

Date: **October 04, 2021**



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

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

**Carrier Designation:** **Verizon Wireless Co-Locate**  
**Site Number:** 228807  
**Site Name:** Commerce

**Crown Castle Designation:** **BU Number:** 846219  
**Site Name:** Fairgrounds  
**JDE Job Number:** 666438  
**Work Order Number:** 2025491  
**Order Number:** 567455 Rev. 1

**Engineering Firm Designation:** **B+T Group Project Number:** 100061.008.01

**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:

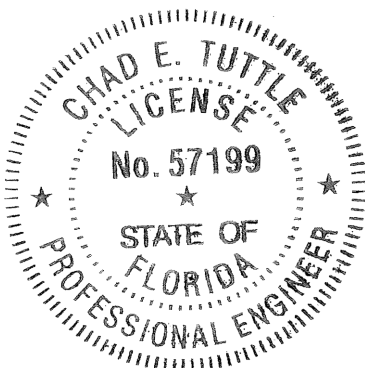
LC5: Proposed Equipment Configuration

**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: Erika Ruiz

Respectfully submitted by: B+T Engineering, Inc.  
COA: 27496



Chad E. Tuttle, P.E.

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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)   |
|---------------------|----------------------------|--------------------|----------------------|-------------------------|----------------------|-----------------------|
| 153.0               | 153.0                      | 1                  | --                   | Sector Mount [SM 502-3] | 19<br>1<br>2         | 1-5/8<br>1-1/4<br>3/8 |
|                     | 150.0                      | 1                  | Commscope            | VHLPX3-11W              |                      |                       |
|                     |                            | 2                  | Aviat Networks       | ODU600                  |                      |                       |
|                     |                            | 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  |                      |                       |

**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)       |
|---------------------|----------------------------|--------------------|----------------------|-------------------------|----------------------|---------------------------|
| 183.0               | 183.0                      | 6                  | Andrew               | CBC819-DF               | 18<br>12<br>6<br>3   | 7/8<br>3/4<br>3/8<br>5/16 |
|                     |                            | 3                  | Andrew               | DBXLH-9090C-R2M         |                      |                           |
|                     |                            | 6                  | Andrew               | ETD819H-12UB            |                      |                           |
|                     |                            | 9                  | Cci Antennas         | BSA-M65R-BUU-H6         |                      |                           |
|                     |                            | 6                  | Ericsson             | RRUS 11                 |                      |                           |
|                     |                            | 6                  | Ericsson             | RRUS 32                 |                      |                           |
|                     |                            | 6                  | Ericsson             | RRUS 32 B2              |                      |                           |
|                     |                            | 6                  | Ericsson             | RRUS 32 B66             |                      |                           |
|                     |                            | 3                  | Ericsson             | RRUS 4478 B14           |                      |                           |
|                     |                            | 6                  | Ericsson             | RRUS-11                 |                      |                           |
|                     |                            | 3                  | Raycap               | DC6-48-60-18-8C         |                      |                           |
|                     |                            | 3                  | Raycap               | DC6-48-60-18-8F         |                      |                           |
|                     |                            | 1                  | --                   | Sector Mount [SM 502-3] |                      |                           |
| 174.0               | 174.0                      | 1                  | Andrew               | HSX6-59-P3A/B           | 1                    | EW52                      |

| Mounting Level (ft) | Center Line Elevation (ft) | Number of Antennas | Antenna Manufacturer | Antenna Model         | Number of Feed Lines | Feed Line Size (in) |
|---------------------|----------------------------|--------------------|----------------------|-----------------------|----------------------|---------------------|
|                     |                            | 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] |                      |                     |

### 3) ANALYSIS PROCEDURE

**Table 3 - Documents Provided**

| Document                            | Reference        | Source    |
|-------------------------------------|------------------|-----------|
| Tower Mapping                       | 5016030          | CCI Sites |
| Mount Analysis Report               | 9989311          | 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: 09/24/2021 | 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                | -52.981 | 99.127         | 53.4       | Pass        |
| T2          | 164.818 - 144.818 | Leg            | ROHN 2.5 STD | 59               | -50.427 | 75.218         | 67.0       | Pass        |
| T3          | 144.818 - 124.818 | Leg            | ROHN 2.5 STD | 115              | -46.789 | 61.326         | 76.3       | Pass        |

| Section No. | Elevation (ft)    | Component Type | Size            | Critical Element | P (K)   | SF*P_allow (K) | % Capacity | Pass / Fail |
|-------------|-------------------|----------------|-----------------|------------------|---------|----------------|------------|-------------|
| T4          | 124.818 - 104.818 | Leg            | ROHN 2.5 STD    | 150              | -48.536 | 61.326         | 79.1       | Pass        |
| T5          | 104.818 - 84.8177 | Leg            | ROHN 2.5 EH     | 183              | -50.476 | 79.978         | 63.1       | Pass        |
| T6          | 84.8177 - 64.8177 | Leg            | ROHN 2.5 EH     | 214              | -57.387 | 79.978         | 71.8       | Pass        |
| T7          | 64.8177 - 44.8177 | Leg            | ROHN 2.5 EH     | 249              | -74.734 | 79.978         | 93.4       | Pass        |
| T8          | 44.8177 - 24.8177 | Leg            | ROHN 2.5 EH     | 282              | -75.820 | 79.978         | 94.8       | Pass        |
| T9          | 24.8177 - 4.81771 | Leg            | ROHN 2.5 EH     | 314              | -67.420 | 79.978         | 84.3       | Pass        |
| T10         | 4.81771 - 0       | Leg            | ROHN 2.5 EH     | 346              | -51.576 | 104.279        | 49.5       | Pass        |
| T1          | 184.818 - 164.818 | Diagonal       | ROHN 1.5 x 11GA | 10               | -5.820  | 11.431         | 50.9       | Pass        |
| T2          | 164.818 - 144.818 | Diagonal       | ROHN 1.5 x 16GA | 109              | -3.949  | 6.519          | 60.6       | Pass        |
| T3          | 144.818 - 124.818 | Diagonal       | ROHN 1.5 x 16GA | 126              | -5.428  | 6.519          | 83.3       | Pass        |
| T4          | 124.818 - 104.818 | Diagonal       | ROHN 1.5 x 16GA | 176              | -3.739  | 6.519          | 57.4       | Pass        |
| T5          | 104.818 - 84.8177 | Diagonal       | ROHN 1.5 x 16GA | 190              | -3.417  | 6.519          | 52.4       | Pass        |
| T6          | 84.8177 - 64.8177 | Diagonal       | ROHN 1.5 x 16GA | 242              | -5.237  | 6.519          | 80.3       | Pass        |
| T7          | 64.8177 - 44.8177 | Diagonal       | ROHN 1.5 x 16GA | 278              | -3.724  | 6.519          | 57.1       | Pass        |
| T8          | 44.8177 - 24.8177 | Diagonal       | ROHN 1.5 x 16GA | 291              | -2.458  | 6.519          | 37.7       | Pass        |
| T9          | 24.8177 - 4.81771 | Diagonal       | ROHN 1.5 x 16GA | 330              | -3.574  | 6.519          | 54.8       | Pass        |
| T10         | 4.81771 - 0       | Horizontal     | L4x4x1/4        | 352              | -0.943  | 61.857         | 8.0        | Pass        |
| T1          | 184.818 - 164.818 | Top Girt       | ROHN 1.5 x 16GA | 4                | -0.082  | 7.401          | 1.1        | Pass        |
| T2          | 164.818 - 144.818 | Top Girt       | ROHN 1.5 x 16GA | 62               | -0.914  | 7.401          | 12.4       | Pass        |
| T3          | 144.818 - 124.818 | Top Girt       | ROHN 1.5 x 16GA | 120              | -0.839  | 7.401          | 11.3       | Pass        |
| T4          | 124.818 - 104.818 | Top Girt       | ROHN 1.5 x 16GA | 152              | -0.841  | 7.401          | 11.4       | Pass        |
| T5          | 104.818 - 84.8177 | Top Girt       | ROHN 1.5 x 16GA | 185              | -0.910  | 7.401          | 12.3       | Pass        |
| T6          | 84.8177 - 64.8177 | Top Girt       | ROHN 1.5 x 16GA | 217              | -1.011  | 7.401          | 13.7       | Pass        |
| T7          | 64.8177 - 44.8177 | Top Girt       | ROHN 1.5 x 16GA | 251              | -1.305  | 7.401          | 17.6       | Pass        |
| T8          | 44.8177 - 24.8177 | Top Girt       | ROHN 1.5 x 16GA | 284              | -1.313  | 7.401          | 17.7       | Pass        |
| T9          | 24.8177 - 4.81771 | Top Girt       | ROHN 1.5 x 16GA | 317              | -1.191  | 7.401          | 16.1       | Pass        |
| T10         | 4.81771 - 0       | Top Girt       | L4x4x1/4        | 349              | 10.113  | 65.999         | 15.3       | Pass        |
| T1          | 184.818 - 164.818 | Bottom Girt    | ROHN 1.5 x 16GA | 8                | -0.918  | 7.401          | 12.4       | Pass        |
| T2          | 164.818 - 144.818 | Bottom Girt    | ROHN 1.5 x 16GA | 65               | -0.914  | 7.401          | 12.4       | Pass        |
| T3          | 144.818 - 124.818 | Bottom Girt    | ROHN 1.5 x 16GA | 123              | -1.433  | 7.401          | 19.4       | Pass        |
| T4          | 124.818 - 104.818 | Bottom Girt    | ROHN 1.5 x 16GA | 155              | -0.841  | 7.401          | 11.4       | Pass        |
| T5          | 104.818 - 84.8177 | Bottom Girt    | ROHN 1.5 x 16GA | 189              | -1.179  | 7.401          | 15.9       | Pass        |
| T6          | 84.8177 - 64.8177 | Bottom Girt    | ROHN 1.5 x 16GA | 220              | -1.011  | 7.401          | 13.7       | Pass        |
| T7          | 64.8177 - 44.8177 | Bottom Girt    | ROHN 1.5 x 16GA | 254              | -1.305  | 7.401          | 17.6       | Pass        |
| T8          | 44.8177 - 24.8177 | Bottom Girt    | ROHN 1.5 x 16GA | 287              | -1.313  | 7.401          | 17.7       | Pass        |
| T9          | 24.8177 - 4.81771 | Bottom Girt    | ROHN 1.5 x 16GA | 320              | -1.191  | 7.401          | 16.1       | Pass        |
| T1          | 184.818 - 164.818 | Guy A@167.341  | 3/4             | 373              | 23.838  | 36.729         | 64.9       | Pass        |
| T4          | 124.818 - 104.818 | Guy A@124.203  | 5/8             | 381              | 14.796  | 26.712         | 55.4       | Pass        |
| T6          | 84.8177 - 64.8177 | Guy A@84.2031  | 9/16            | 387              | 16.207  | 22.050         | 73.5       | Pass        |
| T1          | 184.818 - 164.818 | Guy B@167.341  | 3/4             | 368              | 24.474  | 36.729         | 66.6       | Pass        |
| T4          | 124.818 - 104.818 | Guy B@124.203  | 5/8             | 380              | 15.166  | 26.712         | 56.8       | Pass        |
| T6          | 84.8177 - 64.8177 | Guy B@84.2031  | 9/16            | 386              | 16.436  | 22.050         | 74.5       | Pass        |
| T1          | 184.818 - 164.818 | Guy C@167.341  | 3/4             | 362              | 21.856  | 36.729         | 59.5       | Pass        |
| T4          | 124.818 - 104.818 | Guy C@124.203  | 5/8             | 376              | 13.661  | 26.712         | 51.1       | Pass        |

