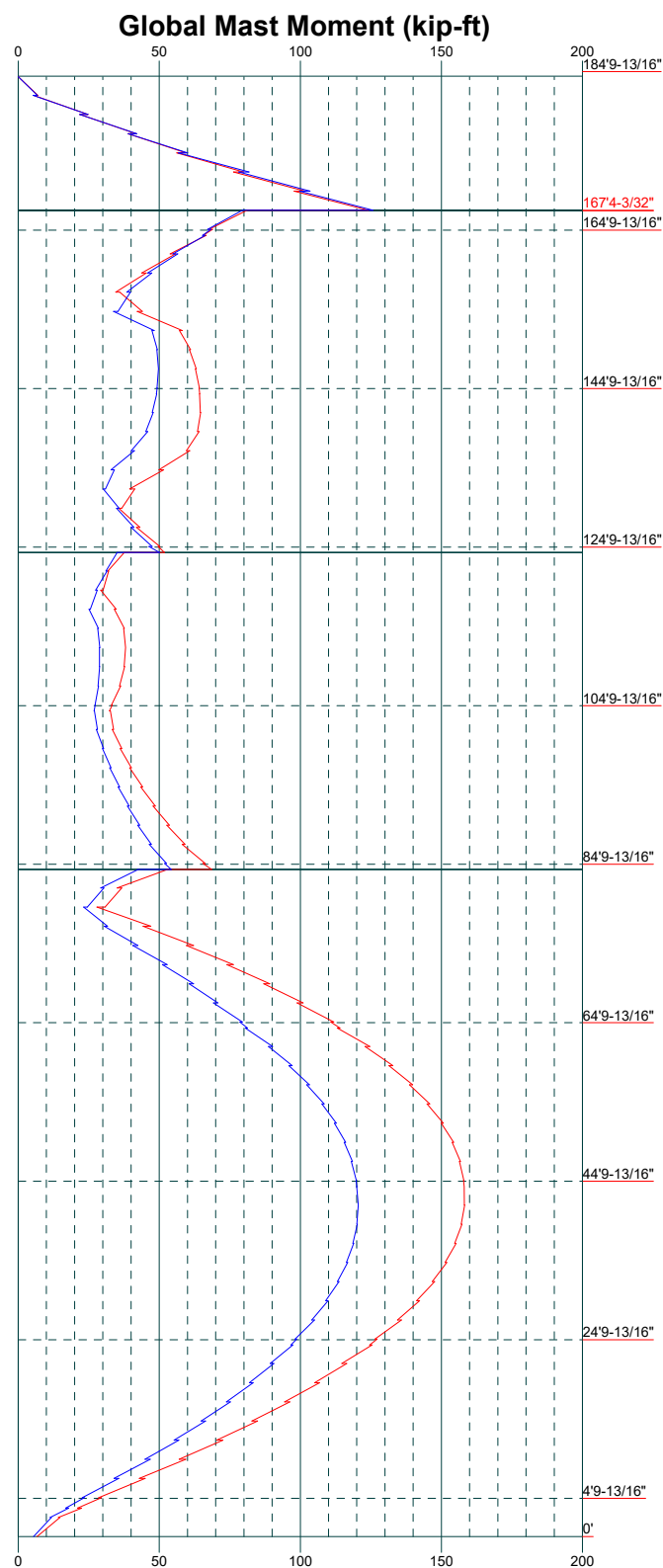
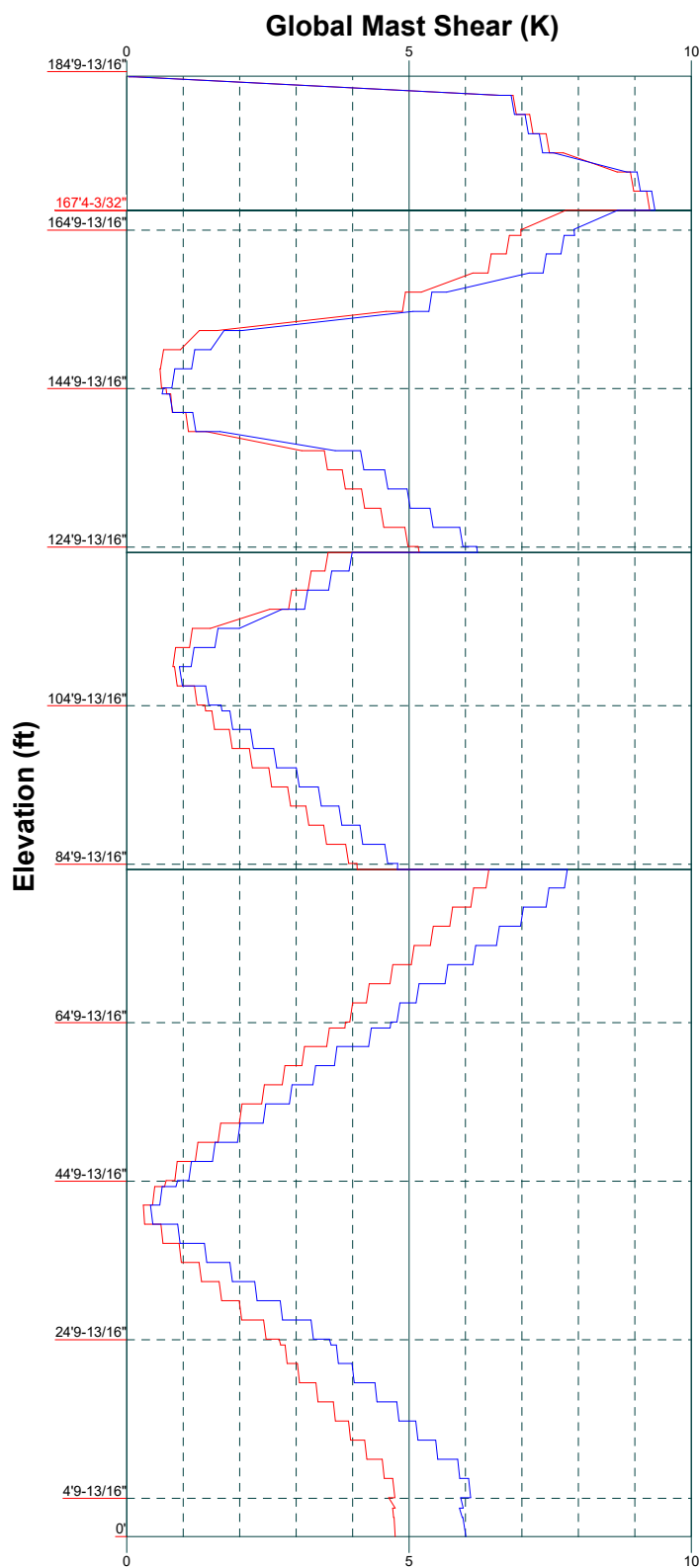
**B+T Group**  
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Job: **100061.009.01.0001 - FAIRGROUNDS, FL (BU# 846213)**  
 Project:  
 Client: Crown Castle  
 Code: TIA-222-H  
 Path:  
 Drawn by: Vinayak  
 Date: 12/28/22  
 App'd:  
 Scale: NTS  
 Dwg No: E-3

# TIA-222-H - 118 mph Exposure C

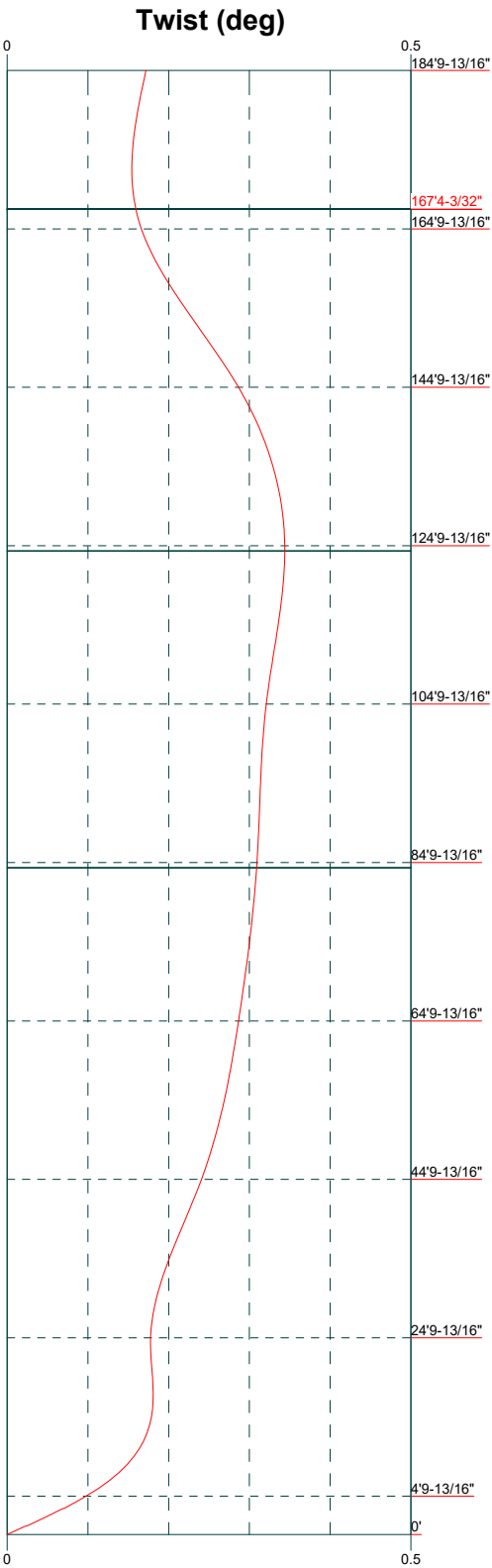
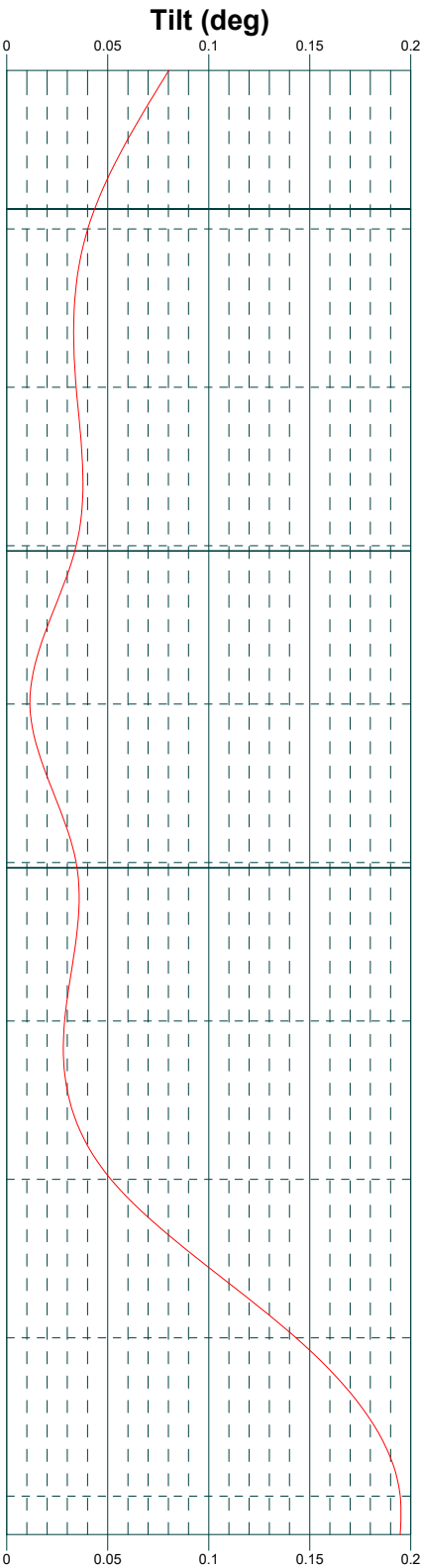
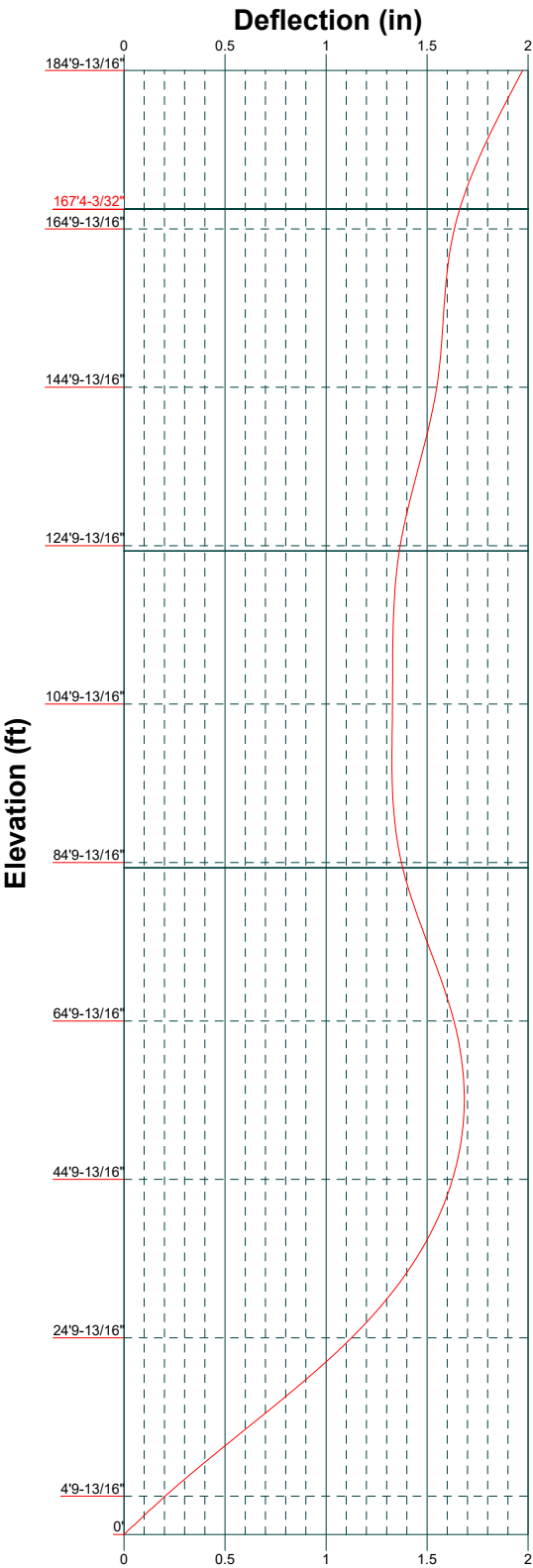
Vx Vz

Maximum Values  
Mx Mz



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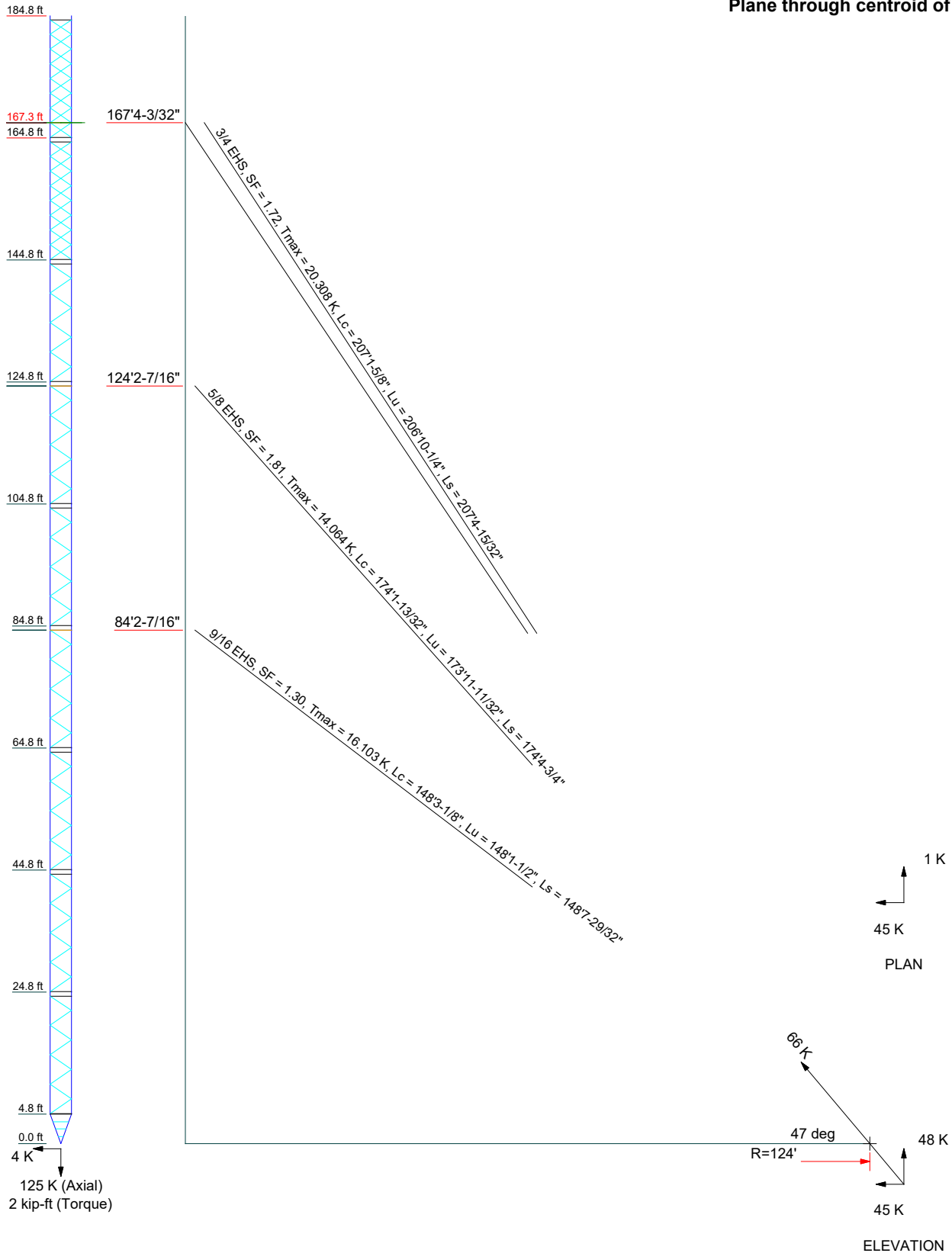
Job: **100061.009.01.0001 - FAIRGROUNDS, FL (BU# 846219)**  
Project:  
Client: Crown Castle  
Code: TIA-222-H  
Path:  
Drawn by: Vinayak  
Date: 12/28/22  
App'd:  
Scale: NTS  
Dwg No: E-4



# Guy Tensions and Tower Reactions

## TIA-222-H - 118 mph Exposure C

Maximum Values  
Anchor 'C' @ 124 ft Azimuth 240 deg Elev 0 ft  
Plane through centroid of tower



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Tulsa, OK 74119  
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FAX: (918) 587-4630

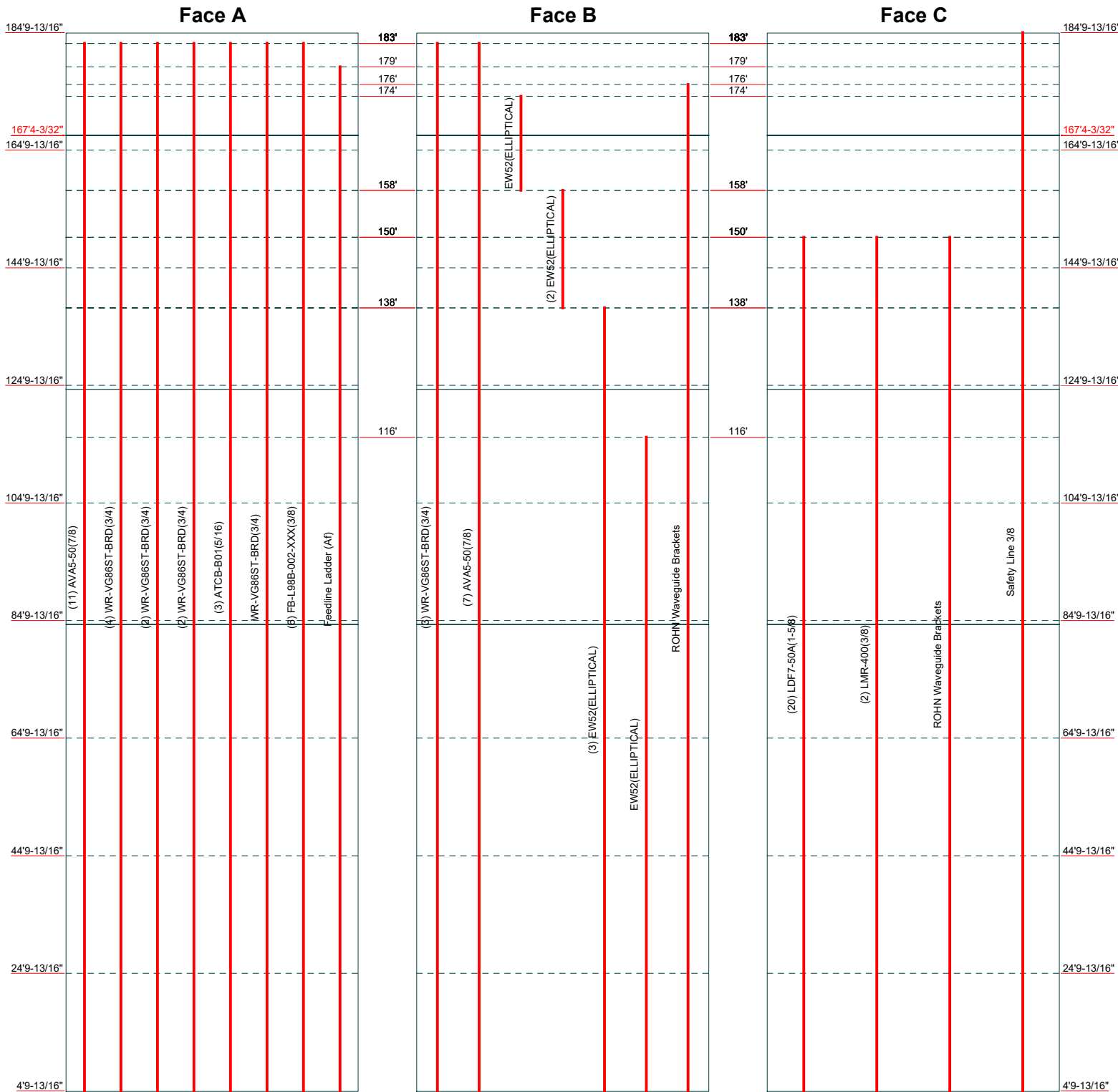
Job: **100061.009.01.0001 - FAIRGROUNDS, FL (BU# 846219)**  
Project:  
Client: Crown Castle  
Code: TIA-222-H  
Path:  
Drawn by: Vinayak  
Date: 12/28/22  
App'd:  
Scale: NTS  
Dwg No: E-6

C:\Users\VINAYAK\Documents\100061\_846219 Fairgrounds-Vinayak-PTM 009 01 0001\100061\_009 01 0001 FAIRGROUNDS.dwg

Feed Line Distribution Chart  
4'9-13/16" - 184'9-13/16"

Round Flat App In Face App Out Face Truss Leg

Elevation (ft)



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

Job: **100061.009.01.0001 - FAIRGROUNDS, FL (BU# 846219)**

|                 |                                                                                                               |                   |             |
|-----------------|---------------------------------------------------------------------------------------------------------------|-------------------|-------------|
| Project:        | Client: Crown Castle                                                                                          | Drawn by: Vinayak | App'd:      |
| Code: TIA-222-H | Date: 12/28/22                                                                                                | Scale: NTS        | Dwg No: E-7 |
| Path:           | C:\Users\VINAYAK\Desktop\100061_846219_Fairgrounds-Vinayak-PTm 009 01 0001\100061_009_01_0001_FAIRGROUNDS.dwg |                   |             |

|                                                                                                                                          |                                                                 |                                  |
|------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|----------------------------------|
| <b>tnxTower</b><br><br><b>B+T Group</b><br>1717 S. Boulder, Suite 300<br>Tulsa, OK 74119<br>Phone: (918) 587-4630<br>FAX: (918) 587-4630 | <b>Job</b><br>100061.009.01.0001 - FAIRGROUNDS, FL (BU# 846219) | <b>Page</b><br>1 of 52           |
|                                                                                                                                          | <b>Project</b>                                                  | <b>Date</b><br>22:32:58 12/28/22 |
|                                                                                                                                          | <b>Client</b><br>Crown Castle                                   | <b>Designed by</b><br>Vinayak    |

## Tower Input Data

The main tower is a 3x guyed tower with an overall height of 184'9-13/16" above the ground line.

The base of the tower is set at an elevation of 0' above the ground line.

The face width of the tower is 3'5" at the top and tapered at the base.

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

The following design criteria apply:

Tower is located in Columbia County, Florida.

Tower base elevation above sea level: 156'.

Basic wind speed of 118 mph.

Risk Category II.

Exposure Category C.

Simplified Topographic Factor Procedure for wind speed-up calculations is used.

Topographic Category: 1.

Crest Height: 0'.

Deflections calculated using a wind speed of 60 mph.

TIA-222-H Annex S.

Pressures are calculated at each section.

Stress ratio used in tower member design is 1.

Safety factor used in guy design is 1.

Tower analysis based on target reliabilities in accordance with Annex S.

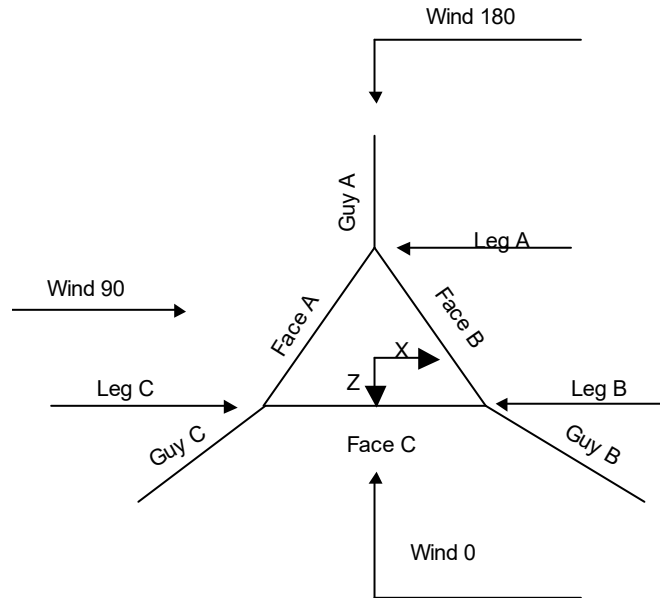
Load Modification Factors used:  $K_{cs}(F_w) = 0.95$ .

Maximum demand-capacity ratio is: 1.05.

Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

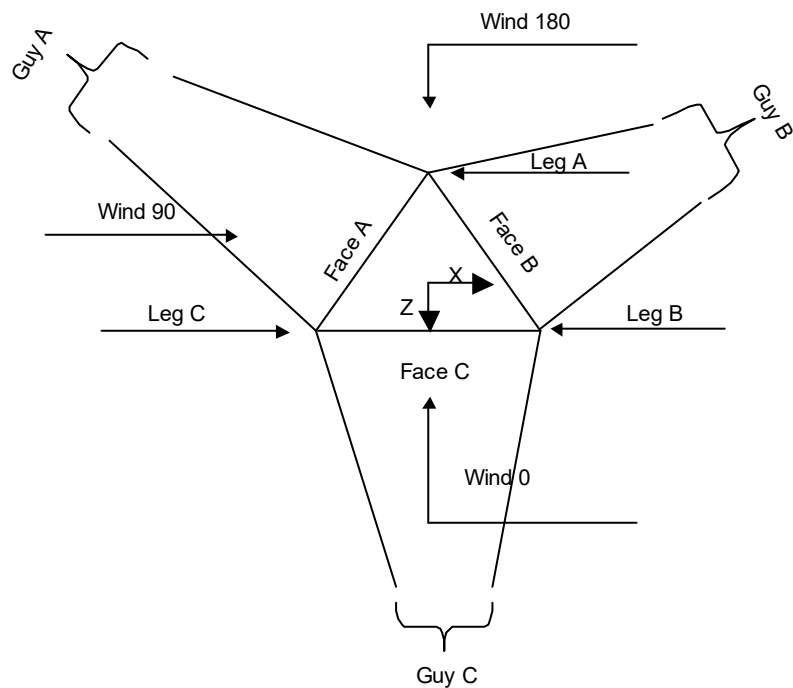
## Options

|                                     |                                      |                                         |
|-------------------------------------|--------------------------------------|-----------------------------------------|
| Consider Moments - Legs             | Distribute Leg Loads As Uniform      | Use ASCE 10 X-Brace Ly Rules            |
| Consider Moments - Horizontals      | Assume Legs Pinned                   | √ Calculate Redundant Bracing Forces    |
| Consider Moments - Diagonals        | √ Assume Rigid Index Plate           | Ignore Redundant Members in FEA         |
| Use Moment Magnification            | √ Use Clear Spans For Wind Area      | √ SR Leg Bolts Resist Compression       |
| √ Use Code Stress Ratios            | √ Use Clear Spans For KL/r           | All Leg Panels Have Same Allowable      |
| √ Use Code Safety Factors - Guys    | √ Retension Guys To Initial Tension  | Offset Girt At Foundation               |
| Escalate Ice                        | √ Bypass Mast Stability Checks       | √ Consider Feed Line Torque             |
| Always Use Max Kz                   | √ Use Azimuth Dish Coefficients      | √ Include Angle Block Shear Check       |
| Use Special Wind Profile            | √ Project Wind Area of Appurt.       | Use TIA-222-H Bracing Resist. Exemption |
| Include Bolts In Member Capacity    | √ Autocalc Torque Arm Areas          | Use TIA-222-H Tension Splice Exemption  |
| √ Leg Bolts Are At Top Of Section   | Add IBC .6D+W Combination            | Poles                                   |
| √ Secondary Horizontal Braces Leg   | √ Sort Capacity Reports By Component | Include Shear-Torsion Interaction       |
| Use Diamond Inner Bracing (4 Sided) | Triangulate Diamond Inner Bracing    | Always Use Sub-Critical Flow            |
| SR Members Have Cut Ends            | Treat Feed Line Bundles As Cylinder  | Use Top Mounted Sockets                 |
| SR Members Are Concentric           | Ignore KL/ry For 60 Deg. Angle Legs  | Pole Without Linear Attachments         |
|                                     |                                      | Pole With Shroud Or No Appurtenances    |
|                                     |                                      | Outside and Inside Corner Radii Are     |
|                                     |                                      | Known                                   |



**Corner & Starmount Guyed Tower**

|                                                                                                                                          |                                                                 |                                  |
|------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|----------------------------------|
| <b>tnxTower</b><br><br><b>B+T Group</b><br>1717 S. Boulder, Suite 300<br>Tulsa, OK 74119<br>Phone: (918) 587-4630<br>FAX: (918) 587-4630 | <b>Job</b><br>100061.009.01.0001 - FAIRGROUNDS, FL (BU# 846219) | <b>Page</b><br>3 of 52           |
|                                                                                                                                          | <b>Project</b>                                                  | <b>Date</b><br>22:32:58 12/28/22 |
|                                                                                                                                          | <b>Client</b><br>Crown Castle                                   | <b>Designed by</b><br>Vinayak    |



**Face Guyed**

## Tower Section Geometry

| Tower Section | Tower Elevation           | Assembly Database | Description | Section Width | Number of Sections | Section Length |
|---------------|---------------------------|-------------------|-------------|---------------|--------------------|----------------|
|               | ft                        |                   |             | ft            |                    | ft             |
| T1            | 184'9-13/16"-164'9-13/16" |                   |             | 3'5"          | 1                  | 20'            |
| T2            | 164'9-13/16"-144'9-13/16" |                   |             | 3'5"          | 1                  | 20'            |
| T3            | 144'9-13/16"-124'9-13/16" |                   |             | 3'5"          | 1                  | 20'            |
| T4            | 124'9-13/16"-104'9-13/16" |                   |             | 3'5"          | 1                  | 20'            |
| T5            | 104'9-13/16"-84'9-13/16"  |                   |             | 3'5"          | 1                  | 20'            |
| T6            | 84'9-13/16"-64'9-13/16"   |                   |             | 3'5"          | 1                  | 20'            |
| T7            | 64'9-13/16"-44'9-13/16"   |                   |             | 3'5"          | 1                  | 20'            |
| T8            | 44'9-13/16"-24'9-13/16"   |                   |             | 3'5"          | 1                  | 20'            |

|                                                                                                                                          |                                                                 |                                  |
|------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|----------------------------------|
| <b>tnxTower</b><br><br><b>B+T Group</b><br>1717 S. Boulder, Suite 300<br>Tulsa, OK 74119<br>Phone: (918) 587-4630<br>FAX: (918) 587-4630 | <b>Job</b><br>100061.009.01.0001 - FAIRGROUNDS, FL (BU# 846219) | <b>Page</b><br>4 of 52           |
|                                                                                                                                          | <b>Project</b>                                                  | <b>Date</b><br>22:32:58 12/28/22 |
|                                                                                                                                          | <b>Client</b><br>Crown Castle                                   | <b>Designed by</b><br>Vinayak    |

| Tower Section | Tower Elevation         | Assembly Database | Description | Section Width | Number of Sections | Section Length |
|---------------|-------------------------|-------------------|-------------|---------------|--------------------|----------------|
|               | ft                      |                   |             | ft            |                    | ft             |
| T9            | 24'9-13/16"-4'9-1 3/16" |                   |             | 3'5"          | 1                  | 20'            |
| T10           | 4'9-13/16"-0'           |                   |             | 3'5"          | 1                  | 4'9-13/16"     |

### Tower Section Geometry (cont'd)

| Tower Section | Tower Elevation            | Diagonal Spacing | Bracing Type | Has K Brace End Panels | Has Horizontals | Top Girt Offset | Bottom Girt Offset |
|---------------|----------------------------|------------------|--------------|------------------------|-----------------|-----------------|--------------------|
|               | ft                         | ft               |              |                        |                 | in              | in                 |
| T1            | 184'9-13/16"-164' 9-13/16" | 2'4-29/32"       | CX Brace     | No                     | No              | 7.375           | 1.375              |
| T2            | 164'9-13/16"-144' 9-13/16" | 2'4-29/32"       | CX Brace     | No                     | No              | 7.375           | 1.375              |
| T3            | 144'9-13/16"-124' 9-13/16" | 2'4-29/32"       | K Brace Left | No                     | No              | 7.375           | 1.375              |
| T4            | 124'9-13/16"-104' 9-13/16" | 2'4-29/32"       | K Brace Left | No                     | No              | 7.375           | 1.375              |
| T5            | 104'9-13/16"-84'9 -13/16"  | 2'4-29/32"       | K Brace Left | No                     | No              | 7.375           | 1.375              |
| T6            | 84'9-13/16"-64'9-13/16"    | 2'4-29/32"       | K Brace Left | No                     | No              | 7.375           | 1.375              |
| T7            | 64'9-13/16"-44'9-13/16"    | 2'4-29/32"       | K Brace Left | No                     | No              | 7.375           | 1.375              |
| T8            | 44'9-13/16"-24'9-13/16"    | 2'4-29/32"       | K Brace Left | No                     | No              | 7.375           | 1.375              |
| T9            | 24'9-13/16"-4'9-1 3/16"    | 2'4-29/32"       | K Brace Left | No                     | No              | 7.375           | 1.375              |
| T10           | 4'9-13/16"-0'              | 1'2-7/16"        | X Brace      | No                     | Yes             | 0.000           | 0.000              |

### Tower Section Geometry (cont'd)

| Tower Elevation                  | Leg Type | Leg Size     | Leg Grade        | Diagonal Type | Diagonal Size   | Diagonal Grade    |
|----------------------------------|----------|--------------|------------------|---------------|-----------------|-------------------|
| ft                               |          |              |                  |               |                 |                   |
| T1<br>184'9-13/16"-164' 9-13/16" | Pipe     | ROHN 2.5 EH  | A572-50 (50 ksi) | Pipe          | ROHN 1.5 x 11GA | A36 (36 ksi)      |
| T2<br>164'9-13/16"-144' 9-13/16" | Pipe     | ROHN 2.5 STD | A572-50 (50 ksi) | Pipe          | ROHN 1.5 x 16GA | A53-B-42 (42 ksi) |
| T3<br>144'9-13/16"-124' 9-13/16" | Pipe     | ROHN 2.5 STD | A572-50 (50 ksi) | Pipe          | ROHN 1.5 x 16GA | A53-B-42 (42 ksi) |
| T4<br>124'9-13/16"-104' 9-13/16" | Pipe     | ROHN 2.5 STD | A572-50 (50 ksi) | Pipe          | ROHN 1.5 x 16GA | A53-B-42 (42 ksi) |
| T5<br>104'9-13/16"-84'9 -13/16"  | Pipe     | ROHN 2.5 EH  | A572-50 (50 ksi) | Pipe          | ROHN 1.5 x 16GA | A53-B-42 (42 ksi) |
| T6<br>84'9-13/16"-64'9-          | Pipe     | ROHN 2.5 EH  | A572-50 (50 ksi) | Pipe          | ROHN 1.5 x 16GA | A53-B-42 (42 ksi) |

|                                                                                                                                          |                                                                 |                                  |
|------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|----------------------------------|
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|                                                                                                                                          | <b>Project</b>                                                  | <b>Date</b><br>22:32:58 12/28/22 |
|                                                                                                                                          | <b>Client</b><br>Crown Castle                                   | <b>Designed by</b><br>Vinayak    |

| Tower Elevation<br>ft                   | Leg Type | Leg Size    | Leg Grade           | Diagonal Type | Diagonal Size   | Diagonal Grade       |
|-----------------------------------------|----------|-------------|---------------------|---------------|-----------------|----------------------|
| 13/16"<br>T7<br>64'9-13/16"-44'9-13/16" | Pipe     | ROHN 2.5 EH | A572-50<br>(50 ksi) | Pipe          | ROHN 1.5 x 16GA | A53-B-42<br>(42 ksi) |
| 44'9-13/16"-24'9-13/16"<br>T8           | Pipe     | ROHN 2.5 EH | A572-50<br>(50 ksi) | Pipe          | ROHN 1.5 x 16GA | A53-B-42<br>(42 ksi) |
| 24'9-13/16"-4'9-13/16"<br>T9            | Pipe     | ROHN 2.5 EH | A572-50<br>(50 ksi) | Pipe          | ROHN 1.5 x 16GA | A53-B-42<br>(42 ksi) |
| T10 4'9-13/16"-0"                       | Pipe     | ROHN 2.5 EH | A572-50<br>(50 ksi) | Single Angle  |                 | A36<br>(36 ksi)      |