| Section No. | Elevation (ft)    | Component Type           | Size          | Critical Element | P (K)  | SF*P_allow (K)        | % Capacity | Pass / Fail |
|-------------|-------------------|--------------------------|---------------|------------------|--------|-----------------------|------------|-------------|
| T6          | 84.8177 - 64.8177 | Guy C@84.2031            | 9/16          | 382              | 15.438 | 22.050                | 70.0       | Pass        |
| T1          | 184.818 - 164.818 | Top Guy Pull-Off@167.341 | 2L2x2x1/4x3/8 | 367              | 12.417 | 51.556                | 24.1       | Pass        |
| T4          | 124.818 - 104.818 | Top Guy Pull-Off@124.203 | 4 1/2x3/8     | 377              | 4.930  | 57.409                | 8.6        | Pass        |
| T6          | 84.8177 - 64.8177 | Top Guy Pull-Off@84.2031 | 4 1/2x3/8     | 383              | 6.444  | 57.409                | 11.2       | Pass        |
| T1          | 184.818 - 164.818 | Torque Arm Top@167.341   | C15x33.9      | 370              | -5.446 | 306.341               | 45.8       | Pass        |
|             |                   |                          |               |                  |        |                       | Summary    |             |
|             |                   |                          |               |                  |        | Leg (T8)              | 94.8       | Pass        |
|             |                   |                          |               |                  |        | Diagonal (T3)         | 83.3       | Pass        |
|             |                   |                          |               |                  |        | Horizontal (T10)      | 8.0        | Pass        |
|             |                   |                          |               |                  |        | Top Girt (T8)         | 17.7       | Pass        |
|             |                   |                          |               |                  |        | Bottom Girt (T3)      | 19.4       | Pass        |
|             |                   |                          |               |                  |        | Guy A (T6)            | 73.5       | Pass        |
|             |                   |                          |               |                  |        | Guy B (T6)            | 74.5       | Pass        |
|             |                   |                          |               |                  |        | Guy C (T6)            | 70.0       | Pass        |
|             |                   |                          |               |                  |        | Top Guy Pull-Off (T1) | 24.1       | Pass        |
|             |                   |                          |               |                  |        | Torque Arm Top (T1)   | 45.8       | Pass        |
|             |                   |                          |               |                  |        | Bolt Checks           | 83.3       | Pass        |
|             |                   |                          |               |                  |        | Rating =              | 94.8       | Pass        |

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

| Notes | Component                                | Elevation (ft) | % Capacity | Pass / Fail |
|-------|------------------------------------------|----------------|------------|-------------|
| 1,2   | Base Foundation (Structure)              | Base           | 43.9       | Pass        |
| 1,2   | Base Foundation (Soil Interaction)       | Base           | 33.8       | Pass        |
| 1,2   | Guy Anchor Shaft                         | Base           | 73.7       | Pass        |
| 1,2   | Guy Anchor Foundation (Structure)        | Base           | 22.7       | Pass        |
| 1,2   | Guy Anchor Foundation (Soil Interaction) | Base           | 26.0       | Pass        |

|                                                     |              |
|-----------------------------------------------------|--------------|
| <b>Structure Rating (max from all components) =</b> | <b>94.8%</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 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**

| <i><b>Elevation<br/>(ft)</b></i> | <i><b>Dish Model</b></i> | <i><b>Diameter<br/>(ft)</b></i> | <i><b>Tilt<br/>(°)</b></i> | <i><b>Twist<br/>(°)</b></i> |
|----------------------------------|--------------------------|---------------------------------|----------------------------|-----------------------------|
| 150.0                            | VHLPX3-11W               | 3.2833                          | 0.369                      | 1.078                       |

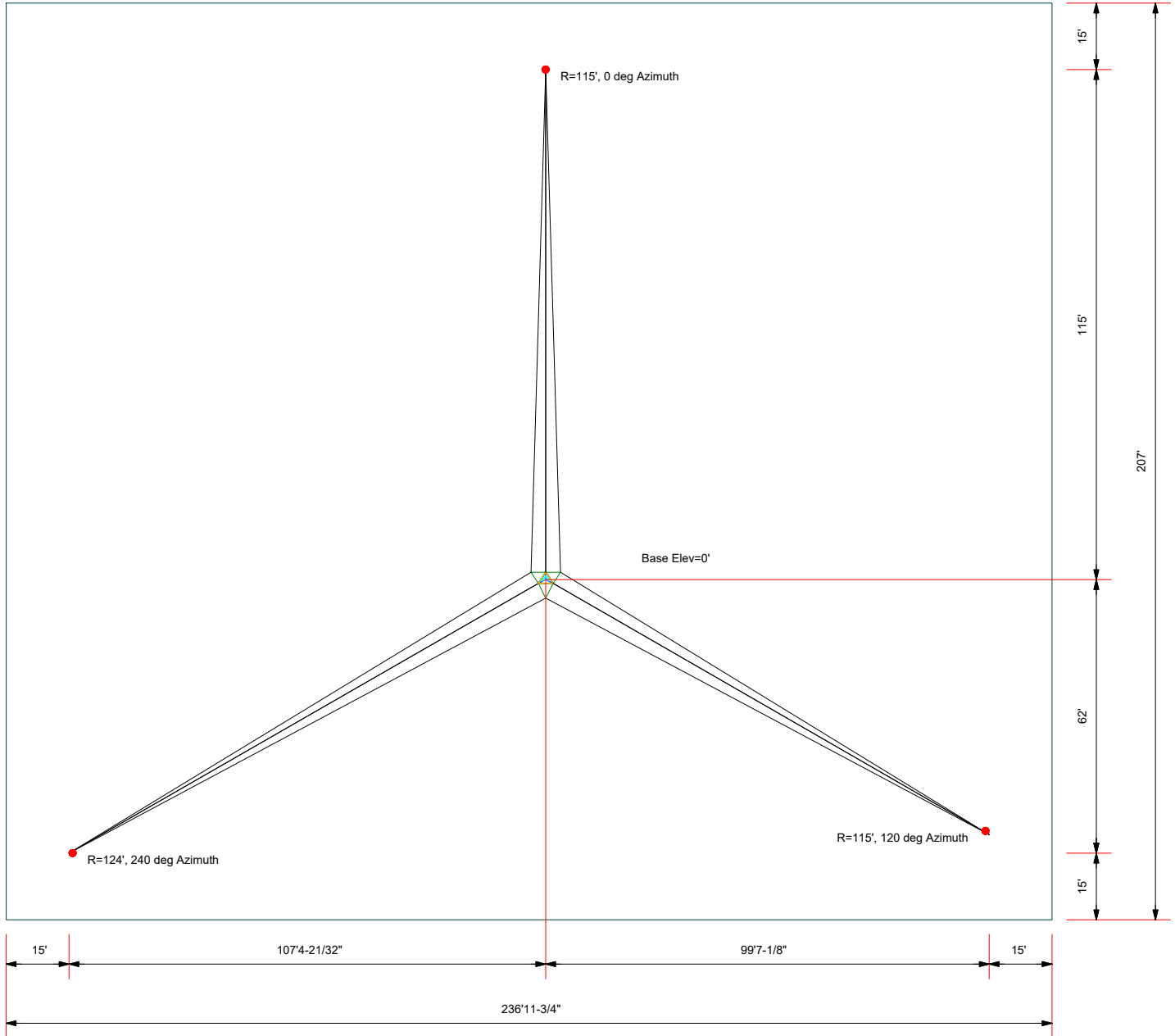
## **APPENDIX A**

### **TNXTOWER OUTPUT**



# Plot Plan

Total Area - 1.13 Acres

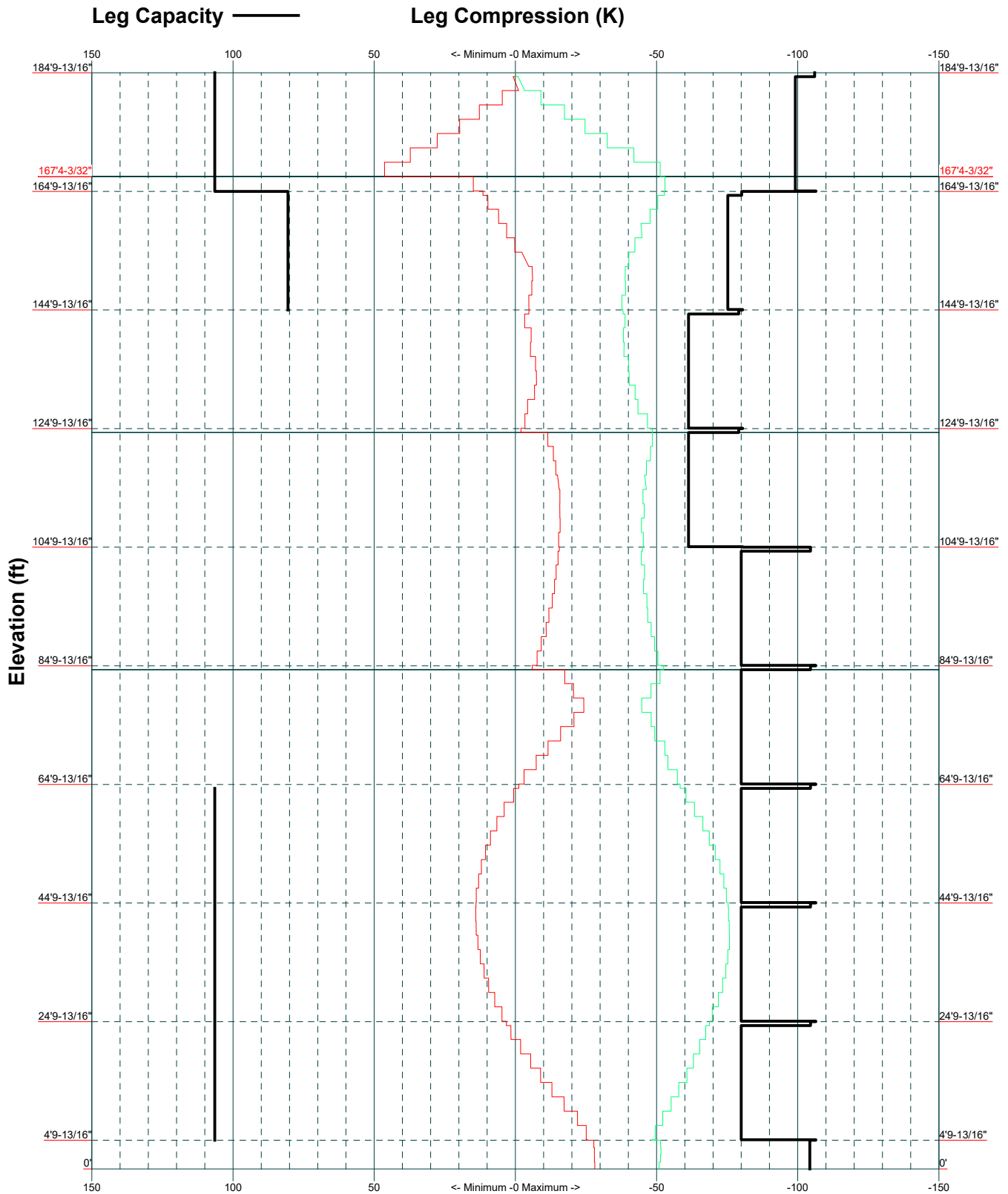


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|                                                          |                   |            |
|----------------------------------------------------------|-------------------|------------|
| Job: <b>100061.008.01 - FAIRGROUNDS, FL (BU# 846219)</b> |                   |            |
| Project:                                                 |                   |            |
| Client: Crown Castle                                     | Drawn by: Vinayak | App'd:     |
| Code: TIA-222-H                                          | Date: 09/28/21    | Scale: NTS |
| Path:                                                    | Dwg No. E-2       |            |

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# TIA-222-H - 118 mph Exposure C



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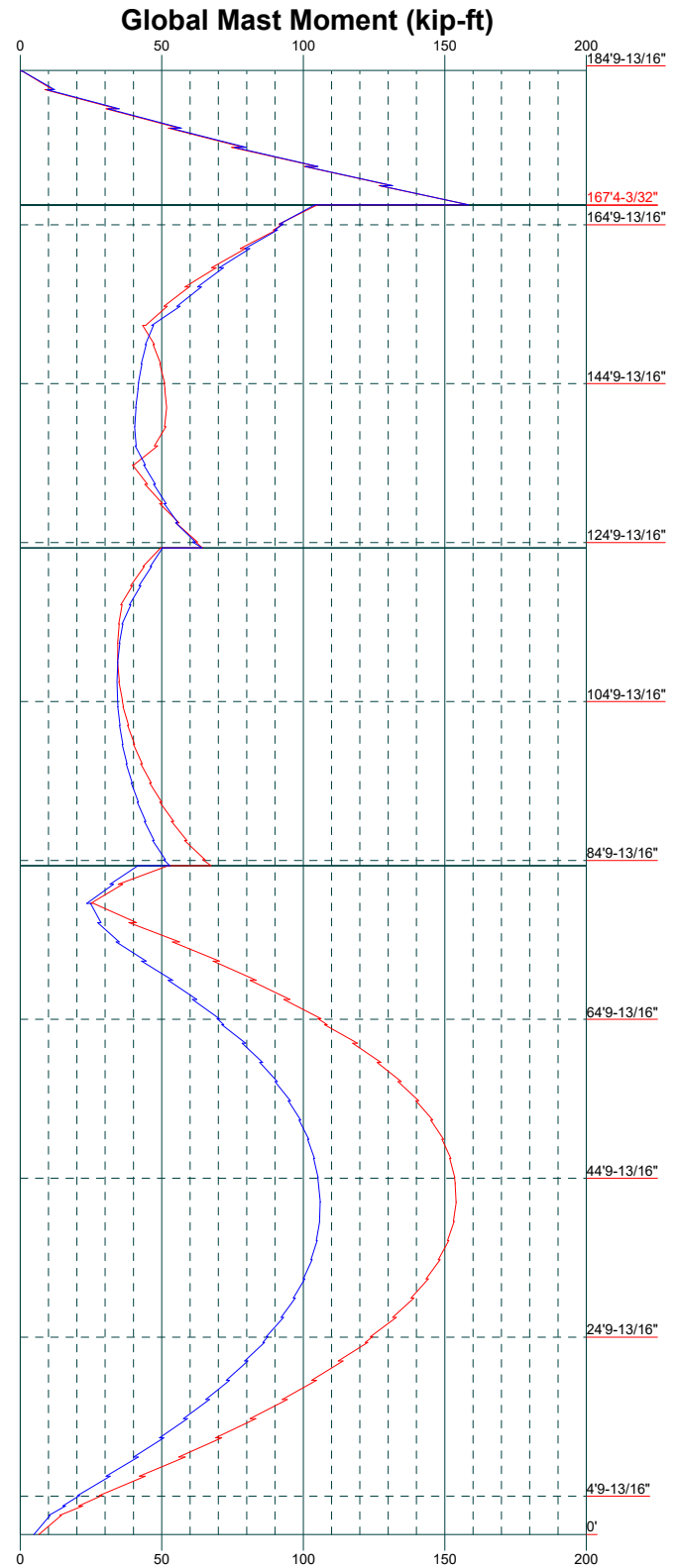
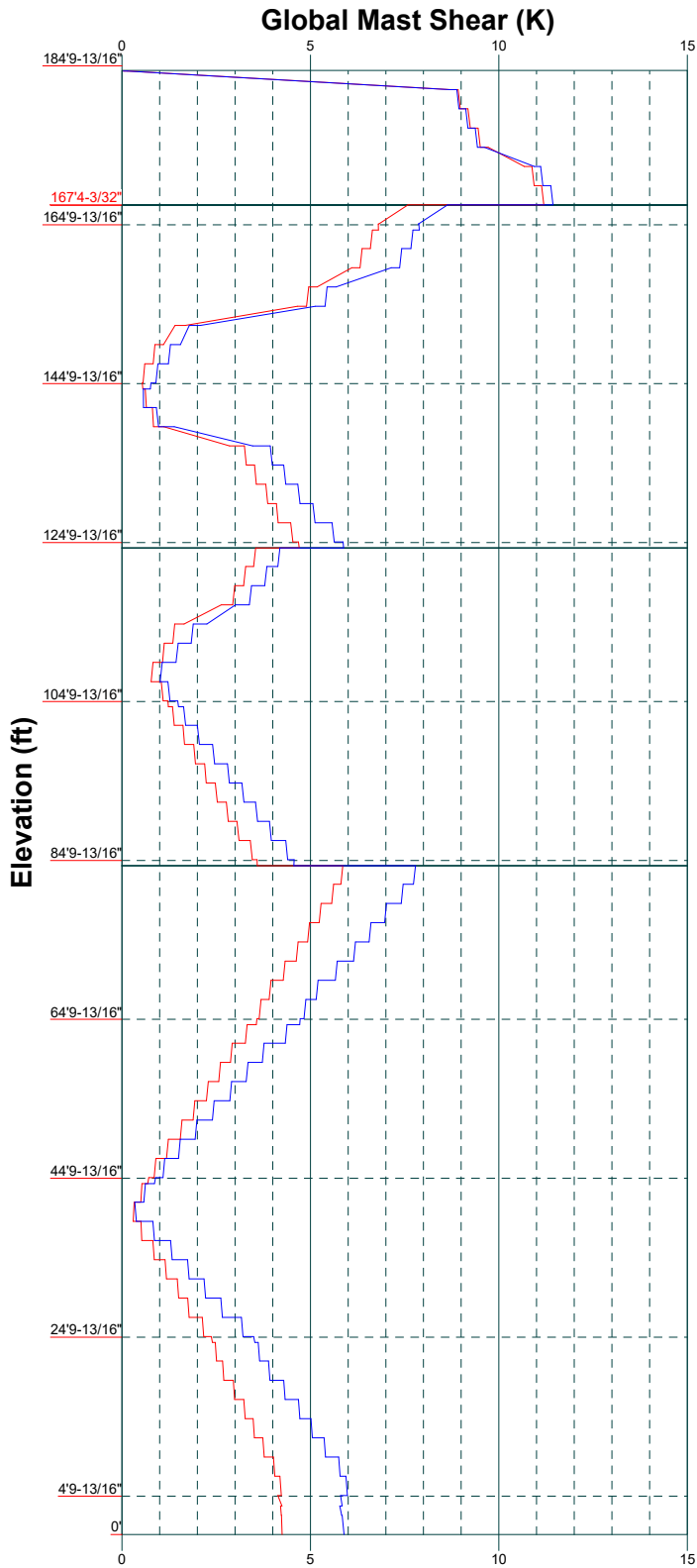
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|----------------------------------------------------------|-------------------|------------|
| Job: <b>100061.008.01 - FAIRGROUNDS, FL (BU# 846219)</b> |                   |            |
| Project:                                                 |                   |            |
| Client: Crown Castle                                     | Drawn by: Vinayak | App'd:     |
| Code: TIA-222-H                                          | Date: 09/28/21    | Scale: NTS |
| Path:                                                    | Dwg No. E-3       |            |

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# TIA-222-H - 118 mph Exposure C