### Tower Section Geometry (cont'd)

| Tower Elevation<br>ft           | Top Girt Type | Top Girt Size   | Top Girt Grade       | Bottom Girt Type | Bottom Girt Size | Bottom Girt Grade    |
|---------------------------------|---------------|-----------------|----------------------|------------------|------------------|----------------------|
| 184'9-13/16"-164'9-13/16"<br>T1 | Pipe          | ROHN 1.5 x 16GA | A53-B-42<br>(42 ksi) | Pipe             | ROHN 1.5 x 16GA  | A53-B-42<br>(42 ksi) |
| 164'9-13/16"-144'9-13/16"<br>T2 | Pipe          | ROHN 1.5 x 16GA | A53-B-42<br>(42 ksi) | Pipe             | ROHN 1.5 x 16GA  | A53-B-42<br>(42 ksi) |
| 144'9-13/16"-124'9-13/16"<br>T3 | Pipe          | ROHN 1.5 x 16GA | A53-B-42<br>(42 ksi) | Pipe             | ROHN 1.5 x 16GA  | A53-B-42<br>(42 ksi) |
| 124'9-13/16"-104'9-13/16"<br>T4 | Pipe          | ROHN 1.5 x 16GA | A53-B-42<br>(42 ksi) | Pipe             | ROHN 1.5 x 16GA  | A53-B-42<br>(42 ksi) |
| 104'9-13/16"-84'9-13/16"<br>T5  | Pipe          | ROHN 1.5 x 16GA | A53-B-42<br>(42 ksi) | Pipe             | ROHN 1.5 x 16GA  | A53-B-42<br>(42 ksi) |
| 84'9-13/16"-64'9-13/16"<br>T6   | Pipe          | ROHN 1.5 x 16GA | A53-B-42<br>(42 ksi) | Pipe             | ROHN 1.5 x 16GA  | A53-B-42<br>(42 ksi) |
| 64'9-13/16"-44'9-13/16"<br>T7   | Pipe          | ROHN 1.5 x 16GA | A53-B-42<br>(42 ksi) | Pipe             | ROHN 1.5 x 16GA  | A53-B-42<br>(42 ksi) |
| 44'9-13/16"-24'9-13/16"<br>T8   | Pipe          | ROHN 1.5 x 16GA | A53-B-42<br>(42 ksi) | Pipe             | ROHN 1.5 x 16GA  | A53-B-42<br>(42 ksi) |
| 24'9-13/16"-4'9-13/16"<br>T9    | Pipe          | ROHN 1.5 x 16GA | A53-B-42<br>(42 ksi) | Pipe             | ROHN 1.5 x 16GA  | A53-B-42<br>(42 ksi) |
| T10 4'9-13/16"-0"               | Single Angle  | L4x4x1/4        | A36<br>(36 ksi)      | Single Angle     | L4x4x1/4         | A36<br>(36 ksi)      |

### Tower Section Geometry (cont'd)



|                                                                                                                                          |                                                                 |                                  |
|------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|----------------------------------|
| <b>tnxTower</b><br><br><b>B+T Group</b><br>1717 S. Boulder, Suite 300<br>Tulsa, OK 74119<br>Phone: (918) 587-4630<br>FAX: (918) 587-4630 | <b>Job</b><br>100061.009.01.0001 - FAIRGROUNDS, FL (BU# 846219) | <b>Page</b><br>7 of 52           |
|                                                                                                                                          | <b>Project</b>                                                  | <b>Date</b><br>22:32:58 12/28/22 |
|                                                                                                                                          | <b>Client</b><br>Crown Castle                                   | <b>Designed by</b><br>Vinayak    |

| Tower<br>Elevation<br><br>ft        | Calc<br>K<br>Single<br>Angles | Calc<br>K<br>Solid<br>Rounds | K Factors <sup>1</sup> |                               |                               |                           |                 |                  |                          |                          |
|-------------------------------------|-------------------------------|------------------------------|------------------------|-------------------------------|-------------------------------|---------------------------|-----------------|------------------|--------------------------|--------------------------|
|                                     |                               |                              | Legs                   | X<br>Brace<br>Diags<br>X<br>Y | K<br>Brace<br>Diags<br>X<br>Y | Single<br>Diags<br>X<br>Y | Girts<br>X<br>Y | Horiz.<br>X<br>Y | Sec.<br>Horiz.<br>X<br>Y | Inner<br>Brace<br>X<br>Y |
|                                     |                               |                              |                        |                               |                               |                           |                 |                  |                          |                          |
| T2<br>164'9-13/16"-<br>144'9-13/16" | No                            | No                           | 1                      | 1<br>1                        | 1<br>1                        | 1<br>1                    | 1<br>1          | 1<br>1           | 1<br>1                   | 1<br>1                   |
| T3<br>144'9-13/16"-<br>124'9-13/16" | No                            | No                           | 1                      | 1<br>1                        | 1<br>1                        | 1<br>1                    | 1<br>1          | 1<br>1           | 1<br>1                   | 1<br>1                   |
| T4<br>124'9-13/16"-<br>104'9-13/16" | No                            | No                           | 1                      | 1<br>1                        | 1<br>1                        | 1<br>1                    | 1<br>1          | 1<br>1           | 1<br>1                   | 1<br>1                   |
| T5<br>104'9-13/16"-<br>84'9-13/16"  | No                            | No                           | 1                      | 1<br>1                        | 1<br>1                        | 1<br>1                    | 1<br>1          | 1<br>1           | 1<br>1                   | 1<br>1                   |
| T6<br>84'9-13/16"-6<br>4'9-13/16"   | No                            | No                           | 1                      | 1<br>1                        | 1<br>1                        | 1<br>1                    | 1<br>1          | 1<br>1           | 1<br>1                   | 1<br>1                   |
| T7<br>64'9-13/16"-4<br>4'9-13/16"   | No                            | No                           | 1                      | 1<br>1                        | 1<br>1                        | 1<br>1                    | 1<br>1          | 1<br>1           | 1<br>1                   | 1<br>1                   |
| T8<br>44'9-13/16"-2<br>4'9-13/16"   | No                            | No                           | 1                      | 1<br>1                        | 1<br>1                        | 1<br>1                    | 1<br>1          | 1<br>1           | 1<br>1                   | 1<br>1                   |
| T9<br>24'9-13/16"-4'<br>9-13/16"    | No                            | No                           | 1                      | 1<br>1                        | 1<br>1                        | 1<br>1                    | 1<br>1          | 1<br>1           | 1<br>1                   | 1<br>1                   |
| T10<br>4'9-13/16"-0'                | Yes                           | No                           | 1                      | 1<br>1                        | 1<br>1                        | 1<br>1                    | 1<br>1          | 1<br>1           | 1<br>1                   | 1<br>1                   |

<sup>1</sup>Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.

## Tower Section Geometry (cont'd)

| Tower<br>Elevation<br>ft            | Leg                       |   | Diagonal                  |   | Top Girt                  |   | Bottom Girt               |   | Mid Girt                  |      | Long Horizontal           |   | Short Horizontal          |      |
|-------------------------------------|---------------------------|---|---------------------------|---|---------------------------|---|---------------------------|---|---------------------------|------|---------------------------|---|---------------------------|------|
|                                     | Net Width<br>Deduct<br>in | U | Net Width<br>Deduct<br>in | U | Net Width<br>Deduct<br>in | U | Net Width<br>Deduct<br>in | U | Net Width<br>Deduct<br>in | U    | Net Width<br>Deduct<br>in | U | Net Width<br>Deduct<br>in | U    |
| T1<br>184'9-13/16"-1<br>64'9-13/16" | 0.000                     | 1 | 0.000                     | 1 | 0.000                     | 1 | 0.000                     | 1 | 0.000                     | 0.75 | 0.000                     | 1 | 0.000                     | 0.75 |
| T2<br>164'9-13/16"-1<br>44'9-13/16" | 0.000                     | 1 | 0.000                     | 1 | 0.000                     | 1 | 0.000                     | 1 | 0.000                     | 0.75 | 0.000                     | 1 | 0.000                     | 0.75 |
| T3<br>144'9-13/16"-1<br>24'9-13/16" | 0.000                     | 1 | 0.000                     | 1 | 0.000                     | 1 | 0.000                     | 1 | 0.000                     | 0.75 | 0.000                     | 1 | 0.000                     | 0.75 |
| T4<br>124'9-13/16"-1<br>04'9-13/16" | 0.000                     | 1 | 0.000                     | 1 | 0.000                     | 1 | 0.000                     | 1 | 0.000                     | 0.75 | 0.000                     | 1 | 0.000                     | 0.75 |
| T5<br>104'9-13/16"-8<br>4'9-13/16"  | 0.000                     | 1 | 0.000                     | 1 | 0.000                     | 1 | 0.000                     | 1 | 0.000                     | 0.75 | 0.000                     | 1 | 0.000                     | 0.75 |

|                                                                                                                                          |                                                                 |                                  |
|------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|----------------------------------|
| <b>tnxTower</b><br><br><b>B+T Group</b><br>1717 S. Boulder, Suite 300<br>Tulsa, OK 74119<br>Phone: (918) 587-4630<br>FAX: (918) 587-4630 | <b>Job</b><br>100061.009.01.0001 - FAIRGROUNDS, FL (BU# 846219) | <b>Page</b><br>8 of 52           |
|                                                                                                                                          | <b>Project</b>                                                  | <b>Date</b><br>22:32:58 12/28/22 |
|                                                                                                                                          | <b>Client</b><br>Crown Castle                                   | <b>Designed by</b><br>Vinayak    |

| Tower<br>Elevation<br>ft          | Leg                       |   | Diagonal                  |      | Top Girt                  |      | Bottom Girt               |      | Mid Girt                  |      | Long Horizontal           |      | Short Horizontal          |      |
|-----------------------------------|---------------------------|---|---------------------------|------|---------------------------|------|---------------------------|------|---------------------------|------|---------------------------|------|---------------------------|------|
|                                   | Net Width<br>Deduct<br>in | U | Net Width<br>Deduct<br>in | U    | Net Width<br>Deduct<br>in | U    | Net Width<br>Deduct<br>in | U    | Net Width<br>Deduct<br>in | U    | Net Width<br>Deduct<br>in | U    | Net Width<br>Deduct<br>in | U    |
| T6<br>84'9-13/16"-64'<br>9-13/16" | 0.000                     | 1 | 0.000                     | 1    | 0.000                     | 1    | 0.000                     | 1    | 0.000                     | 0.75 | 0.000                     | 1    | 0.000                     | 0.75 |
| T7<br>64'9-13/16"-44'<br>9-13/16" | 0.000                     | 1 | 0.000                     | 1    | 0.000                     | 1    | 0.000                     | 1    | 0.000                     | 0.75 | 0.000                     | 1    | 0.000                     | 0.75 |
| T8<br>44'9-13/16"-24'<br>9-13/16" | 0.000                     | 1 | 0.000                     | 1    | 0.000                     | 1    | 0.000                     | 1    | 0.000                     | 0.75 | 0.000                     | 1    | 0.000                     | 0.75 |
| T9<br>24'9-13/16"-4'9-<br>-13/16" | 0.000                     | 1 | 0.000                     | 1    | 0.000                     | 1    | 0.000                     | 1    | 0.000                     | 0.75 | 0.000                     | 1    | 0.000                     | 0.75 |
| T10<br>4'9-13/16"-0'              | 0.000                     | 1 | 0.000                     | 0.75 | 0.000                     | 0.75 | 0.000                     | 0.75 | 0.000                     | 0.75 | 0.000                     | 0.75 | 0.000                     | 0.75 |

| Tower<br>Elevation<br>ft            | Redundant<br>Horizontal   |      | Redundant<br>Diagonal     |      | Redundant<br>Sub-Diagonal |      | Redundant<br>Sub-Horizontal |      | Redundant Vertical        | Redundant Hip             |      | Redundant Hip<br>Diagonal |      |
|-------------------------------------|---------------------------|------|---------------------------|------|---------------------------|------|-----------------------------|------|---------------------------|---------------------------|------|---------------------------|------|
|                                     | Net Width<br>Deduct<br>in | U    | Net Width<br>Deduct<br>in | U    | Net Width<br>Deduct<br>in | U    | Net Width<br>Deduct<br>in   | U    | Net Width<br>Deduct<br>in | Net Width<br>Deduct<br>in | U    | Net Width<br>Deduct<br>in | U    |
| T1<br>184'9-13/16"-1<br>64'9-13/16" | 0.000                     | 0.75 | 0.000                     | 0.75 | 0.000                     | 0.75 | 0.000                       | 0.75 | 0.000                     | 0.75                      | 0.75 | 0.000                     | 0.75 |
| T2<br>164'9-13/16"-1<br>44'9-13/16" | 0.000                     | 0.75 | 0.000                     | 0.75 | 0.000                     | 0.75 | 0.000                       | 0.75 | 0.000                     | 0.75                      | 0.75 | 0.000                     | 0.75 |
| T3<br>144'9-13/16"-1<br>24'9-13/16" | 0.000                     | 0.75 | 0.000                     | 0.75 | 0.000                     | 0.75 | 0.000                       | 0.75 | 0.000                     | 0.75                      | 0.75 | 0.000                     | 0.75 |
| T4<br>124'9-13/16"-1<br>04'9-13/16" | 0.000                     | 0.75 | 0.000                     | 0.75 | 0.000                     | 0.75 | 0.000                       | 0.75 | 0.000                     | 0.75                      | 0.75 | 0.000                     | 0.75 |
| T5<br>104'9-13/16"-8<br>4'9-13/16"  | 0.000                     | 0.75 | 0.000                     | 0.75 | 0.000                     | 0.75 | 0.000                       | 0.75 | 0.000                     | 0.75                      | 0.75 | 0.000                     | 0.75 |
| T6<br>84'9-13/16"-64'<br>9-13/16"   | 0.000                     | 0.75 | 0.000                     | 0.75 | 0.000                     | 0.75 | 0.000                       | 0.75 | 0.000                     | 0.75                      | 0.75 | 0.000                     | 0.75 |
| T7<br>64'9-13/16"-44'<br>9-13/16"   | 0.000                     | 0.75 | 0.000                     | 0.75 | 0.000                     | 0.75 | 0.000                       | 0.75 | 0.000                     | 0.75                      | 0.75 | 0.000                     | 0.75 |
| T8<br>44'9-13/16"-24'<br>9-13/16"   | 0.000                     | 0.75 | 0.000                     | 0.75 | 0.000                     | 0.75 | 0.000                       | 0.75 | 0.000                     | 0.75                      | 0.75 | 0.000                     | 0.75 |
| T9<br>24'9-13/16"-4'9-<br>-13/16"   | 0.000                     | 0.75 | 0.000                     | 0.75 | 0.000                     | 0.75 | 0.000                       | 0.75 | 0.000                     | 0.75                      | 0.75 | 0.000                     | 0.75 |
| T10<br>4'9-13/16"-0'                | 0.000                     | 0.75 | 0.000                     | 0.75 | 0.000                     | 0.75 | 0.000                       | 0.75 | 0.000                     | 0.75                      | 0.75 | 0.000                     | 0.75 |

|                                                                                                                                          |                                                                 |                                  |
|------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|----------------------------------|
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|                                                                                                                                          | <b>Project</b>                                                  | <b>Date</b><br>22:32:58 12/28/22 |
|                                                                                                                                          | <b>Client</b><br>Crown Castle                                   | <b>Designed by</b><br>Vinayak    |

## Tower Section Geometry (cont'd)

| Tower<br>Elevation                  | Connection Offsets |               |               |                |              |               |               |                |
|-------------------------------------|--------------------|---------------|---------------|----------------|--------------|---------------|---------------|----------------|
|                                     | Diagonal           |               |               |                | K-Bracing    |               |               |                |
|                                     | Vert.<br>Top       | Horiz.<br>Top | Vert.<br>Bot. | Horiz.<br>Bot. | Vert.<br>Top | Horiz.<br>Top | Vert.<br>Bot. | Horiz.<br>Bot. |
| ft                                  | in                 | in            | in            | in             | in           | in            | in            | in             |
| T1<br>184'9-13/16"-1<br>64'9-13/16" | 0.000              | 3.500         | 0.000         | 3.500          | 0.000        | 0.000         | 0.000         | 0.000          |
| T2<br>164'9-13/16"-1<br>44'9-13/16" | 0.000              | 3.500         | 0.000         | 3.500          | 0.000        | 0.000         | 0.000         | 0.000          |
| T3<br>144'9-13/16"-1<br>24'9-13/16" | 0.000              | 3.500         | 0.000         | 3.500          | 0.000        | 0.000         | 0.000         | 0.000          |
| T4<br>124'9-13/16"-1<br>04'9-13/16" | 0.000              | 3.500         | 0.000         | 3.500          | 0.000        | 0.000         | 0.000         | 0.000          |
| T5<br>104'9-13/16"-8<br>4'9-13/16"  | 0.000              | 3.500         | 0.000         | 3.500          | 0.000        | 0.000         | 0.000         | 0.000          |
| T6<br>84'9-13/16"-64'<br>9-13/16"   | 0.000              | 3.500         | 0.000         | 3.500          | 0.000        | 0.000         | 0.000         | 0.000          |
| T7<br>64'9-13/16"-44'<br>9-13/16"   | 0.000              | 3.500         | 0.000         | 3.500          | 0.000        | 0.000         | 0.000         | 0.000          |
| T8<br>44'9-13/16"-24'<br>9-13/16"   | 0.000              | 3.500         | 0.000         | 3.500          | 0.000        | 0.000         | 0.000         | 0.000          |
| T9<br>24'9-13/16"-49'<br>-13/16"    | 0.000              | 3.500         | 0.000         | 3.500          | 0.000        | 0.000         | 0.000         | 0.000          |
| T10<br>4'9-13/16"-0'                | 0.000              | 0.000         | 0.000         | 0.000          | 0.000        | 0.000         | 0.000         | 0.000          |

## Tower Section Geometry (cont'd)

| Tower<br>Elevation<br>ft            | Leg<br>Connection<br>Type | Leg             |     | Diagonal        |     | Top Girt        |     | Bottom Girt     |     | Mid Girt        |     | Long Horizontal |     | Short Horizontal |     |
|-------------------------------------|---------------------------|-----------------|-----|-----------------|-----|-----------------|-----|-----------------|-----|-----------------|-----|-----------------|-----|------------------|-----|
|                                     |                           | Bolt Size<br>in | No. | Bolt Size<br>in | No. | Bolt Size<br>in | No. | Bolt Size<br>in | No. | Bolt Size<br>in | No. | Bolt Size<br>in | No. | Bolt Size<br>in  | No. |
| T1<br>184'9-13/16"-1<br>64'9-13/16" | Flange                    | 0.750<br>A325X  | 0   | 0.500<br>A325X  | 1   | 0.500<br>A325X  | 1   | 0.500<br>A325X  | 1   | 0.625<br>A325N  | 0   | 0.625<br>A325X  | 0   | 0.625<br>A325N   | 0   |
| T2<br>164'9-13/16"-1<br>44'9-13/16" | Flange                    | 0.750<br>A325X  | 4   | 0.500<br>A325X  | 1   | 0.500<br>A325X  | 1   | 0.500<br>A325X  | 1   | 0.625<br>A325N  | 0   | 0.625<br>A325X  | 0   | 0.625<br>A325N   | 0   |
| T3<br>144'9-13/16"-1<br>24'9-13/16" | Flange                    | 0.750<br>A325X  | 4   | 0.500<br>A325X  | 1   | 0.500<br>A325X  | 1   | 0.500<br>A325X  | 1   | 0.625<br>A325N  | 0   | 0.625<br>A325X  | 0   | 0.625<br>A325N   | 0   |
| T4<br>124'9-13/16"-1<br>04'9-13/16" | Flange                    | 0.750<br>A325X  | 4   | 0.500<br>A325X  | 1   | 0.500<br>A325X  | 1   | 0.500<br>A325X  | 1   | 0.625<br>A325N  | 0   | 0.625<br>A325X  | 0   | 0.625<br>A325N   | 0   |

|                                                                                                                                          |                                                                 |                                  |
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|                                                                                                                                          | <b>Project</b>                                                  | <b>Date</b><br>22:32:58 12/28/22 |
|                                                                                                                                          | <b>Client</b><br>Crown Castle                                   | <b>Designed by</b><br>Vinayak    |

| Tower<br>Elevation<br>ft           | Leg<br>Connection<br>Type | Leg             |     | Diagonal        |     | Top Girt        |     | Bottom Girt     |     | Mid Girt        |     | Long Horizontal |     | Short Horizontal |     |
|------------------------------------|---------------------------|-----------------|-----|-----------------|-----|-----------------|-----|-----------------|-----|-----------------|-----|-----------------|-----|------------------|-----|
|                                    |                           | Bolt Size<br>in | No. | Bolt Size<br>in | No. | Bolt Size<br>in | No. | Bolt Size<br>in | No. | Bolt Size<br>in | No. | Bolt Size<br>in | No. | Bolt Size<br>in  | No. |
| T5<br>104'9-13/16"-8<br>4'9-13/16" | Flange                    | 0.750<br>A325X  | 4   | 0.500<br>A325X  | 1   | 0.500<br>A325X  | 1   | 0.500<br>A325X  | 1   | 0.625<br>A325N  | 0   | 0.625<br>A325X  | 0   | 0.625<br>A325N   | 0   |
| T6<br>84'9-13/16"-64'<br>9-13/16"  | Flange                    | 0.750<br>A325X  | 4   | 0.500<br>A325X  | 1   | 0.500<br>A325X  | 1   | 0.500<br>A325X  | 1   | 0.625<br>A325N  | 0   | 0.625<br>A325X  | 0   | 0.625<br>A325N   | 0   |
| T7<br>64'9-13/16"-44'<br>9-13/16"  | Flange                    | 0.750<br>A325X  | 4   | 0.500<br>A325X  | 1   | 0.500<br>A325X  | 1   | 0.500<br>A325X  | 1   | 0.625<br>A325N  | 0   | 0.625<br>A325X  | 0   | 0.625<br>A325N   | 0   |
| T8<br>44'9-13/16"-24'<br>9-13/16"  | Flange                    | 0.750<br>A325X  | 4   | 0.500<br>A325X  | 1   | 0.500<br>A325X  | 1   | 0.500<br>A325X  | 1   | 0.625<br>A325N  | 0   | 0.625<br>A325X  | 0   | 0.625<br>A325N   | 0   |
| T9<br>24'9-13/16"-4'9<br>-13/16"   | Flange                    | 0.750<br>A325X  | 4   | 0.500<br>A325X  | 1   | 0.500<br>A325X  | 1   | 0.500<br>A325X  | 1   | 0.625<br>A325N  | 0   | 0.625<br>A325X  | 0   | 0.625<br>A325N   | 0   |
| T10<br>4'9-13/16"-0'               | Flange                    | 0.750<br>A325X  | 4   | 0.500<br>A325X  | 0 * | 0.500<br>A325X  | 0 * | 0.500<br>A325X  | 0 * | 0.625<br>A325N  | 0   | 0.625<br>A325X  | 0 * | 0.625<br>A325N   | 0   |

\* Out-of-plane partial restraint assumed

## Guy Data

| Guy<br>Elevation<br>ft | Guy<br>Grade | Guy<br>Size | Initial<br>Tension<br>K | %   | Guy<br>Modulus<br>ksi | Guy<br>Weight<br>plf | $L_u$<br>ft   | Anchor<br>Radius<br>ft | Anchor<br>Azimuth<br>Adj.<br>° | Anchor<br>Elevation<br>ft | End<br>Fitting<br>Efficiency<br>% |
|------------------------|--------------|-------------|-------------------------|-----|-----------------------|----------------------|---------------|------------------------|--------------------------------|---------------------------|-----------------------------------|
| 167.341                | EHS          | A 3/4       | 8.745                   | 15% | 24000.000             | 1.155                | 201'8-15/16"  | 115'                   | 0.000                          | 0'                        | 100%                              |
|                        |              | B 3/4       | 8.745                   | 15% | 24000.000             | 1.155                | 201'8-15/16"  | 115'                   | 0.000                          | 0'                        | 100%                              |
|                        |              | C 3/4       | 8.745                   | 15% | 24000.000             | 1.155                | 206'10-15/16" | 124'                   | 0.000                          | 0'                        | 100%                              |
| 124.203                | EHS          | A 5/8       | 4.240                   | 10% | 23000.000             | 0.813                | 167'9-21/32"  | 115'                   | 0.000                          | 0'                        | 100%                              |
|                        |              | B 5/8       | 4.240                   | 10% | 23000.000             | 0.813                | 167'9-21/32"  | 115'                   | 0.000                          | 0'                        | 100%                              |
|                        |              | C 5/8       | 4.240                   | 10% | 23000.000             | 0.813                | 173'11-13/16" | 124'                   | 0.000                          | 0'                        | 100%                              |
| 84.2031                | EHS          | A 9/16      | 3.500                   | 10% | 23000.000             | 0.671                | 140'10-1/32"  | 115'                   | 0.000                          | 0'                        | 100%                              |
|                        |              | B 9/16      | 3.500                   | 10% | 23000.000             | 0.671                | 140'10-1/32"  | 115'                   | 0.000                          | 0'                        | 100%                              |
|                        |              | C 9/16      | 3.500                   | 10% | 23000.000             | 0.671                | 148'1-3/4"    | 124'                   | 0.000                          | 0'                        | 100%                              |

## Guy Data(cont'd)

| Guy<br>Elevation<br>ft | Mount<br>Type    | Torque-Arm<br>Spread<br>ft | Torque-Arm<br>Leg Angle<br>° | Torque-Arm<br>Style | Torque-Arm<br>Grade | Torque-Arm<br>Type | Torque-Arm Size |
|------------------------|------------------|----------------------------|------------------------------|---------------------|---------------------|--------------------|-----------------|
| 167.341                | Torque Arm       | 6'10"                      | 0.000                        | Channel             | A36<br>(36 ksi)     | Channel            | C15x33.9        |
| 124.203<br>84.2031     | Corner<br>Corner |                            |                              |                     |                     |                    |                 |

|                                                                                                                                          |                                                                 |                                  |
|------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|----------------------------------|
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|                                                                                                                                          | <b>Project</b>                                                  | <b>Date</b><br>22:32:58 12/28/22 |
|                                                                                                                                          | <b>Client</b><br>Crown Castle                                   | <b>Designed by</b><br>Vinayak    |

### Guy Data (cont'd)

| Guy Elevation<br>ft | Diagonal Grade      | Diagonal Type | Upper Diagonal Size | Lower Diagonal Size | Is Strap. | Pull-Off Grade  | Pull-Off Type | Pull-Off Size |
|---------------------|---------------------|---------------|---------------------|---------------------|-----------|-----------------|---------------|---------------|
| 167'4-3/32'         | A572-50<br>(50 ksi) | Solid Round   |                     |                     | No        | A36<br>(36 ksi) | Double Angle  | 2L2x2x1/4x3/8 |
| 124'2-7/16'         | A572-50<br>(50 ksi) | Solid Round   |                     |                     | Yes       | A36<br>(36 ksi) | Flat Bar      | 4 1/2x3/8     |
| 84'2-7/16"          | A572-50<br>(50 ksi) | Solid Round   |                     |                     | Yes       | A36<br>(36 ksi) | Flat Bar      | 4 1/2x3/8     |

### Guy Data (cont'd)

| Guy Elevation<br>ft | Cable Weight<br>A<br>K | Cable Weight<br>B<br>K | Cable Weight<br>C<br>K | Cable Weight<br>D<br>K | Tower Intercept<br>A<br>ft   | Tower Intercept<br>B<br>ft   | Tower Intercept<br>C<br>ft  | Tower Intercept<br>D<br>ft |
|---------------------|------------------------|------------------------|------------------------|------------------------|------------------------------|------------------------------|-----------------------------|----------------------------|
| 167.341             | 0.233                  | 0.233                  | 0.239                  |                        | 2'7-15/16"<br>2.8 sec/pulse  | 2'7-15/16"<br>2.8 sec/pulse  | 2'9-19/32"<br>2.9 sec/pulse |                            |
| 124.203             | 0.136                  | 0.136                  | 0.141                  |                        | 2'8-1/32"<br>2.8 sec/pulse   | 2'8-1/32"<br>2.8 sec/pulse   | 2'10-7/16"<br>2.9 sec/pulse |                            |
| 84.2031             | 0.095                  | 0.095                  | 0.099                  |                        | 1'10-21/32"<br>2.4 sec/pulse | 1'10-21/32"<br>2.4 sec/pulse | 2'1-1/16"<br>2.5 sec/pulse  |                            |

### Guy Data (cont'd)

| Guy Elevation<br>ft | Calc<br>K<br>Single<br>Angles | Calc<br>K<br>Solid<br>Rounds | Torque Arm     |                | Pull Off       |                | Diagonal       |                |
|---------------------|-------------------------------|------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|
|                     |                               |                              | K <sub>x</sub> | K <sub>y</sub> | K <sub>x</sub> | K <sub>y</sub> | K <sub>x</sub> | K <sub>y</sub> |
| 167.341             | No                            | No                           | 1              | 1              | 1              | 1              | 1              | 1              |
| 124.203             | No                            | No                           |                |                | 1              | 1              | 1              | 1              |
| 84.2031             | No                            | No                           |                |                | 1              | 1              | 1              | 1              |

### Guy Data (cont'd)

| Guy Elevation<br>ft | Torque-Arm      |        |                           |      | Pull Off        |        |                           |      | Diagonal        |        |                           |      |
|---------------------|-----------------|--------|---------------------------|------|-----------------|--------|---------------------------|------|-----------------|--------|---------------------------|------|
|                     | Bolt Size<br>in | Number | Net Width<br>Deduct<br>in | U    | Bolt Size<br>in | Number | Net Width<br>Deduct<br>in | U    | Bolt Size<br>in | Number | Net Width<br>Deduct<br>in | U    |
| 167.341             | 0.875<br>A325N  | 2      | 0.000                     | 0.75 | 0.625<br>A325N  | 2      | 0.000                     | 0.75 | 0.625<br>A325N  | 0      | 0.000                     | 0.75 |
| 124.203             | 0.625<br>A325N  | 0      | 0.000                     | 0.75 | 0.750<br>A325N  | 2      | 0.000                     | 1    | 0.625<br>A325N  | 0      | 0.000                     | 0.75 |
| 84.2031             | 0.625<br>A325N  | 0      | 0.000                     | 0.75 | 0.750<br>A325N  | 2      | 0.000                     | 1    | 0.625<br>A325N  | 0      | 0.000                     | 0.75 |

|                                                                                                                                          |                                                   |                    |
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|                                                                                                                                          | <b>Project</b>                                    | <b>Date</b>        |
|                                                                                                                                          | <b>Client</b>                                     | <b>Designed by</b> |
|                                                                                                                                          | Crown Castle                                      | Vinayak            |

## Guy Pressures

| Guy<br>Elevation<br>ft | Guy<br>Location | z<br>ft    | q <sub>z</sub><br>ksf | q <sub>z</sub><br>Ice<br>ksf | Ice<br>Thickness<br>in |
|------------------------|-----------------|------------|-----------------------|------------------------------|------------------------|
| 167.341                | A               | 83'8-1/16" | 0.035                 |                              |                        |
|                        | B               | 83'8-1/16" | 0.035                 |                              |                        |
|                        | C               | 83'8-1/16" | 0.035                 |                              |                        |
| 124.203                | A               | 62'1-7/32" | 0.033                 |                              |                        |
|                        | B               | 62'1-7/32" | 0.033                 |                              |                        |
|                        | C               | 62'1-7/32" | 0.033                 |                              |                        |
| 84.2031                | A               | 42'1-7/32" | 0.030                 |                              |                        |
|                        | B               | 42'1-7/32" | 0.030                 |                              |                        |
|                        | C               | 42'1-7/32" | 0.030                 |                              |                        |

## Guy-Mast Forces (Excluding Wind) - No Ice

| Guy<br>Elevation | Guy<br>Location | Chord<br>Angle | Guy Tension<br>Top<br>Bottom<br>K | F <sub>x</sub> | F <sub>y</sub> | F <sub>z</sub> | M <sub>x</sub> | M <sub>y</sub> | M <sub>z</sub> |
|------------------|-----------------|----------------|-----------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|
| ft               |                 | °              |                                   | K              | K              | K              | kip-ft         | kip-ft         | kip-ft         |
| 167.341          | A               | 55.952         | 8.938                             | -0.150         | 7.442          | -4.948         | -14.681        | 17.200         | -25.428        |
|                  |                 |                | 8.745                             |                |                |                |                |                |                |
|                  | A               | 55.952         | 8.938                             | 0.150          | 7.442          | -4.948         | -14.681        | -17.200        | 25.428         |
|                  |                 |                | 8.745                             |                |                |                |                |                |                |
|                  | B               | 55.952         | 8.938                             | 4.360          | 7.442          | 2.344          | 29.361         | 17.200         | 0.000          |
|                  |                 |                | 8.745                             |                |                |                |                |                |                |
|                  | B               | 55.952         | 8.938                             | 4.210          | 7.442          | 2.603          | -14.681        | -17.200        | -25.428        |
|                  |                 |                | 8.745                             |                |                |                |                |                |                |
|                  | C               | 53.889         | 8.938                             | -4.438         | 7.262          | 2.730          | -14.326        | 18.083         | 24.813         |
|                  |                 |                | 8.745                             |                |                |                |                |                |                |
|                  | C               | 53.889         | 8.938                             | -4.583         | 7.262          | 2.478          | 28.651         | -18.083        | 0.000          |
|                  |                 |                | 8.745                             |                |                |                |                |                |                |
| 124.203          |                 |                | Sum:                              | <b>-0.451</b>  | 44.293         | <b>0.261</b>   | <b>-0.355</b>  | 0.000          | <b>-0.615</b>  |
|                  | A               | 47.697         | 4.341                             | 0.000          | 3.241          | -2.887         | -6.394         | 0.000          | 0.000          |
|                  |                 |                | 4.240                             |                |                |                |                |                |                |
|                  | B               | 47.697         | 4.341                             | 2.501          | 3.241          | 1.444          | 3.197          | 0.000          | -5.537         |
|                  |                 |                | 4.240                             |                |                |                |                |                |                |
|                  | C               | 45.506         | 4.341                             | -2.604         | 3.131          | 1.503          | 3.088          | -0.000         | 5.349          |
| 84.2031          |                 |                | 4.240                             |                |                |                |                |                |                |
|                  |                 |                | Sum:                              | <b>-0.103</b>  | 9.614          | <b>0.060</b>   | <b>-0.109</b>  | 0.000          | <b>-0.188</b>  |
|                  | A               | 36.685         | 3.556                             | 0.000          | 2.155          | -2.829         | -4.251         | 0.000          | 0.000          |
|                  |                 |                | 3.500                             |                |                |                |                |                |                |
|                  | B               | 36.685         | 3.556                             | 2.450          | 2.155          | 1.415          | 2.126          | 0.000          | -3.682         |
|                  |                 |                | 3.500                             |                |                |                |                |                |                |
|                  | C               | 34.607         | 3.556                             | -2.515         | 2.053          | 1.452          | 2.025          | -0.000         | 3.508          |
|                  |                 |                | 3.500                             |                |                |                |                |                |                |
|                  |                 |                | Sum:                              | <b>-0.065</b>  | 6.364          | <b>0.037</b>   | <b>-0.100</b>  | 0.000          | <b>-0.173</b>  |

## Guy-Mast Forces (Excluding Wind) - Service

|                                                                                                                                          |                                                   |                    |
|------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|--------------------|
| <b>tnxTower</b><br><br><b>B+T Group</b><br>1717 S. Boulder, Suite 300<br>Tulsa, OK 74119<br>Phone: (918) 587-4630<br>FAX: (918) 587-4630 | <b>Job</b>                                        | <b>Page</b>        |
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|                                                                                                                                          | <b>Project</b>                                    | <b>Date</b>        |
|                                                                                                                                          | <b>Client</b>                                     | <b>Designed by</b> |
|                                                                                                                                          | Crown Castle                                      | Vinayak            |

| Guy Elevation | Guy Location | Chord Angle | Guy Tension Top Bottom K | F <sub>x</sub> | F <sub>y</sub> | F <sub>z</sub> | M <sub>x</sub> | M <sub>y</sub> | M <sub>z</sub> |
|---------------|--------------|-------------|--------------------------|----------------|----------------|----------------|----------------|----------------|----------------|
| ft            |              | °           |                          | K              | K              | K              | kip-ft         | kip-ft         | kip-ft         |
| 167.341       | A            | 55.952      | 8.938                    | -0.150         | 7.442          | -4.948         | -14.681        | 17.200         | -25.428        |
|               |              |             | 8.745                    |                |                |                |                |                |                |
|               | A            | 55.952      | 8.938                    | 0.150          | 7.442          | -4.948         | -14.681        | -17.200        | 25.428         |
|               |              |             | 8.745                    |                |                |                |                |                |                |
|               | B            | 55.952      | 8.938                    | 4.360          | 7.442          | 2.344          | 29.361         | 17.200         | 0.000          |
|               |              |             | 8.745                    |                |                |                |                |                |                |
| 124.203       | B            | 55.952      | 8.938                    | 4.210          | 7.442          | 2.603          | -14.681        | -17.200        | -25.428        |
|               |              |             | 8.745                    |                |                |                |                |                |                |
|               | C            | 53.889      | 8.938                    | -4.438         | 7.262          | 2.730          | -14.326        | 18.083         | 24.813         |
|               |              |             | 8.745                    |                |                |                |                |                |                |
|               | C            | 53.889      | 8.938                    | -4.583         | 7.262          | 2.478          | 28.651         | -18.083        | 0.000          |
|               |              |             | 8.745                    |                |                |                |                |                |                |
| 84.2031       |              |             | Sum:                     | -0.451         | 44.293         | 0.261          | -0.355         | 0.000          | -0.615         |
|               | A            | 47.697      | 4.341                    | 0.000          | 3.241          | -2.887         | -6.394         | 0.000          | 0.000          |
|               |              |             | 4.240                    |                |                |                |                |                |                |
|               | B            | 47.697      | 4.341                    | 2.501          | 3.241          | 1.444          | 3.197          | 0.000          | -5.537         |
|               |              |             | 4.240                    |                |                |                |                |                |                |
|               | C            | 45.506      | 4.341                    | -2.604         | 3.131          | 1.503          | 3.088          | -0.000         | 5.349          |
| 84.2031       |              |             | 4.240                    |                |                |                |                |                |                |
|               | A            | 36.685      | 3.556                    | 0.000          | 2.155          | -2.829         | -4.251         | 0.000          | 0.000          |
|               |              |             | 3.500                    |                |                |                |                |                |                |
|               | B            | 36.685      | 3.556                    | 2.450          | 2.155          | 1.415          | 2.126          | 0.000          | -3.682         |
|               |              |             | 3.500                    |                |                |                |                |                |                |
|               | C            | 34.607      | 3.556                    | -2.515         | 2.053          | 1.452          | 2.025          | -0.000         | 3.508          |
| 84.2031       |              |             | 3.500                    |                |                |                |                |                |                |
|               |              |             | Sum:                     | -0.065         | 6.364          | 0.037          | -0.100         | 0.000          | -0.173         |