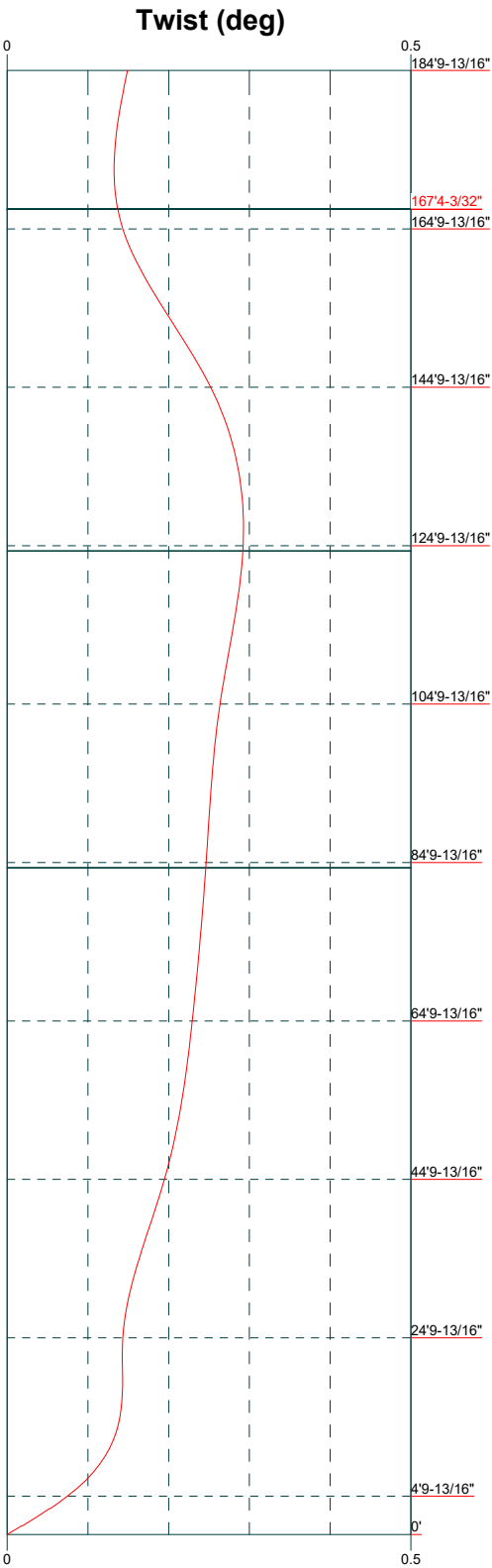
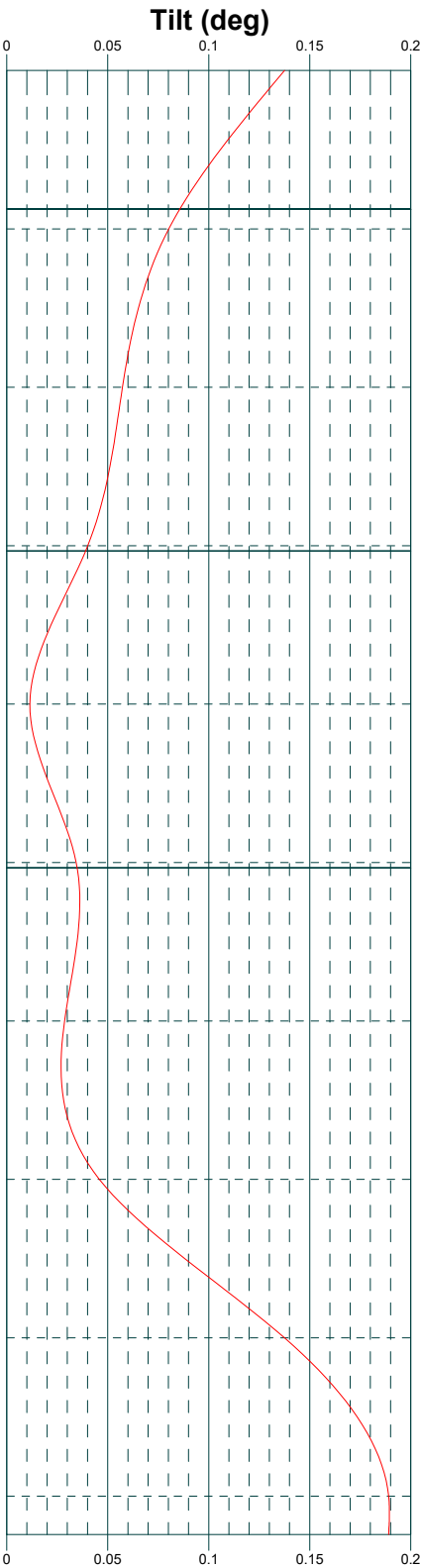
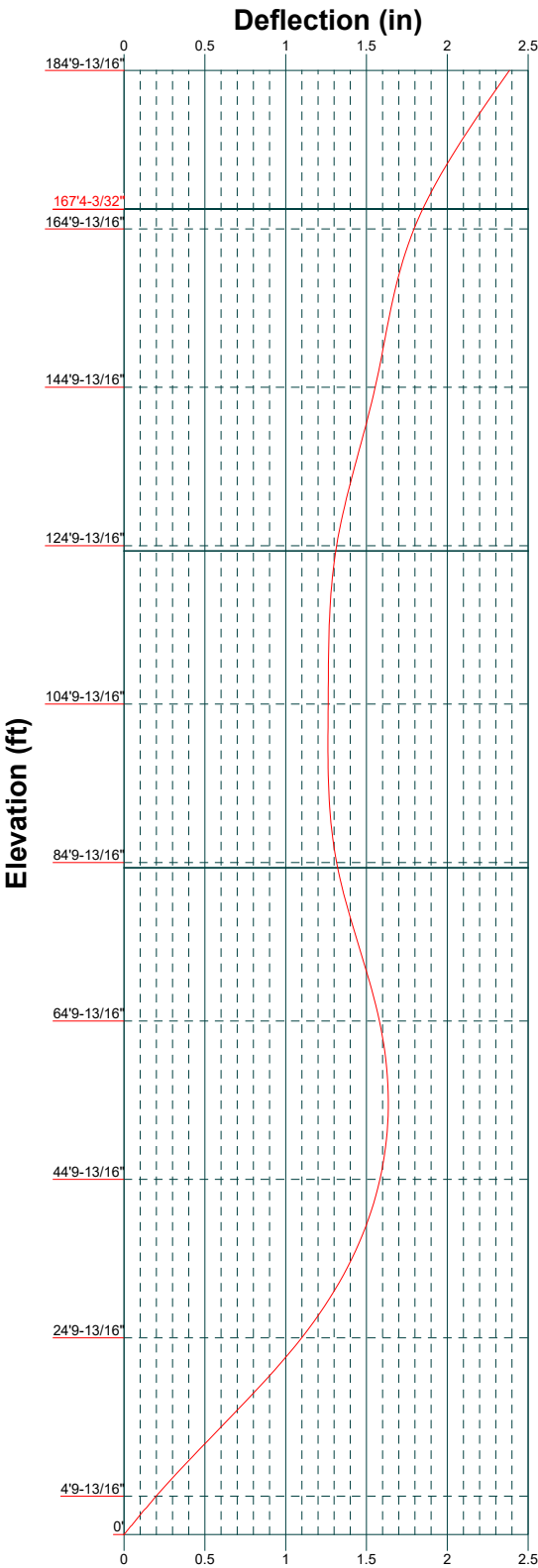
Vx Vz

Maximum Values  
Mx Mz



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Job: **100061.008.01 - FAIRGROUNDS, FL (BU# 846219)**  
 Project:  
 Client: Crown Castle  
 Code: TIA-222-H  
 Path:  
 Drawn by: Vinayak  
 Date: 09/28/21  
 App'd:  
 Scale: NTS  
 Dwg No. E-4



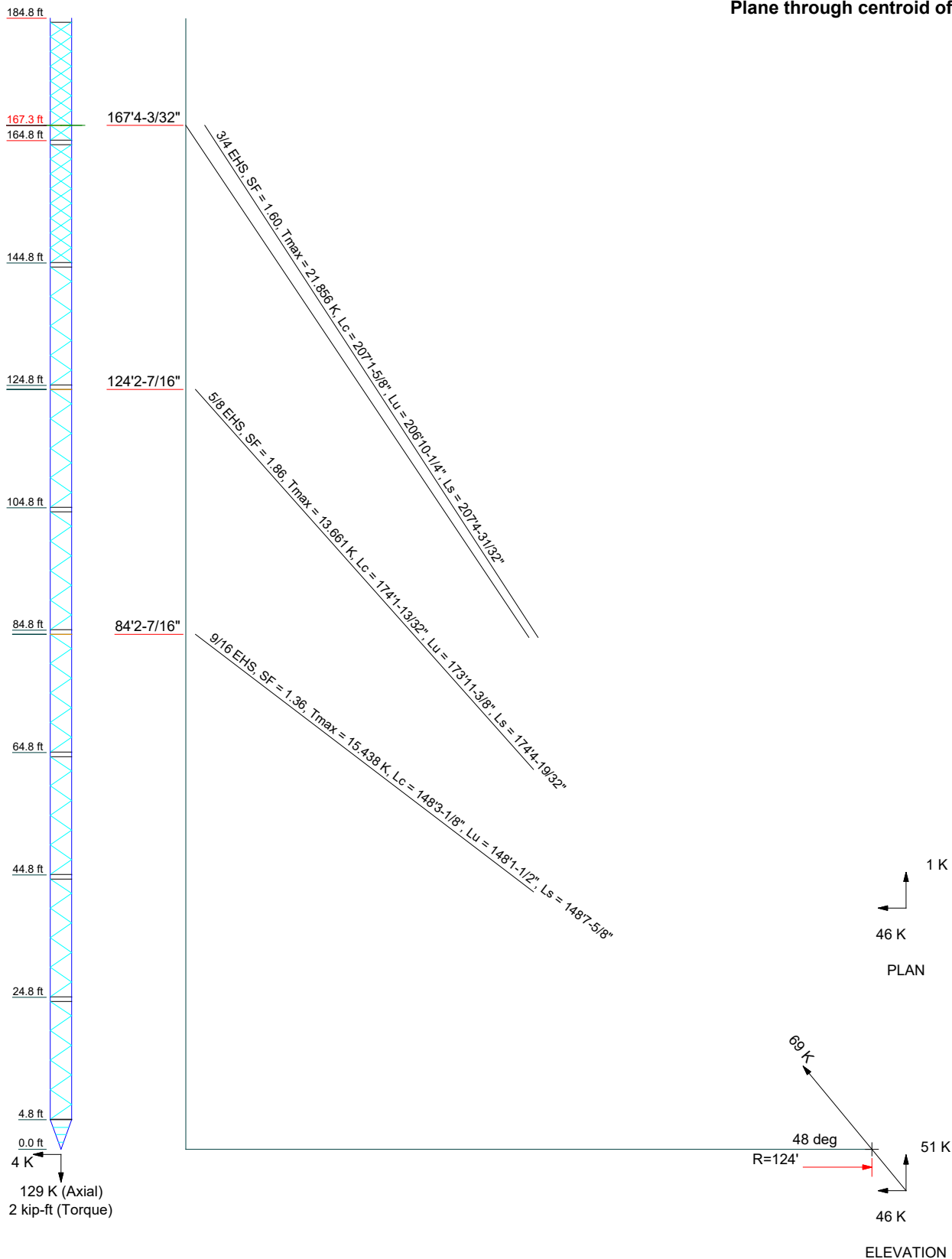
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|                                                          |                   |            |
|----------------------------------------------------------|-------------------|------------|
| Job: <b>100061.008.01 - FAIRGROUNDS, FL (BU# 846219)</b> |                   |            |
| Project:                                                 |                   |            |
| Client: Crown Castle                                     | Drawn by: Vinayak | App'd:     |
| Code: TIA-222-H                                          | Date: 09/28/21    | Scale: NTS |
| Path:                                                    | Dwg No. E-5       |            |

# 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



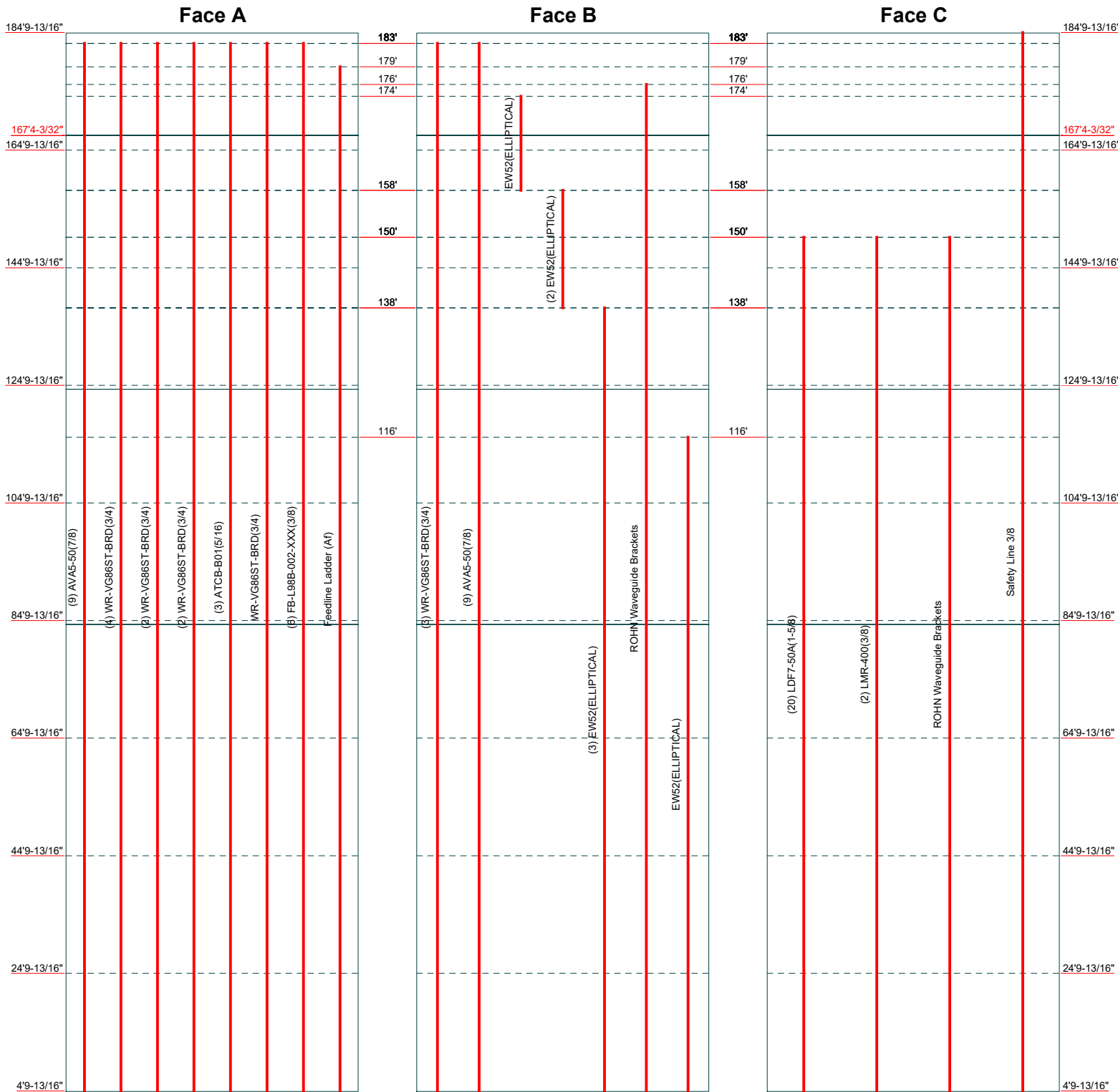
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Job: **100061.008.01 - FAIRGROUNDS, FL (BU# 846219)**  
Project:  
Client: Crown Castle  
Code: TIA-222-H  
Path:  
Drawn by: Vinayak  
Date: 09/28/21  
Scale: NTS  
Dwg No. E-6

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>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>100061.008.01 - FAIRGROUNDS, FL (BU# 846219) | <b>Page</b><br>1 of 51           |
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|                                                                                                                                          | <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.

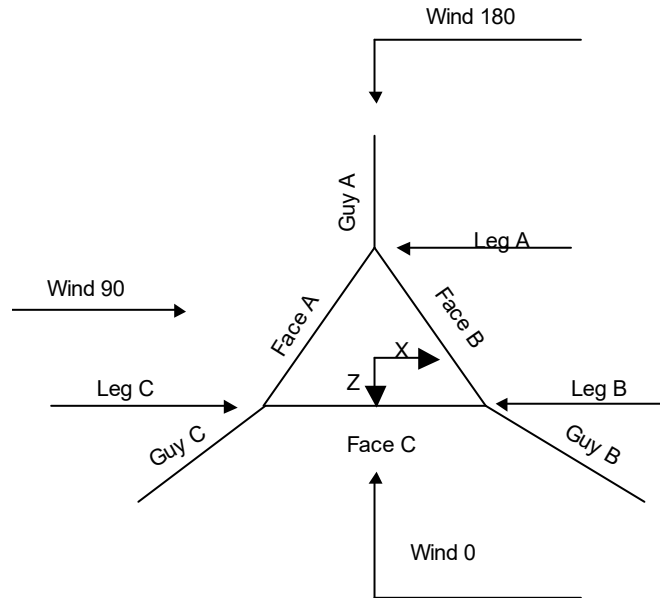
Load Modification Factors used:  $K_{cs}(F_w) = 0.95$ .

Maximum demand-capacity ratio is: 1.05.

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

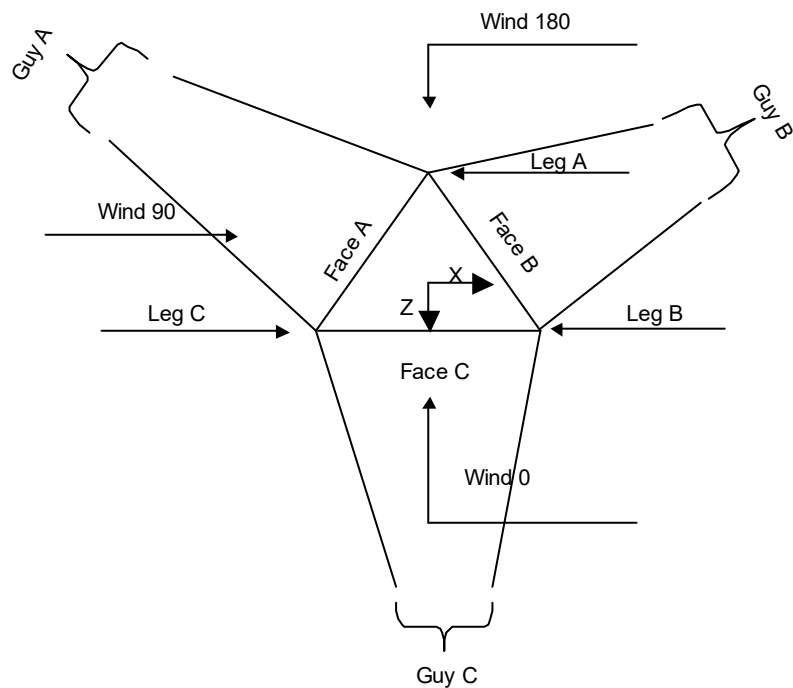
## Options

|                                     |                                      |                                         |
|-------------------------------------|--------------------------------------|-----------------------------------------|
| 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>100061.008.01 - FAIRGROUNDS, FL (BU# 846219) | <b>Page</b><br>3 of 51           |
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|                                                                                                                                          | <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>                                   | <b>Page</b>        |
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|                                                                                                                                          | <b>Client</b>                                | <b>Designed by</b> |
|                                                                                                                                          | Crown Castle                                 | 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>Client</b>                                | <b>Designed by</b> |
|                                                                                                                                          | Crown Castle                                 | Vinayak            |

| <i>Tower<br/>Elevation<br/>ft</i> | <i>Leg<br/>Type</i> | <i>Leg<br/>Size</i> | <i>Leg<br/>Grade</i> | <i>Diagonal<br/>Type</i> | <i>Diagonal<br/>Size</i> | <i>Diagonal<br/>Grade</i> |
|-----------------------------------|---------------------|---------------------|----------------------|--------------------------|--------------------------|---------------------------|
| 13/16"                            |                     |                     |                      |                          |                          |                           |
| T7<br>64'9-13/16"-44'9-<br>13/16" | Pipe                | ROHN 2.5 EH         | A572-50<br>(50 ksi)  | Pipe                     | ROHN 1.5 x 16GA          | A53-B-42<br>(42 ksi)      |
| T8<br>44'9-13/16"-24'9-<br>13/16" | Pipe                | ROHN 2.5 EH         | A572-50<br>(50 ksi)  | Pipe                     | ROHN 1.5 x 16GA          | A53-B-42<br>(42 ksi)      |
| T9<br>24'9-13/16"-4'9-1<br>3/16"  | 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)

| <i>Tower<br/>Elevation<br/>ft</i>   | <i>Top Girt<br/>Type</i> | <i>Top Girt<br/>Size</i> | <i>Top Girt<br/>Grade</i> | <i>Bottom Girt<br/>Type</i> | <i>Bottom Girt<br/>Size</i> | <i>Bottom Girt<br/>Grade</i> |
|-------------------------------------|--------------------------|--------------------------|---------------------------|-----------------------------|-----------------------------|------------------------------|
| T1<br>184'9-13/16"-164'<br>9-13/16" | Pipe                     | ROHN 1.5 x 16GA          | A53-B-42<br>(42 ksi)      | Pipe                        | ROHN 1.5 x 16GA             | A53-B-42<br>(42 ksi)         |
| T2<br>164'9-13/16"-144'<br>9-13/16" | Pipe                     | ROHN 1.5 x 16GA          | A53-B-42<br>(42 ksi)      | Pipe                        | ROHN 1.5 x 16GA             | A53-B-42<br>(42 ksi)         |
| T3<br>144'9-13/16"-124'<br>9-13/16" | Pipe                     | ROHN 1.5 x 16GA          | A53-B-42<br>(42 ksi)      | Pipe                        | ROHN 1.5 x 16GA             | A53-B-42<br>(42 ksi)         |
| T4<br>124'9-13/16"-104'<br>9-13/16" | Pipe                     | ROHN 1.5 x 16GA          | A53-B-42<br>(42 ksi)      | Pipe                        | ROHN 1.5 x 16GA             | A53-B-42<br>(42 ksi)         |
| T5<br>104'9-13/16"-84'9<br>-13/16"  | Pipe                     | ROHN 1.5 x 16GA          | A53-B-42<br>(42 ksi)      | Pipe                        | ROHN 1.5 x 16GA             | A53-B-42<br>(42 ksi)         |
| T6<br>84'9-13/16"-64'9-<br>13/16"   | Pipe                     | ROHN 1.5 x 16GA          | A53-B-42<br>(42 ksi)      | Pipe                        | ROHN 1.5 x 16GA             | A53-B-42<br>(42 ksi)         |
| T7<br>64'9-13/16"-44'9-<br>13/16"   | Pipe                     | ROHN 1.5 x 16GA          | A53-B-42<br>(42 ksi)      | Pipe                        | ROHN 1.5 x 16GA             | A53-B-42<br>(42 ksi)         |
| T8<br>44'9-13/16"-24'9-<br>13/16"   | Pipe                     | ROHN 1.5 x 16GA          | A53-B-42<br>(42 ksi)      | Pipe                        | ROHN 1.5 x 16GA             | A53-B-42<br>(42 ksi)         |
| T9<br>24'9-13/16"-4'9-1<br>3/16"    | 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)



|                                                                                                                                          |                                                            |                                  |
|------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|----------------------------------|
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|                                                                                                                                          | <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>100061.008.01 - FAIRGROUNDS, FL (BU# 846219) | <b>Page</b><br>8 of 51           |
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|                                                                                                                                          | <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 |

|                                                                                                                                          |                                                            |                                  |
|------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|----------------------------------|
| <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>100061.008.01 - FAIRGROUNDS, FL (BU# 846219) | <b>Page</b><br>9 of 51           |
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|                                                                                                                                          | <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>16:11:28 09/28/21 |
|                                                                                                                                          | <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   |