## Guy-Tensioning Information

| Temperature At Time Of Tensioning |   |        |                    |           |                    |           |                    |           |                    |           |                    |           |                    |           |                    |           |      |
|-----------------------------------|---|--------|--------------------|-----------|--------------------|-----------|--------------------|-----------|--------------------|-----------|--------------------|-----------|--------------------|-----------|--------------------|-----------|------|
| Guy<br>Elevation                  | H | V      | 0 F                |           | 20 F               |           | 40 F               |           | 60 F               |           | 80 F               |           | 100 F              |           | 120 F              |           |      |
|                                   |   |        | Initial<br>Tension | Intercept | Initial<br>Tension | Intercept | Initial<br>Tension | Intercept | Initial<br>Tension | Intercept | Initial<br>Tension | Intercept | Initial<br>Tension | Intercept | Initial<br>Tension | Intercept |      |
|                                   |   |        | K                  | ft        | K                  | ft        | K                  | ft        | K                  | ft        | K                  | ft        | K                  | ft        | K                  | ft        |      |
| 167.341                           | A | 113.08 | 167.34             | 9.718     | 2.40               | 9.393     | 2.48               | 9.069     | 2.57               | 8.745     | 2.66               | 8.422     | 2.76               | 8.100     | 2.87               | 7.778     | 2.99 |
|                                   | B | 113.08 | 167.34             | 9.718     | 2.40               | 9.393     | 2.48               | 9.069     | 2.57               | 8.745     | 2.66               | 8.422     | 2.76               | 8.100     | 2.87               | 7.778     | 2.99 |
|                                   | C | 122.08 | 167.34             | 9.821     | 2.49               | 9.462     | 2.59               | 9.103     | 2.69               | 8.745     | 2.80               | 8.388     | 2.92               | 8.032     | 3.05               | 7.678     | 3.19 |
| 124.203                           | A | 113.03 | 124.20             | 5.165     | 2.20               | 4.855     | 2.33               | 4.546     | 2.49               | 4.240     | 2.67               | 3.937     | 2.87               | 3.638     | 3.11               | 3.344     | 3.38 |
|                                   | B | 113.03 | 124.20             | 5.165     | 2.20               | 4.855     | 2.33               | 4.546     | 2.49               | 4.240     | 2.67               | 3.937     | 2.87               | 3.638     | 3.11               | 3.344     | 3.38 |
|                                   | C | 122.03 | 124.20             | 5.238     | 2.33               | 4.903     | 2.49               | 4.570     | 2.67               | 4.240     | 2.87               | 3.914     | 3.11               | 3.594     | 3.38               | 3.281     | 3.70 |
| 84.2031                           | A | 113.03 | 84.20              | 4.587     | 1.44               | 4.221     | 1.57               | 3.859     | 1.71               | 3.500     | 1.89               | 3.146     | 2.10               | 2.800     | 2.36               | 2.465     | 2.67 |
|                                   | B | 113.03 | 84.20              | 4.587     | 1.44               | 4.221     | 1.57               | 3.859     | 1.71               | 3.500     | 1.89               | 3.146     | 2.10               | 2.800     | 2.36               | 2.465     | 2.67 |
|                                   | C | 122.03 | 84.20              | 4.639     | 1.58               | 4.256     | 1.72               | 3.876     | 1.89               | 3.500     | 2.09               | 3.131     | 2.33               | 2.771     | 2.63               | 2.425     | 3.00 |

## Feed Line/Linear Appurtenances - Entered As Round Or Flat

| Description | Face or Leg | Allow Shield | Exclude From Torque Calculation | Component Type | Placement<br>ft | Face Offset<br>in | Lateral Offset<br>(Frac FW) | #<br>Row | #<br>Per | Clear Spacing<br>in | Width or Diameter<br>in | Perimeter<br>in | Weight<br>klf |
|-------------|-------------|--------------|---------------------------------|----------------|-----------------|-------------------|-----------------------------|----------|----------|---------------------|-------------------------|-----------------|---------------|
|-------------|-------------|--------------|---------------------------------|----------------|-----------------|-------------------|-----------------------------|----------|----------|---------------------|-------------------------|-----------------|---------------|

|                                                                                                                                          |                                                                 |                                  |
|------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|----------------------------------|
| <b>tnxTower</b><br><br><b>B+T Group</b><br>1717 S. Boulder, Suite 300<br>Tulsa, OK 74119<br>Phone: (918) 587-4630<br>FAX: (918) 587-4630 | <b>Job</b><br>100061.009.01.0001 - FAIRGROUNDS, FL (BU# 846219) | <b>Page</b><br>14 of 52          |
|                                                                                                                                          | <b>Project</b>                                                  | <b>Date</b><br>22:32:58 12/28/22 |
|                                                                                                                                          | <b>Client</b><br>Crown Castle                                   | <b>Designed by</b><br>Vinayak    |

| Description             | Face<br>or<br>Leg | Allow<br>Shield | Exclude<br>From<br>Torque<br>Calculation | Component<br>Type | Placement<br>ft    | Face<br>Offset<br>in | Lateral<br>Offset<br>(Frac FW) | #  | #<br>Per<br>Row | Clear<br>Spacing<br>in | Width or<br>Diameter<br>in | Perimeter<br>in | Weight<br>klf |
|-------------------------|-------------------|-----------------|------------------------------------------|-------------------|--------------------|----------------------|--------------------------------|----|-----------------|------------------------|----------------------------|-----------------|---------------|
| *<br>**Face A*          |                   |                 |                                          |                   |                    |                      |                                |    |                 |                        |                            |                 |               |
| AVA5-50(7/8)            | A                 | No              | No                                       | Ar (CaAa)         | 183' - 0'          | 0.000                | 0.15                           | 11 | 9               | 0.500                  | 1.102                      |                 | 0.000         |
| WR-VG86ST-BRD(3/4)      | A                 | No              | No                                       | Ar (CaAa)         | 183' - 0'          | 3.000                | 0.15                           | 4  | 4               | 0.850<br>0.750         | 0.795                      |                 | 0.001         |
| WR-VG86ST-BRD(3/4)      | A                 | No              | No                                       | Ar (CaAa)         | 183' - 0'          | 0.000                | -0.2                           | 2  | 2               | 0.850<br>0.750         | 0.795                      |                 | 0.001         |
| WR-VG86ST-BRD(3/4)      | A                 | No              | No                                       | Ar (CaAa)         | 183' - 0'          | 0.000                | -0.1                           | 2  | 2               | 0.850<br>0.750         | 0.795                      |                 | 0.001         |
| ATCB-B01(5/16)          | A                 | No              | No                                       | Ar (CaAa)         | 183' - 0'          | 0.000                | -0.05                          | 3  | 2               | 0.500                  | 0.315                      |                 | 0.000         |
| WR-VG86ST-BRD(3/4)      | A                 | No              | No                                       | Ar (CaAa)         | 183' - 0'          | 0.000                | 0                              | 1  | 1               | 0.850<br>0.750         | 0.795                      |                 | 0.001         |
| FB-L98B-002-XXX(3/8)    | A                 | No              | No                                       | Ar (CaAa)         | 183' - 0'          | 0.000                | 0.04                           | 6  | 2               | 0.500                  | 0.394                      |                 | 0.000         |
| Feedline Ladder (Af)    | A                 | No              | No                                       | Af (CaAa)         | 179' - 0'          | 0.000                | 0                              | 1  | 1               | 3.000                  | 3.000                      |                 | 0.008         |
| *<br>**Face B**         |                   |                 |                                          |                   |                    |                      |                                |    |                 |                        |                            |                 |               |
| WR-VG86ST-BRD(3/4)      | B                 | No              | No                                       | Ar (CaAa)         | 183' - 0'          | 0.000                | -0.2                           | 3  | 3               | 0.850<br>0.750         | 0.795                      |                 | 0.001         |
| *<br>**Face C**         |                   |                 |                                          |                   |                    |                      |                                |    |                 |                        |                            |                 |               |
| AVA5-50(7/8)            | B                 | No              | No                                       | Ar (CaAa)         | 183' - 0'          | 0.000                | 0.25                           | 7  | 7               | 0.500                  | 1.102                      |                 | 0.000         |
| EW52(ELLIPTICAL)        | B                 | No              | No                                       | Ar (CaAa)         | 174' - 158'        | 0.000                | 0                              | 1  | 1               | 1.000<br>0.750         | 2.250                      |                 | 0.001         |
| EW52(ELLIPTICAL)        | B                 | No              | No                                       | Ar (CaAa)         | 158' - 138'        | 0.000                | 0                              | 2  | 2               | 1.000<br>0.750         | 2.250                      |                 | 0.001         |
| EW52(ELLIPTICAL)        | B                 | No              | No                                       | Ar (CaAa)         | 138' - 0'          | 0.000                | 0                              | 3  | 3               | 1.000<br>0.750         | 2.250                      |                 | 0.001         |
| EW52(ELLIPTICAL)        | B                 | No              | No                                       | Ar (CaAa)         | 116' - 0'          | 0.000                | 0.39                           | 1  | 1               | 1.000<br>0.750         | 2.250                      |                 | 0.001         |
| ROHN Waveguide Brackets | B                 | No              | No                                       | Af (CaAa)         | 176' - 0'          | 0.000                | 0.01                           | 1  | 1               | 1.750                  | 1.750                      |                 | 0.001         |
| *<br>**Face C**         |                   |                 |                                          |                   |                    |                      |                                |    |                 |                        |                            |                 |               |
| LDF7-50A(1-5/8)         | C                 | No              | No                                       | Ar (CaAa)         | 150' - 0'          | 0.000                | 0                              | 20 | 10              | 0.500                  | 1.980                      |                 | 0.001         |
| LMR-400(3/8) ROHN       | C                 | No              | No                                       | Ar (CaAa)         | 150' - 0'          | 4.500                | 0.27                           | 2  | 2               | 0.500                  | 0.405                      |                 | 0.000         |
| Waveguide Brackets      | C                 | No              | No                                       | Af (CaAa)         | 150' - 0'          | 0.000                | 0                              | 1  | 1               | 1.750                  | 1.750                      |                 | 0.001         |
| *<br>Safety Line 3/8    |                   |                 |                                          |                   |                    |                      |                                |    |                 |                        |                            |                 |               |
|                         | C                 | No              | No                                       | Ar (CaAa)         | 184'9"-13/16' - 0' | 0.000                | 0.5                            | 1  | 1               | 0.375                  | 0.375                      |                 | 0.000         |
| *                       |                   |                 |                                          |                   |                    |                      |                                |    |                 |                        |                            |                 |               |

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

|                                                                                                                                          |                                                   |                    |
|------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|--------------------|
| <b>tnxTower</b><br><br><b>B+T Group</b><br>1717 S. Boulder, Suite 300<br>Tulsa, OK 74119<br>Phone: (918) 587-4630<br>FAX: (918) 587-4630 | <b>Job</b>                                        | <b>Page</b>        |
|                                                                                                                                          | 100061.009.01.0001 - FAIRGROUNDS, FL (BU# 846219) | 15 of 52           |
|                                                                                                                                          | <b>Project</b>                                    | <b>Date</b>        |
|                                                                                                                                          | <b>Client</b>                                     | 22:32:58 12/28/22  |
|                                                                                                                                          | Crown Castle                                      | <b>Designed by</b> |
|                                                                                                                                          |                                                   | Vinayak            |

| Description                                               | Face<br>or<br>Leg | Allow<br>Shield | Exclude<br>From<br>Torque<br>Calculation | Component<br>Type | Placement<br>ft | Total<br>Number | C <sub>A</sub> A <sub>A</sub><br>ft <sup>2</sup> /ft | Weight<br>klf |
|-----------------------------------------------------------|-------------------|-----------------|------------------------------------------|-------------------|-----------------|-----------------|------------------------------------------------------|---------------|
| *<br>**Face A*<br>*<br>**Face B**<br>*<br>**Face C**<br>* |                   |                 |                                          |                   |                 |                 |                                                      |               |

### Feed Line/Linear Appurtenances Section Areas

| Tower<br>Section | Tower<br>Elevation<br>ft      | Face | A <sub>R</sub><br>ft <sup>2</sup> | A <sub>F</sub><br>ft <sup>2</sup> | C <sub>A</sub> A <sub>A</sub><br>In Face<br>ft <sup>2</sup> | C <sub>A</sub> A <sub>A</sub><br>Out Face<br>ft <sup>2</sup> | Weight<br>K |
|------------------|-------------------------------|------|-----------------------------------|-----------------------------------|-------------------------------------------------------------|--------------------------------------------------------------|-------------|
| T1               | 184'9-13/16"-164'<br>9-13/16" | A    | 0.000                             | 0.000                             | 48.154                                                      | 0.000                                                        | 0.286       |
|                  |                               | B    | 0.000                             | 0.000                             | 23.690                                                      | 0.000                                                        | 0.090       |
|                  |                               | C    | 0.000                             | 0.000                             | 0.750                                                       | 0.000                                                        | 0.004       |
| T2               | 164'9-13/16"-144'<br>9-13/16" | A    | 0.000                             | 0.000                             | 55.168                                                      | 0.000                                                        | 0.351       |
|                  |                               | B    | 0.000                             | 0.000                             | 33.497                                                      | 0.000                                                        | 0.122       |
|                  |                               | C    | 0.000                             | 0.000                             | 23.203                                                      | 0.000                                                        | 0.097       |
| T3               | 144'9-13/16"-124'<br>9-13/16" | A    | 0.000                             | 0.000                             | 55.168                                                      | 0.000                                                        | 0.351       |
|                  |                               | B    | 0.000                             | 0.000                             | 37.997                                                      | 0.000                                                        | 0.134       |
|                  |                               | C    | 0.000                             | 0.000                             | 87.403                                                      | 0.000                                                        | 0.360       |
| T4               | 124'9-13/16"-104'<br>9-13/16" | A    | 0.000                             | 0.000                             | 55.168                                                      | 0.000                                                        | 0.351       |
|                  |                               | B    | 0.000                             | 0.000                             | 42.047                                                      | 0.000                                                        | 0.144       |
|                  |                               | C    | 0.000                             | 0.000                             | 87.403                                                      | 0.000                                                        | 0.360       |
| T5               | 104'9-13/16"-84'9-<br>13/16"  | A    | 0.000                             | 0.000                             | 55.168                                                      | 0.000                                                        | 0.351       |
|                  |                               | B    | 0.000                             | 0.000                             | 44.031                                                      | 0.000                                                        | 0.150       |
|                  |                               | C    | 0.000                             | 0.000                             | 87.403                                                      | 0.000                                                        | 0.360       |
| T6               | 84'9-13/16"-64'9-1<br>3/16"   | A    | 0.000                             | 0.000                             | 55.168                                                      | 0.000                                                        | 0.351       |
|                  |                               | B    | 0.000                             | 0.000                             | 44.031                                                      | 0.000                                                        | 0.150       |
|                  |                               | C    | 0.000                             | 0.000                             | 87.403                                                      | 0.000                                                        | 0.360       |
| T7               | 64'9-13/16"-44'9-1<br>3/16"   | A    | 0.000                             | 0.000                             | 55.168                                                      | 0.000                                                        | 0.351       |
|                  |                               | B    | 0.000                             | 0.000                             | 44.031                                                      | 0.000                                                        | 0.150       |
|                  |                               | C    | 0.000                             | 0.000                             | 87.403                                                      | 0.000                                                        | 0.360       |
| T8               | 44'9-13/16"-24'9-1<br>3/16"   | A    | 0.000                             | 0.000                             | 55.168                                                      | 0.000                                                        | 0.351       |
|                  |                               | B    | 0.000                             | 0.000                             | 44.031                                                      | 0.000                                                        | 0.150       |
|                  |                               | C    | 0.000                             | 0.000                             | 87.403                                                      | 0.000                                                        | 0.360       |
| T9               | 24'9-13/16"-4'9-13<br>/16"    | A    | 0.000                             | 0.000                             | 55.168                                                      | 0.000                                                        | 0.351       |
|                  |                               | B    | 0.000                             | 0.000                             | 44.031                                                      | 0.000                                                        | 0.150       |
|                  |                               | C    | 0.000                             | 0.000                             | 87.403                                                      | 0.000                                                        | 0.360       |
| T10              | 4'9-13/16"-0'                 | A    | 0.000                             | 0.000                             | 13.289                                                      | 0.000                                                        | 0.085       |
|                  |                               | B    | 0.000                             | 0.000                             | 10.607                                                      | 0.000                                                        | 0.036       |
|                  |                               | C    | 0.000                             | 0.000                             | 21.054                                                      | 0.000                                                        | 0.087       |

### Feed Line Center of Pressure

| Section | Elevation<br>ft               | CP <sub>x</sub><br>in | CP <sub>z</sub><br>in | CP <sub>x</sub><br>Ice<br>in | CP <sub>z</sub><br>Ice<br>in |
|---------|-------------------------------|-----------------------|-----------------------|------------------------------|------------------------------|
| T1      | 184'9-13/16"-164'9-1<br>3/16" | -1.864                | -4.024                | -1.864                       | -4.024                       |

|                                                                                                                                          |                                                                 |                                  |
|------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|----------------------------------|
| <b>tnxTower</b><br><br><b>B+T Group</b><br>1717 S. Boulder, Suite 300<br>Tulsa, OK 74119<br>Phone: (918) 587-4630<br>FAX: (918) 587-4630 | <b>Job</b><br>100061.009.01.0001 - FAIRGROUNDS, FL (BU# 846219) | <b>Page</b><br>16 of 52          |
|                                                                                                                                          | <b>Project</b>                                                  | <b>Date</b><br>22:32:58 12/28/22 |
|                                                                                                                                          | <b>Client</b><br>Crown Castle                                   | <b>Designed by</b><br>Vinayak    |

| Section | Elevation                     | CP <sub>x</sub> | CP <sub>z</sub> | CP <sub>x</sub> | CP <sub>z</sub> |
|---------|-------------------------------|-----------------|-----------------|-----------------|-----------------|
|         | ft                            | in              | in              | Ice<br>in       | Ice<br>in       |
| T2      | 164'9-13/16"-144'9-1<br>3/16" | -1.233          | -3.793          | -1.233          | -3.793          |
| T3      | 144'9-13/16"-124'9-1<br>3/16" | -0.830          | -2.551          | -0.830          | -2.551          |
| T4      | 124'9-13/16"-104'9-1<br>3/16" | -0.479          | -2.361          | -0.479          | -2.361          |
| T5      | 104'9-13/16"-84'9-13<br>/16"  | -0.269          | -2.290          | -0.269          | -2.290          |
| T6      | 84'9-13/16"-64'9-13/<br>16"   | -0.260          | -2.213          | -0.260          | -2.213          |
| T7      | 64'9-13/16"-44'9-13/<br>16"   | -0.269          | -2.290          | -0.269          | -2.290          |
| T8      | 44'9-13/16"-24'9-13/<br>16"   | -0.269          | -2.290          | -0.269          | -2.290          |
| T9      | 24'9-13/16"-4'9-13/1<br>6"    | -0.269          | -2.290          | -0.269          | -2.290          |
| T10     | 4'9-13/16"-0'                 | -0.395          | -2.001          | -0.395          | -2.001          |

## Shielding Factor Ka

| Tower<br>Section | Feed Line<br>Record No. | Description             | Feed Line<br>Segment Elev. | K <sub>a</sub><br>No Ice | K <sub>a</sub><br>Ice |
|------------------|-------------------------|-------------------------|----------------------------|--------------------------|-----------------------|
| T1               | 5                       | AVA5-50(7/8)            | 164.82 -<br>183.00         | 0.6000                   | 0.6000                |
| T1               | 6                       | WR-VG86ST-BRD(3/4)      | 164.82 -<br>183.00         | 0.6000                   | 0.6000                |
| T1               | 7                       | WR-VG86ST-BRD(3/4)      | 164.82 -<br>183.00         | 0.6000                   | 0.6000                |
| T1               | 8                       | WR-VG86ST-BRD(3/4)      | 164.82 -<br>183.00         | 0.6000                   | 0.6000                |
| T1               | 9                       | ATCB-B01(5/16)          | 164.82 -<br>183.00         | 0.6000                   | 0.6000                |
| T1               | 10                      | WR-VG86ST-BRD(3/4)      | 164.82 -<br>183.00         | 0.6000                   | 0.6000                |
| T1               | 11                      | FB-L98B-002-XXX(3/8)    | 164.82 -<br>183.00         | 0.6000                   | 0.6000                |
| T1               | 12                      | Feedline Ladder (Af)    | 164.82 -<br>179.00         | 0.6000                   | 0.6000                |
| T1               | 14                      | WR-VG86ST-BRD(3/4)      | 164.82 -<br>183.00         | 0.6000                   | 0.6000                |
| T1               | 19                      | AVA5-50(7/8)            | 164.82 -<br>183.00         | 0.6000                   | 0.6000                |
| T1               | 21                      | EW52(ELLIPTICAL)        | 164.82 -<br>174.00         | 0.6000                   | 0.6000                |
| T1               | 27                      | ROHN Waveguide Brackets | 164.82 -<br>176.00         | 0.6000                   | 0.6000                |
| T1               | 35                      | Safety Line 3/8         | 164.82 -<br>184.82         | 0.6000                   | 0.6000                |
| T2               | 5                       | AVA5-50(7/8)            | 144.82 -<br>164.82         | 0.6000                   | 0.6000                |
| T2               | 6                       | WR-VG86ST-BRD(3/4)      | 144.82 -<br>164.82         | 0.6000                   | 0.6000                |
| T2               | 7                       | WR-VG86ST-BRD(3/4)      | 144.82 -<br>164.82         | 0.6000                   | 0.6000                |
| T2               | 8                       | WR-VG86ST-BRD(3/4)      | 144.82 -                   | 0.6000                   | 0.6000                |

|                                                                                                                                          |                                                   |                    |
|------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|--------------------|
| <b>tnxTower</b><br><br><b>B+T Group</b><br>1717 S. Boulder, Suite 300<br>Tulsa, OK 74119<br>Phone: (918) 587-4630<br>FAX: (918) 587-4630 | <b>Job</b>                                        | <b>Page</b>        |
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|                                                                                                                                          | <b>Project</b>                                    | <b>Date</b>        |
|                                                                                                                                          | <b>Client</b>                                     | <b>Designed by</b> |
|                                                                                                                                          | Crown Castle                                      | Vinayak            |

| Tower Section | Feed Line Record No. | Description             | Feed Line Segment Elev. | K <sub>o</sub> No Ice | K <sub>o</sub> Ice |
|---------------|----------------------|-------------------------|-------------------------|-----------------------|--------------------|
| T2            | 9                    | ATCB-B01(5/16)          | 164.82<br>144.82 -      | 0.6000                | 0.6000             |
| T2            | 10                   | WR-VG86ST-BRD(3/4)      | 164.82<br>144.82 -      | 0.6000                | 0.6000             |
| T2            | 11                   | FB-L98B-002-XXX(3/8)    | 164.82<br>144.82 -      | 0.6000                | 0.6000             |
| T2            | 12                   | Feedline Ladder (Af)    | 164.82<br>144.82 -      | 0.6000                | 0.6000             |
| T2            | 14                   | WR-VG86ST-BRD(3/4)      | 164.82<br>144.82 -      | 0.6000                | 0.6000             |
| T2            | 19                   | AVA5-50(7/8)            | 164.82<br>144.82 -      | 0.6000                | 0.6000             |
| T2            | 21                   | EW52(ELLIPTICAL)        | 164.82<br>158.00 -      | 0.6000                | 0.6000             |
| T2            | 22                   | EW52(ELLIPTICAL)        | 164.82<br>144.82 -      | 0.6000                | 0.6000             |
| T2            | 27                   | ROHN Waveguide Brackets | 158.00<br>144.82 -      | 0.6000                | 0.6000             |
| T2            | 31                   | LDF7-50A(1-5/8)         | 164.82<br>144.82 -      | 0.6000                | 0.6000             |
| T2            | 32                   | LMR-400(3/8)            | 150.00<br>144.82 -      | 0.6000                | 0.6000             |
| T2            | 33                   | ROHN Waveguide Brackets | 150.00<br>144.82 -      | 0.6000                | 0.6000             |
| T2            | 35                   | Safety Line 3/8         | 150.00<br>144.82 -      | 0.6000                | 0.6000             |
| T3            | 5                    | AVA5-50(7/8)            | 164.82<br>124.82 -      | 0.6000                | 0.6000             |
| T3            | 6                    | WR-VG86ST-BRD(3/4)      | 144.82<br>124.82 -      | 0.6000                | 0.6000             |
| T3            | 7                    | WR-VG86ST-BRD(3/4)      | 144.82<br>124.82 -      | 0.6000                | 0.6000             |
| T3            | 8                    | WR-VG86ST-BRD(3/4)      | 144.82<br>124.82 -      | 0.6000                | 0.6000             |
| T3            | 9                    | ATCB-B01(5/16)          | 144.82<br>124.82 -      | 0.6000                | 0.6000             |
| T3            | 10                   | WR-VG86ST-BRD(3/4)      | 144.82<br>124.82 -      | 0.6000                | 0.6000             |
| T3            | 11                   | FB-L98B-002-XXX(3/8)    | 144.82<br>124.82 -      | 0.6000                | 0.6000             |
| T3            | 12                   | Feedline Ladder (Af)    | 144.82<br>124.82 -      | 0.6000                | 0.6000             |
| T3            | 14                   | WR-VG86ST-BRD(3/4)      | 144.82<br>124.82 -      | 0.6000                | 0.6000             |
| T3            | 19                   | AVA5-50(7/8)            | 144.82<br>124.82 -      | 0.6000                | 0.6000             |
| T3            | 22                   | EW52(ELLIPTICAL)        | 144.82<br>138.00 -      | 0.6000                | 0.6000             |
| T3            | 23                   | EW52(ELLIPTICAL)        | 144.82<br>124.82 -      | 0.6000                | 0.6000             |
| T3            | 27                   | ROHN Waveguide Brackets | 138.00<br>124.82 -      | 0.6000                | 0.6000             |
| T3            | 31                   | LDF7-50A(1-5/8)         | 144.82<br>124.82 -      | 0.6000                | 0.6000             |
| T3            | 32                   | LMR-400(3/8)            | 144.82<br>124.82 -      | 0.6000                | 0.6000             |
| T3            | 33                   | ROHN Waveguide Brackets | 144.82<br>124.82 -      | 0.6000                | 0.6000             |
| T3            | 35                   | Safety Line 3/8         | 144.82<br>124.82 -      | 0.6000                | 0.6000             |
| T4            | 5                    | AVA5-50(7/8)            | 104.82 -                | 0.6000                | 0.6000             |

|                                                                                                                                          |                                                                 |                                  |
|------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|----------------------------------|
| <b>tnxTower</b><br><br><b>B+T Group</b><br>1717 S. Boulder, Suite 300<br>Tulsa, OK 74119<br>Phone: (918) 587-4630<br>FAX: (918) 587-4630 | <b>Job</b><br>100061.009.01.0001 - FAIRGROUNDS, FL (BU# 846219) | <b>Page</b><br>18 of 52          |
|                                                                                                                                          | <b>Project</b>                                                  | <b>Date</b><br>22:32:58 12/28/22 |
|                                                                                                                                          | <b>Client</b><br>Crown Castle                                   | <b>Designed by</b><br>Vinayak    |

| Tower Section | Feed Line Record No. | Description             | Feed Line Segment Elev. | K <sub>o</sub> No Ice | K <sub>o</sub> Ice |
|---------------|----------------------|-------------------------|-------------------------|-----------------------|--------------------|
| T4            | 6                    | WR-VG86ST-BRD(3/4)      | 124.82                  | 0.6000                | 0.6000             |
| T4            | 7                    | WR-VG86ST-BRD(3/4)      | 104.82 - 124.82         | 0.6000                | 0.6000             |
| T4            | 8                    | WR-VG86ST-BRD(3/4)      | 104.82 - 124.82         | 0.6000                | 0.6000             |
| T4            | 9                    | ATCB-B01(5/16)          | 104.82 - 124.82         | 0.6000                | 0.6000             |
| T4            | 10                   | WR-VG86ST-BRD(3/4)      | 104.82 - 124.82         | 0.6000                | 0.6000             |
| T4            | 11                   | FB-L98B-002-XXX(3/8)    | 104.82 - 124.82         | 0.6000                | 0.6000             |
| T4            | 12                   | Feedline Ladder (Af)    | 104.82 - 124.82         | 0.6000                | 0.6000             |
| T4            | 14                   | WR-VG86ST-BRD(3/4)      | 104.82 - 124.82         | 0.6000                | 0.6000             |
| T4            | 19                   | AVA5-50(7/8)            | 104.82 - 124.82         | 0.6000                | 0.6000             |
| T4            | 23                   | EW52(ELLIPTICAL)        | 104.82 - 124.82         | 0.6000                | 0.6000             |
| T4            | 25                   | EW52(ELLIPTICAL)        | 104.82 - 116.00         | 0.6000                | 0.6000             |
| T4            | 27                   | ROHN Waveguide Brackets | 104.82 - 124.82         | 0.6000                | 0.6000             |
| T4            | 31                   | LDF7-50A(1-5/8)         | 104.82 - 124.82         | 0.6000                | 0.6000             |
| T4            | 32                   | LMR-400(3/8)            | 104.82 - 124.82         | 0.6000                | 0.6000             |
| T4            | 33                   | ROHN Waveguide Brackets | 104.82 - 124.82         | 0.6000                | 0.6000             |
| T4            | 35                   | Safety Line 3/8         | 104.82 - 124.82         | 0.6000                | 0.6000             |
| T5            | 5                    | AVA5-50(7/8)            | 84.82 - 104.82          | 0.6000                | 0.6000             |
| T5            | 6                    | WR-VG86ST-BRD(3/4)      | 84.82 - 104.82          | 0.6000                | 0.6000             |
| T5            | 7                    | WR-VG86ST-BRD(3/4)      | 84.82 - 104.82          | 0.6000                | 0.6000             |
| T5            | 8                    | WR-VG86ST-BRD(3/4)      | 84.82 - 104.82          | 0.6000                | 0.6000             |
| T5            | 9                    | ATCB-B01(5/16)          | 84.82 - 104.82          | 0.6000                | 0.6000             |
| T5            | 10                   | WR-VG86ST-BRD(3/4)      | 84.82 - 104.82          | 0.6000                | 0.6000             |
| T5            | 11                   | FB-L98B-002-XXX(3/8)    | 84.82 - 104.82          | 0.6000                | 0.6000             |
| T5            | 12                   | Feedline Ladder (Af)    | 84.82 - 104.82          | 0.6000                | 0.6000             |
| T5            | 14                   | WR-VG86ST-BRD(3/4)      | 84.82 - 104.82          | 0.6000                | 0.6000             |
| T5            | 19                   | AVA5-50(7/8)            | 84.82 - 104.82          | 0.6000                | 0.6000             |
| T5            | 23                   | EW52(ELLIPTICAL)        | 84.82 - 104.82          | 0.6000                | 0.6000             |
| T5            | 25                   | EW52(ELLIPTICAL)        | 84.82 - 104.82          | 0.6000                | 0.6000             |
| T5            | 27                   | ROHN Waveguide Brackets | 84.82 - 104.82          | 0.6000                | 0.6000             |
| T5            | 31                   | LDF7-50A(1-5/8)         | 84.82 - 104.82          | 0.6000                | 0.6000             |
| T5            | 32                   | LMR-400(3/8)            | 84.82 - 104.82          | 0.6000                | 0.6000             |
| T5            | 33                   | ROHN Waveguide Brackets | 84.82 - 104.82          | 0.6000                | 0.6000             |
| T5            | 35                   | Safety Line 3/8         | 84.82 - 104.82          | 0.6000                | 0.6000             |
| T6            | 5                    | AVA5-50(7/8)            | 64.82 - 84.82           | 0.6000                | 0.6000             |
| T6            | 6                    | WR-VG86ST-BRD(3/4)      | 64.82 - 84.82           | 0.6000                | 0.6000             |
| T6            | 7                    | WR-VG86ST-BRD(3/4)      | 64.82 - 84.82           | 0.6000                | 0.6000             |
| T6            | 8                    | WR-VG86ST-BRD(3/4)      | 64.82 - 84.82           | 0.6000                | 0.6000             |
| T6            | 9                    | ATCB-B01(5/16)          | 64.82 - 84.82           | 0.6000                | 0.6000             |
| T6            | 10                   | WR-VG86ST-BRD(3/4)      | 64.82 - 84.82           | 0.6000                | 0.6000             |
| T6            | 11                   | FB-L98B-002-XXX(3/8)    | 64.82 - 84.82           | 0.6000                | 0.6000             |
| T6            | 12                   | Feedline Ladder (Af)    | 64.82 - 84.82           | 0.6000                | 0.6000             |
| T6            | 14                   | WR-VG86ST-BRD(3/4)      | 64.82 - 84.82           | 0.6000                | 0.6000             |
| T6            | 19                   | AVA5-50(7/8)            | 64.82 - 84.82           | 0.6000                | 0.6000             |
| T6            | 23                   | EW52(ELLIPTICAL)        | 64.82 - 84.82           | 0.6000                | 0.6000             |
| T6            | 25                   | EW52(ELLIPTICAL)        | 64.82 - 84.82           | 0.6000                | 0.6000             |

|                                                                                                                                          |                                                   |                    |
|------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|--------------------|
| <b>tnxTower</b><br><br><b>B+T Group</b><br>1717 S. Boulder, Suite 300<br>Tulsa, OK 74119<br>Phone: (918) 587-4630<br>FAX: (918) 587-4630 | <b>Job</b>                                        | <b>Page</b>        |
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|                                                                                                                                          | <b>Project</b>                                    | <b>Date</b>        |
|                                                                                                                                          | <b>Client</b>                                     | <b>Designed by</b> |
|                                                                                                                                          | Crown Castle                                      | Vinayak            |

| Tower Section | Feed Line Record No. | Description             | Feed Line Segment Elev. | K <sub>o</sub> No Ice | K <sub>o</sub> Ice |
|---------------|----------------------|-------------------------|-------------------------|-----------------------|--------------------|
| T6            | 27                   | ROHN Waveguide Brackets | 64.82 - 84.82           | 0.6000                | 0.6000             |
| T6            | 31                   | LDF7-50A(1-5/8)         | 64.82 - 84.82           | 0.6000                | 0.6000             |
| T6            | 32                   | LMR-400(3/8)            | 64.82 - 84.82           | 0.6000                | 0.6000             |
| T6            | 33                   | ROHN Waveguide Brackets | 64.82 - 84.82           | 0.6000                | 0.6000             |
| T6            | 35                   | Safety Line 3/8         | 64.82 - 84.82           | 0.6000                | 0.6000             |
| T7            | 5                    | AVA5-50(7/8)            | 44.82 - 64.82           | 0.6000                | 0.6000             |
| T7            | 6                    | WR-VG86ST-BRD(3/4)      | 44.82 - 64.82           | 0.6000                | 0.6000             |
| T7            | 7                    | WR-VG86ST-BRD(3/4)      | 44.82 - 64.82           | 0.6000                | 0.6000             |
| T7            | 8                    | WR-VG86ST-BRD(3/4)      | 44.82 - 64.82           | 0.6000                | 0.6000             |
| T7            | 9                    | ATCB-B01(5/16)          | 44.82 - 64.82           | 0.6000                | 0.6000             |
| T7            | 10                   | WR-VG86ST-BRD(3/4)      | 44.82 - 64.82           | 0.6000                | 0.6000             |
| T7            | 11                   | FB-L98B-002-XXX(3/8)    | 44.82 - 64.82           | 0.6000                | 0.6000             |
| T7            | 12                   | Feedline Ladder (Af)    | 44.82 - 64.82           | 0.6000                | 0.6000             |
| T7            | 14                   | WR-VG86ST-BRD(3/4)      | 44.82 - 64.82           | 0.6000                | 0.6000             |
| T7            | 19                   | AVA5-50(7/8)            | 44.82 - 64.82           | 0.6000                | 0.6000             |
| T7            | 23                   | EW52(ELLIPTICAL)        | 44.82 - 64.82           | 0.6000                | 0.6000             |
| T7            | 25                   | EW52(ELLIPTICAL)        | 44.82 - 64.82           | 0.6000                | 0.6000             |
| T7            | 27                   | ROHN Waveguide Brackets | 44.82 - 64.82           | 0.6000                | 0.6000             |
| T7            | 31                   | LDF7-50A(1-5/8)         | 44.82 - 64.82           | 0.6000                | 0.6000             |
| T7            | 32                   | LMR-400(3/8)            | 44.82 - 64.82           | 0.6000                | 0.6000             |
| T7            | 33                   | ROHN Waveguide Brackets | 44.82 - 64.82           | 0.6000                | 0.6000             |
| T7            | 35                   | Safety Line 3/8         | 44.82 - 64.82           | 0.6000                | 0.6000             |
| T8            | 5                    | AVA5-50(7/8)            | 24.82 - 44.82           | 0.6000                | 0.6000             |
| T8            | 6                    | WR-VG86ST-BRD(3/4)      | 24.82 - 44.82           | 0.6000                | 0.6000             |
| T8            | 7                    | WR-VG86ST-BRD(3/4)      | 24.82 - 44.82           | 0.6000                | 0.6000             |
| T8            | 8                    | WR-VG86ST-BRD(3/4)      | 24.82 - 44.82           | 0.6000                | 0.6000             |
| T8            | 9                    | ATCB-B01(5/16)          | 24.82 - 44.82           | 0.6000                | 0.6000             |
| T8            | 10                   | WR-VG86ST-BRD(3/4)      | 24.82 - 44.82           | 0.6000                | 0.6000             |
| T8            | 11                   | FB-L98B-002-XXX(3/8)    | 24.82 - 44.82           | 0.6000                | 0.6000             |
| T8            | 12                   | Feedline Ladder (Af)    | 24.82 - 44.82           | 0.6000                | 0.6000             |
| T8            | 14                   | WR-VG86ST-BRD(3/4)      | 24.82 - 44.82           | 0.6000                | 0.6000             |
| T8            | 19                   | AVA5-50(7/8)            | 24.82 - 44.82           | 0.6000                | 0.6000             |
| T8            | 23                   | EW52(ELLIPTICAL)        | 24.82 - 44.82           | 0.6000                | 0.6000             |
| T8            | 25                   | EW52(ELLIPTICAL)        | 24.82 - 44.82           | 0.6000                | 0.6000             |
| T8            | 27                   | ROHN Waveguide Brackets | 24.82 - 44.82           | 0.6000                | 0.6000             |
| T8            | 31                   | LDF7-50A(1-5/8)         | 24.82 - 44.82           | 0.6000                | 0.6000             |
| T8            | 32                   | LMR-400(3/8)            | 24.82 - 44.82           | 0.6000                | 0.6000             |
| T8            | 33                   | ROHN Waveguide Brackets | 24.82 - 44.82           | 0.6000                | 0.6000             |
| T8            | 35                   | Safety Line 3/8         | 24.82 - 44.82           | 0.6000                | 0.6000             |
| T9            | 5                    | AVA5-50(7/8)            | 4.82 - 24.82            | 0.6000                | 0.6000             |
| T9            | 6                    | WR-VG86ST-BRD(3/4)      | 4.82 - 24.82            | 0.6000                | 0.6000             |
| T9            | 7                    | WR-VG86ST-BRD(3/4)      | 4.82 - 24.82            | 0.6000                | 0.6000             |
| T9            | 8                    | WR-VG86ST-BRD(3/4)      | 4.82 - 24.82            | 0.6000                | 0.6000             |
| T9            | 9                    | ATCB-B01(5/16)          | 4.82 - 24.82            | 0.6000                | 0.6000             |
| T9            | 10                   | WR-VG86ST-BRD(3/4)      | 4.82 - 24.82            | 0.6000                | 0.6000             |
| T9            | 11                   | FB-L98B-002-XXX(3/8)    | 4.82 - 24.82            | 0.6000                | 0.6000             |
| T9            | 12                   | Feedline Ladder (Af)    | 4.82 - 24.82            | 0.6000                | 0.6000             |
| T9            | 14                   | WR-VG86ST-BRD(3/4)      | 4.82 - 24.82            | 0.6000                | 0.6000             |
| T9            | 19                   | AVA5-50(7/8)            | 4.82 - 24.82            | 0.6000                | 0.6000             |
| T9            | 23                   | EW52(ELLIPTICAL)        | 4.82 - 24.82            | 0.6000                | 0.6000             |
| T9            | 25                   | EW52(ELLIPTICAL)        | 4.82 - 24.82            | 0.6000                | 0.6000             |
| T9            | 27                   | ROHN Waveguide Brackets | 4.82 - 24.82            | 0.6000                | 0.6000             |
| T9            | 31                   | LDF7-50A(1-5/8)         | 4.82 - 24.82            | 0.6000                | 0.6000             |
| T9            | 32                   | LMR-400(3/8)            | 4.82 - 24.82            | 0.6000                | 0.6000             |
| T9            | 33                   | ROHN Waveguide Brackets | 4.82 - 24.82            | 0.6000                | 0.6000             |
| T9            | 35                   | Safety Line 3/8         | 4.82 - 24.82            | 0.6000                | 0.6000             |
| T10           | 5                    | AVA5-50(7/8)            | 0.00 - 4.82             | 0.4608                | 0.4608             |
| T10           | 6                    | WR-VG86ST-BRD(3/4)      | 0.00 - 4.82             | 0.4608                | 0.4608             |
| T10           | 7                    | WR-VG86ST-BRD(3/4)      | 0.00 - 4.82             | 0.4608                | 0.4608             |
| T10           | 8                    | WR-VG86ST-BRD(3/4)      | 0.00 - 4.82             | 0.4608                | 0.4608             |
| T10           | 9                    | ATCB-B01(5/16)          | 0.00 - 4.82             | 0.4608                | 0.4608             |
| T10           | 10                   | WR-VG86ST-BRD(3/4)      | 0.00 - 4.82             | 0.4608                | 0.4608             |

|                                                                                                                                          |                                                                 |                                  |
|------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|----------------------------------|
| <b>tnxTower</b><br><br><b>B+T Group</b><br>1717 S. Boulder, Suite 300<br>Tulsa, OK 74119<br>Phone: (918) 587-4630<br>FAX: (918) 587-4630 | <b>Job</b><br>100061.009.01.0001 - FAIRGROUNDS, FL (BU# 846219) | <b>Page</b><br>20 of 52          |
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|                                                                                                                                          | <b>Client</b><br>Crown Castle                                   | <b>Designed by</b><br>Vinayak    |

| Tower Section | Feed Line Record No. | Description             | Feed Line Segment Elev. | K <sub>o</sub> No Ice | K <sub>o</sub> Ice |
|---------------|----------------------|-------------------------|-------------------------|-----------------------|--------------------|
| T10           | 11                   | FB-L98B-002-XXX(3/8)    | 0.00 - 4.82             | 0.4608                | 0.4608             |
| T10           | 12                   | Feedline Ladder (Af)    | 0.00 - 4.82             | 0.4608                | 0.4608             |
| T10           | 14                   | WR-VG86ST-BRD(3/4)      | 0.00 - 4.82             | 0.4608                | 0.4608             |
| T10           | 19                   | AVA5-50(7/8)            | 0.00 - 4.82             | 0.4608                | 0.4608             |
| T10           | 23                   | EW52(ELLIPTICAL)        | 0.00 - 4.82             | 0.4608                | 0.4608             |
| T10           | 25                   | EW52(ELLIPTICAL)        | 0.00 - 4.82             | 0.4608                | 0.4608             |
| T10           | 27                   | ROHN Waveguide Brackets | 0.00 - 4.82             | 0.4608                | 0.4608             |
| T10           | 31                   | LDF7-50A(1-5/8)         | 0.00 - 4.82             | 0.4608                | 0.4608             |
| T10           | 32                   | LMR-400(3/8)            | 0.00 - 4.82             | 0.4608                | 0.4608             |
| T10           | 33                   | ROHN Waveguide Brackets | 0.00 - 4.82             | 0.4608                | 0.4608             |
| T10           | 35                   | Safety Line 3/8         | 0.00 - 4.82             | 0.4608                | 0.4608             |

## Discrete Tower Loads

| Description             | Face or Leg | Offset Type | Offsets: Horz Lateral Vert<br>ft<br>ft<br>ft | Azimuth Adjustment<br>° | Placement<br>ft |        | C <sub>A</sub> A <sub>A</sub> Front<br>ft <sup>2</sup> | C <sub>A</sub> A <sub>A</sub> Side<br>ft <sup>2</sup> | Weight<br>K |
|-------------------------|-------------|-------------|----------------------------------------------|-------------------------|-----------------|--------|--------------------------------------------------------|-------------------------------------------------------|-------------|
| *                       |             |             |                                              |                         |                 |        |                                                        |                                                       |             |
| Lightning Rod 5/8" x 8' | B           | From Leg    | 0.000<br>0'<br>4'                            | 0.000                   | 184°9-13/16"    | No Ice | 0.500                                                  | 0.500                                                 | 0.031       |
| *                       |             |             |                                              |                         |                 |        |                                                        |                                                       |             |
| (2) RRUS 32             | A           | From Leg    | 4.000<br>0'<br>1'                            | 0.000                   | 182'            | No Ice | 2.857                                                  | 1.777                                                 | 0.055       |
| (2) RRUS 32             | B           | From Leg    | 4.000<br>0'<br>1'                            | 0.000                   | 182'            | No Ice | 2.857                                                  | 1.777                                                 | 0.055       |
| (2) RRUS 32             | C           | From Leg    | 4.000<br>0'<br>1'                            | 0.000                   | 182'            | No Ice | 2.857                                                  | 1.777                                                 | 0.055       |
| (2) RRUS-11             | A           | From Leg    | 4.000<br>0'<br>1'                            | 0.000                   | 182'            | No Ice | 2.784                                                  | 1.187                                                 | 0.048       |
| (2) RRUS-11             | B           | From Leg    | 4.000<br>0'<br>1'                            | 0.000                   | 182'            | No Ice | 2.784                                                  | 1.187                                                 | 0.048       |
| (2) RRUS-11             | C           | From Leg    | 4.000<br>0'<br>1'                            | 0.000                   | 182'            | No Ice | 2.784                                                  | 1.187                                                 | 0.048       |
| RRUS 4478 B14           | A           | From Leg    | 4.000<br>0'<br>1'                            | 0.000                   | 182'            | No Ice | 1.843                                                  | 1.059                                                 | 0.060       |
| RRUS 4478 B14           | B           | From Leg    | 4.000<br>0'<br>1'                            | 0.000                   | 182'            | No Ice | 1.843                                                  | 1.059                                                 | 0.060       |
| RRUS 4478 B14           | C           | From Leg    | 4.000<br>0'<br>1'                            | 0.000                   | 182'            | No Ice | 1.843                                                  | 1.059                                                 | 0.060       |
| (2) RRUS 32 B2          | A           | From Leg    | 4.000<br>0'                                  | 0.000                   | 182'            | No Ice | 2.731                                                  | 1.668                                                 | 0.053       |

|                                                                                                                                          |                                                   |                    |
|------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|--------------------|
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|                                                                                                                                          | <b>Project</b>                                    | <b>Date</b>        |
|                                                                                                                                          | <b>Client</b>                                     | <b>Designed by</b> |
|                                                                                                                                          | Crown Castle                                      | Vinayak            |

| Description                        | Face<br>or<br>Leg | Offset<br>Type | Offsets:<br>Horz<br>Lateral<br>Vert<br>ft<br>ft<br>ft | Azimuth<br>Adjustment<br><br>° | Placement<br><br>ft |        | C <sub>A</sub> A <sub>A</sub><br>Front<br><br>ft <sup>2</sup> | C <sub>A</sub> A <sub>A</sub><br>Side<br><br>ft <sup>2</sup> | Weight<br><br>K |
|------------------------------------|-------------------|----------------|-------------------------------------------------------|--------------------------------|---------------------|--------|---------------------------------------------------------------|--------------------------------------------------------------|-----------------|
| (2) RRUS 32 B2                     | B                 | From Leg       | 1'<br>4.000<br>0'                                     | 0.000                          | 182'                | No Ice | 2.731                                                         | 1.668                                                        | 0.053           |
| (2) RRUS 32 B2                     | C                 | From Leg       | 1'<br>4.000<br>0'                                     | 0.000                          | 182'                | No Ice | 2.731                                                         | 1.668                                                        | 0.053           |
| (2) RRUS 32 B66                    | A                 | From Leg       | 1'<br>4.000<br>0'                                     | 0.000                          | 182'                | No Ice | 2.743                                                         | 1.668                                                        | 0.053           |
| (2) RRUS 32 B66                    | B                 | From Leg       | 1'<br>4.000<br>0'                                     | 0.000                          | 182'                | No Ice | 2.743                                                         | 1.668                                                        | 0.053           |
| (2) RRUS 32 B66                    | C                 | From Leg       | 1'<br>4.000<br>0'                                     | 0.000                          | 182'                | No Ice | 2.743                                                         | 1.668                                                        | 0.053           |
| DC6-48-60-18-8F                    | A                 | From Leg       | 1'<br>4.000<br>0'                                     | 0.000                          | 182'                | No Ice | 1.212                                                         | 1.212                                                        | 0.033           |
| DC6-48-60-18-8F                    | C                 | From Leg       | 1'<br>4.000<br>0'                                     | 0.000                          | 182'                | No Ice | 1.212                                                         | 1.212                                                        | 0.033           |
| (2) 2NN2HH-33B-R4                  | A                 | From Leg       | 1'<br>4.000<br>0'                                     | 0.000                          | 182'                | No Ice | 9.287                                                         | 3.414                                                        | 0.147           |
| (2) 2NN2HH-33B-R4                  | B                 | From Leg       | 1'<br>4.000<br>0'                                     | 0.000                          | 182'                | No Ice | 9.287                                                         | 3.414                                                        | 0.147           |
| (2) 2NN2HH-33B-R4                  | C                 | From Leg       | 1'<br>4.000<br>0'                                     | 0.000                          | 182'                | No Ice | 9.287                                                         | 3.414                                                        | 0.147           |
| (2) AIR 6419 B77G w/<br>Mount Pipe | A                 | From Leg       | 1'<br>4.000<br>0'                                     | 0.000                          | 182'                | No Ice | 4.325                                                         | 2.492                                                        | 0.078           |
| (2) AIR 6419 B77G w/<br>Mount Pipe | B                 | From Leg       | 1'<br>4.000<br>0'                                     | 0.000                          | 182'                | No Ice | 4.325                                                         | 2.492                                                        | 0.078           |
| (2) AIR 6419 B77G w/<br>Mount Pipe | C                 | From Leg       | 1'<br>4.000<br>0'                                     | 0.000                          | 182'                | No Ice | 4.325                                                         | 2.492                                                        | 0.078           |
| (2) AIR 6449 B77D C-BAND           | A                 | From Leg       | 1'<br>4.000<br>0'                                     | 0.000                          | 182'                | No Ice | 3.640                                                         | 1.720                                                        | 0.088           |
| (2) AIR 6449 B77D C-BAND           | B                 | From Leg       | 1'<br>4.000<br>0'                                     | 0.000                          | 182'                | No Ice | 3.640                                                         | 1.720                                                        | 0.088           |
| (2) AIR 6449 B77D C-BAND           | C                 | From Leg       | 1'<br>4.000<br>0'                                     | 0.000                          | 182'                | No Ice | 3.640                                                         | 1.720                                                        | 0.088           |
| (2) 10' x 2" Mount Pipe            | A                 | From Leg       | 1'<br>4.000<br>0'                                     | 0.000                          | 182'                | No Ice | 2.375                                                         | 2.375                                                        | 0.037           |
| (2) 10' x 2" Mount Pipe            | B                 | From Leg       | 1'<br>4.000<br>0'                                     | 0.000                          | 182'                | No Ice | 2.375                                                         | 2.375                                                        | 0.037           |
| (2) 10' x 2" Mount Pipe            | C                 | From Leg       | 1'<br>4.000<br>0'                                     | 0.000                          | 182'                | No Ice | 2.375                                                         | 2.375                                                        | 0.037           |



|                                                                                                                                          |                                                                 |  |  |  |  |  |                                  |  |  |
|------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|--|--|--|--|--|----------------------------------|--|--|
| <b>tnxTower</b><br><br><b>B+T Group</b><br>1717 S. Boulder, Suite 300<br>Tulsa, OK 74119<br>Phone: (918) 587-4630<br>FAX: (918) 587-4630 | <b>Job</b><br>100061.009.01.0001 - FAIRGROUNDS, FL (BU# 846219) |  |  |  |  |  | <b>Page</b><br>23 of 52          |  |  |
|                                                                                                                                          | <b>Project</b>                                                  |  |  |  |  |  | <b>Date</b><br>22:32:58 12/28/22 |  |  |
|                                                                                                                                          | <b>Client</b><br>Crown Castle                                   |  |  |  |  |  | <b>Designed by</b><br>Vinayak    |  |  |

| Description                           | Face<br>or<br>Leg | Offset<br>Type | Offsets:<br>Horz<br>Lateral<br>Vert<br>ft<br>ft<br>ft | Azimuth<br>Adjustment<br><br>° | Placement<br><br>ft |        | C <sub>A</sub> A <sub>A</sub><br>Front<br><br>ft <sup>2</sup> | C <sub>A</sub> A <sub>A</sub><br>Side<br><br>ft <sup>2</sup> | Weight<br><br>K |
|---------------------------------------|-------------------|----------------|-------------------------------------------------------|--------------------------------|---------------------|--------|---------------------------------------------------------------|--------------------------------------------------------------|-----------------|
| Pipe Mount [PM 601-1]                 | B                 | From Leg       | 0.500<br>0'<br>0'                                     | 0.000                          | 158'                | No Ice | 1.320                                                         | 1.320                                                        | 0.065           |
| (2) Horizontal 10' x 2" Mount<br>Pipe | B                 | From Face      | 0.500<br>0'<br>0'                                     | 0.000                          | 158'                | No Ice | 2.375                                                         | 2.375                                                        | 0.037           |
| *                                     |                   |                |                                                       |                                |                     |        |                                                               |                                                              |                 |
| X7CQAP-665-VR0 w/ Mount<br>Pipe       | A                 | From Leg       | 4.000<br>0'<br>-3'                                    | 0.000                          | 153'                | No Ice | 8.882                                                         | 6.439                                                        | 0.089           |
| X7CQAP-665-VR0 w/ Mount<br>Pipe       | B                 | From Leg       | 4.000<br>0'<br>-3'                                    | 0.000                          | 153'                | No Ice | 8.882                                                         | 6.439                                                        | 0.089           |
| X7CQAP-665-VR0 w/ Mount<br>Pipe       | C                 | From Leg       | 4.000<br>0'<br>-3'                                    | 0.000                          | 153'                | No Ice | 8.882                                                         | 6.439                                                        | 0.089           |
| RHSDC-3315-PF-48                      | A                 | From Leg       | 4.000<br>0'<br>-3'                                    | 0.000                          | 153'                | No Ice | 3.708                                                         | 2.192                                                        | 0.032           |
| (2) ODU600                            | C                 | From Leg       | 4.000<br>0'<br>-3'                                    | 0.000                          | 153'                | No Ice | 0.901                                                         | 0.425                                                        | 0.011           |
| AIR 6449 w/ Mount Pipe                | A                 | From Leg       | 4.000<br>0'<br>-3'                                    | 0.000                          | 153'                | No Ice | 5.185                                                         | 2.715                                                        | 0.118           |
| AIR 6449 w/ Mount Pipe                | B                 | From Leg       | 4.000<br>0'<br>-3'                                    | 0.000                          | 153'                | No Ice | 5.185                                                         | 2.715                                                        | 0.118           |
| AIR 6449 w/ Mount Pipe                | C                 | From Leg       | 4.000<br>0'<br>-3'                                    | 0.000                          | 153'                | No Ice | 5.185                                                         | 2.715                                                        | 0.118           |
| (2) MX06FIT665-02 w/<br>Mount Pipe    | A                 | From Leg       | 4.000<br>0'<br>-3'                                    | 0.000                          | 153'                | No Ice | 3.207                                                         | 3.328                                                        | 0.083           |
| (2) MX06FIT665-02 w/<br>Mount Pipe    | B                 | From Leg       | 4.000<br>0'<br>-3'                                    | 0.000                          | 153'                | No Ice | 3.207                                                         | 3.328                                                        | 0.083           |
| (2) MX06FIT665-02 w/<br>Mount Pipe    | C                 | From Leg       | 4.000<br>0'<br>-3'                                    | 0.000                          | 153'                | No Ice | 3.207                                                         | 3.328                                                        | 0.083           |
| 4449 B5 B13 VZ                        | A                 | From Leg       | 4.000<br>0'<br>-3'                                    | 0.000                          | 153'                | No Ice | 1.969                                                         | 1.381                                                        | 0.067           |
| 4449 B5 B13 VZ                        | B                 | From Leg       | 4.000<br>0'<br>-3'                                    | 0.000                          | 153'                | No Ice | 1.969                                                         | 1.381                                                        | 0.067           |
| 4449 B5 B13 VZ                        | C                 | From Leg       | 4.000<br>0'<br>-3'                                    | 0.000                          | 153'                | No Ice | 1.969                                                         | 1.381                                                        | 0.067           |
| 8843 B2 B66A VZ                       | A                 | From Leg       | 4.000<br>0'<br>-3'                                    | 0.000                          | 153'                | No Ice | 1.973                                                         | 1.660                                                        | 0.072           |
| 8843 B2 B66A VZ                       | B                 | From Leg       | 4.000<br>0'<br>-3'                                    | 0.000                          | 153'                | No Ice | 1.973                                                         | 1.660                                                        | 0.072           |
| 8843 B2 B66A VZ                       | C                 | From Leg       | 4.000<br>0'                                           | 0.000                          | 153'                | No Ice | 1.973                                                         | 1.660                                                        | 0.072           |

|                                                                                                                                          |                                                   |                    |
|------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|--------------------|
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|                                                                                                                                          | <b>Project</b>                                    | <b>Date</b>        |
|                                                                                                                                          | <b>Client</b>                                     | <b>Designed by</b> |
|                                                                                                                                          | Crown Castle                                      | Vinayak            |

| Description                       | Face<br>or<br>Leg | Offset<br>Type | Offsets:<br>Horz<br>Lateral<br>Vert<br>ft<br>ft<br>ft | Azimuth<br>Adjustment<br><br>° | Placement<br><br>ft |        | C <sub>A</sub> A <sub>A</sub><br>Front<br><br>ft <sup>2</sup> | C <sub>A</sub> A <sub>A</sub><br>Side<br><br>ft <sup>2</sup> | Weight<br><br>K |
|-----------------------------------|-------------------|----------------|-------------------------------------------------------|--------------------------------|---------------------|--------|---------------------------------------------------------------|--------------------------------------------------------------|-----------------|
| RVZDC-6627-PF-48_CCIV2            | A                 | From Leg       | -3'<br>4.000<br>0'                                    | 0.000                          | 153'                | No Ice | 4.056                                                         | 3.098                                                        | 0.032           |
| Sector Mount [SM 502-3]           | C                 | None           | -3'                                                   | 0.000                          | 153'                | No Ice | 29.820                                                        | 29.820                                                       | 1.673           |
| *<br>Pipe Mount [PM 601-1]        | C                 | From Leg       | 0.500<br>0'                                           | 0.000                          | 138'                | No Ice | 1.320                                                         | 1.320                                                        | 0.065           |
| Horizontal 10' x 2" Mount<br>Pipe | A                 | From Face      | 0.500<br>0'                                           | 0.000                          | 138'                | No Ice | 2.375                                                         | 2.375                                                        | 0.037           |
| *<br>Pipe Mount [PM 601-1]        | B                 | From Leg       | 0.500<br>0'                                           | 0.000                          | 116'                | No Ice | 1.320                                                         | 1.320                                                        | 0.065           |
| *                                 |                   |                | 0'                                                    |                                |                     |        |                                                               |                                                              |                 |

## Dishes

| Description                  | Face<br>or<br>Leg | Dish<br>Type                | Offset<br>Type | Offsets:<br>Horz<br>Lateral<br>Vert<br>ft | Azimuth<br>Adjustment<br><br>° | 3 dB<br>Beam<br>Width<br><br>° | Elevation<br><br>ft | Outside<br>Diameter<br><br>ft | Aperture<br>Area<br><br>ft <sup>2</sup> | Weight<br><br>K |
|------------------------------|-------------------|-----------------------------|----------------|-------------------------------------------|--------------------------------|--------------------------------|---------------------|-------------------------------|-----------------------------------------|-----------------|
| *<br>HSX6-59-P3A/B           | C                 | Paraboloid<br>w/Shroud (HP) | From<br>Leg    | 1.000<br>0'                               | -90.000                        |                                | 174'                | 6.000                         | No Ice                                  | 28.270          |
| *<br>Andrew HSX6-59A         | B                 | Paraboloid<br>w/Shroud (HP) | From<br>Leg    | 1.000<br>0'                               | 40.000                         |                                | 158'                | 6.000                         | No Ice                                  | 28.300          |
| *<br>Commscope<br>VHLPX3-11W | C                 | Paraboloid<br>w/Shroud (HP) | From<br>Leg    | 4.000<br>0'                               | 13.000                         |                                | 153'                | 3.283                         | No Ice                                  | 8.467           |
| *<br>HSX8-59                 | C                 | Paraboloid<br>w/Shroud (HP) | From<br>Leg    | -3'<br>1.000<br>0'                        | -90.000                        |                                | 138'                | 8.875                         | No Ice                                  | 61.862          |
| *<br>HSX6-59-P3A/B           | B                 | Paraboloid<br>w/Shroud (HP) | From<br>Leg    | 0'                                        | -60.000                        |                                | 116'                | 6.000                         | No Ice                                  | 28.270          |
| *                            |                   |                             |                | 0'                                        |                                |                                |                     |                               |                                         |                 |

## Load Combinations

|                                                                                                                                          |                                                   |                    |
|------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|--------------------|
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|                                                                                                                                          | <b>Project</b>                                    | <b>Date</b>        |
|                                                                                                                                          | <b>Client</b>                                     | 22:32:58 12/28/22  |
|                                                                                                                                          | Crown Castle                                      | <b>Designed by</b> |
|                                                                                                                                          |                                                   | Vinayak            |

| Comb.<br>No. | Description                                    |
|--------------|------------------------------------------------|
| 1            | Dead Only                                      |
| 2            | 1.2 Dead+1.0 Wind 0 deg - No Ice+1.0 Guy       |
| 3            | 1.2D+1.0W (pattern 1) 0 deg - No Ice+1.0 Guy   |
| 4            | 1.2D+1.0W (pattern 2) 0 deg - No Ice+1.0 Guy   |
| 5            | 1.2D+1.0W (pattern 3) 0 deg - No Ice+1.0 Guy   |
| 6            | 1.2D+1.0W (pattern 4) 0 deg - No Ice+1.0 Guy   |
| 7            | 1.2 Dead+1.0 Wind 30 deg - No Ice+1.0 Guy      |
| 8            | 1.2D+1.0W (pattern 1) 30 deg - No Ice+1.0 Guy  |
| 9            | 1.2D+1.0W (pattern 2) 30 deg - No Ice+1.0 Guy  |
| 10           | 1.2D+1.0W (pattern 3) 30 deg - No Ice+1.0 Guy  |
| 11           | 1.2D+1.0W (pattern 4) 30 deg - No Ice+1.0 Guy  |
| 12           | 1.2 Dead+1.0 Wind 60 deg - No Ice+1.0 Guy      |
| 13           | 1.2D+1.0W (pattern 1) 60 deg - No Ice+1.0 Guy  |
| 14           | 1.2D+1.0W (pattern 2) 60 deg - No Ice+1.0 Guy  |
| 15           | 1.2D+1.0W (pattern 3) 60 deg - No Ice+1.0 Guy  |
| 16           | 1.2D+1.0W (pattern 4) 60 deg - No Ice+1.0 Guy  |
| 17           | 1.2 Dead+1.0 Wind 90 deg - No Ice+1.0 Guy      |
| 18           | 1.2D+1.0W (pattern 1) 90 deg - No Ice+1.0 Guy  |
| 19           | 1.2D+1.0W (pattern 2) 90 deg - No Ice+1.0 Guy  |
| 20           | 1.2D+1.0W (pattern 3) 90 deg - No Ice+1.0 Guy  |
| 21           | 1.2D+1.0W (pattern 4) 90 deg - No Ice+1.0 Guy  |
| 22           | 1.2 Dead+1.0 Wind 120 deg - No Ice+1.0 Guy     |
| 23           | 1.2D+1.0W (pattern 1) 120 deg - No Ice+1.0 Guy |
| 24           | 1.2D+1.0W (pattern 2) 120 deg - No Ice+1.0 Guy |
| 25           | 1.2D+1.0W (pattern 3) 120 deg - No Ice+1.0 Guy |
| 26           | 1.2D+1.0W (pattern 4) 120 deg - No Ice+1.0 Guy |
| 27           | 1.2 Dead+1.0 Wind 150 deg - No Ice+1.0 Guy     |
| 28           | 1.2D+1.0W (pattern 1) 150 deg - No Ice+1.0 Guy |
| 29           | 1.2D+1.0W (pattern 2) 150 deg - No Ice+1.0 Guy |
| 30           | 1.2D+1.0W (pattern 3) 150 deg - No Ice+1.0 Guy |
| 31           | 1.2D+1.0W (pattern 4) 150 deg - No Ice+1.0 Guy |
| 32           | 1.2 Dead+1.0 Wind 180 deg - No Ice+1.0 Guy     |
| 33           | 1.2D+1.0W (pattern 1) 180 deg - No Ice+1.0 Guy |
| 34           | 1.2D+1.0W (pattern 2) 180 deg - No Ice+1.0 Guy |
| 35           | 1.2D+1.0W (pattern 3) 180 deg - No Ice+1.0 Guy |
| 36           | 1.2D+1.0W (pattern 4) 180 deg - No Ice+1.0 Guy |
| 37           | 1.2 Dead+1.0 Wind 210 deg - No Ice+1.0 Guy     |
| 38           | 1.2D+1.0W (pattern 1) 210 deg - No Ice+1.0 Guy |
| 39           | 1.2D+1.0W (pattern 2) 210 deg - No Ice+1.0 Guy |
| 40           | 1.2D+1.0W (pattern 3) 210 deg - No Ice+1.0 Guy |
| 41           | 1.2D+1.0W (pattern 4) 210 deg - No Ice+1.0 Guy |
| 42           | 1.2 Dead+1.0 Wind 240 deg - No Ice+1.0 Guy     |
| 43           | 1.2D+1.0W (pattern 1) 240 deg - No Ice+1.0 Guy |
| 44           | 1.2D+1.0W (pattern 2) 240 deg - No Ice+1.0 Guy |
| 45           | 1.2D+1.0W (pattern 3) 240 deg - No Ice+1.0 Guy |
| 46           | 1.2D+1.0W (pattern 4) 240 deg - No Ice+1.0 Guy |
| 47           | 1.2 Dead+1.0 Wind 270 deg - No Ice+1.0 Guy     |
| 48           | 1.2D+1.0W (pattern 1) 270 deg - No Ice+1.0 Guy |
| 49           | 1.2D+1.0W (pattern 2) 270 deg - No Ice+1.0 Guy |
| 50           | 1.2D+1.0W (pattern 3) 270 deg - No Ice+1.0 Guy |
| 51           | 1.2D+1.0W (pattern 4) 270 deg - No Ice+1.0 Guy |
| 52           | 1.2 Dead+1.0 Wind 300 deg - No Ice+1.0 Guy     |
| 53           | 1.2D+1.0W (pattern 1) 300 deg - No Ice+1.0 Guy |
| 54           | 1.2D+1.0W (pattern 2) 300 deg - No Ice+1.0 Guy |
| 55           | 1.2D+1.0W (pattern 3) 300 deg - No Ice+1.0 Guy |
| 56           | 1.2D+1.0W (pattern 4) 300 deg - No Ice+1.0 Guy |
| 57           | 1.2 Dead+1.0 Wind 330 deg - No Ice+1.0 Guy     |
| 58           | 1.2D+1.0W (pattern 1) 330 deg - No Ice+1.0 Guy |
| 59           | 1.2D+1.0W (pattern 2) 330 deg - No Ice+1.0 Guy |
| 60           | 1.2D+1.0W (pattern 3) 330 deg - No Ice+1.0 Guy |
| 61           | 1.2D+1.0W (pattern 4) 330 deg - No Ice+1.0 Guy |

|                                                                                                                                          |                                                   |                    |
|------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|--------------------|
| <b>tnxTower</b><br><br><b>B+T Group</b><br>1717 S. Boulder, Suite 300<br>Tulsa, OK 74119<br>Phone: (918) 587-4630<br>FAX: (918) 587-4630 | <b>Job</b>                                        | <b>Page</b>        |
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|                                                                                                                                          | <b>Project</b>                                    | <b>Date</b>        |
|                                                                                                                                          | <b>Client</b>                                     | 22:32:58 12/28/22  |
|                                                                                                                                          | Crown Castle                                      | <b>Designed by</b> |
|                                                                                                                                          |                                                   | Vinayak            |

| Comb. No. | Description                     |
|-----------|---------------------------------|
| 62        | Dead+Wind 0 deg - Service+Guy   |
| 63        | Dead+Wind 30 deg - Service+Guy  |
| 64        | Dead+Wind 60 deg - Service+Guy  |
| 65        | Dead+Wind 90 deg - Service+Guy  |
| 66        | Dead+Wind 120 deg - Service+Guy |
| 67        | Dead+Wind 150 deg - Service+Guy |
| 68        | Dead+Wind 180 deg - Service+Guy |
| 69        | Dead+Wind 210 deg - Service+Guy |
| 70        | Dead+Wind 240 deg - Service+Guy |
| 71        | Dead+Wind 270 deg - Service+Guy |
| 72        | Dead+Wind 300 deg - Service+Guy |
| 73        | Dead+Wind 330 deg - Service+Guy |

## Maximum Member Forces

| Section No. | Elevation ft      | Component Type | Condition        | Gov. Load Comb. | Axial K | Major Axis Moment kip-ft | Minor Axis Moment kip-ft |
|-------------|-------------------|----------------|------------------|-----------------|---------|--------------------------|--------------------------|
| T1          | 184.818 - 164.818 | Leg            | Max Tension      | 54              | 35.363  | -0.674                   | -0.270                   |
|             |                   |                | Max. Compression | 5               | -43.744 | -0.035                   | 0.370                    |
|             |                   |                | Max. Mx          | 48              | -7.427  | 1.733                    | 0.308                    |
|             |                   |                | Max. My          | 33              | -3.904  | 0.051                    | -1.797                   |
|             |                   |                | Max. Vy          | 48              | 3.602   | 1.733                    | 0.308                    |
|             |                   |                | Max. Vx          | 33              | -3.799  | 0.051                    | -1.797                   |
|             |                   | Diagonal       | Max Tension      | 3               | 3.981   | 0.000                    | 0.000                    |
|             |                   |                | Max. Compression | 18              | -5.560  | 0.000                    | 0.000                    |
|             |                   |                | Max. Mx          | 6               | 2.312   | 0.003                    | 0.000                    |
|             |                   |                | Max. My          | 59              | -1.897  | 0.000                    | 0.000                    |
|             |                   |                | Max. Vy          | 6               | -0.003  | 0.000                    | 0.000                    |
|             |                   |                | Max. Vx          | 59              | -0.000  | 0.000                    | 0.000                    |
|             |                   | Top Girt       | Max Tension      | 35              | 0.470   | 0.000                    | 0.000                    |
|             |                   |                | Max. Compression | 4               | -0.542  | 0.000                    | 0.000                    |
|             |                   |                | Max. Mx          | 43              | -0.518  | 0.002                    | 0.000                    |
|             |                   |                | Max. My          | 59              | -0.072  | 0.000                    | -0.000                   |
|             |                   |                | Max. Vy          | 43              | -0.002  | 0.000                    | 0.000                    |
|             |                   |                | Max. Vx          | 59              | 0.000   | 0.000                    | 0.000                    |
|             |                   | Bottom Girt    | Max Tension      | 23              | 1.102   | 0.000                    | 0.000                    |
|             |                   |                | Max. Compression | 54              | -0.019  | 0.000                    | 0.000                    |
|             |                   |                | Max. Mx          | 43              | 1.085   | 0.002                    | 0.000                    |
|             |                   |                | Max. My          | 61              | 0.609   | 0.000                    | 0.000                    |
|             |                   |                | Max. Vy          | 43              | -0.002  | 0.000                    | 0.000                    |
|             |                   |                | Max. Vx          | 61              | -0.000  | 0.000                    | 0.000                    |
|             |                   | Guy A          | Bottom Tension   | 33              | 21.206  |                          |                          |
|             |                   |                | Top Tension      | 33              | 21.398  |                          |                          |
|             |                   |                | Top Cable Vert   | 33              | 17.821  |                          |                          |
|             |                   |                | Top Cable Norm   | 33              | 11.844  |                          |                          |
|             |                   |                | Top Cable Tan    | 33              | 0.003   |                          |                          |
|             |                   |                | Bot Cable Vert   | 33              | -17.416 |                          |                          |
|             |                   |                | Bot Cable Norm   | 33              | 12.099  |                          |                          |
|             |                   |                | Bot Cable Tan    | 33              | 0.008   |                          |                          |
|             |                   | Guy B          | Bottom Tension   | 53              | 21.975  |                          |                          |
|             |                   |                | Top Tension      | 53              | 22.167  |                          |                          |
|             |                   |                | Top Cable Vert   | 53              | 18.456  |                          |                          |
|             |                   |                | Top Cable Norm   | 53              | 12.279  |                          |                          |
|             |                   |                | Top Cable Tan    | 53              | 0.001   |                          |                          |
|             |                   |                | Bot Cable Vert   | 53              | -18.050 |                          |                          |
|             |                   |                | Bot Cable Norm   | 53              | 12.534  |                          |                          |
|             |                   |                | Bot Cable Tan    | 53              | 0.010   |                          |                          |



|                                                                                                                                          |                                                   |                    |
|------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|--------------------|
| <b>tnxTower</b><br><br><b>B+T Group</b><br>1717 S. Boulder, Suite 300<br>Tulsa, OK 74119<br>Phone: (918) 587-4630<br>FAX: (918) 587-4630 | <b>Job</b>                                        | <b>Page</b>        |
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|                                                                                                                                          | <b>Project</b>                                    | <b>Date</b>        |
|                                                                                                                                          | <b>Client</b>                                     | <b>Designed by</b> |
|                                                                                                                                          | Crown Castle                                      | Vinayak            |

| Section No.      | Elevation ft      | Component Type   | Condition        | Gov. Load Comb. | Axial K | Major Axis Moment kip-ft | Minor Axis Moment kip-ft |
|------------------|-------------------|------------------|------------------|-----------------|---------|--------------------------|--------------------------|
| T4               | 124.818 - 104.818 | Bottom Girt      | Max. My          | 6               | 0.688   | 0.000                    | -0.000                   |
|                  |                   |                  | Max. Vy          | 58              | -0.002  | 0.000                    | 0.000                    |
|                  |                   |                  | Max. Vx          | 6               | 0.000   | 0.000                    | 0.000                    |
|                  |                   |                  | Max Tension      | 2               | 1.785   | 0.000                    | 0.000                    |
|                  |                   |                  | Max. Compression | 36              | -1.501  | 0.000                    | 0.000                    |
|                  |                   |                  | Max. Mx          | 16              | 0.478   | 0.002                    | 0.000                    |
|                  |                   | Leg              | Max. My          | 58              | -1.157  | 0.000                    | -0.000                   |
|                  |                   |                  | Max. Vy          | 16              | -0.002  | 0.000                    | 0.000                    |
|                  |                   |                  | Max. Vx          | 58              | 0.000   | 0.000                    | 0.000                    |
|                  |                   |                  | Max Tension      | 1               | 0.000   | 0.000                    | 0.000                    |
|                  |                   | Diagonal         | Max. Compression | 44              | -40.711 | 0.641                    | -0.683                   |
|                  |                   |                  | Max. Mx          | 17              | -33.013 | -1.198                   | -0.123                   |
|                  |                   |                  | Max. My          | 2               | -35.283 | -0.067                   | 1.367                    |
|                  |                   |                  | Max. Vy          | 19              | 2.483   | -0.932                   | -0.076                   |
|                  |                   |                  | Max. Vx          | 36              | 3.096   | 0.128                    | -1.262                   |
|                  |                   |                  | Max Tension      | 40              | 3.169   | 0.000                    | 0.000                    |
|                  |                   | Top Girt         | Max. Compression | 5               | -3.527  | 0.000                    | 0.000                    |
|                  |                   |                  | Max. Mx          | 6               | 0.050   | 0.001                    | 0.000                    |
|                  |                   |                  | Max. My          | 59              | 0.498   | 0.000                    | 0.000                    |
|                  |                   |                  | Max. Vy          | 6               | -0.002  | 0.000                    | 0.000                    |
|                  |                   |                  | Max. Vx          | 59              | -0.000  | 0.000                    | 0.000                    |
|                  |                   |                  | Max Tension      | 2               | 0.776   | 0.000                    | 0.000                    |
|                  |                   | Bottom Girt      | Max. Compression | 1               | 0.000   | 0.000                    | 0.000                    |
|                  |                   |                  | Max. Mx          | 42              | 0.227   | 0.002                    | 0.000                    |
|                  |                   |                  | Max. My          | 58              | 0.321   | 0.000                    | -0.000                   |
|                  |                   |                  | Max. Vy          | 42              | -0.002  | 0.000                    | 0.000                    |
|                  |                   |                  | Max. Vx          | 58              | 0.000   | 0.000                    | 0.000                    |
|                  |                   |                  | Max Tension      | 48              | 0.287   | 0.000                    | 0.000                    |
|                  |                   | Guy A            | Max. Compression | 21              | -0.138  | 0.000                    | 0.000                    |
|                  |                   |                  | Max. Mx          | 57              | 0.162   | 0.002                    | 0.000                    |
|                  |                   |                  | Max. My          | 58              | -0.032  | 0.000                    | -0.000                   |
|                  |                   |                  | Max. Vy          | 57              | -0.002  | 0.000                    | 0.000                    |
|                  |                   |                  | Max. Vx          | 58              | 0.000   | 0.000                    | 0.000                    |
|                  |                   |                  | Bottom Tension   | 36              | 14.962  |                          |                          |
|                  |                   | Guy B            | Top Tension      | 36              | 15.062  |                          |                          |
|                  |                   |                  | Top Cable Vert   | 36              | 11.199  |                          |                          |
|                  |                   |                  | Top Cable Norm   | 36              | 10.072  |                          |                          |
|                  |                   |                  | Top Cable Tan    | 36              | 0.002   |                          |                          |
|                  |                   |                  | Bot Cable Vert   | 36              | -10.955 |                          |                          |
|                  |                   |                  | Bot Cable Norm   | 36              | 10.190  |                          |                          |
|                  |                   | Guy C            | Bot Cable Tan    | 36              | 0.002   |                          |                          |
|                  |                   |                  | Bottom Tension   | 57              | 15.215  |                          |                          |
|                  |                   |                  | Top Tension      | 57              | 15.315  |                          |                          |
|                  |                   |                  | Top Cable Vert   | 57              | 11.382  |                          |                          |
|                  |                   |                  | Top Cable Norm   | 57              | 10.247  |                          |                          |
|                  |                   |                  | Top Cable Tan    | 57              | 0.018   |                          |                          |
| Top Guy Pull-Off |                   |                  | Bot Cable Vert   | 57              | -11.143 |                          |                          |
|                  |                   |                  | Bot Cable Norm   | 57              | 10.359  |                          |                          |
|                  |                   |                  | Bot Cable Tan    | 57              | 0.101   |                          |                          |
|                  |                   |                  | Bottom Tension   | 11              | 13.964  |                          |                          |
|                  |                   |                  | Top Tension      | 11              | 14.064  |                          |                          |
|                  |                   |                  | Top Cable Vert   | 11              | 10.097  |                          |                          |
|                  |                   | Top Guy Pull-Off | Top Cable Norm   | 11              | 9.790   |                          |                          |
|                  |                   |                  | Top Cable Tan    | 11              | 0.021   |                          |                          |
|                  |                   |                  | Bot Cable Vert   | 11              | -9.851  |                          |                          |
|                  |                   |                  | Bot Cable Norm   | 11              | 9.896   |                          |                          |
|                  |                   |                  | Bot Cable Tan    | 11              | 0.099   |                          |                          |
|                  |                   |                  | Max Tension      | 2               | 4.981   | 0.000                    | 0.000                    |
|                  |                   |                  | Max. Compression | 1               | 0.000   | 0.000                    | 0.000                    |
|                  |                   |                  | Max. Mx          | 42              | 1.458   | 0.011                    | 0.000                    |