## 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 <sub>u</sub><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                | Corner        |                            |                              |                     |                     |                    |                 |
| 84.2031                | Corner        |                            |                              |                     |                     |                    |                 |

|                                                                                                                                          |                |                                              |                    |                   |
|------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------------------------------------|--------------------|-------------------|
| <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>     | 100061.008.01 - FAIRGROUNDS, FL (BU# 846219) | <b>Page</b>        | 11 of 51          |
|                                                                                                                                          | <b>Project</b> |                                              | <b>Date</b>        | 16:11:28 09/28/21 |
|                                                                                                                                          | <b>Client</b>  | Crown Castle                                 | <b>Designed by</b> | 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<br>ft | Guy<br>Location | Chord<br>Angle<br>° | Guy Tension<br>Top<br>Bottom<br>K | F <sub>x</sub><br>K | F <sub>y</sub><br>K | F <sub>z</sub><br>K | M <sub>x</sub><br>kip-ft | M <sub>y</sub><br>kip-ft | M <sub>z</sub><br>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                | A               | 47.697              | Sum:                              | <b>-0.451</b>       | 44.293              | <b>0.261</b>        | <b>-0.355</b>            | 0.000                    | <b>-0.615</b>            |
|                        |                 |                     | 4.341                             | 0.000               | 3.241               | -2.887              | -6.394                   | 0.000                    | 0.000                    |
|                        | B               | 47.697              | 4.240                             |                     |                     |                     |                          |                          |                          |
|                        |                 |                     | 4.341                             | 2.501               | 3.241               | 1.444               | 3.197                    | 0.000                    | -5.537                   |
|                        | C               | 45.506              | 4.240                             |                     |                     |                     |                          |                          |                          |
|                        |                 |                     | 4.341                             | -2.604              | 3.131               | 1.503               | 3.088                    | -0.000                   | 5.349                    |
|                        | A               | 36.685              | Sum:                              | <b>-0.103</b>       | 9.614               | <b>0.060</b>        | <b>-0.109</b>            | 0.000                    | <b>-0.188</b>            |
|                        |                 |                     | 3.556                             | 0.000               | 2.155               | -2.829              | -4.251                   | 0.000                    | 0.000                    |
|                        | B               | 36.685              | 3.500                             |                     |                     |                     |                          |                          |                          |
|                        |                 |                     | 3.556                             | 2.450               | 2.155               | 1.415               | 2.126                    | 0.000                    | -3.682                   |
|                        | C               | 34.607              | 3.500                             |                     |                     |                     |                          |                          |                          |
|                        |                 |                     | 3.556                             | -2.515              | 2.053               | 1.452               | 2.025                    | -0.000                   | 3.508                    |
| 84.2031                |                 |                     | Sum:                              | <b>-0.065</b>       | 6.364               | <b>0.037</b>        | <b>-0.100</b>            | 0.000                    | <b>-0.173</b>            |
|                        |                 |                     | 3.500                             |                     |                     |                     |                          |                          |                          |

## 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<br>8.745           | -0.150         | 7.442          | -4.948         | -14.681        | 17.200         | -25.428        |
|               | A            | 55.952      | 8.938<br>8.745           | 0.150          | 7.442          | -4.948         | -14.681        | -17.200        | 25.428         |
|               | B            | 55.952      | 8.938<br>8.745           | 4.360          | 7.442          | 2.344          | 29.361         | 17.200         | 0.000          |
|               | B            | 55.952      | 8.938<br>8.745           | 4.210          | 7.442          | 2.603          | -14.681        | -17.200        | -25.428        |
|               | C            | 53.889      | 8.938<br>8.745           | -4.438         | 7.262          | 2.730          | -14.326        | 18.083         | 24.813         |
|               | C            | 53.889      | 8.938<br>8.745           | -4.583         | 7.262          | 2.478          | 28.651         | -18.083        | 0.000          |
| 124.203       |              |             | Sum:                     | -0.451         | 44.293         | 0.261          | -0.355         | 0.000          | -0.615         |
|               | A            | 47.697      | 4.341<br>4.240           | 0.000          | 3.241          | -2.887         | -6.394         | 0.000          | 0.000          |
|               | B            | 47.697      | 4.341<br>4.240           | 2.501          | 3.241          | 1.444          | 3.197          | 0.000          | -5.537         |
|               | C            | 45.506      | 4.341<br>4.240           | -2.604         | 3.131          | 1.503          | 3.088          | -0.000         | 5.349          |
|               |              |             | Sum:                     | -0.103         | 9.614          | 0.060          | -0.109         | 0.000          | -0.188         |
|               | A            | 36.685      | 3.556<br>3.500           | 0.000          | 2.155          | -2.829         | -4.251         | 0.000          | 0.000          |
| 84.2031       | B            | 36.685      | 3.556<br>3.500           | 2.450          | 2.155          | 1.415          | 2.126          | 0.000          | -3.682         |
|               | C            | 34.607      | 3.556<br>3.500           | -2.515         | 2.053          | 1.452          | 2.025          | -0.000         | 3.508          |
|               |              |             | Sum:                     | -0.065         | 6.364          | 0.037          | -0.100         | 0.000          | -0.173         |

## Guy-Tensioning Information

| Temperature At Time Of Tensioning |         |         |                         |                 |                         |                 |                         |                 |                         |                 |                         |                 |                         |                 |                         |                 |      |
|-----------------------------------|---------|---------|-------------------------|-----------------|-------------------------|-----------------|-------------------------|-----------------|-------------------------|-----------------|-------------------------|-----------------|-------------------------|-----------------|-------------------------|-----------------|------|
| Guy<br>Elevation<br>ft            | H<br>ft | V<br>ft | 0 F                     |                 | 20 F                    |                 | 40 F                    |                 | 60 F                    |                 | 80 F                    |                 | 100 F                   |                 | 120 F                   |                 |      |
|                                   |         |         | Initial<br>Tension<br>K | Intercept<br>ft | Initial<br>Tension<br>K | Intercept<br>ft | Initial<br>Tension<br>K | Intercept<br>ft | Initial<br>Tension<br>K | Intercept<br>ft | Initial<br>Tension<br>K | Intercept<br>ft | Initial<br>Tension<br>K | Intercept<br>ft | Initial<br>Tension<br>K | Intercept<br>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 ft | Face Offset in | Lateral Offset (Frac FW) | # | # Per Row | Clear Spacing in | Width or Diameter in | Perimeter in | Weight 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>100061.008.01 - FAIRGROUNDS, FL (BU# 846219) | <b>Page</b><br>14 of 51          |
|                                                                                                                                          | <b>Project</b>                                             | <b>Date</b><br>16:11:28 09/28/21 |
|                                                                                                                                          | <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 |
|--------------------------------------|-------------------|-----------------|------------------------------------------|-------------------|-------------------|----------------------|--------------------------------|----|-----------------|------------------------|----------------------------|-----------------|---------------|
| **Face A*                            |                   |                 |                                          |                   |                   |                      |                                |    |                 |                        |                            |                 |               |
| *                                    |                   |                 |                                          |                   |                   |                      |                                |    |                 |                        |                            |                 |               |
| AVA5-50(7/8)                         | A                 | No              | No                                       | Ar (CaAa)         | 183' - 0'         | 0.000                | 0.15                           | 9  | 5               | 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         |
| *                                    |                   |                 |                                          |                   |                   |                      |                                |    |                 |                        |                            |                 |               |
| 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         |
| **Face B**                           |                   |                 |                                          |                   |                   |                      |                                |    |                 |                        |                            |                 |               |
| *                                    |                   |                 |                                          |                   |                   |                      |                                |    |                 |                        |                            |                 |               |
| AVA5-50(7/8)                         | B                 | No              | No                                       | Ar (CaAa)         | 183' - 0'         | 0.000                | 0.25                           | 9  | 3               | 0.500                  | 1.102                      |                 | 0.000         |
| *                                    |                   |                 |                                          |                   |                   |                      |                                |    |                 |                        |                            |                 |               |
| EW52(ELLIP TICAL)                    | B                 | No              | No                                       | Ar (CaAa)         | 174' - 158'       | 0.000                | 0                              | 1  | 1               | 1.000<br>0.750         | 2.250                      |                 | 0.001         |
| EW52(ELLIP TICAL)                    | B                 | No              | No                                       | Ar (CaAa)         | 158' - 138'       | 0.000                | 0                              | 2  | 2               | 1.000<br>0.750         | 2.250                      |                 | 0.001         |
| EW52(ELLIP TICAL)                    | B                 | No              | No                                       | Ar (CaAa)         | 138' - 0'         | 0.000                | 0                              | 3  | 3               | 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         |
| *                                    |                   |                 |                                          |                   |                   |                      |                                |    |                 |                        |                            |                 |               |
| EW52(ELLIP TICAL)                    | B                 | No              | No                                       | Ar (CaAa)         | 116' - 0'         | 0.000                | 0.39                           | 1  | 1               | 1.000<br>0.750         | 2.250                      |                 | 0.001         |
| **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 Waveguide Brackets | C                 | No              | No                                       | Ar (CaAa)         | 150' - 0'         | 4.500                | 0.27                           | 2  | 2               | 0.500                  | 0.405                      |                 | 0.000         |
|                                      | C                 | No              | No                                       | Af (CaAa)         | 150' - 0'         | 0.000                | 0                              | 1  | 1               | 1.750                  | 1.750                      |                 | 0.001         |
| *                                    |                   |                 |                                          |                   |                   |                      |                                |    |                 |                        |                            |                 |               |
| 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>        |
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|                                                                                                                                          | <b>Client</b>                                | 16:11:28 09/28/21  |
|                                                                                                                                          | 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                             | 44.147                                                      | 0.000                                                        | 0.275       |
|                  |                               | B    | 0.000                             | 0.000                             | 27.697                                                      | 0.000                                                        | 0.101       |
|                  |                               | 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                             | 50.760                                                      | 0.000                                                        | 0.339       |
|                  |                               | B    | 0.000                             | 0.000                             | 37.905                                                      | 0.000                                                        | 0.134       |
|                  |                               | 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                             | 50.760                                                      | 0.000                                                        | 0.339       |
|                  |                               | B    | 0.000                             | 0.000                             | 42.405                                                      | 0.000                                                        | 0.146       |
|                  |                               | 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                             | 50.760                                                      | 0.000                                                        | 0.339       |
|                  |                               | B    | 0.000                             | 0.000                             | 46.455                                                      | 0.000                                                        | 0.156       |
|                  |                               | 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                             | 50.760                                                      | 0.000                                                        | 0.339       |
|                  |                               | B    | 0.000                             | 0.000                             | 48.439                                                      | 0.000                                                        | 0.162       |
|                  |                               | 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                             | 50.760                                                      | 0.000                                                        | 0.339       |
|                  |                               | B    | 0.000                             | 0.000                             | 48.439                                                      | 0.000                                                        | 0.162       |
|                  |                               | 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                             | 50.760                                                      | 0.000                                                        | 0.339       |
|                  |                               | B    | 0.000                             | 0.000                             | 48.439                                                      | 0.000                                                        | 0.162       |
|                  |                               | 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                             | 50.760                                                      | 0.000                                                        | 0.339       |
|                  |                               | B    | 0.000                             | 0.000                             | 48.439                                                      | 0.000                                                        | 0.162       |
|                  |                               | 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                             | 50.760                                                      | 0.000                                                        | 0.339       |
|                  |                               | B    | 0.000                             | 0.000                             | 48.439                                                      | 0.000                                                        | 0.162       |
|                  |                               | C    | 0.000                             | 0.000                             | 87.403                                                      | 0.000                                                        | 0.360       |
| T10              | 4'9-13/16"-0'                 | A    | 0.000                             | 0.000                             | 12.227                                                      | 0.000                                                        | 0.082       |
|                  |                               | B    | 0.000                             | 0.000                             | 11.668                                                      | 0.000                                                        | 0.039       |
|                  |                               | 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" | -1.140                | -3.784                | -1.140                       | -3.784                       |