|                                                                                                                                          |                                                   |                    |
|------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|--------------------|
| <b>tnxTower</b><br><br><b>B+T Group</b><br>1717 S. Boulder, Suite 300<br>Tulsa, OK 74119<br>Phone: (918) 587-4630<br>FAX: (918) 587-4630 | <b>Job</b>                                        | <b>Page</b>        |
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|                                                                                                                                          | <b>Project</b>                                    | <b>Date</b>        |
|                                                                                                                                          | <b>Client</b>                                     | <b>Designed by</b> |
|                                                                                                                                          | Crown Castle                                      | Vinayak            |

| Section No. | Elevation ft      | Component Type | Condition        | Gov. Load Comb. | Axial K | Major Axis Moment kip-ft | Minor Axis Moment kip-ft |
|-------------|-------------------|----------------|------------------|-----------------|---------|--------------------------|--------------------------|
| T5          | 104.818 - 84.8177 | Leg            | Max. My          | 58              | 2.062   | 0.000                    | -0.000                   |
|             |                   |                | Max. Vy          | 42              | -0.012  | 0.000                    | 0.000                    |
|             |                   |                | Max. Vx          | 58              | 0.000   | 0.000                    | 0.000                    |
|             |                   |                | Max Tension      | 1               | 0.000   | 0.000                    | 0.000                    |
|             |                   | Diagonal       | Max. Compression | 3               | -48.921 | 0.385                    | -0.136                   |
|             |                   |                | Max. Mx          | 48              | -35.251 | 0.849                    | 0.041                    |
|             |                   |                | Max. My          | 8               | -22.476 | -0.268                   | 0.642                    |
|             |                   |                | Max. Vy          | 18              | 1.943   | 0.433                    | -0.113                   |
|             |                   |                | Max. Vx          | 36              | 2.117   | -0.182                   | 0.246                    |
|             |                   |                | Max Tension      | 51              | 3.476   | 0.000                    | 0.000                    |
|             |                   |                | Max. Compression | 51              | -3.762  | 0.000                    | 0.000                    |
|             |                   |                | Max. Mx          | 58              | 1.217   | 0.001                    | 0.000                    |
|             |                   | Top Girt       | Max. My          | 58              | 0.706   | 0.000                    | 0.000                    |
|             |                   |                | Max. Vy          | 58              | -0.002  | 0.000                    | 0.000                    |
|             |                   |                | Max. Vx          | 58              | -0.000  | 0.000                    | 0.000                    |
|             |                   |                | Max Tension      | 21              | 0.361   | 0.000                    | 0.000                    |
|             |                   |                | Max. Compression | 48              | -0.215  | 0.000                    | 0.000                    |
|             |                   |                | Max. Mx          | 29              | 0.014   | 0.002                    | 0.000                    |
|             |                   |                | Max. My          | 58              | 0.235   | 0.000                    | -0.000                   |
|             |                   |                | Max. Vy          | 29              | -0.002  | 0.000                    | 0.000                    |
|             |                   | Bottom Girt    | Max. Vx          | 58              | 0.000   | 0.000                    | 0.000                    |
|             |                   |                | Max Tension      | 6               | 1.596   | 0.000                    | 0.000                    |
|             |                   |                | Max. Compression | 36              | -1.232  | 0.000                    | 0.000                    |
|             |                   |                | Max. Mx          | 15              | 0.297   | 0.002                    | 0.000                    |
|             |                   |                | Max. My          | 40              | -0.874  | 0.000                    | 0.000                    |
|             |                   |                | Max. Vy          | 15              | -0.002  | 0.000                    | 0.000                    |
|             |                   |                | Max. Vx          | 40              | -0.000  | 0.000                    | 0.000                    |
|             |                   |                | Max Tension      | 5               | 1.856   | -0.158                   | 0.621                    |
| T6          | 84.8177 - 64.8177 | Leg            | Max. My          | 58              | 2.062   | 0.000                    | -0.000                   |
|             |                   |                | Max. Vy          | 42              | -0.012  | 0.000                    | 0.000                    |
|             |                   |                | Max. Vx          | 58              | 0.000   | 0.000                    | 0.000                    |
|             |                   |                | Max Tension      | 1               | 0.000   | 0.000                    | 0.000                    |
|             |                   | Diagonal       | Max. Compression | 3               | -48.921 | 0.385                    | -0.136                   |
|             |                   |                | Max. Mx          | 48              | -35.251 | 0.849                    | 0.041                    |
|             |                   |                | Max. My          | 8               | -22.476 | -0.268                   | 0.642                    |
|             |                   |                | Max. Vy          | 18              | 1.943   | 0.433                    | -0.113                   |
|             |                   |                | Max. Vx          | 36              | 2.117   | -0.182                   | 0.246                    |
|             |                   |                | Max Tension      | 51              | 3.476   | 0.000                    | 0.000                    |
|             |                   |                | Max. Compression | 51              | -3.762  | 0.000                    | 0.000                    |
|             |                   |                | Max. Mx          | 58              | 1.217   | 0.001                    | 0.000                    |
|             |                   | Top Girt       | Max. My          | 58              | 0.706   | 0.000                    | 0.000                    |
|             |                   |                | Max. Vy          | 58              | -0.002  | 0.000                    | 0.000                    |
|             |                   |                | Max. Vx          | 58              | -0.000  | 0.000                    | 0.000                    |
|             |                   |                | Max Tension      | 21              | 0.361   | 0.000                    | 0.000                    |
|             |                   |                | Max. Compression | 48              | -0.215  | 0.000                    | 0.000                    |
|             |                   |                | Max. Mx          | 29              | 0.014   | 0.002                    | 0.000                    |
|             |                   |                | Max. My          | 58              | 0.235   | 0.000                    | -0.000                   |
|             |                   |                | Max. Vy          | 29              | -0.002  | 0.000                    | 0.000                    |
|             |                   | Bottom Girt    | Max. Vx          | 58              | 0.000   | 0.000                    | 0.000                    |
|             |                   |                | Max Tension      | 6               | 1.596   | 0.000                    | 0.000                    |
|             |                   |                | Max. Compression | 36              | -1.232  | 0.000                    | 0.000                    |
|             |                   |                | Max. Mx          | 15              | 0.297   | 0.002                    | 0.000                    |
|             |                   |                | Max. My          | 40              | -0.874  | 0.000                    | 0.000                    |
|             |                   |                | Max. Vy          | 15              | -0.002  | 0.000                    | 0.000                    |
|             |                   |                | Max. Vx          | 40              | -0.000  | 0.000                    | 0.000                    |
|             |                   |                | Max Tension      | 5               | 1.856   | -0.158                   | 0.621                    |
|             |                   | Diagonal       | Max. Compression | 35              | -58.565 | 0.367                    | -0.280                   |
|             |                   |                | Max. Mx          | 21              | -35.999 | -1.391                   | -0.146                   |
|             |                   |                | Max. My          | 6               | -36.673 | -0.020                   | 1.723                    |
|             |                   |                | Max. Vy          | 18              | 1.946   | -0.762                   | 0.003                    |
|             |                   |                | Max. Vx          | 59              | 2.184   | 0.231                    | 0.858                    |
|             |                   |                | Max Tension      | 29              | 5.115   | 0.000                    | 0.000                    |
|             |                   |                | Max. Compression | 59              | -5.178  | 0.000                    | 0.000                    |
|             |                   |                | Max. Mx          | 10              | 4.668   | 0.002                    | 0.000                    |
|             |                   | Top Girt       | Max. My          | 59              | -1.915  | 0.000                    | 0.000                    |
|             |                   |                | Max. Vy          | 10              | -0.002  | 0.000                    | 0.000                    |
|             |                   |                | Max. Vx          | 59              | -0.000  | 0.000                    | 0.000                    |
|             |                   |                | Max Tension      | 6               | 1.031   | 0.000                    | 0.000                    |
|             |                   |                | Max. Compression | 36              | -0.012  | 0.000                    | 0.000                    |
|             |                   |                | Max. Mx          | 15              | 0.029   | 0.002                    | 0.000                    |
|             |                   |                | Max. My          | 40              | 0.298   | 0.000                    | 0.000                    |
|             |                   |                | Max. Vy          | 15              | -0.002  | 0.000                    | 0.000                    |
|             |                   | Bottom Girt    | Max. Vx          | 40              | -0.000  | 0.000                    | 0.000                    |
|             |                   |                | Max Tension      | 35              | 0.789   | 0.000                    | 0.000                    |
|             |                   |                | Max. Compression | 2               | -0.494  | 0.000                    | 0.000                    |
|             |                   |                | Max. Mx          | 56              | -0.162  | 0.002                    | 0.000                    |
|             |                   |                | Max. My          | 58              | 0.477   | 0.000                    | -0.000                   |
|             |                   |                | Max. Vy          | 56              | -0.002  | 0.000                    | 0.000                    |
|             |                   |                | Max. Vx          | 58              | 0.000   | 0.000                    | 0.000                    |
|             |                   |                | Max Tension      | 41              | 16.546  |                          |                          |
|             |                   | Guy A          | Top Tension      | 41              | 16.602  |                          |                          |
|             |                   |                | Top Cable Vert   | 41              | 9.945   |                          |                          |
|             |                   |                | Top Cable Norm   | 41              | 13.294  |                          |                          |
|             |                   |                | Top Cable Tan    | 41              | 0.022   |                          |                          |
|             |                   |                | Bot Cable Vert   | 41              | -9.790  |                          |                          |
|             |                   |                | Bot Cable Norm   | 41              | 13.339  |                          |                          |
|             |                   |                | Bot Cable Tan    | 41              | 0.095   |                          |                          |

|                                                                                                                                          |                                                   |                    |
|------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|--------------------|
| <b>tnxTower</b><br><br><b>B+T Group</b><br>1717 S. Boulder, Suite 300<br>Tulsa, OK 74119<br>Phone: (918) 587-4630<br>FAX: (918) 587-4630 | <b>Job</b>                                        | <b>Page</b>        |
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|                                                                                                                                          | <b>Project</b>                                    | <b>Date</b>        |
|                                                                                                                                          | <b>Client</b>                                     | <b>Designed by</b> |
|                                                                                                                                          | Crown Castle                                      | Vinayak            |

| Section No. | Elevation ft      | Component Type   | Condition        | Gov. Load Comb. | Axial K | Major Axis Moment kip-ft | Minor Axis Moment kip-ft |
|-------------|-------------------|------------------|------------------|-----------------|---------|--------------------------|--------------------------|
| T7          | 64.8177 - 44.8177 | Guy B            | Bottom Tension   | 61              | 16.683  |                          |                          |
|             |                   |                  | Top Tension      | 61              | 16.739  |                          |                          |
|             |                   |                  | Top Cable Vert   | 61              | 10.027  |                          |                          |
|             |                   |                  | Top Cable Norm   | 61              | 13.404  |                          |                          |
|             |                   |                  | Top Cable Tan    | 61              | 0.022   |                          |                          |
|             |                   |                  | Bot Cable Vert   | 61              | -9.872  |                          |                          |
|             |                   |                  | Bot Cable Norm   | 61              | 13.449  |                          |                          |
|             |                   |                  | Bot Cable Tan    | 61              | 0.095   |                          |                          |
|             |                   | Guy C            | Bottom Tension   | 11              | 16.047  |                          |                          |
|             |                   |                  | Top Tension      | 11              | 16.103  |                          |                          |
|             |                   |                  | Top Cable Vert   | 11              | 9.179   |                          |                          |
|             |                   |                  | Top Cable Norm   | 11              | 13.230  |                          |                          |
|             |                   |                  | Top Cable Tan    | 11              | 0.018   |                          |                          |
|             |                   |                  | Bot Cable Vert   | 11              | -9.019  |                          |                          |
|             |                   |                  | Bot Cable Norm   | 11              | 13.272  |                          |                          |
|             |                   |                  | Bot Cable Tan    | 11              | 0.093   |                          |                          |
|             |                   | Top Guy Pull-Off | Max Tension      | 6               | 6.623   | 0.000                    | 0.000                    |
|             |                   |                  | Max. Compression | 36              | -0.080  | 0.000                    | 0.000                    |
|             |                   |                  | Max. Mx          | 15              | 0.185   | 0.011                    | 0.000                    |
|             |                   |                  | Max. My          | 40              | 1.913   | 0.000                    | 0.000                    |
|             |                   |                  | Max. Vy          | 15              | -0.013  | 0.000                    | 0.000                    |
|             |                   |                  | Max. Vx          | 40              | -0.000  | 0.000                    | 0.000                    |
|             |                   |                  | Max Tension      | 5               | 16.620  | 0.065                    | -0.120                   |
|             |                   |                  | Max. Compression | 35              | -75.952 | 0.243                    | 0.200                    |
|             |                   | Diagonal         | Max. Mx          | 20              | -54.506 | 0.708                    | -0.272                   |
|             |                   |                  | Max. My          | 37              | -57.275 | -0.252                   | 0.925                    |
|             |                   |                  | Max. Vy          | 49              | 1.800   | 0.412                    | -0.109                   |
|             |                   |                  | Max. Vx          | 59              | 2.196   | 0.088                    | 0.607                    |
|             |                   |                  | Max Tension      | 59              | 3.537   | 0.000                    | 0.000                    |
|             |                   |                  | Max. Compression | 29              | -3.708  | 0.000                    | 0.000                    |
|             |                   |                  | Max. Mx          | 6               | -0.886  | 0.001                    | 0.000                    |
|             |                   |                  | Max. My          | 59              | -1.098  | 0.000                    | 0.000                    |
|             |                   | Top Girt         | Max. Vy          | 6               | -0.002  | 0.000                    | 0.000                    |
|             |                   |                  | Max. Vx          | 59              | -0.000  | 0.000                    | 0.000                    |
|             |                   |                  | Max Tension      | 24              | 0.539   | 0.000                    | 0.000                    |
|             |                   |                  | Max. Compression | 57              | -0.519  | 0.000                    | 0.000                    |
|             |                   |                  | Max. Mx          | 56              | 0.227   | 0.002                    | 0.000                    |
|             |                   |                  | Max. My          | 58              | -0.279  | 0.000                    | -0.000                   |
|             |                   |                  | Max. Vy          | 56              | -0.002  | 0.000                    | 0.000                    |
|             |                   |                  | Max. Vx          | 58              | 0.000   | 0.000                    | 0.000                    |
|             |                   | Bottom Girt      | Max Tension      | 52              | 0.341   | 0.000                    | 0.000                    |
|             |                   |                  | Max. Compression | 24              | -0.079  | 0.000                    | 0.000                    |
|             |                   |                  | Max. Mx          | 25              | 0.164   | 0.002                    | 0.000                    |
|             |                   |                  | Max. My          | 61              | 0.278   | 0.000                    | -0.000                   |
|             |                   |                  | Max. Vy          | 25              | -0.002  | 0.000                    | 0.000                    |
|             |                   |                  | Max. Vx          | 61              | 0.000   | 0.000                    | 0.000                    |
|             |                   | Leg              | Max Tension      | 5               | 16.619  | 0.063                    | -0.128                   |
|             |                   |                  | Max. Compression | 35              | -76.448 | -0.039                   | 0.079                    |
|             |                   |                  | Max. Mx          | 45              | -0.728  | -0.683                   | 0.049                    |
|             |                   |                  | Max. My          | 6               | 4.062   | 0.316                    | -0.734                   |
|             |                   |                  | Max. Vy          | 45              | -1.587  | -0.501                   | 0.024                    |
|             |                   |                  | Max. Vx          | 6               | -1.720  | 0.241                    | -0.537                   |
|             |                   | Diagonal         | Max Tension      | 6               | 2.007   | 0.000                    | 0.000                    |
|             |                   |                  | Max. Compression | 6               | -2.615  | 0.000                    | 0.000                    |
|             |                   |                  | Max. Mx          | 6               | 1.799   | 0.002                    | 0.000                    |
|             |                   |                  | Max. My          | 27              | 1.514   | 0.000                    | -0.000                   |
|             |                   |                  | Max. Vy          | 6               | -0.002  | 0.000                    | 0.000                    |
|             |                   |                  | Max. Vx          | 27              | 0.000   | 0.000                    | 0.000                    |
|             |                   | Top Girt         | Max Tension      | 30              | 0.197   | 0.000                    | 0.000                    |
|             |                   |                  |                  |                 |         |                          |                          |
| T8          | 44.8177 - 24.8177 | Leg              | Max Tension      | 5               | 16.619  | 0.063                    | -0.128                   |
|             |                   |                  | Max. Compression | 35              | -76.448 | -0.039                   | 0.079                    |
|             |                   |                  | Max. Mx          | 45              | -0.728  | -0.683                   | 0.049                    |
|             |                   |                  | Max. My          | 6               | 4.062   | 0.316                    | -0.734                   |
|             |                   |                  | Max. Vy          | 45              | -1.587  | -0.501                   | 0.024                    |
|             |                   |                  | Max. Vx          | 6               | -1.720  | 0.241                    | -0.537                   |
|             |                   | Diagonal         | Max Tension      | 6               | 2.007   | 0.000                    | 0.000                    |
|             |                   |                  | Max. Compression | 6               | -2.615  | 0.000                    | 0.000                    |
|             |                   |                  | Max. Mx          | 6               | 1.799   | 0.002                    | 0.000                    |
|             |                   |                  | Max. My          | 27              | 1.514   | 0.000                    | -0.000                   |
|             |                   |                  | Max. Vy          | 6               | -0.002  | 0.000                    | 0.000                    |
|             |                   |                  | Max. Vx          | 27              | 0.000   | 0.000                    | 0.000                    |
|             |                   | Top Girt         | Max Tension      | 30              | 0.197   | 0.000                    | 0.000                    |
|             |                   |                  |                  |                 |         |                          |                          |

|                                                                                                                                          |                                                   |                    |
|------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|--------------------|
| <b>tnxTower</b><br><br><b>B+T Group</b><br>1717 S. Boulder, Suite 300<br>Tulsa, OK 74119<br>Phone: (918) 587-4630<br>FAX: (918) 587-4630 | <b>Job</b>                                        | <b>Page</b>        |
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|                                                                                                                                          | <b>Project</b>                                    | <b>Date</b>        |
|                                                                                                                                          | <b>Client</b>                                     | <b>Designed by</b> |
|                                                                                                                                          | Crown Castle                                      | Vinayak            |

| Section No. | Elevation ft      | Component Type | Condition        | Gov. Load Comb. | Axial K | Major Axis Moment kip-ft | Minor Axis Moment kip-ft |
|-------------|-------------------|----------------|------------------|-----------------|---------|--------------------------|--------------------------|
| T9          | 24.8177 - 4.81771 | Bottom Girt    | Max. Compression | 59              | -0.096  | 0.000                    | 0.000                    |
|             |                   |                | Max. Mx          | 25              | 0.188   | 0.002                    | 0.000                    |
|             |                   |                | Max. My          | 61              | -0.065  | 0.000                    | -0.000                   |
|             |                   |                | Max. Vy          | 25              | -0.002  | 0.000                    | 0.000                    |
|             |                   |                | Max. Vx          | 61              | 0.000   | 0.000                    | 0.000                    |
|             |                   |                | Max Tension      | 2               | 0.433   | 0.000                    | 0.000                    |
|             |                   |                | Max. Compression | 35              | -0.298  | 0.000                    | 0.000                    |
|             |                   |                | Max. Mx          | 43              | 0.110   | 0.002                    | 0.000                    |
|             |                   |                | Max. My          | 57              | -0.176  | 0.000                    | -0.000                   |
|             |                   |                | Max. Vy          | 43              | -0.002  | 0.000                    | 0.000                    |
|             |                   |                | Max. Vx          | 57              | 0.000   | 0.000                    | 0.000                    |
|             |                   |                | Max Tension      | 5               | 5.241   | 0.229                    | -0.537                   |
|             |                   | Diagonal       | Max. Compression | 35              | -69.299 | 0.372                    | -0.218                   |
|             |                   |                | Max. Mx          | 51              | -42.586 | 1.506                    | 0.135                    |
|             |                   |                | Max. My          | 6               | -25.240 | 0.172                    | 1.835                    |
|             |                   |                | Max. Vy          | 17              | 4.005   | -1.065                   | 0.223                    |
|             |                   |                | Max. Vx          | 34              | 4.415   | -0.156                   | -1.351                   |
|             |                   |                | Max Tension      | 2               | 3.882   | 0.000                    | 0.000                    |
|             |                   |                | Max. Compression | 2               | -3.770  | 0.000                    | 0.000                    |
|             |                   |                | Max. Mx          | 6               | 2.493   | 0.002                    | 0.000                    |
|             |                   |                | Max. My          | 61              | 1.697   | 0.000                    | 0.000                    |
|             |                   |                | Max. Vy          | 6               | -0.002  | 0.000                    | 0.000                    |
|             |                   |                | Max. Vx          | 61              | -0.000  | 0.000                    | 0.000                    |
|             |                   |                | Max Tension      | 27              | 0.625   | 0.000                    | 0.000                    |
|             |                   | Top Girt       | Max. Compression | 5               | -0.414  | 0.000                    | 0.000                    |
|             |                   |                | Max. Mx          | 44              | 0.285   | 0.002                    | 0.000                    |
|             |                   |                | Max. My          | 57              | 0.402   | 0.000                    | -0.000                   |
|             |                   |                | Max. Vy          | 44              | -0.002  | 0.000                    | 0.000                    |
|             |                   |                | Max. Vx          | 57              | 0.000   | 0.000                    | 0.000                    |
|             |                   |                | Max Tension      | 2               | 1.583   | 0.000                    | 0.000                    |
|             |                   |                | Max. Compression | 1               | 0.000   | 0.000                    | 0.000                    |
|             |                   |                | Max. Mx          | 15              | 0.713   | 0.002                    | 0.000                    |
|             |                   |                | Max. My          | 27              | 1.066   | 0.000                    | -0.000                   |
|             |                   |                | Max. Vy          | 15              | -0.002  | 0.000                    | 0.000                    |
|             |                   |                | Max. Vx          | 27              | 0.000   | 0.000                    | 0.000                    |
|             |                   |                | Max Tension      | 1               | 0.000   | 0.000                    | 0.000                    |
| T10         | 4.81771 - 0       | Leg            | Max. Compression | 2               | -50.237 | 0.010                    | -0.082                   |
|             |                   |                | Max. Mx          | 2               | -50.005 | 0.694                    | -0.576                   |
|             |                   |                | Max. My          | 59              | -40.735 | -0.271                   | -0.951                   |
|             |                   |                | Max. Vy          | 2               | 0.707   | -0.353                   | -0.247                   |
|             |                   |                | Max. Vx          | 59              | 0.890   | -0.271                   | -0.951                   |
|             |                   |                | Max Tension      | 2               | 0.762   | -0.129                   | -0.110                   |
|             |                   | Horizontal     | Max. Compression | 61              | -0.483  | -0.192                   | -0.326                   |
|             |                   |                | Max. Mx          | 59              | -0.015  | 0.975                    | -0.092                   |
|             |                   |                | Max. My          | 6               | -0.381  | 0.282                    | -0.388                   |
|             |                   |                | Max. Vy          | 59              | -1.916  | 0.975                    | -0.092                   |
|             |                   |                | Max. Vx          | 6               | -0.560  | 0.137                    | 0.090                    |
|             |                   |                | Max Tension      | 2               | 9.933   | -0.075                   | 0.278                    |
|             |                   | Top Girt       | Max. Compression | 1               | 0.000   | 0.000                    | 0.000                    |
|             |                   |                | Max. Mx          | 6               | 7.624   | 1.008                    | -0.302                   |
|             |                   |                | Max. My          | 22              | 7.722   | 0.706                    | -0.326                   |
|             |                   |                | Max. Vy          | 6               | -0.565  | 1.008                    | -0.302                   |
|             |                   |                | Max. Vx          | 27              | 0.142   | -0.505                   | 0.159                    |
|             |                   |                |                  |                 |         |                          |                          |

## Maximum Reactions

|                                                                                                                                          |                                                   |                    |
|------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|--------------------|
| <b>tnxTower</b><br><br><b>B+T Group</b><br>1717 S. Boulder, Suite 300<br>Tulsa, OK 74119<br>Phone: (918) 587-4630<br>FAX: (918) 587-4630 | <b>Job</b>                                        | <b>Page</b>        |
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|                                                                                                                                          | <b>Project</b>                                    | <b>Date</b>        |
|                                                                                                                                          | <b>Client</b>                                     | <b>Designed by</b> |
|                                                                                                                                          | Crown Castle                                      | Vinayak            |

| Location                                       | Condition           | Gov.<br>Load<br>Comb. | Vertical<br>K | Horizontal, X<br>K | Horizontal, Z<br>K |
|------------------------------------------------|---------------------|-----------------------|---------------|--------------------|--------------------|
| Mast                                           | Max. Vert           | 2                     | 125.138       | -0.044             | 3.478              |
|                                                | Max. H <sub>x</sub> | 50                    | 106.064       | 3.428              | -0.021             |
|                                                | Max. H <sub>z</sub> | 5                     | 113.924       | -0.027             | 3.946              |
|                                                | Max. M <sub>x</sub> | 1                     | 0.000         | -0.012             | 0.011              |
|                                                | Max. M <sub>z</sub> | 1                     | 0.000         | -0.012             | 0.011              |
|                                                | Max. Torsion        | 59                    | 2.479         | 1.794              | 3.009              |
|                                                | Min. Vert           | 1                     | 85.296        | -0.012             | 0.011              |
|                                                | Min. H <sub>x</sub> | 20                    | 104.970       | -3.476             | 0.023              |
|                                                | Min. H <sub>z</sub> | 35                    | 101.327       | -0.004             | -4.073             |
|                                                | Min. M <sub>x</sub> | 1                     | 0.000         | -0.012             | 0.011              |
|                                                | Min. M <sub>z</sub> | 1                     | 0.000         | -0.012             | 0.011              |
|                                                | Min. Torsion        | 29                    | -2.462        | -1.747             | -3.100             |
|                                                | Max. Vert           | 43                    | -1.586        | -0.851             | 0.492              |
|                                                |                     |                       |               |                    |                    |
| Guy C @ 124 ft<br>Elev 0 ft<br>Azimuth 240 deg |                     |                       |               |                    |                    |
|                                                | Max. H <sub>x</sub> | 42                    | -1.587        | -0.845             | 0.489              |
|                                                | Max. H <sub>z</sub> | 7                     | -48.345       | -38.761            | 22.946             |
|                                                | Min. Vert           | 7                     | -48.345       | -38.761            | 22.946             |
|                                                | Min. H <sub>x</sub> | 7                     | -48.345       | -38.761            | 22.946             |
|                                                | Min. H <sub>z</sub> | 42                    | -1.587        | -0.845             | 0.489              |
| Guy B @ 115 ft<br>Elev 0 ft<br>Azimuth 120 deg | Max. Vert           | 23                    | -1.842        | 0.897              | 0.519              |
|                                                |                     |                       |               |                    |                    |
|                                                | Max. H <sub>x</sub> | 57                    | -54.753       | 40.455             | 23.880             |
|                                                | Max. H <sub>z</sub> | 57                    | -54.753       | 40.455             | 23.880             |
|                                                | Min. Vert           | 57                    | -54.753       | 40.455             | 23.880             |
|                                                | Min. H <sub>x</sub> | 22                    | -1.847        | 0.897              | 0.519              |
|                                                | Min. H <sub>z</sub> | 22                    | -1.847        | 0.897              | 0.519              |
| Guy A @ 115 ft<br>Elev 0 ft<br>Azimuth 0 deg   | Max. Vert           | 3                     | -1.717        | -0.001             | -0.946             |
|                                                |                     |                       |               |                    |                    |
|                                                | Max. H <sub>x</sub> | 47                    | -25.125       | 0.805              | -21.259            |
|                                                | Max. H <sub>z</sub> | 2                     | -1.717        | -0.001             | -0.943             |
|                                                | Min. Vert           | 32                    | -53.807       | 0.020              | -46.211            |
|                                                | Min. H <sub>x</sub> | 17                    | -29.052       | -0.815             | -24.138            |
|                                                | Min. H <sub>z</sub> | 32                    | -53.807       | 0.020              | -46.211            |

## Tower Mast Reaction Summary

| Load<br>Combination                              | Vertical<br>K | Shear <sub>x</sub><br>K | Shear <sub>z</sub><br>K | Overturning<br>Moment, M <sub>x</sub><br>kip-ft | Overturning<br>Moment, M <sub>z</sub><br>kip-ft | Torque<br>kip-ft |
|--------------------------------------------------|---------------|-------------------------|-------------------------|-------------------------------------------------|-------------------------------------------------|------------------|
| Dead Only                                        | 85.296        | 0.012                   | -0.011                  | 0.000                                           | 0.000                                           | 0.003            |
| 1.2 Dead+1.0 Wind 0 deg - No<br>Ice+1.0 Guy      | 125.138       | 0.044                   | -3.478                  | 0.000                                           | 0.000                                           | -0.642           |
| 1.2D+1.0W (pattern 1) 0 deg -<br>No Ice+1.0 Guy  | 121.659       | 0.044                   | -1.720                  | 0.000                                           | 0.000                                           | -0.669           |
| 1.2D+1.0W (pattern 2) 0 deg -<br>No Ice+1.0 Guy  | 120.130       | 0.048                   | -3.679                  | 0.000                                           | 0.000                                           | -0.896           |
| 1.2D+1.0W (pattern 3) 0 deg -<br>No Ice+1.0 Guy  | 113.924       | 0.027                   | -3.946                  | 0.000                                           | 0.000                                           | -0.363           |
| 1.2D+1.0W (pattern 4) 0 deg -<br>No Ice+1.0 Guy  | 115.403       | 0.043                   | -3.673                  | 0.000                                           | 0.000                                           | -0.589           |
| 1.2 Dead+1.0 Wind 30 deg - No<br>Ice+1.0 Guy     | 114.373       | 1.856                   | -2.937                  | 0.000                                           | 0.000                                           | 1.666            |
| 1.2D+1.0W (pattern 1) 30 deg -<br>No Ice+1.0 Guy | 111.744       | 1.032                   | -1.480                  | 0.000                                           | 0.000                                           | 1.684            |

|                                                                                                                                          |                                                                 |                                  |
|------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|----------------------------------|
| <b>tnxTower</b><br><br><b>B+T Group</b><br>1717 S. Boulder, Suite 300<br>Tulsa, OK 74119<br>Phone: (918) 587-4630<br>FAX: (918) 587-4630 | <b>Job</b><br>100061.009.01.0001 - FAIRGROUNDS, FL (BU# 846219) | <b>Page</b><br>33 of 52          |
|                                                                                                                                          | <b>Project</b>                                                  | <b>Date</b><br>22:32:58 12/28/22 |
|                                                                                                                                          | <b>Client</b><br>Crown Castle                                   | <b>Designed by</b><br>Vinayak    |

| Load<br>Combination                               | Vertical<br>K | Shear <sub>x</sub><br>K | Shear <sub>z</sub><br>K | Overturning<br>Moment, M <sub>x</sub><br>kip-ft | Overturning<br>Moment, M <sub>z</sub><br>kip-ft | Torque<br>kip-ft |
|---------------------------------------------------|---------------|-------------------------|-------------------------|-------------------------------------------------|-------------------------------------------------|------------------|
| 1.2D+1.0W (pattern 2) 30 deg -<br>No Ice+1.0 Guy  | 110.678       | 1.910                   | -3.063                  | 0.000                                           | 0.000                                           | 1.448            |
| 1.2D+1.0W (pattern 3) 30 deg -<br>No Ice+1.0 Guy  | 106.534       | 1.928                   | -3.262                  | 0.000                                           | 0.000                                           | 1.918            |
| 1.2D+1.0W (pattern 4) 30 deg -<br>No Ice+1.0 Guy  | 108.390       | 1.860                   | -3.038                  | 0.000                                           | 0.000                                           | 1.707            |
| 1.2 Dead+1.0 Wind 60 deg - No<br>Ice+1.0 Guy      | 100.378       | 2.937                   | -1.708                  | 0.000                                           | 0.000                                           | 1.033            |
| 1.2D+1.0W (pattern 1) 60 deg -<br>No Ice+1.0 Guy  | 99.510        | 1.574                   | -0.922                  | 0.000                                           | 0.000                                           | 1.050            |
| 1.2D+1.0W (pattern 2) 60 deg -<br>No Ice+1.0 Guy  | 99.039        | 3.007                   | -1.749                  | 0.000                                           | 0.000                                           | 0.825            |
| 1.2D+1.0W (pattern 3) 60 deg -<br>No Ice+1.0 Guy  | 98.317        | 3.085                   | -1.790                  | 0.000                                           | 0.000                                           | 0.870            |
| 1.2D+1.0W (pattern 4) 60 deg -<br>No Ice+1.0 Guy  | 99.144        | 2.932                   | -1.705                  | 0.000                                           | 0.000                                           | 0.998            |
| 1.2 Dead+1.0 Wind 90 deg - No<br>Ice+1.0 Guy      | 112.197       | 3.185                   | -0.103                  | 0.000                                           | 0.000                                           | -0.347           |
| 1.2D+1.0W (pattern 1) 90 deg -<br>No Ice+1.0 Guy  | 109.823       | 1.639                   | -0.121                  | 0.000                                           | 0.000                                           | -0.319           |
| 1.2D+1.0W (pattern 2) 90 deg -<br>No Ice+1.0 Guy  | 108.841       | 3.305                   | -0.093                  | 0.000                                           | 0.000                                           | -0.480           |
| 1.2D+1.0W (pattern 3) 90 deg -<br>No Ice+1.0 Guy  | 104.970       | 3.476                   | -0.023                  | 0.000                                           | 0.000                                           | -0.666           |
| 1.2D+1.0W (pattern 4) 90 deg -<br>No Ice+1.0 Guy  | 106.377       | 3.267                   | -0.059                  | 0.000                                           | 0.000                                           | -0.401           |
| 1.2 Dead+1.0 Wind 120 deg -<br>No Ice+1.0 Guy     | 119.114       | 2.666                   | 1.497                   | 0.000                                           | 0.000                                           | 0.780            |
| 1.2D+1.0W (pattern 1) 120 deg<br>- No Ice+1.0 Guy | 116.139       | 1.330                   | 0.724                   | 0.000                                           | 0.000                                           | 0.817            |
| 1.2D+1.0W (pattern 2) 120 deg<br>- No Ice+1.0 Guy | 114.815       | 2.801                   | 1.567                   | 0.000                                           | 0.000                                           | 0.771            |
| 1.2D+1.0W (pattern 3) 120 deg<br>- No Ice+1.0 Guy | 109.311       | 2.991                   | 1.700                   | 0.000                                           | 0.000                                           | 0.497            |
| 1.2D+1.0W (pattern 4) 120 deg<br>- No Ice+1.0 Guy | 110.173       | 2.803                   | 1.576                   | 0.000                                           | 0.000                                           | 0.719            |
| 1.2 Dead+1.0 Wind 150 deg -<br>No Ice+1.0 Guy     | 115.033       | 1.660                   | 2.994                   | 0.000                                           | 0.000                                           | 2.315            |
| 1.2D+1.0W (pattern 1) 150 deg<br>- No Ice+1.0 Guy | 112.325       | 0.812                   | 1.553                   | 0.000                                           | 0.000                                           | 2.353            |
| 1.2D+1.0W (pattern 2) 150 deg<br>- No Ice+1.0 Guy | 111.273       | 1.747                   | 3.100                   | 0.000                                           | 0.000                                           | 2.462            |
| 1.2D+1.0W (pattern 3) 150 deg<br>- No Ice+1.0 Guy | 107.374       | 1.886                   | 3.240                   | 0.000                                           | 0.000                                           | 2.078            |
| 1.2D+1.0W (pattern 4) 150 deg<br>- No Ice+1.0 Guy | 109.009       | 1.748                   | 3.049                   | 0.000                                           | 0.000                                           | 2.237            |
| 1.2 Dead+1.0 Wind 180 deg -<br>No Ice+1.0 Guy     | 104.256       | -0.013                  | 3.862                   | 0.000                                           | 0.000                                           | 0.303            |
| 1.2D+1.0W (pattern 1) 180 deg<br>- No Ice+1.0 Guy | 102.983       | -0.010                  | 2.050                   | 0.000                                           | 0.000                                           | 0.311            |
| 1.2D+1.0W (pattern 2) 180 deg<br>- No Ice+1.0 Guy | 102.432       | -0.023                  | 3.960                   | 0.000                                           | 0.000                                           | 0.563            |
| 1.2D+1.0W (pattern 3) 180 deg<br>- No Ice+1.0 Guy | 101.327       | 0.004                   | 4.073                   | 0.000                                           | 0.000                                           | 0.096            |
| 1.2D+1.0W (pattern 4) 180 deg<br>- No Ice+1.0 Guy | 102.486       | -0.008                  | 3.866                   | 0.000                                           | 0.000                                           | 0.235            |
| 1.2 Dead+1.0 Wind 210 deg -<br>No Ice+1.0 Guy     | 113.782       | -1.701                  | 3.010                   | 0.000                                           | 0.000                                           | -2.136           |
| 1.2D+1.0W (pattern 1) 210 deg<br>- No Ice+1.0 Guy | 111.019       | -0.851                  | 1.567                   | 0.000                                           | 0.000                                           | -2.166           |
| 1.2D+1.0W (pattern 2) 210 deg                     | 109.605       | -1.802                  | 3.123                   | 0.000                                           | 0.000                                           | -1.920           |

|                                                                                                                                          |                                                                 |                                  |
|------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|----------------------------------|
| <b>tnxTower</b><br><br><b>B+T Group</b><br>1717 S. Boulder, Suite 300<br>Tulsa, OK 74119<br>Phone: (918) 587-4630<br>FAX: (918) 587-4630 | <b>Job</b><br>100061.009.01.0001 - FAIRGROUNDS, FL (BU# 846219) | <b>Page</b><br>34 of 52          |
|                                                                                                                                          | <b>Project</b>                                                  | <b>Date</b><br>22:32:58 12/28/22 |
|                                                                                                                                          | <b>Client</b><br>Crown Castle                                   | <b>Designed by</b><br>Vinayak    |

| Load<br>Combination           | Vertical<br>K | Shear <sub>x</sub><br>K | Shear <sub>z</sub><br>K | Overturning<br>Moment, M <sub>x</sub><br>kip-ft | Overturning<br>Moment, M <sub>z</sub><br>kip-ft | Torque<br>kip-ft |
|-------------------------------|---------------|-------------------------|-------------------------|-------------------------------------------------|-------------------------------------------------|------------------|
| - No Ice+1.0 Guy              |               |                         |                         |                                                 |                                                 |                  |
| 1.2D+1.0W (pattern 3) 210 deg | 107.168       | -1.886                  | 3.240                   | 0.000                                           | 0.000                                           | -2.236           |
| - No Ice+1.0 Guy              |               |                         |                         |                                                 |                                                 |                  |
| 1.2D+1.0W (pattern 4) 210 deg | 108.546       | -1.775                  | 3.057                   | 0.000                                           | 0.000                                           | -2.161           |
| - No Ice+1.0 Guy              |               |                         |                         |                                                 |                                                 |                  |
| 1.2 Dead+1.0 Wind 240 deg -   | 119.752       | -2.655                  | 1.514                   | 0.000                                           | 0.000                                           | -0.893           |
| No Ice+1.0 Guy                |               |                         |                         |                                                 |                                                 |                  |
| 1.2D+1.0W (pattern 1) 240 deg | 116.667       | -1.317                  | 0.742                   | 0.000                                           | 0.000                                           | -0.933           |
| - No Ice+1.0 Guy              |               |                         |                         |                                                 |                                                 |                  |
| 1.2D+1.0W (pattern 2) 240 deg | 114.902       | -2.807                  | 1.601                   | 0.000                                           | 0.000                                           | -0.677           |
| - No Ice+1.0 Guy              |               |                         |                         |                                                 |                                                 |                  |
| 1.2D+1.0W (pattern 3) 240 deg | 110.230       | -2.971                  | 1.703                   | 0.000                                           | 0.000                                           | -0.826           |
| - No Ice+1.0 Guy              |               |                         |                         |                                                 |                                                 |                  |
| 1.2D+1.0W (pattern 4) 240 deg | 110.685       | -2.797                  | 1.596                   | 0.000                                           | 0.000                                           | -0.892           |
| - No Ice+1.0 Guy              |               |                         |                         |                                                 |                                                 |                  |
| 1.2 Dead+1.0 Wind 270 deg -   | 112.536       | -3.148                  | -0.009                  | 0.000                                           | 0.000                                           | 0.263            |
| No Ice+1.0 Guy                |               |                         |                         |                                                 |                                                 |                  |
| 1.2D+1.0W (pattern 1) 270 deg | 110.042       | -1.604                  | -0.024                  | 0.000                                           | 0.000                                           | 0.221            |
| - No Ice+1.0 Guy              |               |                         |                         |                                                 |                                                 |                  |
| 1.2D+1.0W (pattern 2) 270 deg | 108.696       | -3.281                  | 0.018                   | 0.000                                           | 0.000                                           | 0.476            |
| - No Ice+1.0 Guy              |               |                         |                         |                                                 |                                                 |                  |
| 1.2D+1.0W (pattern 3) 270 deg | 106.064       | -3.428                  | 0.021                   | 0.000                                           | 0.000                                           | 0.519            |
| - No Ice+1.0 Guy              |               |                         |                         |                                                 |                                                 |                  |
| 1.2D+1.0W (pattern 4) 270 deg | 107.058       | -3.227                  | 0.030                   | 0.000                                           | 0.000                                           | 0.330            |
| - No Ice+1.0 Guy              |               |                         |                         |                                                 |                                                 |                  |
| 1.2 Dead+1.0 Wind 300 deg -   | 103.573       | -2.840                  | -1.606                  | 0.000                                           | 0.000                                           | -0.969           |
| No Ice+1.0 Guy                |               |                         |                         |                                                 |                                                 |                  |
| 1.2D+1.0W (pattern 1) 300 deg | 102.555       | -1.487                  | -0.826                  | 0.000                                           | 0.000                                           | -0.993           |
| - No Ice+1.0 Guy              |               |                         |                         |                                                 |                                                 |                  |
| 1.2D+1.0W (pattern 2) 300 deg | 102.079       | -2.917                  | -1.639                  | 0.000                                           | 0.000                                           | -0.839           |
| - No Ice+1.0 Guy              |               |                         |                         |                                                 |                                                 |                  |
| 1.2D+1.0W (pattern 3) 300 deg | 100.602       | -3.006                  | -1.735                  | 0.000                                           | 0.000                                           | -0.699           |
| - No Ice+1.0 Guy              |               |                         |                         |                                                 |                                                 |                  |
| 1.2D+1.0W (pattern 4) 300 deg | 101.566       | -2.838                  | -1.616                  | 0.000                                           | 0.000                                           | -0.869           |
| - No Ice+1.0 Guy              |               |                         |                         |                                                 |                                                 |                  |
| 1.2 Dead+1.0 Wind 330 deg -   | 116.933       | -1.744                  | -2.877                  | 0.000                                           | 0.000                                           | -2.293           |
| No Ice+1.0 Guy                |               |                         |                         |                                                 |                                                 |                  |
| 1.2D+1.0W (pattern 1) 330 deg | 114.220       | -0.923                  | -1.428                  | 0.000                                           | 0.000                                           | -2.333           |
| - No Ice+1.0 Guy              |               |                         |                         |                                                 |                                                 |                  |
| 1.2D+1.0W (pattern 2) 330 deg | 113.128       | -1.794                  | -3.009                  | 0.000                                           | 0.000                                           | -2.479           |
| - No Ice+1.0 Guy              |               |                         |                         |                                                 |                                                 |                  |
| 1.2D+1.0W (pattern 3) 330 deg | 108.443       | -1.853                  | -3.225                  | 0.000                                           | 0.000                                           | -2.048           |
| - No Ice+1.0 Guy              |               |                         |                         |                                                 |                                                 |                  |
| 1.2D+1.0W (pattern 4) 330 deg | 110.191       | -1.751                  | -2.995                  | 0.000                                           | 0.000                                           | -2.216           |
| - No Ice+1.0 Guy              |               |                         |                         |                                                 |                                                 |                  |
| Dead+Wind 0 deg -             | 85.576        | 0.021                   | -1.112                  | 0.000                                           | 0.000                                           | -0.186           |
| Service+Guy                   |               |                         |                         |                                                 |                                                 |                  |
| Dead+Wind 30 deg -            | 85.418        | 0.536                   | -0.892                  | 0.000                                           | 0.000                                           | 0.481            |
| Service+Guy                   |               |                         |                         |                                                 |                                                 |                  |
| Dead+Wind 60 deg -            | 85.387        | 0.833                   | -0.486                  | 0.000                                           | 0.000                                           | 0.282            |
| Service+Guy                   |               |                         |                         |                                                 |                                                 |                  |
| Dead+Wind 90 deg -            | 85.401        | 0.949                   | -0.017                  | 0.000                                           | 0.000                                           | -0.093           |
| Service+Guy                   |               |                         |                         |                                                 |                                                 |                  |
| Dead+Wind 120 deg -           | 85.481        | 0.833                   | 0.456                   | 0.000                                           | 0.000                                           | 0.223            |
| Service+Guy                   |               |                         |                         |                                                 |                                                 |                  |
| Dead+Wind 150 deg -           | 85.577        | 0.523                   | 0.870                   | 0.000                                           | 0.000                                           | 0.641            |
| Service+Guy                   |               |                         |                         |                                                 |                                                 |                  |
| Dead+Wind 180 deg -           | 85.679        | 0.009                   | 1.086                   | 0.000                                           | 0.000                                           | 0.075            |
| Service+Guy                   |               |                         |                         |                                                 |                                                 |                  |
| Dead+Wind 210 deg -           | 85.729        | -0.510                  | 0.870                   | 0.000                                           | 0.000                                           | -0.609           |
| Service+Guy                   |               |                         |                         |                                                 |                                                 |                  |

|                                                                                                                                          |                                                   |                    |
|------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|--------------------|
| <b>tnxTower</b><br><br><b>B+T Group</b><br>1717 S. Boulder, Suite 300<br>Tulsa, OK 74119<br>Phone: (918) 587-4630<br>FAX: (918) 587-4630 | <b>Job</b>                                        | <b>Page</b>        |
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|                                                                                                                                          | <b>Project</b>                                    | <b>Date</b>        |
|                                                                                                                                          | <b>Client</b>                                     | <b>Designed by</b> |
|                                                                                                                                          | Crown Castle                                      | Vinayak            |

| Load Combination                   | Vertical<br>K | Shear <sub>x</sub><br>K | Shear <sub>z</sub><br>K | Overturning<br>Moment, M <sub>x</sub><br>kip-ft | Overturning<br>Moment, M <sub>z</sub><br>kip-ft | Torque<br>kip-ft |
|------------------------------------|---------------|-------------------------|-------------------------|-------------------------------------------------|-------------------------------------------------|------------------|
| Dead+Wind 240 deg -<br>Service+Guy | 85.740        | -0.815                  | 0.462                   | 0.000                                           | 0.000                                           | -0.266           |
| Dead+Wind 270 deg -<br>Service+Guy | 85.690        | -0.920                  | 0.006                   | 0.000                                           | 0.000                                           | 0.066            |
| Dead+Wind 300 deg -<br>Service+Guy | 85.651        | -0.794                  | -0.470                  | 0.000                                           | 0.000                                           | -0.260           |
| Dead+Wind 330 deg -<br>Service+Guy | 85.587        | -0.491                  | -0.887                  | 0.000                                           | 0.000                                           | -0.646           |

## Solution Summary

| Load Comb. | Sum of Applied Forces |         |         | Sum of Reactions |         |         | % Error |
|------------|-----------------------|---------|---------|------------------|---------|---------|---------|
|            | PX<br>K               | PY<br>K | PZ<br>K | PX<br>K          | PY<br>K | PZ<br>K |         |
| 1          | 0.000                 | -27.146 | 0.000   | 0.001            | 27.146  | -0.000  | 0.003%  |
| 2          | -1.018                | -32.281 | -44.938 | 1.018            | 32.280  | 44.937  | 0.002%  |
| 3          | -1.018                | -32.281 | -40.458 | 1.018            | 32.280  | 40.458  | 0.002%  |
| 4          | -1.160                | -32.281 | -42.019 | 1.160            | 32.280  | 42.018  | 0.002%  |
| 5          | -0.636                | -32.281 | -39.754 | 0.636            | 32.280  | 39.753  | 0.002%  |
| 6          | -0.860                | -32.281 | -40.783 | 0.860            | 32.280  | 40.781  | 0.003%  |
| 7          | 19.097                | -32.166 | -37.327 | -19.097          | 32.166  | 37.326  | 0.002%  |
| 8          | 17.023                | -32.166 | -33.734 | -17.023          | 32.166  | 33.733  | 0.002%  |
| 9          | 17.606                | -32.166 | -34.979 | -17.606          | 32.166  | 34.978  | 0.002%  |
| 10         | 17.391                | -32.166 | -32.961 | -17.391          | 32.166  | 32.960  | 0.002%  |
| 11         | 17.334                | -32.166 | -33.765 | -17.334          | 32.166  | 33.764  | 0.001%  |
| 12         | 34.735                | -32.046 | -19.855 | -34.734          | 32.046  | 19.855  | 0.002%  |
| 13         | 31.412                | -32.046 | -17.936 | -31.411          | 32.046  | 17.936  | 0.002%  |
| 14         | 32.463                | -32.046 | -18.543 | -32.462          | 32.046  | 18.543  | 0.001%  |
| 15         | 30.960                | -32.046 | -17.712 | -30.959          | 32.046  | 17.712  | 0.002%  |
| 16         | 31.264                | -32.046 | -17.894 | -31.263          | 32.046  | 17.894  | 0.002%  |
| 17         | 40.456                | -32.166 | 1.163   | -40.455          | 32.166  | -1.162  | 0.002%  |
| 18         | 36.661                | -32.166 | 1.163   | -36.660          | 32.166  | -1.162  | 0.003%  |
| 19         | 37.893                | -32.166 | 1.280   | -37.893          | 32.166  | -1.279  | 0.002%  |
| 20         | 35.964                | -32.166 | 0.744   | -35.963          | 32.166  | -0.743  | 0.002%  |
| 21         | 36.345                | -32.166 | 1.007   | -36.344          | 32.166  | -1.007  | 0.002%  |
| 22         | 34.983                | -32.281 | 21.260  | -34.982          | 32.280  | -21.260 | 0.002%  |
| 23         | 31.666                | -32.281 | 19.345  | -31.665          | 32.280  | -19.345 | 0.002%  |
| 24         | 32.729                | -32.281 | 20.123  | -32.727          | 32.280  | -20.123 | 0.003%  |
| 25         | 31.137                | -32.281 | 18.616  | -31.136          | 32.280  | -18.616 | 0.003%  |
| 26         | 31.475                | -32.281 | 19.081  | -31.474          | 32.280  | -19.081 | 0.002%  |
| 27         | 21.336                | -32.153 | 36.844  | -21.335          | 32.153  | -36.843 | 0.002%  |
| 28         | 19.262                | -32.153 | 33.251  | -19.261          | 32.153  | -33.251 | 0.002%  |
| 29         | 19.965                | -32.153 | 34.548  | -19.964          | 32.153  | -34.547 | 0.002%  |
| 30         | 18.922                | -32.153 | 32.640  | -18.921          | 32.153  | -32.640 | 0.002%  |
| 31         | 19.284                | -32.153 | 33.278  | -19.283          | 32.153  | -33.278 | 0.002%  |
| 32         | 0.531                 | -32.025 | 43.938  | -0.532           | 32.025  | -43.938 | 0.002%  |
| 33         | 0.531                 | -32.025 | 39.466  | -0.532           | 32.025  | -39.466 | 0.003%  |
| 34         | 0.759                 | -32.025 | 41.007  | -0.759           | 32.025  | -41.007 | 0.001%  |
| 35         | 0.229                 | -32.025 | 39.059  | -0.230           | 32.025  | -39.059 | 0.003%  |
| 36         | 0.403                 | -32.025 | 39.884  | -0.404           | 32.025  | -39.884 | 0.002%  |
| 37         | -19.829               | -32.140 | 36.751  | 19.828           | 32.140  | -36.751 | 0.002%  |
| 38         | -17.754               | -32.140 | 33.158  | 17.754           | 32.140  | -33.157 | 0.002%  |
| 39         | -18.269               | -32.140 | 34.339  | 18.268           | 32.140  | -34.338 | 0.002%  |
| 40         | -17.968               | -32.140 | 32.614  | 17.967           | 32.140  | -32.613 | 0.002%  |
| 41         | -17.996               | -32.140 | 33.255  | 17.995           | 32.140  | -33.254 | 0.002%  |
| 42         | -34.561               | -32.259 | 20.606  | 34.560           | 32.259  | -20.606 | 0.002%  |
| 43         | -31.230               | -32.259 | 18.683  | 31.229           | 32.259  | -18.683 | 0.002%  |
| 44         | -32.205               | -32.259 | 19.246  | 32.204           | 32.259  | -19.246 | 0.003%  |

|                                                                                                                                          |                                                   |                    |
|------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|--------------------|
| <b>tnxTower</b><br><br><b>B+T Group</b><br>1717 S. Boulder, Suite 300<br>Tulsa, OK 74119<br>Phone: (918) 587-4630<br>FAX: (918) 587-4630 | <b>Job</b>                                        | <b>Page</b>        |
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|                                                                                                                                          | <b>Project</b>                                    | <b>Date</b>        |
|                                                                                                                                          | <b>Client</b>                                     | <b>Designed by</b> |
|                                                                                                                                          | Crown Castle                                      | Vinayak            |

| Load Comb. | Sum of Applied Forces |         |         | Sum of Reactions |         |         | % Error |
|------------|-----------------------|---------|---------|------------------|---------|---------|---------|
|            | PX<br>K               | PY<br>K | PZ<br>K | PX<br>K          | PY<br>K | PZ<br>K |         |
| 45         | -30.906               | -32.259 | 18.291  | 30.905           | 32.259  | -18.290 | 0.002%  |
| 46         | -31.130               | -32.259 | 18.569  | 31.129           | 32.259  | -18.569 | 0.002%  |
| 47         | -40.768               | -32.140 | -1.968  | 40.767           | 32.140  | 1.968   | 0.003%  |
| 48         | -36.973               | -32.140 | -1.968  | 36.973           | 32.140  | 1.968   | 0.001%  |
| 49         | -38.116               | -32.140 | -2.112  | 38.115           | 32.140  | 2.113   | 0.002%  |
| 50         | -36.262               | -32.140 | -1.293  | 36.261           | 32.140  | 1.293   | 0.002%  |
| 51         | -36.635               | -32.140 | -1.719  | 36.634           | 32.140  | 1.720   | 0.003%  |
| 52         | -35.684               | -32.025 | -21.851 | 35.683           | 32.025  | 21.851  | 0.002%  |
| 53         | -32.374               | -32.025 | -19.940 | 32.374           | 32.025  | 19.940  | 0.001%  |
| 54         | -33.376               | -32.025 | -20.781 | 33.375           | 32.025  | 20.781  | 0.002%  |
| 55         | -31.670               | -32.025 | -18.971 | 31.670           | 32.025  | 18.972  | 0.002%  |
| 56         | -32.109               | -32.025 | -19.599 | 32.108           | 32.025  | 19.599  | 0.002%  |
| 57         | -21.629               | -32.153 | -37.832 | 21.629           | 32.153  | 37.831  | 0.002%  |
| 58         | -19.555               | -32.153 | -34.239 | 19.555           | 32.153  | 34.238  | 0.002%  |
| 59         | -20.326               | -32.153 | -35.496 | 20.326           | 32.153  | 35.495  | 0.002%  |
| 60         | -19.078               | -32.153 | -33.356 | 19.078           | 32.153  | 33.355  | 0.002%  |
| 61         | -19.529               | -32.153 | -34.183 | 19.529           | 32.153  | 34.182  | 0.002%  |
| 62         | -0.277                | -27.181 | -12.232 | 0.277            | 27.181  | 12.231  | 0.001%  |
| 63         | 5.198                 | -27.149 | -10.160 | -5.198           | 27.149  | 10.160  | 0.002%  |
| 64         | 9.455                 | -27.117 | -5.404  | -9.454           | 27.117  | 5.404   | 0.001%  |
| 65         | 11.012                | -27.149 | 0.316   | -11.011          | 27.149  | -0.316  | 0.001%  |
| 66         | 9.522                 | -27.181 | 5.787   | -9.522           | 27.181  | -5.787  | 0.002%  |
| 67         | 5.807                 | -27.146 | 10.029  | -5.807           | 27.146  | -10.028 | 0.002%  |
| 68         | 0.144                 | -27.111 | 11.960  | -0.144           | 27.111  | -11.959 | 0.001%  |
| 69         | -5.397                | -27.142 | 10.003  | 5.397            | 27.142  | -10.003 | 0.002%  |
| 70         | -9.407                | -27.175 | 5.609   | 9.407            | 27.175  | -5.608  | 0.002%  |
| 71         | -11.097               | -27.142 | -0.536  | 11.096           | 27.142  | 0.536   | 0.002%  |
| 72         | -9.713                | -27.111 | -5.948  | 9.713            | 27.111  | 5.947   | 0.001%  |
| 73         | -5.887                | -27.146 | -10.297 | 5.887            | 27.146  | 10.297  | 0.002%  |

## Non-Linear Convergence Results

| Load Combination | Converged? | Number of Cycles | Displacement Tolerance | Force Tolerance |
|------------------|------------|------------------|------------------------|-----------------|
| 1                | Yes        | 9                | 0.00000001             | 0.00006257      |
| 2                | Yes        | 21               | 0.00000001             | 0.00005759      |
| 3                | Yes        | 20               | 0.00000001             | 0.00006762      |
| 4                | Yes        | 20               | 0.00000001             | 0.00007999      |
| 5                | Yes        | 20               | 0.00000001             | 0.00006998      |
| 6                | Yes        | 20               | 0.00000001             | 0.00008737      |
| 7                | Yes        | 20               | 0.00000001             | 0.00005710      |
| 8                | Yes        | 19               | 0.00000001             | 0.00006690      |
| 9                | Yes        | 19               | 0.00000001             | 0.00007944      |
| 10               | Yes        | 19               | 0.00000001             | 0.00008115      |
| 11               | Yes        | 20               | 0.00000001             | 0.00005285      |
| 12               | Yes        | 15               | 0.00000001             | 0.00009217      |
| 13               | Yes        | 14               | 0.00000001             | 0.00009679      |
| 14               | Yes        | 15               | 0.00000001             | 0.00007485      |
| 15               | Yes        | 15               | 0.00000001             | 0.00008677      |
| 16               | Yes        | 15               | 0.00000001             | 0.00009856      |
| 17               | Yes        | 19               | 0.00000001             | 0.00008944      |
| 18               | Yes        | 18               | 0.00000001             | 0.00009956      |
| 19               | Yes        | 19               | 0.00000001             | 0.00006316      |
| 20               | Yes        | 19               | 0.00000001             | 0.00006503      |
| 21               | Yes        | 19               | 0.00000001             | 0.00008581      |
| 22               | Yes        | 20               | 0.00000001             | 0.00007143      |

|                                                                                                                                          |                                                   |                    |
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| <b>tnxTower</b><br><br><b>B+T Group</b><br>1717 S. Boulder, Suite 300<br>Tulsa, OK 74119<br>Phone: (918) 587-4630<br>FAX: (918) 587-4630 | <b>Job</b>                                        | <b>Page</b>        |
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|                                                                                                                                          | <b>Project</b>                                    | <b>Date</b>        |
|                                                                                                                                          | <b>Client</b>                                     | <b>Designed by</b> |
|                                                                                                                                          | Crown Castle                                      | Vinayak            |

|    |     |    |            |            |
|----|-----|----|------------|------------|
| 23 | Yes | 19 | 0.00000001 | 0.00008025 |
| 24 | Yes | 19 | 0.00000001 | 0.00009625 |
| 25 | Yes | 19 | 0.00000001 | 0.00009406 |
| 26 | Yes | 20 | 0.00000001 | 0.00006208 |
| 27 | Yes | 20 | 0.00000001 | 0.00006298 |
| 28 | Yes | 19 | 0.00000001 | 0.00007339 |
| 29 | Yes | 19 | 0.00000001 | 0.00008802 |
| 30 | Yes | 19 | 0.00000001 | 0.00008632 |
| 31 | Yes | 20 | 0.00000001 | 0.00005739 |
| 32 | Yes | 19 | 0.00000001 | 0.00005480 |
| 33 | Yes | 16 | 0.00000001 | 0.00008023 |
| 34 | Yes | 16 | 0.00000001 | 0.00005025 |
| 35 | Yes | 18 | 0.00000001 | 0.00007700 |
| 36 | Yes | 19 | 0.00000001 | 0.00006050 |
| 37 | Yes | 20 | 0.00000001 | 0.00005883 |
| 38 | Yes | 19 | 0.00000001 | 0.00006894 |
| 39 | Yes | 19 | 0.00000001 | 0.00007868 |
| 40 | Yes | 19 | 0.00000001 | 0.00008709 |
| 41 | Yes | 20 | 0.00000001 | 0.00005573 |
| 42 | Yes | 20 | 0.00000001 | 0.00007393 |
| 43 | Yes | 19 | 0.00000001 | 0.00008318 |
| 44 | Yes | 19 | 0.00000001 | 0.00009639 |
| 45 | Yes | 20 | 0.00000001 | 0.00005240 |
| 46 | Yes | 20 | 0.00000001 | 0.00006462 |
| 47 | Yes | 19 | 0.00000001 | 0.00009582 |
| 48 | Yes | 19 | 0.00000001 | 0.00005654 |
| 49 | Yes | 19 | 0.00000001 | 0.00006510 |
| 50 | Yes | 19 | 0.00000001 | 0.00007041 |
| 51 | Yes | 19 | 0.00000001 | 0.00009166 |
| 52 | Yes | 16 | 0.00000001 | 0.00006469 |
| 53 | Yes | 15 | 0.00000001 | 0.00005605 |
| 54 | Yes | 15 | 0.00000001 | 0.00008509 |
| 55 | Yes | 17 | 0.00000001 | 0.00005657 |
| 56 | Yes | 16 | 0.00000001 | 0.00006787 |
| 57 | Yes | 20 | 0.00000001 | 0.00007026 |
| 58 | Yes | 19 | 0.00000001 | 0.00008197 |
| 59 | Yes | 19 | 0.00000001 | 0.00009932 |
| 60 | Yes | 19 | 0.00000001 | 0.00009123 |
| 61 | Yes | 20 | 0.00000001 | 0.00006240 |
| 62 | Yes | 14 | 0.00000001 | 0.00005473 |
| 63 | Yes | 13 | 0.00000001 | 0.00007453 |
| 64 | Yes | 13 | 0.00000001 | 0.00005388 |
| 65 | Yes | 13 | 0.00000001 | 0.00006134 |
| 66 | Yes | 13 | 0.00000001 | 0.00007551 |
| 67 | Yes | 13 | 0.00000001 | 0.00007248 |
| 68 | Yes | 13 | 0.00000001 | 0.00006423 |
| 69 | Yes | 13 | 0.00000001 | 0.00008228 |
| 70 | Yes | 13 | 0.00000001 | 0.00008878 |
| 71 | Yes | 13 | 0.00000001 | 0.00006699 |
| 72 | Yes | 13 | 0.00000001 | 0.00005190 |
| 73 | Yes | 13 | 0.00000001 | 0.00007300 |

## Maximum Tower Deflections - Service Wind

| Section No. | Elevation<br>ft   | Horz.<br>Deflection<br>in | Gov.<br>Load<br>Comb. | Tilt<br>° | Twist<br>° |
|-------------|-------------------|---------------------------|-----------------------|-----------|------------|
| T1          | 184.818 - 164.818 | 1.973                     | 72                    | 0.081     | 0.170      |
| T2          | 164.818 - 144.818 | 1.635                     | 72                    | 0.038     | 0.168      |
| T3          | 144.818 - 124.818 | 1.548                     | 68                    | 0.034     | 0.285      |

|                                                                                                                                          |                                                                 |                                  |
|------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|----------------------------------|
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|                                                                                                                                          | <b>Project</b>                                                  | <b>Date</b><br>22:32:58 12/28/22 |
|                                                                                                                                          | <b>Client</b><br>Crown Castle                                   | <b>Designed by</b><br>Vinayak    |

| Section No. | Elevation<br>ft   | Horz. Deflection<br>in | Gov. Load Comb. | Tilt<br>° | Twist<br>° |
|-------------|-------------------|------------------------|-----------------|-----------|------------|
| T4          | 124.818 - 104.818 | 1.367                  | 68              | 0.032     | 0.341      |
| T5          | 104.818 - 84.8177 | 1.329                  | 62              | 0.012     | 0.322      |
| T6          | 84.8177 - 64.8177 | 1.373                  | 62              | 0.034     | 0.308      |
| T7          | 64.8177 - 44.8177 | 1.633                  | 62              | 0.027     | 0.284      |
| T8          | 44.8177 - 24.8177 | 1.626                  | 62              | 0.051     | 0.239      |
| T9          | 24.8177 - 4.81771 | 1.126                  | 62              | 0.142     | 0.176      |
| T10         | 4.81771 - 0       | 0.203                  | 62              | 0.195     | 0.095      |

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

| Elevation<br>ft | Appurtenance                 | Gov. Load Comb. | Deflection<br>in | Tilt<br>° | Twist<br>° | Radius of Curvature<br>ft |
|-----------------|------------------------------|-----------------|------------------|-----------|------------|---------------------------|
| 184'9-13/16"    | Lightning Rod 5/8" x 8'      | 72              | 1.973            | 0.081     | 0.170      | 44319                     |
| 182'            | (2) RRUS 32                  | 72              | 1.915            | 0.074     | 0.165      | 44319                     |
| 174'            | HSX6-59-P3A/B                | 72              | 1.763            | 0.054     | 0.155      | 20485                     |
| 167'4-3/32"     | Guy                          | 72              | 1.663            | 0.042     | 0.161      | 12897                     |
| 158'            | Andrew HSX6-59A              | 72              | 1.589            | 0.033     | 0.201      | 25538                     |
| 153'            | X7CQAP-665-VR0 w/ Mount Pipe | 72              | 1.568            | 0.033     | 0.233      | 78624                     |
| 150'            | Commscope VHLPX3-11W         | 68              | 1.564            | 0.033     | 0.253      | 25770                     |
| 138'            | HSX8-59                      | 68              | 1.494            | 0.036     | 0.316      | 31684                     |
| 124'2-7/16"     | Guy                          | 68              | 1.363            | 0.031     | 0.341      | 16230                     |
| 116'            | HSX6-59-P3A/B                | 68              | 1.331            | 0.022     | 0.336      | 32855                     |
| 84'2-7/16"      | Guy                          | 62              | 1.379            | 0.034     | 0.307      | 11677                     |

### Maximum Tower Deflections - Design Wind

| Section No. | Elevation<br>ft   | Horz. Deflection<br>in | Gov. Load Comb. | Tilt<br>° | Twist<br>° |
|-------------|-------------------|------------------------|-----------------|-----------|------------|
| T1          | 184.818 - 164.818 | 10.509                 | 3               | 0.451     | 0.883      |
| T2          | 164.818 - 144.818 | 10.013                 | 3               | 0.540     | 0.873      |
| T3          | 144.818 - 124.818 | 10.685                 | 2               | 0.402     | 1.297      |
| T4          | 124.818 - 104.818 | 10.789                 | 2               | 0.225     | 1.485      |
| T5          | 104.818 - 84.8177 | 11.252                 | 6               | 0.188     | 1.373      |
| T6          | 84.8177 - 64.8177 | 11.435                 | 6               | 0.183     | 1.247      |
| T7          | 64.8177 - 44.8177 | 11.822                 | 6               | 0.159     | 1.128      |
| T8          | 44.8177 - 24.8177 | 10.561                 | 6               | 0.493     | 0.936      |
| T9          | 24.8177 - 4.81771 | 6.861                  | 6               | 0.929     | 0.678      |
| T10         | 4.81771 - 0       | 1.209                  | 6               | 1.173     | 0.360      |

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

| Elevation<br>ft | Appurtenance            | Gov. Load Comb. | Deflection<br>in | Tilt<br>° | Twist<br>° | Radius of Curvature<br>ft |
|-----------------|-------------------------|-----------------|------------------|-----------|------------|---------------------------|
| 184'9-13/16"    | Lightning Rod 5/8" x 8' | 3               | 10.509           | 0.451     | 0.883      | 10981                     |
| 182'            | (2) RRUS 32             | 3               | 10.402           | 0.471     | 0.864      | 10981                     |
| 174'            | HSX6-59-P3A/B           | 3               | 10.139           | 0.521     | 0.828      | 5075                      |

|                                                                                                                                          |                                                   |                    |
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|                                                                                                                                          | <b>Project</b>                                    | <b>Date</b>        |
|                                                                                                                                          | <b>Client</b>                                     | <b>Designed by</b> |
|                                                                                                                                          | Crown Castle                                      | Vinayak            |

| Elevation   | Appurtenance                 | Gov. Load Comb. | Deflection | Tilt  | Twist | Radius of Curvature |
|-------------|------------------------------|-----------------|------------|-------|-------|---------------------|
| ft          |                              |                 | in         | °     | °     | ft                  |
| 167'4-3/32" | Guy                          | 3               | 10.021     | 0.541 | 0.848 | 3181                |
| 158'        | Andrew HSX6-59A              | 2               | 10.152     | 0.513 | 0.993 | 4447                |
| 153'        | X7CQAP-665-VR0 w/ Mount Pipe | 2               | 10.378     | 0.477 | 1.110 | 4984                |
| 150'        | Commscope VHLPX3-11W         | 2               | 10.508     | 0.450 | 1.182 | 3320                |
| 138'        | HSX8-59                      | 2               | 10.780     | 0.339 | 1.408 | 3343                |
| 124'2-7/16" | Guy                          | 2               | 10.793     | 0.219 | 1.485 | 4340                |
| 116'        | HSX6-59-P3A/B                | 2               | 10.895     | 0.189 | 1.455 | 6508                |
| 84'2-7/16"  | Guy                          | 6               | 11.447     | 0.182 | 1.243 | 3286                |

## Bolt Design Data

| Section No. | Elevation | Component Type   | Bolt Grade | Bolt Size | Number Of Bolts | Maximum Load per Bolt | Allowable Load per Bolt | Ratio Load Allowable | Allowable Ratio | Criteria       |
|-------------|-----------|------------------|------------|-----------|-----------------|-----------------------|-------------------------|----------------------|-----------------|----------------|
|             | ft        |                  |            | in        |                 | K                     | K                       |                      |                 |                |
| T1          | 184.818   | Diagonal         | A325X      | 0.500     | 1               | 5.560                 | 9.777                   | 0.569                | ✓               | Gusset Bearing |
|             |           | Top Girt         | A325X      | 0.500     | 1               | 0.470                 | 5.919                   | 0.079                | ✓               | Member Bearing |
|             |           | Bottom Girt      | A325X      | 0.500     | 1               | 1.102                 | 5.919                   | 0.186                | ✓               | Member Bearing |
|             |           | Top Guy          | A325N      | 0.625     | 2               | 5.441                 | 11.061                  | 0.492                | ✓               | Gusset Bearing |
|             |           | Pull-Off@167.341 |            |           |                 |                       |                         |                      |                 |                |
| T2          | 164.818   | Torque Arm       | A325N      | 0.875     | 2               | 6.487                 | 13.200                  | 0.491                | ✓               | Gusset Bearing |
|             |           | Top@167.341      |            |           |                 |                       |                         |                      |                 |                |
|             |           | Leg              | A325X      | 0.750     | 4               | 3.612                 | 30.101                  | 0.120                | ✓               | Bolt Tension   |
|             |           | Diagonal         | A325X      | 0.500     | 1               | 3.446                 | 5.919                   | 0.582                | ✓               | Member Bearing |
|             |           | Top Girt         | A325X      | 0.500     | 1               | 1.121                 | 5.919                   | 0.189                | ✓               | Member Bearing |
| T3          | 144.818   | Bottom Girt      | A325X      | 0.500     | 1               | 0.751                 | 5.919                   | 0.127                | ✓               | Member Bearing |
|             |           | Leg              | A325X      | 0.750     | 4               | 3.194                 | 30.101                  | 0.106                | ✓               | Bolt Tension   |
|             |           | Diagonal         | A325X      | 0.500     | 1               | 5.328                 | 5.919                   | 0.900                | ✓               | Member Bearing |
|             |           | Top Girt         | A325X      | 0.500     | 1               | 0.844                 | 5.919                   | 0.143                | ✓               | Member Bearing |
|             |           | Bottom Girt      | A325X      | 0.500     | 1               | 1.785                 | 5.919                   | 0.302                | ✓               | Member Bearing |
| T4          | 124.818   | Leg              | A325X      | 0.750     | 4               | 3.393                 | 30.101                  | 0.113                | ✓               | Bolt Tension   |
|             |           | Diagonal         | A325X      | 0.500     | 1               | 3.169                 | 5.919                   | 0.535                | ✓               | Member Bearing |
|             |           | Top Girt         | A325X      | 0.500     | 1               | 0.776                 | 5.919                   | 0.131                | ✓               | Member Bearing |
|             |           | Bottom Girt      | A325X      | 0.500     | 1               | 0.705                 | 5.919                   | 0.119                | ✓               | Member Bearing |
|             |           | Top Guy          | A325N      | 0.750     | 2               | 2.491                 | 12.130                  | 0.205                | ✓               | Gusset Bearing |
| T5          | 104.818   | Pull-Off@124.203 |            |           |                 |                       |                         |                      |                 |                |
|             |           | Leg              | A325X      | 0.750     | 4               | 3.217                 | 30.101                  | 0.107                | ✓               | Bolt Tension   |
|             |           | Diagonal         | A325X      | 0.500     | 1               | 3.476                 | 5.919                   | 0.587                | ✓               | Member Bearing |
|             |           | Top Girt         | A325X      | 0.500     | 1               | 0.847                 | 5.919                   | 0.143                | ✓               | Member Bearing |
|             |           | Bottom Girt      | A325X      | 0.500     | 1               | 1.596                 | 5.919                   | 0.270                | ✓               | Member Bearing |
| T6          | 84.8177   | Leg              | A325X      | 0.750     | 4               | 4.077                 | 30.101                  | 0.135                | ✓               | Bolt Tension   |
|             |           | Diagonal         | A325X      | 0.500     | 1               | 5.115                 | 5.919                   | 0.864                | ✓               | Member Bearing |
|             |           | Top Girt         | A325X      | 0.500     | 1               | 1.031                 | 5.919                   | 0.174                | ✓               | Member Bearing |

|                                                                                                                                          |                                                   |                    |
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|                                                                                                                                          | <b>Client</b>                                     | <b>Designed by</b> |
|                                                                                                                                          | Crown Castle                                      | Vinayak            |

| Section No. | Elevation<br>ft | Component Type           | Bolt Grade | Bolt Size<br>in | Number Of Bolts | Maximum Load per Bolt<br>K | Allowable Load per Bolt<br>K | Ratio Load<br>Allowable | Allowable Ratio | Criteria       |
|-------------|-----------------|--------------------------|------------|-----------------|-----------------|----------------------------|------------------------------|-------------------------|-----------------|----------------|
| T7          | 64.8177         | Bottom Girt              | A325X      | 0.500           | 1               | 1.014                      | 5.919                        | 0.171 ✓                 | 1.05            | Member Bearing |
|             |                 | Top Guy Pull-Off@84.2031 | A325N      | 0.750           | 2               | 3.311                      | 12.130                       | 0.273 ✓                 | 1.05            | Gusset Bearing |
|             |                 | Leg                      | A325X      | 0.750           | 4               | 4.881                      | 30.101                       | 0.162 ✓                 | 1.05            | Bolt Tension   |
|             |                 | Diagonal                 | A325X      | 0.500           | 1               | 3.537                      | 5.919                        | 0.598 ✓                 | 1.05            | Member Bearing |
|             |                 | Top Girt                 | A325X      | 0.500           | 1               | 1.316                      | 5.919                        | 0.222 ✓                 | 1.05            | Member Bearing |
| T8          | 44.8177         | Bottom Girt              | A325X      | 0.500           | 1               | 1.316                      | 5.919                        | 0.222 ✓                 | 1.05            | Member Bearing |
|             |                 | Leg                      | A325X      | 0.750           | 4               | 6.330                      | 30.101                       | 0.210 ✓                 | 1.05            | Bolt Tension   |
|             |                 | Diagonal                 | A325X      | 0.500           | 1               | 2.615                      | 7.016                        | 0.373 ✓                 | 1.05            | Member Bearing |
|             |                 | Top Girt                 | A325X      | 0.500           | 1               | 1.324                      | 5.919                        | 0.224 ✓                 | 1.05            | Member Bearing |
|             |                 | Bottom Girt              | A325X      | 0.500           | 1               | 1.324                      | 5.919                        | 0.224 ✓                 | 1.05            | Member Bearing |
| T9          | 24.8177         | Leg                      | A325X      | 0.750           | 4               | 5.775                      | 30.101                       | 0.192 ✓                 | 1.05            | Bolt Tension   |
|             |                 | Diagonal                 | A325X      | 0.500           | 1               | 3.882                      | 5.919                        | 0.656 ✓                 | 1.05            | Member Bearing |
|             |                 | Top Girt                 | A325X      | 0.500           | 1               | 1.200                      | 5.919                        | 0.203 ✓                 | 1.05            | Member Bearing |
|             |                 | Bottom Girt              | A325X      | 0.500           | 1               | 1.583                      | 5.919                        | 0.267 ✓                 | 1.05            | Member Bearing |
|             |                 | Leg                      | A325X      | 0.750           | 4               | 4.178                      | 30.101                       | 0.139 ✓                 | 1.05            | Bolt Tension   |