|                                                                                                                                          |                                              |                    |
|------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|--------------------|
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|                                                                                                                                          | <b>Project</b>                               | <b>Date</b>        |
|                                                                                                                                          | <b>Client</b>                                | <b>Designed by</b> |
|                                                                                                                                          | Crown Castle                                 | 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" | -0.607          | -3.541          | -0.607          | -3.541          |
| T3      | 144'9-13/16"-124'9-1<br>3/16" | -0.365          | -2.190          | -0.365          | -2.190          |
| T4      | 124'9-13/16"-104'9-1<br>3/16" | -0.030          | -2.002          | -0.030          | -2.002          |
| T5      | 104'9-13/16"-84'9-13<br>/16"  | 0.189           | -1.920          | 0.189           | -1.920          |
| T6      | 84'9-13/16"-64'9-13/<br>16"   | 0.183           | -1.850          | 0.183           | -1.850          |
| T7      | 64'9-13/16"-44'9-13/<br>16"   | 0.189           | -1.920          | 0.189           | -1.920          |
| T8      | 44'9-13/16"-24'9-13/<br>16"   | 0.189           | -1.920          | 0.189           | -1.920          |
| T9      | 24'9-13/16"-4'9-13/1<br>6"    | 0.189           | -1.920          | 0.189           | -1.920          |
| T10     | 4'9-13/16"-0'                 | -0.013          | -1.687          | -0.013          | -1.687          |

## 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               | 4                       | AVA5-50(7/8)            | 164.82 -<br>183.00         | 0.6000                   | 0.6000                |
| T1               | 5                       | WR-VG86ST-BRD(3/4)      | 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                       | ATCB-B01(5/16)          | 164.82 -<br>183.00         | 0.6000                   | 0.6000                |
| T1               | 9                       | WR-VG86ST-BRD(3/4)      | 164.82 -<br>183.00         | 0.6000                   | 0.6000                |
| T1               | 10                      | FB-L98B-002-XXX(3/8)    | 164.82 -<br>183.00         | 0.6000                   | 0.6000                |
| T1               | 11                      | Feedline Ladder (Af)    | 164.82 -<br>179.00         | 0.6000                   | 0.6000                |
| T1               | 13                      | WR-VG86ST-BRD(3/4)      | 164.82 -<br>183.00         | 0.6000                   | 0.6000                |
| T1               | 17                      | AVA5-50(7/8)            | 164.82 -<br>183.00         | 0.6000                   | 0.6000                |
| T1               | 19                      | EW52(ELLIPTICAL)        | 164.82 -<br>174.00         | 0.6000                   | 0.6000                |
| T1               | 22                      | ROHN Waveguide Brackets | 164.82 -<br>176.00         | 0.6000                   | 0.6000                |
| T1               | 32                      | Safety Line 3/8         | 164.82 -<br>184.82         | 0.6000                   | 0.6000                |
| T2               | 4                       | AVA5-50(7/8)            | 144.82 -<br>164.82         | 0.6000                   | 0.6000                |
| T2               | 5                       | WR-VG86ST-BRD(3/4)      | 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 -                   | 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            |

| <i>Tower<br/>Section</i> | <i>Feed Line<br/>Record No.</i> | <i>Description</i>      | <i>Feed Line<br/>Segment Elev.</i> | <i>K<sub>o</sub><br/>No Ice</i> | <i>K<sub>o</sub><br/>Ice</i> |
|--------------------------|---------------------------------|-------------------------|------------------------------------|---------------------------------|------------------------------|
| T2                       | 8                               | ATCB-B01(5/16)          | 164.82<br>144.82 -<br>164.82       | 0.6000                          | 0.6000                       |
| T2                       | 9                               | WR-VG86ST-BRD(3/4)      | 144.82 -<br>164.82                 | 0.6000                          | 0.6000                       |
| T2                       | 10                              | FB-L98B-002-XXX(3/8)    | 144.82 -<br>164.82                 | 0.6000                          | 0.6000                       |
| T2                       | 11                              | Feedline Ladder (Af)    | 144.82 -<br>164.82                 | 0.6000                          | 0.6000                       |
| T2                       | 13                              | WR-VG86ST-BRD(3/4)      | 144.82 -<br>164.82                 | 0.6000                          | 0.6000                       |
| T2                       | 17                              | AVA5-50(7/8)            | 144.82 -<br>164.82                 | 0.6000                          | 0.6000                       |
| T2                       | 19                              | EW52(ELLIPTICAL)        | 158.00 -<br>164.82                 | 0.6000                          | 0.6000                       |
| T2                       | 20                              | EW52(ELLIPTICAL)        | 144.82 -<br>158.00                 | 0.6000                          | 0.6000                       |
| T2                       | 22                              | ROHN Waveguide Brackets | 144.82 -<br>164.82                 | 0.6000                          | 0.6000                       |
| T2                       | 28                              | LDF7-50A(1-5/8)         | 144.82 -<br>150.00                 | 0.6000                          | 0.6000                       |
| T2                       | 29                              | LMR-400(3/8)            | 144.82 -<br>150.00                 | 0.6000                          | 0.6000                       |
| T2                       | 30                              | ROHN Waveguide Brackets | 144.82 -<br>150.00                 | 0.6000                          | 0.6000                       |
| T2                       | 32                              | Safety Line 3/8         | 144.82 -<br>164.82                 | 0.6000                          | 0.6000                       |
| T3                       | 4                               | AVA5-50(7/8)            | 124.82 -<br>144.82                 | 0.6000                          | 0.6000                       |
| T3                       | 5                               | WR-VG86ST-BRD(3/4)      | 124.82 -<br>144.82                 | 0.6000                          | 0.6000                       |
| T3                       | 6                               | WR-VG86ST-BRD(3/4)      | 124.82 -<br>144.82                 | 0.6000                          | 0.6000                       |
| T3                       | 7                               | WR-VG86ST-BRD(3/4)      | 124.82 -<br>144.82                 | 0.6000                          | 0.6000                       |
| T3                       | 8                               | ATCB-B01(5/16)          | 124.82 -<br>144.82                 | 0.6000                          | 0.6000                       |
| T3                       | 9                               | WR-VG86ST-BRD(3/4)      | 124.82 -<br>144.82                 | 0.6000                          | 0.6000                       |
| T3                       | 10                              | FB-L98B-002-XXX(3/8)    | 124.82 -<br>144.82                 | 0.6000                          | 0.6000                       |
| T3                       | 11                              | Feedline Ladder (Af)    | 124.82 -<br>144.82                 | 0.6000                          | 0.6000                       |
| T3                       | 13                              | WR-VG86ST-BRD(3/4)      | 124.82 -<br>144.82                 | 0.6000                          | 0.6000                       |
| T3                       | 17                              | AVA5-50(7/8)            | 124.82 -<br>144.82                 | 0.6000                          | 0.6000                       |
| T3                       | 20                              | EW52(ELLIPTICAL)        | 138.00 -<br>144.82                 | 0.6000                          | 0.6000                       |
| T3                       | 21                              | EW52(ELLIPTICAL)        | 124.82 -<br>138.00                 | 0.6000                          | 0.6000                       |
| T3                       | 22                              | ROHN Waveguide Brackets | 124.82 -<br>144.82                 | 0.6000                          | 0.6000                       |
| T3                       | 28                              | LDF7-50A(1-5/8)         | 124.82 -<br>144.82                 | 0.6000                          | 0.6000                       |
| T3                       | 29                              | LMR-400(3/8)            | 124.82 -<br>144.82                 | 0.6000                          | 0.6000                       |
| T3                       | 30                              | ROHN Waveguide Brackets | 124.82 -<br>144.82                 | 0.6000                          | 0.6000                       |
| T3                       | 32                              | Safety Line 3/8         | 124.82 -<br>144.82                 | 0.6000                          | 0.6000                       |
| T4                       | 4                               | AVA5-50(7/8)            | 104.82 -                           | 0.6000                          | 0.6000                       |

|                                                                                                                                          |                                              |                    |
|------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|--------------------|
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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 |
|---------------|----------------------|-------------------------|-------------------------|-----------------------|--------------------|
| T4            | 5                    | WR-VG86ST-BRD(3/4)      | 124.82                  | 0.6000                | 0.6000             |
| T4            | 6                    | WR-VG86ST-BRD(3/4)      | 104.82 - 124.82         | 0.6000                | 0.6000             |
| T4            | 7                    | WR-VG86ST-BRD(3/4)      | 104.82 - 124.82         | 0.6000                | 0.6000             |
| T4            | 8                    | ATCB-B01(5/16)          | 104.82 - 124.82         | 0.6000                | 0.6000             |
| T4            | 9                    | WR-VG86ST-BRD(3/4)      | 104.82 - 124.82         | 0.6000                | 0.6000             |
| T4            | 10                   | FB-L98B-002-XXX(3/8)    | 104.82 - 124.82         | 0.6000                | 0.6000             |
| T4            | 11                   | Feedline Ladder (Af)    | 104.82 - 124.82         | 0.6000                | 0.6000             |
| T4            | 13                   | WR-VG86ST-BRD(3/4)      | 104.82 - 124.82         | 0.6000                | 0.6000             |
| T4            | 17                   | AVA5-50(7/8)            | 104.82 - 124.82         | 0.6000                | 0.6000             |
| T4            | 21                   | EW52(ELLIPTICAL)        | 104.82 - 124.82         | 0.6000                | 0.6000             |
| T4            | 22                   | ROHN Waveguide Brackets | 104.82 - 124.82         | 0.6000                | 0.6000             |
| T4            | 24                   | EW52(ELLIPTICAL)        | 104.82 - 116.00         | 0.6000                | 0.6000             |
| T4            | 28                   | LDF7-50A(1-5/8)         | 104.82 - 124.82         | 0.6000                | 0.6000             |
| T4            | 29                   | LMR-400(3/8)            | 104.82 - 124.82         | 0.6000                | 0.6000             |
| T4            | 30                   | ROHN Waveguide Brackets | 104.82 - 124.82         | 0.6000                | 0.6000             |
| T4            | 32                   | Safety Line 3/8         | 104.82 - 124.82         | 0.6000                | 0.6000             |
| T5            | 4                    | AVA5-50(7/8)            | 84.82 - 104.82          | 0.6000                | 0.6000             |
| T5            | 5                    | WR-VG86ST-BRD(3/4)      | 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                    | ATCB-B01(5/16)          | 84.82 - 104.82          | 0.6000                | 0.6000             |
| T5            | 9                    | WR-VG86ST-BRD(3/4)      | 84.82 - 104.82          | 0.6000                | 0.6000             |
| T5            | 10                   | FB-L98B-002-XXX(3/8)    | 84.82 - 104.82          | 0.6000                | 0.6000             |
| T5            | 11                   | Feedline Ladder (Af)    | 84.82 - 104.82          | 0.6000                | 0.6000             |
| T5            | 13                   | WR-VG86ST-BRD(3/4)      | 84.82 - 104.82          | 0.6000                | 0.6000             |
| T5            | 17                   | AVA5-50(7/8)            | 84.82 - 104.82          | 0.6000                | 0.6000             |
| T5            | 21                   | EW52(ELLIPTICAL)        | 84.82 - 104.82          | 0.6000                | 0.6000             |
| T5            | 22                   | ROHN Waveguide Brackets | 84.82 - 104.82          | 0.6000                | 0.6000             |
| T5            | 24                   | EW52(ELLIPTICAL)        | 84.82 - 104.82          | 0.6000                | 0.6000             |
| T5            | 28                   | LDF7-50A(1-5/8)         | 84.82 - 104.82          | 0.6000                | 0.6000             |
| T5            | 29                   | LMR-400(3/8)            | 84.82 - 104.82          | 0.6000                | 0.6000             |
| T5            | 30                   | ROHN Waveguide Brackets | 84.82 - 104.82          | 0.6000                | 0.6000             |
| T5            | 32                   | Safety Line 3/8         | 84.82 - 104.82          | 0.6000                | 0.6000             |
| T6            | 4                    | AVA5-50(7/8)            | 64.82 - 84.82           | 0.6000                | 0.6000             |
| T6            | 5                    | WR-VG86ST-BRD(3/4)      | 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                    | ATCB-B01(5/16)          | 64.82 - 84.82           | 0.6000                | 0.6000             |
| T6            | 9                    | WR-VG86ST-BRD(3/4)      | 64.82 - 84.82           | 0.6000                | 0.6000             |
| T6            | 10                   | FB-L98B-002-XXX(3/8)    | 64.82 - 84.82           | 0.6000                | 0.6000             |
| T6            | 11                   | Feedline Ladder (Af)    | 64.82 - 84.82           | 0.6000                | 0.6000             |
| T6            | 13                   | WR-VG86ST-BRD(3/4)      | 64.82 - 84.82           | 0.6000                | 0.6000             |
| T6            | 17                   | AVA5-50(7/8)            | 64.82 - 84.82           | 0.6000                | 0.6000             |
| T6            | 21                   | EW52(ELLIPTICAL)        | 64.82 - 84.82           | 0.6000                | 0.6000             |
| T6            | 22                   | ROHN Waveguide Brackets | 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>     | 100061.008.01 - FAIRGROUNDS, FL (BU# 846219) | <b>Page</b>        | 19 of 51          |
|                                                                                                                                          | <b>Project</b> |                                              | <b>Date</b>        | 16:11:28 09/28/21 |
|                                                                                                                                          | <b>Client</b>  | Crown Castle                                 | <b>Designed by</b> | Vinayak           |