## Guy Design Data

| Section No. | Elevation<br>ft | Size     | Initial Tension<br>K | Breaking Load<br>K | Actual $T_u$<br>K | Allowable $\phi T_n$<br>K | Required S.F. | Actual S.F. |
|-------------|-----------------|----------|----------------------|--------------------|-------------------|---------------------------|---------------|-------------|
| T1          | 167'4-3/32" (A) | 3/4 EHS  | 8.745                | 58.300             | 20.501            | 36.729                    | 0.952         | 1.706 ✓     |
|             | 167'4-3/32" (A) | 3/4 EHS  | 8.745                | 58.300             | 21.398            | 36.729                    | 0.952         | 1.635 ✓     |
|             | 167'4-3/32" (B) | 3/4 EHS  | 8.745                | 58.300             | 22.167            | 36.729                    | 0.952         | 1.578 ✓     |
|             | 167'4-3/32" (B) | 3/4 EHS  | 8.745                | 58.300             | 20.688            | 36.729                    | 0.952         | 1.691 ✓     |
|             | 167'4-3/32" (C) | 3/4 EHS  | 8.745                | 58.300             | 19.753            | 36.729                    | 0.952         | 1.771 ✓     |
|             | 167'4-3/32" (C) | 3/4 EHS  | 8.745                | 58.300             | 20.308            | 36.729                    | 0.952         | 1.722 ✓     |
| T4          | 124'2-7/16" (A) | 5/8 EHS  | 4.240                | 42.400             | 15.062            | 26.712                    | 0.952         | 1.689 ✓     |
|             | 124'2-7/16" (B) | 5/8 EHS  | 4.240                | 42.400             | 15.315            | 26.712                    | 0.952         | 1.661 ✓     |
|             | 124'2-7/16" (C) | 5/8 EHS  | 4.240                | 42.400             | 14.064            | 26.712                    | 0.952         | 1.809 ✓     |
| T6          | 84'2-7/16" (A)  | 9/16 EHS | 3.500                | 35.000             | 16.602            | 22.050                    | 0.952         | 1.265 ✓     |
|             | 84'2-7/16" (B)  | 9/16 EHS | 3.500                | 35.000             | 16.739            | 22.050                    | 0.952         | 1.255 ✓     |
|             | 84'2-7/16" (C)  | 9/16 EHS | 3.500                | 35.000             | 16.102            | 22.050                    | 0.952         | 1.304 ✓     |

|                                                                                                                                          |                                                   |                    |
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|                                                                                                                                          | <b>Client</b>                                     | <b>Designed by</b> |
|                                                                                                                                          | Crown Castle                                      | Vinayak            |

| Section No. | Elevation<br>ft | Size | Initial Tension<br>K | Breaking Load<br>K | Actual $T_u$<br>K | Allowable $\phi T_n$<br>K | Required S.F. | Actual S.F. |
|-------------|-----------------|------|----------------------|--------------------|-------------------|---------------------------|---------------|-------------|
|-------------|-----------------|------|----------------------|--------------------|-------------------|---------------------------|---------------|-------------|

## Compression Checks

## Leg Design Data (Compression)

| Section No. | Elevation<br>ft   | Size         | L<br>ft     | $L_u$<br>ft | Kl/r           | A<br>in <sup>2</sup> | $P_u$<br>K | $\phi P_n$<br>K | Ratio<br>$\frac{P_u}{\phi P_n}$ |
|-------------|-------------------|--------------|-------------|-------------|----------------|----------------------|------------|-----------------|---------------------------------|
| T1          | 184.818 - 164.818 | ROHN 2.5 EH  | 20'         | 2'4-29/3 2" | 31.3<br>K=1.00 | 2.254                | -43.744    | 94.407          | 0.463 <sup>1</sup> ✓            |
| T2          | 164.818 - 144.818 | ROHN 2.5 STD | 20'         | 2'4-29/3 2" | 30.5<br>K=1.00 | 1.704                | -40.914    | 71.637          | 0.571 <sup>1</sup> ✓            |
| T3          | 144.818 - 124.818 | ROHN 2.5 STD | 20'         | 2'4-29/3 2" | 61.0<br>K=2.00 | 1.704                | -39.323    | 58.406          | 0.673 <sup>1</sup> ✓            |
| T4          | 124.818 - 104.818 | ROHN 2.5 STD | 20'         | 2'4-29/3 2" | 61.0<br>K=2.00 | 1.704                | -40.557    | 58.406          | 0.694 <sup>1</sup> ✓            |
| T5          | 104.818 - 84.8177 | ROHN 2.5 EH  | 20'         | 2'4-29/3 2" | 62.6<br>K=2.00 | 2.254                | -46.687    | 76.170          | 0.613 <sup>1</sup> ✓            |
| T6          | 84.8177 - 64.8177 | ROHN 2.5 EH  | 20'         | 2'4-29/3 2" | 62.6<br>K=2.00 | 2.254                | -57.336    | 76.170          | 0.753 <sup>1</sup> ✓            |
| T7          | 64.8177 - 44.8177 | ROHN 2.5 EH  | 20'         | 2'4-29/3 2" | 62.6<br>K=2.00 | 2.254                | -75.394    | 76.170          | 0.990 <sup>1</sup> ✓            |
| T8          | 44.8177 - 24.8177 | ROHN 2.5 EH  | 20'         | 2'4-29/3 2" | 62.6<br>K=2.00 | 2.254                | -76.448    | 76.170          | 1.004 <sup>1</sup> ✓            |
| T9          | 24.8177 - 4.81771 | ROHN 2.5 EH  | 20'         | 2'4-29/3 2" | 62.6<br>K=2.00 | 2.254                | -67.840    | 76.170          | 0.891 <sup>1</sup> ✓            |
| T10         | 4.81771 - 0       | ROHN 2.5 EH  | 5'2-15/3 2" | 1'3-5/8"    | 16.9<br>K=1.00 | 2.254                | -50.237    | 99.313          | 0.506 <sup>1</sup> ✓            |

<sup>1</sup>  $P_u / \phi P_n$  controls

## Diagonal Design Data (Compression)

| Section No. | Elevation<br>ft   | Size            | L<br>ft  | $L_u$<br>ft | Kl/r           | A<br>in <sup>2</sup> | $P_u$<br>K | $\phi P_n$<br>K | Ratio<br>$\frac{P_u}{\phi P_n}$ |
|-------------|-------------------|-----------------|----------|-------------|----------------|----------------------|------------|-----------------|---------------------------------|
| T1          | 184.818 - 164.818 | ROHN 1.5 x 11GA | 3'8-5/8" | 3'8-5/8"    | 91.1<br>K=1.00 | 0.520                | -5.560     | 10.887          | 0.511 <sup>1</sup> ✓            |
| T2          | 164.818 - 144.818 | ROHN 1.5 x 16GA | 3'8-5/8" | 3'8-5/8"    | 87.5<br>K=1.00 | 0.263                | -3.916     | 6.208           | 0.631 <sup>1</sup> ✓            |
| T3          | 144.818 - 124.818 | ROHN 1.5 x 16GA | 3'8-5/8" | 3'8-5/8"    | 87.5<br>K=1.00 | 0.263                | -5.748     | 6.208           | 0.926 <sup>1</sup> ✓            |
| T4          | 124.818 - 104.818 | ROHN 1.5 x 16GA | 3'8-5/8" | 3'8-5/8"    | 87.5<br>K=1.00 | 0.263                | -3.527     | 6.208           | 0.568 <sup>1</sup> ✓            |

|                                                                                                                                          |                                                                 |                                  |
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|                                                                                                                                          | <b>Project</b>                                                  | <b>Date</b><br>22:32:58 12/28/22 |
|                                                                                                                                          | <b>Client</b><br>Crown Castle                                   | <b>Designed by</b><br>Vinayak    |

| Section No. | Elevation<br>ft   | Size            | L<br>ft  | L <sub>u</sub><br>ft | Kl/r           | A<br>in <sup>2</sup> | P <sub>u</sub><br>K | φP <sub>n</sub><br>K | Ratio<br>$\frac{P_u}{\phi P_n}$ |
|-------------|-------------------|-----------------|----------|----------------------|----------------|----------------------|---------------------|----------------------|---------------------------------|
| T5          | 104.818 - 84.8177 | ROHN 1.5 x 16GA | 3'8-5/8" | 3'8-5/8"             | 87.5<br>K=1.00 | 0.263                | -3.762              | 6.208                | 0.606 <sup>1</sup><br>✓         |
| T6          | 84.8177 - 64.8177 | ROHN 1.5 x 16GA | 3'8-5/8" | 3'8-5/8"             | 87.5<br>K=1.00 | 0.263                | -5.178              | 6.208                | 0.834 <sup>1</sup><br>✓         |
| T7          | 64.8177 - 44.8177 | ROHN 1.5 x 16GA | 3'8-5/8" | 3'8-5/8"             | 87.5<br>K=1.00 | 0.263                | -3.708              | 6.208                | 0.597 <sup>1</sup><br>✓         |
| T8          | 44.8177 - 24.8177 | ROHN 1.5 x 16GA | 3'8-5/8" | 3'8-5/8"             | 87.5<br>K=1.00 | 0.263                | -2.615              | 6.208                | 0.421 <sup>1</sup><br>✓         |
| T9          | 24.8177 - 4.81771 | ROHN 1.5 x 16GA | 3'8-5/8" | 3'8-5/8"             | 87.5<br>K=1.00 | 0.263                | -3.770              | 6.208                | 0.607 <sup>1</sup><br>✓         |

<sup>1</sup> P<sub>u</sub> / φP<sub>n</sub> controls

### Horizontal Design Data (Compression)

| Section No. | Elevation<br>ft | Size     | L<br>ft  | L <sub>u</sub><br>ft | Kl/r           | A<br>in <sup>2</sup> | P <sub>u</sub><br>K | φP <sub>n</sub><br>K | Ratio<br>$\frac{P_u}{\phi P_n}$ |
|-------------|-----------------|----------|----------|----------------------|----------------|----------------------|---------------------|----------------------|---------------------------------|
| T10         | 4.81771 - 0     | L4x4x1/4 | 2'6-3/4" | 2'3-7/8"             | 77.5<br>K=2.21 | 1.940                | -0.921              | 55.154               | 0.017 <sup>1</sup><br>✓         |

<sup>1</sup> P<sub>u</sub> / φP<sub>n</sub> controls

### Top Girt Design Data (Compression)

| Section No. | Elevation<br>ft   | Size            | L<br>ft | L <sub>u</sub><br>ft | Kl/r           | A<br>in <sup>2</sup> | P <sub>u</sub><br>K | φP <sub>n</sub><br>K | Ratio<br>$\frac{P_u}{\phi P_n}$ |
|-------------|-------------------|-----------------|---------|----------------------|----------------|----------------------|---------------------|----------------------|---------------------------------|
| T1          | 184.818 - 164.818 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7<br>K=1.00 | 0.263                | -0.542              | 7.049                | 0.077 <sup>1</sup><br>✓         |
| T2          | 164.818 - 144.818 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7<br>K=1.00 | 0.263                | -0.751              | 7.049                | 0.107 <sup>1</sup><br>✓         |
| T3          | 144.818 - 124.818 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7<br>K=1.00 | 0.263                | -0.705              | 7.049                | 0.100 <sup>1</sup><br>✓         |
| T4          | 124.818 - 104.818 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7<br>K=1.00 | 0.263                | -0.705              | 7.049                | 0.100 <sup>1</sup><br>✓         |
| T5          | 104.818 - 84.8177 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7<br>K=1.00 | 0.263                | -0.847              | 7.049                | 0.120 <sup>1</sup><br>✓         |
| T6          | 84.8177 - 64.8177 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7<br>K=1.00 | 0.263                | -1.014              | 7.049                | 0.144 <sup>1</sup><br>✓         |
| T7          | 64.8177 - 44.8177 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7<br>K=1.00 | 0.263                | -1.316              | 7.049                | 0.187 <sup>1</sup><br>✓         |
| T8          | 44.8177 - 24.8177 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7<br>K=1.00 | 0.263                | -1.324              | 7.049                | 0.188 <sup>1</sup><br>✓         |
| T9          | 24.8177 - 4.81771 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7<br>K=1.00 | 0.263                | -1.200              | 7.049                | 0.170 <sup>1</sup><br>✓         |
| T10         | 4.81771 - 0       | L4x4x1/4        | 3'5"    | 3'2-1/8"             | 84.0           | 1.940                | -0.921              | 53.019               | 0.017 <sup>1</sup><br>✓         |

|                                                                                                                                          |                                                   |                    |
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|                                                                                                                                          | <b>Project</b>                                    | <b>Date</b>        |
|                                                                                                                                          | <b>Client</b>                                     | <b>Designed by</b> |
|                                                                                                                                          | Crown Castle                                      | Vinayak            |

| Section No. | Elevation<br>ft | Size | L<br>ft | L <sub>u</sub><br>ft | Kl/r | A<br>in <sup>2</sup> | P <sub>u</sub><br>K | φP <sub>n</sub><br>K | Ratio<br>$\frac{P_u}{\phi P_n}$ |
|-------------|-----------------|------|---------|----------------------|------|----------------------|---------------------|----------------------|---------------------------------|
| K=1.75      |                 |      |         |                      |      |                      |                     |                      | ✓                               |

<sup>1</sup> P<sub>u</sub> / φP<sub>n</sub> controls

### Bottom Girt Design Data (Compression)

| Section No. | Elevation<br>ft   | Size            | L<br>ft | L <sub>u</sub><br>ft | Kl/r           | A<br>in <sup>2</sup> | P <sub>u</sub><br>K | φP <sub>n</sub><br>K | Ratio<br>$\frac{P_u}{\phi P_n}$ |
|-------------|-------------------|-----------------|---------|----------------------|----------------|----------------------|---------------------|----------------------|---------------------------------|
| T1          | 184.818 - 164.818 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7<br>K=1.00 | 0.263                | -0.758              | 7.049                | 0.107 <sup>1</sup> ✓            |
| T2          | 164.818 - 144.818 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7<br>K=1.00 | 0.263                | -0.751              | 7.049                | 0.107 <sup>1</sup> ✓            |
| T3          | 144.818 - 124.818 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7<br>K=1.00 | 0.263                | -1.501              | 7.049                | 0.213 <sup>1</sup> ✓            |
| T4          | 124.818 - 104.818 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7<br>K=1.00 | 0.263                | -0.705              | 7.049                | 0.100 <sup>1</sup> ✓            |
| T5          | 104.818 - 84.8177 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7<br>K=1.00 | 0.263                | -1.232              | 7.049                | 0.175 <sup>1</sup> ✓            |
| T6          | 84.8177 - 64.8177 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7<br>K=1.00 | 0.263                | -1.014              | 7.049                | 0.144 <sup>1</sup> ✓            |
| T7          | 64.8177 - 44.8177 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7<br>K=1.00 | 0.263                | -1.316              | 7.049                | 0.187 <sup>1</sup> ✓            |
| T8          | 44.8177 - 24.8177 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7<br>K=1.00 | 0.263                | -1.324              | 7.049                | 0.188 <sup>1</sup> ✓            |
| T9          | 24.8177 - 4.81771 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7<br>K=1.00 | 0.263                | -1.200              | 7.049                | 0.170 <sup>1</sup> ✓            |

<sup>1</sup> P<sub>u</sub> / φP<sub>n</sub> controls

### Top Guy Pull-Off Design Data (Compression)

| Section No. | Elevation<br>ft   | Size                                                          | L<br>ft | L <sub>u</sub><br>ft | Kl/r            | A<br>in <sup>2</sup> | P <sub>u</sub><br>K | φP <sub>n</sub><br>K | Ratio<br>$\frac{P_u}{\phi P_n}$ |
|-------------|-------------------|---------------------------------------------------------------|---------|----------------------|-----------------|----------------------|---------------------|----------------------|---------------------------------|
| T1          | 184.818 - 164.818 | 2L2x2x1/4x3/8                                                 | 3'5"    | 3'2-1/8"             | 104.8<br>K=1.00 | 1.880                | -9.195              | 43.618               | 0.211 <sup>1</sup>              |
| T6          | 84.8177 - 64.8177 | 2L 'a' > 18.358 in - 365<br>4 1/2x3/8<br>KL/R > 200 (C) - 383 | 3'5"    | 3'2-1/8"             | 352.2<br>K=1.00 | 1.688                | -0.080              | 3.074                | 0.026 <sup>1</sup>              |

<sup>1</sup> P<sub>u</sub> / φP<sub>n</sub> controls

|                                                                                                                                          |                                                                 |                                  |
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|                                                                                                                                          | <b>Project</b>                                                  | <b>Date</b><br>22:32:58 12/28/22 |
|                                                                                                                                          | <b>Client</b><br>Crown Castle                                   | <b>Designed by</b><br>Vinayak    |

### Top Guy Pull-Off Bending Design Data

| Section No. | Elevation<br>ft   | Size          | $M_{ux}$<br>kip-ft | $\phi M_{nx}$<br>kip-ft | Ratio<br>$\frac{M_{ux}}{\phi M_{nx}}$ | $M_{uy}$<br>kip-ft | $\phi M_{ny}$<br>kip-ft | Ratio<br>$\frac{M_{uy}}{\phi M_{ny}}$ |
|-------------|-------------------|---------------|--------------------|-------------------------|---------------------------------------|--------------------|-------------------------|---------------------------------------|
| T1          | 184.818 - 164.818 | 2L2x2x1/4x3/8 | 0.000              | 2.001                   | 0.000                                 | 0.000              | 3.392                   | 0.000                                 |
| T6          | 84.8177 - 64.8177 | 4 1/2x3/8     | 0.000              | 5.126                   | 0.000                                 | 0.000              | 0.427                   | 0.000                                 |

### Top Guy Pull-Off Interaction Design Data

| Section No. | Elevation<br>ft   | Size          | Ratio<br>$\frac{P_u}{\phi P_n}$ | Ratio<br>$\frac{M_{ux}}{\phi M_{nx}}$ | Ratio<br>$\frac{M_{uy}}{\phi M_{ny}}$ | Comb. Stress Ratio | Allow. Stress Ratio | Criteria |
|-------------|-------------------|---------------|---------------------------------|---------------------------------------|---------------------------------------|--------------------|---------------------|----------|
| T1          | 184.818 - 164.818 | 2L2x2x1/4x3/8 | 0.211                           | 0.000                                 | 0.000                                 | 0.211 <sup>1</sup> | 1.050               | 4.8.1 ✓  |
| T6          | 84.8177 - 64.8177 | 4 1/2x3/8     | 0.026                           | 0.000                                 | 0.000                                 | 0.026 <sup>1</sup> | 1.050               | 4.8.1 ✓  |

<sup>1</sup>  $P_u / \phi P_n$  controls

### Torque-Arm Top Design Data

| Section No. | Elevation<br>ft         | Size     | $L$<br>ft | $L_u$<br>ft | $Kl/r$         | $A$<br>in <sup>2</sup> | $P_u$<br>K | $\phi P_n$<br>K | Ratio<br>$\frac{P_u}{\phi P_n}$ |
|-------------|-------------------------|----------|-----------|-------------|----------------|------------------------|------------|-----------------|---------------------------------|
| T1          | 184.818 - 164.818 (363) | C15x33.9 | 3'5"      | 3'3-9/16'   | 43.8<br>K=1.00 | 9.960                  | -3.251     | 291.753         | 0.011                           |
| T1          | 184.818 - 164.818 (364) | C15x33.9 | 3'5"      | 3'3-9/16'   | 43.8<br>K=1.00 | 9.960                  | -4.280     | 291.753         | 0.015                           |
| T1          | 184.818 - 164.818 (370) | C15x33.9 | 3'5"      | 3'3-9/16'   | 43.8<br>K=1.00 | 9.960                  | -4.624     | 291.753         | 0.016                           |
| T1          | 184.818 - 164.818 (371) | C15x33.9 | 3'5"      | 3'3-9/16'   | 43.8<br>K=1.00 | 9.960                  | -6.042     | 291.753         | 0.021                           |
| T1          | 184.818 - 164.818 (374) | C15x33.9 | 3'5"      | 3'3-9/16'   | 43.8<br>K=1.00 | 9.960                  | -4.000     | 291.753         | 0.014                           |
| T1          | 184.818 - 164.818 (375) | C15x33.9 | 3'5"      | 3'3-9/16'   | 43.8<br>K=1.00 | 9.960                  | -3.925     | 291.753         | 0.013                           |

### Torque-Arm Top Bending Design Data

| Section No. | Elevation<br>ft         | Size     | $M_{ux}$<br>kip-ft | $\phi M_{nx}$<br>kip-ft | Ratio<br>$\frac{M_{ux}}{\phi M_{nx}}$ | $M_{uy}$<br>kip-ft | $\phi M_{ny}$<br>kip-ft | Ratio<br>$\frac{M_{uy}}{\phi M_{ny}}$ |
|-------------|-------------------------|----------|--------------------|-------------------------|---------------------------------------|--------------------|-------------------------|---------------------------------------|
| T1          | 184.818 - 164.818 (363) | C15x33.9 | -53.409            | 136.080                 | 0.392                                 | 0.000              | 12.595                  | 0.000                                 |
| T1          | 184.818 - 164.818 (364) | C15x33.9 | -57.763            | 136.080                 | 0.424                                 | 0.000              | 12.595                  | 0.000                                 |

|                                                                                                                                          |                                                   |                    |
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|                                                                                                                                          | <b>Project</b>                                    | <b>Date</b>        |
|                                                                                                                                          | <b>Client</b>                                     | <b>Designed by</b> |
|                                                                                                                                          | Crown Castle                                      | Vinayak            |

| Section No. | Elevation               | Size     | $M_{ux}$ | $\phi M_{nx}$ | Ratio                        | $M_{uy}$ | $\phi M_{ny}$ | Ratio                        |
|-------------|-------------------------|----------|----------|---------------|------------------------------|----------|---------------|------------------------------|
|             | ft                      |          | kip-ft   | kip-ft        | $\frac{M_{ux}}{\phi M_{nx}}$ | kip-ft   | kip-ft        | $\frac{M_{uy}}{\phi M_{ny}}$ |
| T1          | 184.818 - 164.818 (370) | C15x33.9 | -58.936  | 136.080       | 0.433                        | -0.000   | 12.595        | 0.000                        |
| T1          | 184.818 - 164.818 (371) | C15x33.9 | -53.434  | 136.080       | 0.393                        | 0.000    | 12.595        | 0.000                        |
| T1          | 184.818 - 164.818 (374) | C15x33.9 | -59.003  | 136.080       | 0.434                        | -0.000   | 12.595        | 0.000                        |
| T1          | 184.818 - 164.818 (375) | C15x33.9 | -57.741  | 136.080       | 0.424                        | 0.000    | 12.595        | 0.000                        |

### Torque-Arm Top Interaction Design Data

| Section No. | Elevation               | Size     | Ratio                  | Ratio                        | Ratio                        | Comb. Stress Ratio | Allow. Stress Ratio | Criteria |
|-------------|-------------------------|----------|------------------------|------------------------------|------------------------------|--------------------|---------------------|----------|
|             | ft                      |          | $\frac{P_u}{\phi P_n}$ | $\frac{M_{ux}}{\phi M_{nx}}$ | $\frac{M_{uy}}{\phi M_{ny}}$ |                    |                     |          |
| T1          | 184.818 - 164.818 (363) | C15x33.9 | 0.011                  | 0.392                        | 0.000                        | 0.398              | 1.050               | 4.8.1 ✓  |
| T1          | 184.818 - 164.818 (364) | C15x33.9 | 0.015                  | 0.424                        | 0.000                        | 0.432              | 1.050               | 4.8.1 ✓  |
| T1          | 184.818 - 164.818 (370) | C15x33.9 | 0.016                  | 0.433                        | 0.000                        | 0.441              | 1.050               | 4.8.1 ✓  |
| T1          | 184.818 - 164.818 (371) | C15x33.9 | 0.021                  | 0.393                        | 0.000                        | 0.403              | 1.050               | 4.8.1 ✓  |
| T1          | 184.818 - 164.818 (374) | C15x33.9 | 0.014                  | 0.434                        | 0.000                        | 0.440              | 1.050               | 4.8.1 ✓  |
| T1          | 184.818 - 164.818 (375) | C15x33.9 | 0.013                  | 0.424                        | 0.000                        | 0.431              | 1.050               | 4.8.1 ✓  |

### Tension Checks

### Leg Design Data (Tension)

| Section No. | Elevation         | Size         | L   | $L_u$       | Kl/r | A               | $P_u$  | $\phi P_n$ | Ratio                  |
|-------------|-------------------|--------------|-----|-------------|------|-----------------|--------|------------|------------------------|
|             | ft                |              | ft  | ft          |      | in <sup>2</sup> | K      | K          | $\frac{P_u}{\phi P_n}$ |
| T1          | 184.818 - 164.818 | ROHN 2.5 EH  | 20' | 2'-4-29/32" | 31.3 | 2.254           | 35.363 | 101.409    | 0.349 <sup>1</sup> ✓   |
| T2          | 164.818 - 144.818 | ROHN 2.5 STD | 20' | 7-3/8"      | 7.8  | 1.704           | 3.017  | 76.682     | 0.039 <sup>1</sup> ✓   |
| T3          | 144.818 - 124.818 | ROHN 2.5 STD | 20' | 2'-4-29/32" | 30.5 | 1.704           | 1.708  | 76.682     | 0.022 <sup>1</sup> ✓   |
| T6          | 84.8177 - 64.8177 | ROHN 2.5 EH  | 20' | 1-3/8"      | 1.5  | 2.254           | 1.856  | 101.409    | 0.018 <sup>1</sup> ✓   |
| T7          | 64.8177 - 44.8177 | ROHN 2.5 EH  | 20' | 1-3/8"      | 1.5  | 2.254           | 16.619 | 101.409    | 0.164 <sup>1</sup> ✓   |
| T8          | 44.8177 - 24.8177 | ROHN 2.5 EH  | 20' | 7-3/8"      | 8.0  | 2.254           | 16.619 | 101.409    | 0.164 <sup>1</sup> ✓   |

|                                                                                                                                          |                                                   |                    |
|------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|--------------------|
| <b>tnxTower</b><br><br><b>B+T Group</b><br>1717 S. Boulder, Suite 300<br>Tulsa, OK 74119<br>Phone: (918) 587-4630<br>FAX: (918) 587-4630 | <b>Job</b>                                        | <b>Page</b>        |
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|                                                                                                                                          | <b>Project</b>                                    | <b>Date</b>        |
|                                                                                                                                          | <b>Client</b>                                     | <b>Designed by</b> |
|                                                                                                                                          | Crown Castle                                      | Vinayak            |

| Section No. | Elevation         | Size        | L   | L <sub>u</sub> | Kl/r | A               | P <sub>u</sub> | φP <sub>n</sub> | Ratio<br>$\frac{P_u}{\phi P_n}$ |
|-------------|-------------------|-------------|-----|----------------|------|-----------------|----------------|-----------------|---------------------------------|
|             | ft                |             | ft  | ft             |      | in <sup>2</sup> | K              | K               |                                 |
| T9          | 24.8177 - 4.81771 | ROHN 2.5 EH | 20' | 7'-3/8"        | 8.0  | 2.254           | 5.241          | 101.409         | 0.052 <sup>1</sup><br>✓         |

<sup>1</sup> P<sub>u</sub> / φP<sub>n</sub> controls

### Diagonal Design Data (Tension)

| Section No. | Elevation         | Size            | L         | L <sub>u</sub> | Kl/r | A               | P <sub>u</sub> | φP <sub>n</sub> | Ratio<br>$\frac{P_u}{\phi P_n}$ |
|-------------|-------------------|-----------------|-----------|----------------|------|-----------------|----------------|-----------------|---------------------------------|
|             | ft                |                 | ft        | ft             |      | in <sup>2</sup> | K              | K               |                                 |
| T1          | 184.818 - 164.818 | ROHN 1.5 x 11GA | 3'-8-5/8" | 3'-8-5/8"      | 91.1 | 0.520           | 3.981          | 16.856          | 0.236 <sup>1</sup><br>✓         |
| T2          | 164.818 - 144.818 | ROHN 1.5 x 16GA | 3'-8-5/8" | 3'-8-5/8"      | 87.5 | 0.263           | 3.446          | 9.932           | 0.347 <sup>1</sup><br>✓         |
| T3          | 144.818 - 124.818 | ROHN 1.5 x 16GA | 3'-8-5/8" | 3'-8-5/8"      | 87.5 | 0.263           | 5.328          | 9.932           | 0.536 <sup>1</sup><br>✓         |
| T4          | 124.818 - 104.818 | ROHN 1.5 x 16GA | 3'-8-5/8" | 3'-8-5/8"      | 87.5 | 0.263           | 3.169          | 9.932           | 0.319 <sup>1</sup><br>✓         |
| T5          | 104.818 - 84.8177 | ROHN 1.5 x 16GA | 3'-8-5/8" | 3'-8-5/8"      | 87.5 | 0.263           | 3.476          | 9.932           | 0.350 <sup>1</sup><br>✓         |
| T6          | 84.8177 - 64.8177 | ROHN 1.5 x 16GA | 3'-8-5/8" | 3'-8-5/8"      | 87.5 | 0.263           | 5.115          | 9.932           | 0.515 <sup>1</sup><br>✓         |
| T7          | 64.8177 - 44.8177 | ROHN 1.5 x 16GA | 3'-8-5/8" | 3'-8-5/8"      | 87.5 | 0.263           | 3.537          | 9.932           | 0.356 <sup>1</sup><br>✓         |
| T8          | 44.8177 - 24.8177 | ROHN 1.5 x 16GA | 3'-8-5/8" | 3'-8-5/8"      | 87.5 | 0.263           | 2.007          | 9.932           | 0.202 <sup>1</sup><br>✓         |
| T9          | 24.8177 - 4.81771 | ROHN 1.5 x 16GA | 3'-8-5/8" | 3'-8-5/8"      | 87.5 | 0.263           | 3.882          | 9.932           | 0.391 <sup>1</sup><br>✓         |

<sup>1</sup> P<sub>u</sub> / φP<sub>n</sub> controls

### Horizontal Design Data (Tension)

| Section No. | Elevation   | Size     | L         | L <sub>u</sub> | Kl/r | A               | P <sub>u</sub> | φP <sub>n</sub> | Ratio<br>$\frac{P_u}{\phi P_n}$ |
|-------------|-------------|----------|-----------|----------------|------|-----------------|----------------|-----------------|---------------------------------|
|             | ft          |          | ft        | ft             |      | in <sup>2</sup> | K              | K               |                                 |
| T10         | 4.81771 - 0 | L4x4x1/4 | 2'-6-3/4" | 2'-3-7/8"      | 22.3 | 1.940           | 0.921          | 62.856          | 0.015 <sup>1</sup><br>✓         |

<sup>1</sup> P<sub>u</sub> / φP<sub>n</sub> controls

### Top Girt Design Data (Tension)

|                                                                                                                                          |                                                   |                    |
|------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|--------------------|
| <b>tnxTower</b><br><br><b>B+T Group</b><br>1717 S. Boulder, Suite 300<br>Tulsa, OK 74119<br>Phone: (918) 587-4630<br>FAX: (918) 587-4630 | <b>Job</b>                                        | <b>Page</b>        |
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|                                                                                                                                          | <b>Project</b>                                    | <b>Date</b>        |
|                                                                                                                                          | <b>Client</b>                                     | <b>Designed by</b> |
|                                                                                                                                          | Crown Castle                                      | Vinayak            |

| Section No. | Elevation<br>ft   | Size            | L<br>ft | L <sub>u</sub><br>ft | Kl/r | A<br>in <sup>2</sup> | P <sub>u</sub><br>K | φP <sub>n</sub><br>K | Ratio<br>$\frac{P_u}{\phi P_n}$ |
|-------------|-------------------|-----------------|---------|----------------------|------|----------------------|---------------------|----------------------|---------------------------------|
| T1          | 184.818 - 164.818 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7 | 0.263                | 0.470               | 9.932                | 0.047 <sup>1</sup>              |
| T2          | 164.818 - 144.818 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7 | 0.263                | 1.121               | 9.932                | 0.113 <sup>1</sup>              |
| T3          | 144.818 - 124.818 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7 | 0.263                | 0.844               | 9.932                | 0.085 <sup>1</sup>              |
| T4          | 124.818 - 104.818 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7 | 0.263                | 0.776               | 9.932                | 0.078 <sup>1</sup>              |
| T5          | 104.818 - 84.8177 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7 | 0.263                | 0.847               | 9.932                | 0.085 <sup>1</sup>              |
| T6          | 84.8177 - 64.8177 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7 | 0.263                | 1.031               | 9.932                | 0.104 <sup>1</sup>              |
| T7          | 64.8177 - 44.8177 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7 | 0.263                | 1.316               | 9.932                | 0.132 <sup>1</sup>              |
| T8          | 44.8177 - 24.8177 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7 | 0.263                | 1.324               | 9.932                | 0.133 <sup>1</sup>              |
| T9          | 24.8177 - 4.81771 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7 | 0.263                | 1.200               | 9.932                | 0.121 <sup>1</sup>              |
| T10         | 4.81771 - 0       | L4x4x1/4        | 3'5"    | 3'2-1/8"             | 30.5 | 1.940                | 9.933               | 62.856               | 0.158 <sup>1</sup>              |

<sup>1</sup> P<sub>u</sub> / φP<sub>n</sub> controls

### Bottom Girt Design Data (Tension)

| Section No. | Elevation<br>ft   | Size            | L<br>ft | L <sub>u</sub><br>ft | Kl/r | A<br>in <sup>2</sup> | P <sub>u</sub><br>K | φP <sub>n</sub><br>K | Ratio<br>$\frac{P_u}{\phi P_n}$ |
|-------------|-------------------|-----------------|---------|----------------------|------|----------------------|---------------------|----------------------|---------------------------------|
| T1          | 184.818 - 164.818 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7 | 0.263                | 1.102               | 9.932                | 0.111 <sup>1</sup>              |
| T2          | 164.818 - 144.818 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7 | 0.263                | 0.751               | 9.932                | 0.076 <sup>1</sup>              |
| T3          | 144.818 - 124.818 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7 | 0.263                | 1.785               | 9.932                | 0.180 <sup>1</sup>              |
| T4          | 124.818 - 104.818 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7 | 0.263                | 0.705               | 9.932                | 0.071 <sup>1</sup>              |
| T5          | 104.818 - 84.8177 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7 | 0.263                | 1.596               | 9.932                | 0.161 <sup>1</sup>              |
| T6          | 84.8177 - 64.8177 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7 | 0.263                | 1.014               | 9.932                | 0.102 <sup>1</sup>              |
| T7          | 64.8177 - 44.8177 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7 | 0.263                | 1.316               | 9.932                | 0.132 <sup>1</sup>              |
| T8          | 44.8177 - 24.8177 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7 | 0.263                | 1.324               | 9.932                | 0.133 <sup>1</sup>              |
| T9          | 24.8177 - 4.81771 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7 | 0.263                | 1.583               | 9.932                | 0.159 <sup>1</sup>              |

<sup>1</sup> P<sub>u</sub> / φP<sub>n</sub> controls

|                                                                                                                                          |                                                                 |                                  |
|------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|----------------------------------|
| <b>tnxTower</b><br><br><b>B+T Group</b><br>1717 S. Boulder, Suite 300<br>Tulsa, OK 74119<br>Phone: (918) 587-4630<br>FAX: (918) 587-4630 | <b>Job</b><br>100061.009.01.0001 - FAIRGROUNDS, FL (BU# 846219) | <b>Page</b><br>48 of 52          |
|                                                                                                                                          | <b>Project</b>                                                  | <b>Date</b><br>22:32:58 12/28/22 |
|                                                                                                                                          | <b>Client</b><br>Crown Castle                                   | <b>Designed by</b><br>Vinayak    |

### Top Guy Pull-Off Design Data (Tension)

| Section No. | Elevation<br>ft   | Size                                  | L<br>ft | L <sub>u</sub><br>ft | Kl/r  | A<br>in <sup>2</sup> | P <sub>u</sub><br>K | φP <sub>n</sub><br>K | Ratio<br>$\frac{P_u}{\phi P_n}$ |
|-------------|-------------------|---------------------------------------|---------|----------------------|-------|----------------------|---------------------|----------------------|---------------------------------|
| T1          | 184.818 - 164.818 | 2L2x2x1/4x3/8                         | 3'5"    | 3'2-1/8"             | 62.6  | 1.129                | 10.883              | 49.101               | 0.222 <sup>1</sup>              |
| T4          | 124.818 - 104.818 | 2L 'a' > 18.358 in - 367<br>4 1/2x3/8 | 3'5"    | 3'2-1/8"             | 352.2 | 1.688                | 4.981               | 54.675               | 0.091 <sup>1</sup>              |
| T6          | 84.8177 - 64.8177 | 4 1/2x3/8                             | 3'5"    | 3'2-1/8"             | 352.2 | 1.688                | 6.623               | 54.675               | 0.121 <sup>1</sup>              |

<sup>1</sup> P<sub>u</sub> / φP<sub>n</sub> controls

### Top Guy Pull-Off Bending Design Data

| Section No. | Elevation<br>ft   | Size          | M <sub>ux</sub><br>kip-ft | φM <sub>nx</sub><br>kip-ft | Ratio<br>$\frac{M_{ux}}{\phi M_{nx}}$ | M <sub>uy</sub><br>kip-ft | φM <sub>ny</sub><br>kip-ft | Ratio<br>$\frac{M_{uy}}{\phi M_{ny}}$ |
|-------------|-------------------|---------------|---------------------------|----------------------------|---------------------------------------|---------------------------|----------------------------|---------------------------------------|
| T1          | 184.818 - 164.818 | 2L2x2x1/4x3/8 | 0.000                     | 2.001                      | 0.000                                 | 0.000                     | 3.392                      | 0.000                                 |
| T4          | 124.818 - 104.818 | 4 1/2x3/8     | 0.000                     | 5.126                      | 0.000                                 | 0.000                     | 0.427                      | 0.000                                 |
| T6          | 84.8177 - 64.8177 | 4 1/2x3/8     | 0.000                     | 5.126                      | 0.000                                 | 0.000                     | 0.427                      | 0.000                                 |

### Top Guy Pull-Off Interaction Design Data

| Section No. | Elevation<br>ft   | Size          | Ratio<br>$\frac{P_u}{\phi P_n}$ | Ratio<br>$\frac{M_{ux}}{\phi M_{nx}}$ | Ratio<br>$\frac{M_{uy}}{\phi M_{ny}}$ | Comb. Stress Ratio | Allow. Stress Ratio | Criteria |
|-------------|-------------------|---------------|---------------------------------|---------------------------------------|---------------------------------------|--------------------|---------------------|----------|
| T1          | 184.818 - 164.818 | 2L2x2x1/4x3/8 | 0.222                           | 0.000                                 | 0.000                                 | 0.222 <sup>1</sup> | 1.050               | 4.8.1 ✓  |
| T4          | 124.818 - 104.818 | 4 1/2x3/8     | 0.091                           | 0.000                                 | 0.000                                 | 0.091 <sup>1</sup> | 1.050               | 4.8.1 ✓  |
| T6          | 84.8177 - 64.8177 | 4 1/2x3/8     | 0.121                           | 0.000                                 | 0.000                                 | 0.121 <sup>1</sup> | 1.050               | 4.8.1 ✓  |

<sup>1</sup> P<sub>u</sub> / φP<sub>n</sub> controls

### Torque-Arm Top Design Data

| Section No. | Elevation<br>ft | Size | L<br>ft | L <sub>u</sub><br>ft | Kl/r | A<br>in <sup>2</sup> | P <sub>u</sub><br>K | φP <sub>n</sub><br>K | Ratio<br>$\frac{P_u}{\phi P_n}$ |
|-------------|-----------------|------|---------|----------------------|------|----------------------|---------------------|----------------------|---------------------------------|
|-------------|-----------------|------|---------|----------------------|------|----------------------|---------------------|----------------------|---------------------------------|

|                                                                                                                                          |                                                   |                    |
|------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|--------------------|
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|                                                                                                                                          | <b>Project</b>                                    | <b>Date</b>        |
|                                                                                                                                          | <b>Client</b>                                     | <b>Designed by</b> |
|                                                                                                                                          | Crown Castle                                      | Vinayak            |

| Section No. | Elevation<br>ft         | Size     | L<br>ft | L <sub>u</sub><br>ft | Kl/r | A<br>in <sup>2</sup> | P <sub>u</sub><br>K | φP <sub>n</sub><br>K | Ratio<br>$\frac{P_u}{\phi P_n}$ |
|-------------|-------------------------|----------|---------|----------------------|------|----------------------|---------------------|----------------------|---------------------------------|
| T1          | 184.818 - 164.818 (363) | C15x33.9 | 3'5"    | 3'3-9/16'            | 43.8 | 7.170                | 1.339               | 311.895              | 0.004                           |
| T1          | 184.818 - 164.818 (364) | C15x33.9 | 3'5"    | 3'3-9/16'            | 43.8 | 7.170                | 3.780               | 311.895              | 0.012                           |
| T1          | 184.818 - 164.818 (370) | C15x33.9 | 3'5"    | 3'3-9/16'            | 43.8 | 7.170                | 3.789               | 311.895              | 0.012                           |
| T1          | 184.818 - 164.818 (371) | C15x33.9 | 3'5"    | 3'3-9/16'            | 43.8 | 7.170                | 1.220               | 311.895              | 0.004                           |
| T1          | 184.818 - 164.818 (374) | C15x33.9 | 3'5"    | 3'3-9/16'            | 43.8 | 7.170                | 0.126               | 311.895              | 0.000                           |
| T1          | 184.818 - 164.818 (375) | C15x33.9 | 3'5"    | 3'3-9/16'            | 43.8 | 7.170                | 4.215               | 311.895              | 0.014                           |

### Torque-Arm Top Bending Design Data

| Section No. | Elevation<br>ft         | Size     | M <sub>ux</sub><br>kip-ft | φM <sub>nx</sub><br>kip-ft | Ratio<br>$\frac{M_{ux}}{\phi M_{nx}}$ | M <sub>uy</sub><br>kip-ft | φM <sub>ny</sub><br>kip-ft | Ratio<br>$\frac{M_{uy}}{\phi M_{ny}}$ |
|-------------|-------------------------|----------|---------------------------|----------------------------|---------------------------------------|---------------------------|----------------------------|---------------------------------------|
| T1          | 184.818 - 164.818 (363) | C15x33.9 | -54.245                   | 136.080                    | 0.399                                 | 0.000                     | 12.595                     | 0.000                                 |
| T1          | 184.818 - 164.818 (364) | C15x33.9 | -48.253                   | 136.080                    | 0.355                                 | -0.000                    | 12.595                     | 0.000                                 |
| T1          | 184.818 - 164.818 (370) | C15x33.9 | -48.786                   | 136.080                    | 0.359                                 | -0.000                    | 12.595                     | 0.000                                 |
| T1          | 184.818 - 164.818 (371) | C15x33.9 | -52.196                   | 136.080                    | 0.384                                 | -0.000                    | 12.595                     | 0.000                                 |
| T1          | 184.818 - 164.818 (374) | C15x33.9 | -52.046                   | 136.080                    | 0.382                                 | -0.000                    | 12.595                     | 0.000                                 |
| T1          | 184.818 - 164.818 (375) | C15x33.9 | -46.730                   | 136.080                    | 0.343                                 | 0.000                     | 12.595                     | 0.000                                 |

### Torque-Arm Top Interaction Design Data

| Section No. | Elevation<br>ft         | Size     | Ratio<br>$\frac{P_u}{\phi P_n}$ | Ratio<br>$\frac{M_{ux}}{\phi M_{nx}}$ | Ratio<br>$\frac{M_{uy}}{\phi M_{ny}}$ | Comb.<br>Stress<br>Ratio | Allow.<br>Stress<br>Ratio | Criteria |
|-------------|-------------------------|----------|---------------------------------|---------------------------------------|---------------------------------------|--------------------------|---------------------------|----------|
| T1          | 184.818 - 164.818 (363) | C15x33.9 | 0.004                           | 0.399                                 | 0.000                                 | 0.401                    | 1.050                     | 4.8.1 ✓  |
| T1          | 184.818 - 164.818 (364) | C15x33.9 | 0.012                           | 0.355                                 | 0.000                                 | 0.361                    | 1.050                     | 4.8.1 ✓  |
| T1          | 184.818 - 164.818 (370) | C15x33.9 | 0.012                           | 0.359                                 | 0.000                                 | 0.365                    | 1.050                     | 4.8.1 ✓  |
| T1          | 184.818 - 164.818 (371) | C15x33.9 | 0.004                           | 0.384                                 | 0.000                                 | 0.386                    | 1.050                     | 4.8.1 ✓  |
| T1          | 184.818 - 164.818 (374) | C15x33.9 | 0.000                           | 0.382                                 | 0.000                                 | 0.383                    | 1.050                     | 4.8.1 ✓  |
| T1          | 184.818 - 164.818 (375) | C15x33.9 | 0.014                           | 0.343                                 | 0.000                                 | 0.350                    | 1.050                     | 4.8.1 ✓  |

|                                                                                                                                          |                                                   |                    |
|------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|--------------------|
| <b>tnxTower</b><br><br><b>B+T Group</b><br>1717 S. Boulder, Suite 300<br>Tulsa, OK 74119<br>Phone: (918) 587-4630<br>FAX: (918) 587-4630 | <b>Job</b>                                        | <b>Page</b>        |
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|                                                                                                                                          | <b>Project</b>                                    | <b>Date</b>        |
|                                                                                                                                          | <b>Client</b>                                     | <b>Designed by</b> |
|                                                                                                                                          | Crown Castle                                      | Vinayak            |

## Section Capacity Table

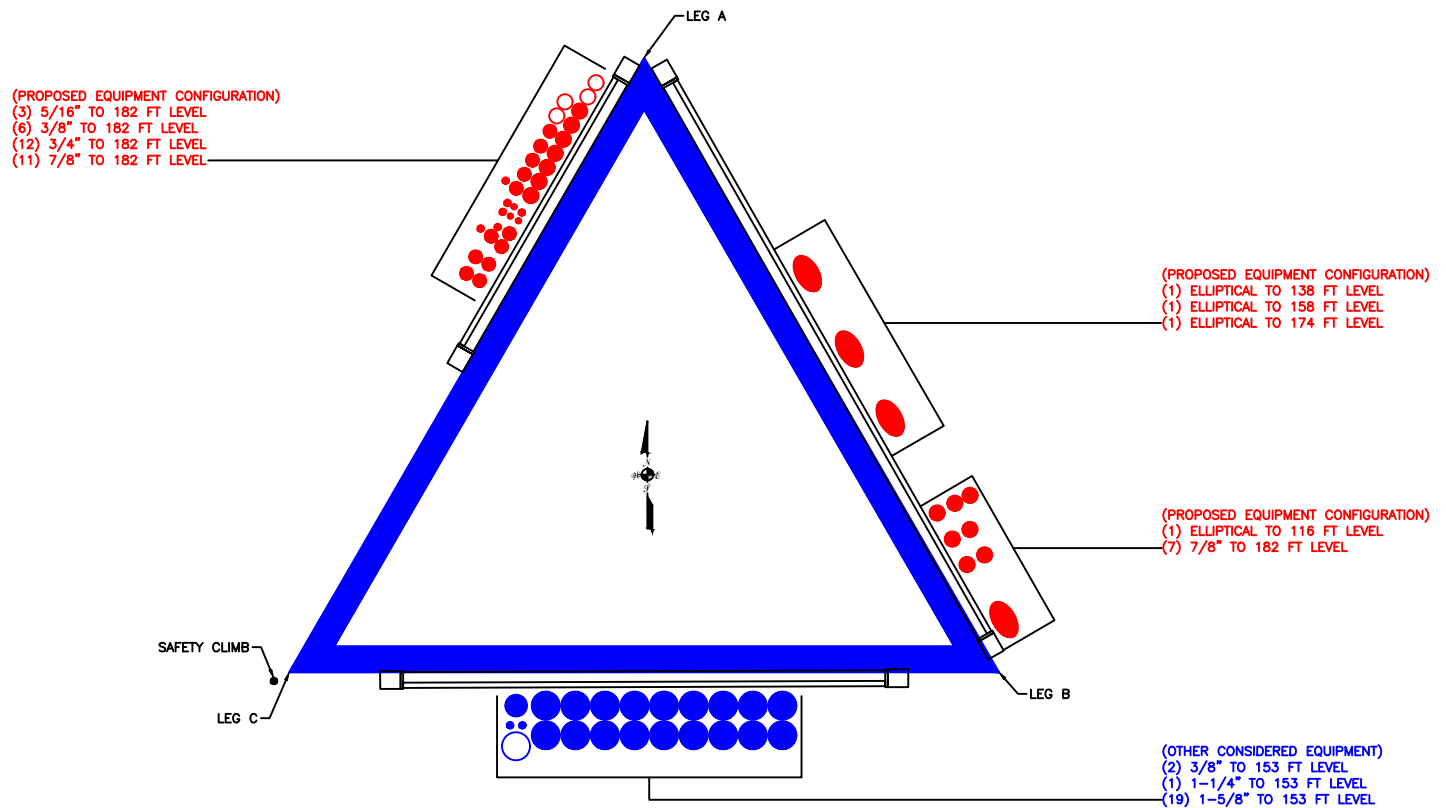
| Section No. | Elevation ft      | Component Type | Size            | Critical Element | P K     | $\phi P_{allow}$ K | % Capacity | Pass Fail |
|-------------|-------------------|----------------|-----------------|------------------|---------|--------------------|------------|-----------|
| T1          | 184.818 - 164.818 | Leg            | ROHN 2.5 EH     | 3                | -43.744 | 99.127             | 44.1       | Pass      |
| T2          | 164.818 - 144.818 | Leg            | ROHN 2.5 STD    | 60               | -40.914 | 75.218             | 54.4       | Pass      |
| T3          | 144.818 - 124.818 | Leg            | ROHN 2.5 STD    | 116              | -39.323 | 61.326             | 64.1       | Pass      |
| T4          | 124.818 - 104.818 | Leg            | ROHN 2.5 STD    | 150              | -40.557 | 61.326             | 66.1       | Pass      |
| T5          | 104.818 - 84.8177 | Leg            | ROHN 2.5 EH     | 183              | -46.687 | 79.978             | 58.4       | Pass      |
| T6          | 84.8177 - 64.8177 | Leg            | ROHN 2.5 EH     | 214              | -57.336 | 79.978             | 71.7       | Pass      |
| T7          | 64.8177 - 44.8177 | Leg            | ROHN 2.5 EH     | 249              | -75.394 | 79.978             | 94.3       | Pass      |
| T8          | 44.8177 - 24.8177 | Leg            | ROHN 2.5 EH     | 282              | -76.448 | 79.978             | 95.6       | Pass      |
| T9          | 24.8177 - 4.81771 | Leg            | ROHN 2.5 EH     | 315              | -67.840 | 79.978             | 84.8       | Pass      |
| T10         | 4.81771 - 0       | Leg            | ROHN 2.5 EH     | 346              | -50.237 | 104.279            | 48.2       | Pass      |
| T1          | 184.818 - 164.818 | Diagonal       | ROHN 1.5 x 11GA | 10               | -5.560  | 11.431             | 48.6       | Pass      |
| T2          | 164.818 - 144.818 | Diagonal       | ROHN 1.5 x 16GA | 109              | -3.916  | 6.519              | 60.1       | Pass      |
| T3          | 144.818 - 124.818 | Diagonal       | ROHN 1.5 x 16GA | 126              | -5.748  | 6.519              | 88.2       | Pass      |
| T4          | 124.818 - 104.818 | Diagonal       | ROHN 1.5 x 16GA | 176              | -3.527  | 6.519              | 54.1       | Pass      |
| T5          | 104.818 - 84.8177 | Diagonal       | ROHN 1.5 x 16GA | 190              | -3.762  | 6.519              | 57.7       | Pass      |
| T6          | 84.8177 - 64.8177 | Diagonal       | ROHN 1.5 x 16GA | 242              | -5.178  | 6.519              | 79.4       | Pass      |
| T7          | 64.8177 - 44.8177 | Diagonal       | ROHN 1.5 x 16GA | 278              | -3.708  | 6.519              | 56.9       | Pass      |
| T8          | 44.8177 - 24.8177 | Diagonal       | ROHN 1.5 x 16GA | 291              | -2.615  | 6.519              | 40.1       | Pass      |
| T9          | 24.8177 - 4.81771 | Diagonal       | ROHN 1.5 x 16GA | 330              | -3.770  | 6.519              | 57.8       | Pass      |
| T10         | 4.81771 - 0       | Horizontal     | L4x4x1/4        | 354              | -0.921  | 61.857             | 9.4        | Pass      |
| T1          | 184.818 - 164.818 | Top Girt       | ROHN 1.5 x 16GA | 4                | -0.542  | 7.401              | 7.3        | Pass      |
| T2          | 164.818 - 144.818 | Top Girt       | ROHN 1.5 x 16GA | 63               | 1.121   | 10.429             | 10.8       | Pass      |
| T3          | 144.818 - 124.818 | Top Girt       | ROHN 1.5 x 16GA | 120              | -0.705  | 7.401              | 9.5        | Pass      |
| T4          | 124.818 - 104.818 | Top Girt       | ROHN 1.5 x 16GA | 153              | -0.705  | 7.401              | 9.5        | Pass      |
| T5          | 104.818 - 84.8177 | Top Girt       | ROHN 1.5 x 16GA | 185              | -0.847  | 7.401              | 11.4       | Pass      |
| T6          | 84.8177 - 64.8177 | Top Girt       | ROHN 1.5 x 16GA | 218              | -1.014  | 7.401              | 13.7       | Pass      |
| T7          | 64.8177 - 44.8177 | Top Girt       | ROHN 1.5 x 16GA | 251              | -1.316  | 7.401              | 17.8       | Pass      |
| T8          | 44.8177 - 24.8177 | Top Girt       | ROHN 1.5 x 16GA | 284              | -1.324  | 7.401              | 17.9       | Pass      |
| T9          | 24.8177 - 4.81771 | Top Girt       | ROHN 1.5 x 16GA | 317              | -1.200  | 7.401              | 16.2       | Pass      |
| T10         | 4.81771 - 0       | Top Girt       | L4x4x1/4        | 349              | 9.933   | 65.999             | 15.1       | Pass      |



|                                                                                                                                                        |                                                                 |                                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|----------------------------------|
| <b><i>tnxTower</i></b><br><br><b><i>B+T Group</i></b><br>1717 S. Boulder, Suite 300<br>Tulsa, OK 74119<br>Phone: (918) 587-4630<br>FAX: (918) 587-4630 | <b>Job</b><br>100061.009.01.0001 - FAIRGROUNDS, FL (BU# 846219) | <b>Page</b><br>52 of 52          |
|                                                                                                                                                        | <b>Project</b>                                                  | <b>Date</b><br>22:32:58 12/28/22 |
|                                                                                                                                                        | <b>Client</b><br>Crown Castle                                   | <b>Designed by</b><br>Vinayak    |

| Section<br>No. | Elevation<br>ft | Component<br>Type | Size | Critical<br>Element | P<br>K | $\phi P_{allow}$<br>K   | %<br>Capacity | Pass<br>Fail |
|----------------|-----------------|-------------------|------|---------------------|--------|-------------------------|---------------|--------------|
|                |                 |                   |      |                     |        | Top (T1)<br>Bolt Checks | 85.7          | Pass         |
|                |                 |                   |      |                     |        | <b>RATING =</b>         | <b>95.6</b>   | <b>Pass</b>  |

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



BUSINESS UNIT: 846219

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

|         |                                       |
|---------|---------------------------------------|
| PROJECT | <b>100061.008.01 - FAIRGROUNDS,FL</b> |
| SUBJECT | <b>Guy Pull Off Brackets</b>          |
| DATE    | <b>12-28-22</b>                       |

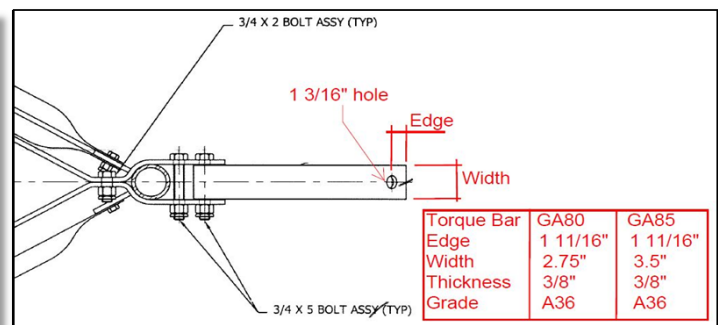
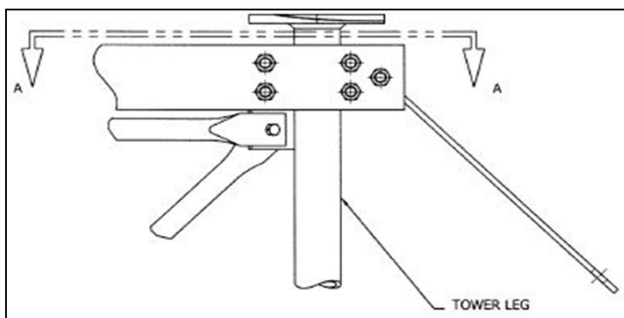
v3.0.3

## Guy Pull Off Brackets

|                               |            |
|-------------------------------|------------|
| TIA Rev.                      | <b>H</b>   |
| Apply TIA-222-H Section 15.5? | <b>Yes</b> |

|                                |                                                         | Units           | <b>Elev. 1</b> | <b>Elev. 2</b> |
|--------------------------------|---------------------------------------------------------|-----------------|----------------|----------------|
| Guy Wire Details               | Elevation                                               | ft              | 85             | 125            |
|                                | Radius                                                  | ft              | 115            | 115            |
|                                | Angle                                                   | degrees         | 54             | 43             |
|                                | Tension Force                                           | kips            | 16.74          | 15.32          |
|                                | Vertical Force                                          | kips            | 9.95           | 11.27          |
| Torque Bar Geometry            | Torque Bar P/N                                          |                 | GA80           | GA80           |
|                                | Vertical Capacity of Guy Bracket*                       | kips            | 14.9           | 14.9           |
|                                | Hole Edge Distance                                      | in              | 1.69           | 1.69           |
|                                | Hole Diameter                                           | in              | 1.19           | 1.19           |
|                                | 3/4" Shackle Pin Diameter                               | in              | 0.89           | 0.89           |
|                                | Plate Thickness                                         | in              | 0.375          | 0.375          |
|                                | Plate Width                                             | in              | 2.75           | 2.75           |
|                                | Plate Grade                                             |                 | A36            | A36            |
|                                | Fy                                                      | ksi             | 36             | 36             |
|                                | Fu                                                      | ksi             | 58             | 58             |
| Bearing & Tearing              | Lc                                                      | in              | 1.09           | 1.09           |
|                                | $\phi$                                                  |                 | 0.8            | 0.8            |
|                                | $1.2(Lc+d/4)$                                           | in              | 1.58           | 1.58           |
|                                | $2.4d$                                                  | in              | 2.14           | 2.14           |
|                                | $\phi P_n = \phi t F_u * \text{Min}[1.2(Lc+d/4), 2.4d]$ | kips            | 27.5           | 27.5           |
| Plate Tension                  | $A_n$                                                   | in <sup>2</sup> | 0.59           | 0.59           |
|                                | $\phi_r$                                                |                 | 0.75           | 0.75           |
|                                | $\phi P_n = \phi A_n F_u$                               | kips            | 25.5           | 25.5           |
|                                | $A_g$                                                   | in <sup>2</sup> | 1.03           | 1.03           |
|                                | $\phi_y$                                                |                 | 0.90           | 0.90           |
|                                | $\phi P_n = \phi A_g F_y$                               | kips            | 33.4           | 33.4           |
| Bolt Shear                     | 3/4" diameter A325N DS Capacity                         | kips            | 39.8           | 39.8           |
| Controlling Resultant Capacity |                                                         | kips            | 25.5           | 25.5           |
| Bracket Rating                 | Vertical                                                |                 | 63.6%          | 72.0%          |
|                                | Resultant                                               |                 | 62.5%          | 57.2%          |

\*This design capacity corresponds to the maximum vertical load component of the guy bracket for which the standard Rohn GA80/GA85 guy bracket is designed.



## Pier and Pad Foundation



BU # : 846219  
 Site Name: Fairgrounds, FL  
 App. Number: 638846 Rev# 0

TIA-222 Revision: H  
 Tower Type: Guyed

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

| Superstructure Analysis Reactions         |         |         |
|-------------------------------------------|---------|---------|
| Compression, $P_{comp}$ :                 | 125     | kips    |
| Base Shear, $V_{u\_comp}$ :               | 4       | kips    |
|                                           |         |         |
|                                           |         |         |
| Moment, $M_u$ :                           | 0       | ft-kips |
| Tower Height, $H$ :                       | 184.818 | ft      |
|                                           |         |         |
| BP Dist. Above Fdn, $bp_{dist}$ :         | 2       | in      |
| Bolt Circle / Bearing Plate Width, $BC$ : |         | in      |

| Pier Properties                  |        |    |
|----------------------------------|--------|----|
| Pier Shape:                      | Square |    |
| Pier Diameter, $dpier$ :         | 2      | ft |
| Ext. Above Grade, $E$ :          | 0.5    | ft |
| Pier Rebar Size, $Sc$ :          | 6      |    |
| Pier Rebar Quantity, $mc$ :      | 8      |    |
| Pier Tie/Spiral Size, $St$ :     | 3      |    |
| Pier Tie/Spiral Quantity, $mt$ : | 20     |    |
| Pier Reinforcement Type:         | Tie    |    |
| Pier Clear Cover, $cc_{pier}$ :  | 3      | in |

| Pad Properties                                 |     |    |
|------------------------------------------------|-----|----|
| Depth, $D$ :                                   | 5   | ft |
| Pad Width, $W_1$ :                             | 8.5 | ft |
| Pad Thickness, $T$ :                           | 1.5 | ft |
| Pad Rebar Size (Top dir. 2), $Sp_{top2}$ :     | 5   |    |
| Pad Rebar Quantity (Top dir. 2), $mp_{top2}$ : | 0   |    |
| Pad Rebar Size (Bottom dir. 2), $Sp_2$ :       | 5   |    |
| Pad Rebar Quantity (Bottom dir. 2), $mp_2$ :   | 10  |    |
| Pad Clear Cover, $cc_{pad}$ :                  | 3   | in |

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

| Soil Properties                    |        |         |
|------------------------------------|--------|---------|
| Total Soil Unit Weight, $\gamma$ : | 119    | pcf     |
| Ultimate Net Bearing, $Q_{net}$ :  | 12.000 | ksf     |
| Cohesion, $C_u$ :                  | 0.000  | ksf     |
| Friction Angle, $\phi$ :           | 36     | degrees |
| SPT Blow Count, $N_{blows}$ :      |        |         |
| Base Friction, $\mu$ :             |        |         |
| Neglected Depth, $N$ :             | 1.00   | ft      |
| Foundation Bearing on Rock?        | No     |         |
| Groundwater Depth, $gw$ :          | 5.2    | ft      |

| Foundation Analysis Checks     |          |        |         |       |
|--------------------------------|----------|--------|---------|-------|
|                                | Capacity | Demand | Rating* | Check |
| Lateral (Sliding) (kips)       | 54.36    | 4.00   | 7.0%    | Pass  |
| Bearing Pressure (ksf)         | 7.56     | 2.63   | 33.1%   | Pass  |
| Overturning (kip*ft)           | 449.43   | 22.67  | 5.0%    | Pass  |
| Pier Flexure (Comp.) (kip*ft)  | 195.53   | 16.00  | 7.8%    | Pass  |
|                                |          |        |         |       |
| Pier Compression (kip)         | 1909.44  | 127.88 | 6.4%    | Pass  |
| Pad Flexure (kip*ft)           | 191.18   | 85.62  | 42.7%   | Pass  |
| Pad Shear - 1-way (kips)       | 117.85   | 33.73  | 27.3%   | Pass  |
| Pad Shear - 2-way (Comp) (ksi) | 0.164    | 0.049  | 28.3%   | Pass  |
| Flexural 2-way (Comp) (kip*ft) | 140.86   | 9.60   | 6.5%    | Pass  |
|                                |          |        |         |       |
|                                |          |        |         |       |

\*Rating per TIA-222-H Section 15.5

|                     |       |
|---------------------|-------|
| Structural Rating*: | 42.7% |
| Soil Rating*:       | 33.1% |

<--Toggle between Gross and Net

## Guyed Anchor Block Foundation

Checks capacity of anchor blocks for a guyed tower.



BU#: 846219  
 Site Name: Fairgrounds, FL  
 Order Number: 638846 Rev# 0  
 Location: B3

TIA-222 Revision: H

| Design Reactions                         |        |      |
|------------------------------------------|--------|------|
| Shear, <b>S:</b>                         | 47.00  | kips |
| Uplift, <b>Ua:</b>                       | 55.00  | kips |
| Resultant Force, <b>Rf:</b>              | 72.35  | kips |
| Tower Height, <b>H:</b>                  | 184.82 | ft   |
| Guy Anchor Radius, <b>R:</b>             | 115.00 | ft   |
| Resultant Angle to Horizontal, <b>θ:</b> | 49.5   | deg  |

| Guy Anchor Properties                      |      |                 |
|--------------------------------------------|------|-----------------|
| Depth to Bottom of Deadman, <b>Da:</b>     | 8    | ft              |
| Anchor Width, <b>Wa:</b>                   | 6.25 | ft              |
| Anchor Thickness, <b>Ta:</b>               | 3    | ft              |
| Anchor Length, <b>La:</b>                  | 19.5 | ft              |
| Concrete Volume, <b>Vc:</b>                | 13.5 | yd <sup>3</sup> |
| Toe Width, <b>toe:</b>                     | 0    | ft              |
| Guyed Anchor Top Rebar Size, <b>Sat:</b>   | 7    |                 |
| No. of Bars in Top of Block:               | 7    |                 |
| Guyed Anchor Front Rebar Size, <b>Saf:</b> | 7    |                 |
| No. of Bars in Front of Block:             | 4    |                 |
| Stirrup Size:                              | 4    |                 |
| Anchor Shaft Diameter, <b>ds:</b>          | 1.25 | in              |
| Anchor Shaft Quantity, <b>n:</b>           | 2    |                 |
| Anchor Shaft Area Override:                |      | in <sup>2</sup> |
| Shear Lag Factor, <b>u:</b>                | 1    |                 |

| Material Properties                         |       |     |
|---------------------------------------------|-------|-----|
| Rebar Grade, <b>Fy:</b>                     | 60    | ksi |
| Concrete Strength, <b>F'c:</b>              | 3     | ksi |
| Wt. Avg. Concrete Density, <b>δx:</b>       | 0.129 | kcf |
| Clear Cover, <b>cc:</b>                     | 3     | in  |
| Anchor Shaft Grade, <b>Fy*:</b>             | 50    | ksi |
| Anchor Shaft Ultimate Strength, <b>Fu*:</b> | 65    | ksi |

| Design Checks                        |          |        |         |       |
|--------------------------------------|----------|--------|---------|-------|
|                                      | Capacity | Demand | Rating* | Check |
| Lateral Capacity (kips):             | 244.55   | 47.00  | 18.3%   | Pass  |
| Uplift Capacity (kips):              | 212.10   | 55.00  | 24.7%   | Pass  |
| Lateral Flexural Capacity (ft*kips): | 759.00   | 114.56 | 14.4%   | Pass  |
| Uplift Flexural Capacity (ft*kips):  | 593.53   | 134.06 | 21.5%   | Pass  |
| Anchor Shaft (kips):                 | 98.17    | 72.35  | 70.2%   | Pass  |

\*Rating per TIA-222-H Section 15.5

|                      |       |
|----------------------|-------|
| Anchor Shaft Rating: | 70.2% |
| Structural Rating:   | 21.5% |
| Soil Rating:         | 24.7% |

|                               |   |    |
|-------------------------------|---|----|
| Neglect Depth, <b>Neg:</b>    | 0 | ft |
| Groundwater Level, <b>gw:</b> | 7 | ft |

| Soil Properties: |        | No. of Soil Layers: |        |      |                   |              |
|------------------|--------|---------------------|--------|------|-------------------|--------------|
| Layer            | φ, deg | cu, ksf             | δ, pcf |      | Ultimate fs (ksf) | N (blows/ft) |
| 1                | 0      | 0.000               | 120    | 0.50 |                   |              |
| 2                | 32     | 0.000               | 120    | 3.00 |                   | 8            |
| 3                | 34     | 0.000               | 120    | 7.00 |                   | 17           |
| 4                | 0      | 2.750               | 57.6   | 8.00 |                   |              |

\*key: φ = Internal Angle of Friction

cu = Cohesion / Undrained Shear Strength

δ = Buoyant Soil Unit Weight

d = Depth to Bottom of Layer

Ultimate fs = Geotechnical Report-provided skin friction / adhesion

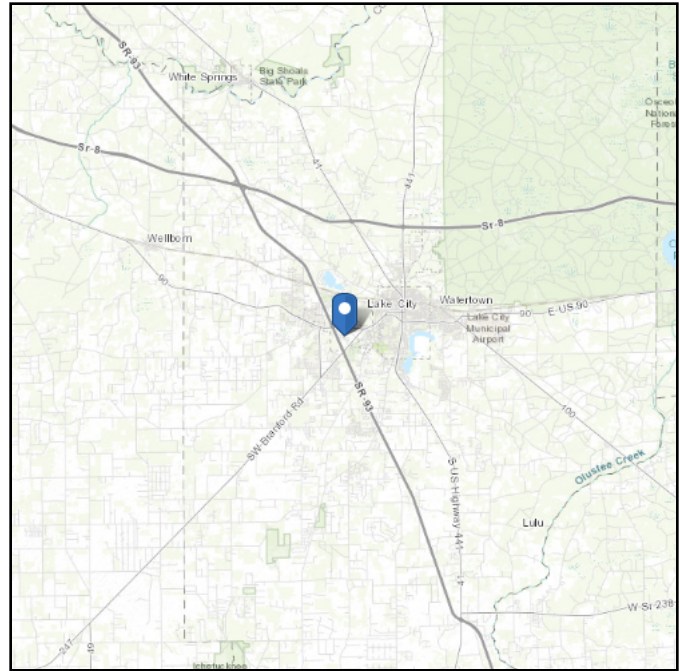
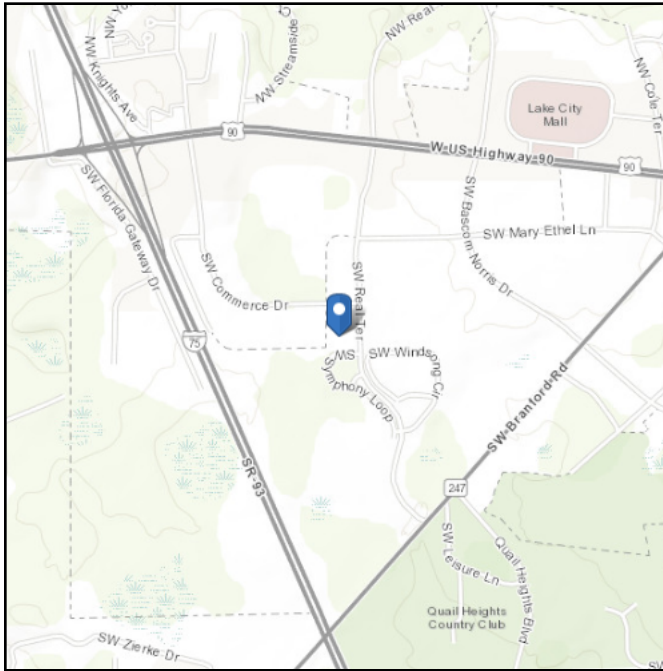
N = SPT Blow Count

# ASCE 7 Hazards Report

**Address:**  
No Address at This Location

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

**Latitude:** 30.174008  
**Longitude:** -82.680519  
**Elevation:** 155.97 ft (NAVD 88)



## Wind

### Results:

|              |          |
|--------------|----------|
| Wind Speed   | 118 Vmph |
| 10-year MRI  | 75 Vmph  |
| 25-year MRI  | 84 Vmph  |
| 50-year MRI  | 90 Vmph  |
| 100-year MRI | 97 Vmph  |

**Data Source:** ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2  
**Date Accessed:** Tue Dec 27 2022

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

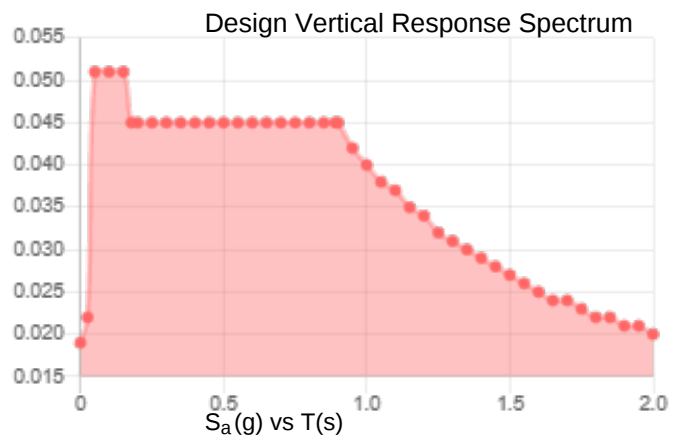
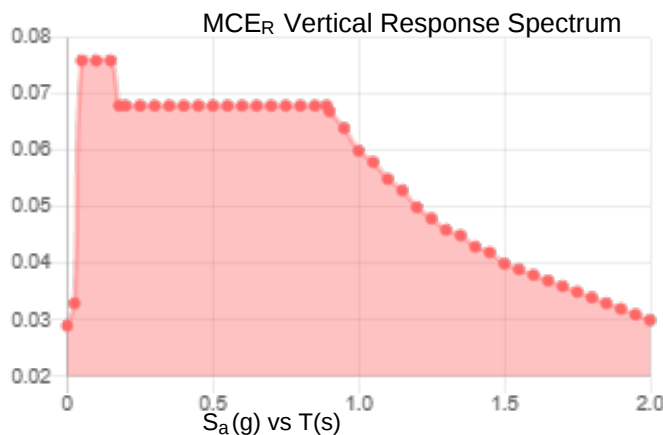
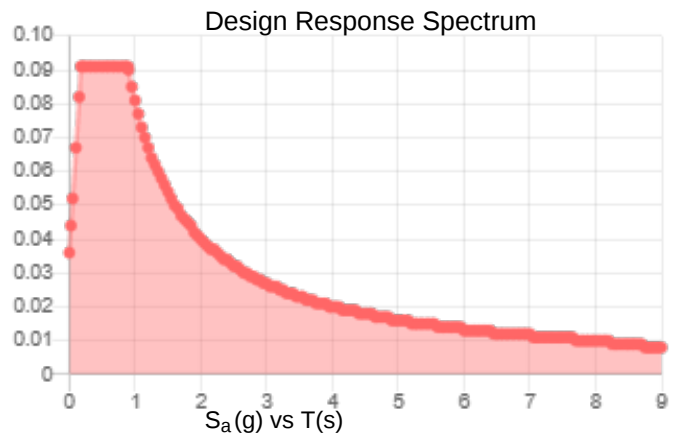
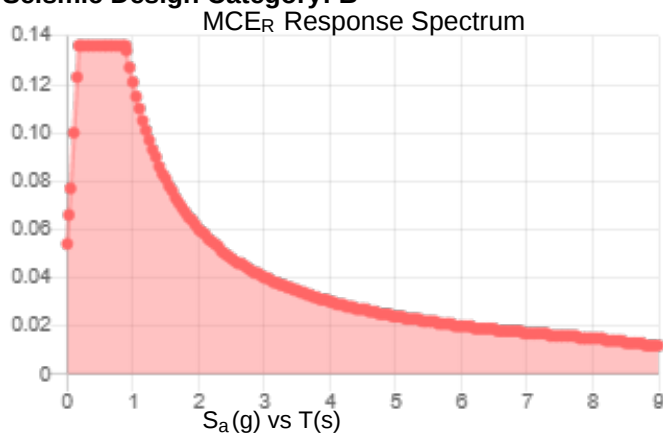
Site is in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

**Site Soil Class:**

**Results:**

|            |       |                    |       |
|------------|-------|--------------------|-------|
| $S_S$ :    | 0.085 | $S_{D1}$ :         | 0.081 |
| $S_1$ :    | 0.05  | $T_L$ :            | 8     |
| $F_a$ :    | 1.6   | PGA :              | 0.04  |
| $F_v$ :    | 2.4   | PGA <sub>M</sub> : | 0.065 |
| $S_{MS}$ : | 0.136 | $F_{PGA}$ :        | 1.6   |
| $S_{M1}$ : | 0.121 | $I_e$ :            | 1     |
| $S_{DS}$ : | 0.091 | $C_v$ :            | 0.7   |

**Seismic Design Category: B**



**Data Accessed:**

**Tue Dec 27 2022**

**Date Source:**

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

**Results:**

Ice Thickness: 0.25 in.  
Concurrent Temperature: 25 F  
Gust Speed 30 mph

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

**Date Accessed:** Tue Dec 27 2022

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

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

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