| Tower Section | Feed Line Record No. | Description             | Feed Line Segment Elev. | K <sub>o</sub> No Ice | K <sub>o</sub> Ice |
|---------------|----------------------|-------------------------|-------------------------|-----------------------|--------------------|
| T6            | 24                   | EW52(ELLIPTICAL)        | 64.82 - 84.82           | 0.6000                | 0.6000             |
| T6            | 28                   | LDF7-50A(1-5/8)         | 64.82 - 84.82           | 0.6000                | 0.6000             |
| T6            | 29                   | LMR-400(3/8)            | 64.82 - 84.82           | 0.6000                | 0.6000             |
| T6            | 30                   | ROHN Waveguide Brackets | 64.82 - 84.82           | 0.6000                | 0.6000             |
| T6            | 32                   | Safety Line 3/8         | 64.82 - 84.82           | 0.6000                | 0.6000             |
| T7            | 4                    | AVA5-50(7/8)            | 44.82 - 64.82           | 0.6000                | 0.6000             |
| T7            | 5                    | WR-VG86ST-BRD(3/4)      | 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                    | ATCB-B01(5/16)          | 44.82 - 64.82           | 0.6000                | 0.6000             |
| T7            | 9                    | WR-VG86ST-BRD(3/4)      | 44.82 - 64.82           | 0.6000                | 0.6000             |
| T7            | 10                   | FB-L98B-002-XXX(3/8)    | 44.82 - 64.82           | 0.6000                | 0.6000             |
| T7            | 11                   | Feedline Ladder (Af)    | 44.82 - 64.82           | 0.6000                | 0.6000             |
| T7            | 13                   | WR-VG86ST-BRD(3/4)      | 44.82 - 64.82           | 0.6000                | 0.6000             |
| T7            | 17                   | AVA5-50(7/8)            | 44.82 - 64.82           | 0.6000                | 0.6000             |
| T7            | 21                   | EW52(ELLIPTICAL)        | 44.82 - 64.82           | 0.6000                | 0.6000             |
| T7            | 22                   | ROHN Waveguide Brackets | 44.82 - 64.82           | 0.6000                | 0.6000             |
| T7            | 24                   | EW52(ELLIPTICAL)        | 44.82 - 64.82           | 0.6000                | 0.6000             |
| T7            | 28                   | LDF7-50A(1-5/8)         | 44.82 - 64.82           | 0.6000                | 0.6000             |
| T7            | 29                   | LMR-400(3/8)            | 44.82 - 64.82           | 0.6000                | 0.6000             |
| T7            | 30                   | ROHN Waveguide Brackets | 44.82 - 64.82           | 0.6000                | 0.6000             |
| T7            | 32                   | Safety Line 3/8         | 44.82 - 64.82           | 0.6000                | 0.6000             |
| T8            | 4                    | AVA5-50(7/8)            | 24.82 - 44.82           | 0.6000                | 0.6000             |
| T8            | 5                    | WR-VG86ST-BRD(3/4)      | 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                    | ATCB-B01(5/16)          | 24.82 - 44.82           | 0.6000                | 0.6000             |
| T8            | 9                    | WR-VG86ST-BRD(3/4)      | 24.82 - 44.82           | 0.6000                | 0.6000             |
| T8            | 10                   | FB-L98B-002-XXX(3/8)    | 24.82 - 44.82           | 0.6000                | 0.6000             |
| T8            | 11                   | Feedline Ladder (Af)    | 24.82 - 44.82           | 0.6000                | 0.6000             |
| T8            | 13                   | WR-VG86ST-BRD(3/4)      | 24.82 - 44.82           | 0.6000                | 0.6000             |
| T8            | 17                   | AVA5-50(7/8)            | 24.82 - 44.82           | 0.6000                | 0.6000             |
| T8            | 21                   | EW52(ELLIPTICAL)        | 24.82 - 44.82           | 0.6000                | 0.6000             |
| T8            | 22                   | ROHN Waveguide Brackets | 24.82 - 44.82           | 0.6000                | 0.6000             |
| T8            | 24                   | EW52(ELLIPTICAL)        | 24.82 - 44.82           | 0.6000                | 0.6000             |
| T8            | 28                   | LDF7-50A(1-5/8)         | 24.82 - 44.82           | 0.6000                | 0.6000             |
| T8            | 29                   | LMR-400(3/8)            | 24.82 - 44.82           | 0.6000                | 0.6000             |
| T8            | 30                   | ROHN Waveguide Brackets | 24.82 - 44.82           | 0.6000                | 0.6000             |
| T8            | 32                   | Safety Line 3/8         | 24.82 - 44.82           | 0.6000                | 0.6000             |
| T9            | 4                    | AVA5-50(7/8)            | 4.82 - 24.82            | 0.6000                | 0.6000             |
| T9            | 5                    | WR-VG86ST-BRD(3/4)      | 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                    | ATCB-B01(5/16)          | 4.82 - 24.82            | 0.6000                | 0.6000             |
| T9            | 9                    | WR-VG86ST-BRD(3/4)      | 4.82 - 24.82            | 0.6000                | 0.6000             |
| T9            | 10                   | FB-L98B-002-XXX(3/8)    | 4.82 - 24.82            | 0.6000                | 0.6000             |
| T9            | 11                   | Feedline Ladder (Af)    | 4.82 - 24.82            | 0.6000                | 0.6000             |
| T9            | 13                   | WR-VG86ST-BRD(3/4)      | 4.82 - 24.82            | 0.6000                | 0.6000             |
| T9            | 17                   | AVA5-50(7/8)            | 4.82 - 24.82            | 0.6000                | 0.6000             |
| T9            | 21                   | EW52(ELLIPTICAL)        | 4.82 - 24.82            | 0.6000                | 0.6000             |
| T9            | 22                   | ROHN Waveguide Brackets | 4.82 - 24.82            | 0.6000                | 0.6000             |
| T9            | 24                   | EW52(ELLIPTICAL)        | 4.82 - 24.82            | 0.6000                | 0.6000             |
| T9            | 28                   | LDF7-50A(1-5/8)         | 4.82 - 24.82            | 0.6000                | 0.6000             |
| T9            | 29                   | LMR-400(3/8)            | 4.82 - 24.82            | 0.6000                | 0.6000             |
| T9            | 30                   | ROHN Waveguide Brackets | 4.82 - 24.82            | 0.6000                | 0.6000             |
| T9            | 32                   | Safety Line 3/8         | 4.82 - 24.82            | 0.6000                | 0.6000             |
| T10           | 4                    | AVA5-50(7/8)            | 0.00 - 4.82             | 0.4608                | 0.4608             |
| T10           | 5                    | WR-VG86ST-BRD(3/4)      | 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                    | ATCB-B01(5/16)          | 0.00 - 4.82             | 0.4608                | 0.4608             |
| T10           | 9                    | 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>100061.008.01 - FAIRGROUNDS, FL (BU# 846219) | <b>Page</b><br>20 of 51          |
|                                                                                                                                          | <b>Project</b>                                             | <b>Date</b><br>16:11:28 09/28/21 |
|                                                                                                                                          | <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           | 10                   | FB-L98B-002-XXX(3/8)    | 0.00 - 4.82             | 0.4608                | 0.4608             |
| T10           | 11                   | Feedline Ladder (Af)    | 0.00 - 4.82             | 0.4608                | 0.4608             |
| T10           | 13                   | WR-VG86ST-BRD(3/4)      | 0.00 - 4.82             | 0.4608                | 0.4608             |
| T10           | 17                   | AVA5-50(7/8)            | 0.00 - 4.82             | 0.4608                | 0.4608             |
| T10           | 21                   | EW52(ELLIPTICAL)        | 0.00 - 4.82             | 0.4608                | 0.4608             |
| T10           | 22                   | ROHN Waveguide Brackets | 0.00 - 4.82             | 0.4608                | 0.4608             |
| T10           | 24                   | EW52(ELLIPTICAL)        | 0.00 - 4.82             | 0.4608                | 0.4608             |
| T10           | 28                   | LDF7-50A(1-5/8)         | 0.00 - 4.82             | 0.4608                | 0.4608             |
| T10           | 29                   | LMR-400(3/8)            | 0.00 - 4.82             | 0.4608                | 0.4608             |
| T10           | 30                   | ROHN Waveguide Brackets | 0.00 - 4.82             | 0.4608                | 0.4608             |
| T10           | 32                   | 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       |
| *                                    |             |             |                                              |                         |                 |        |                                                        |                                                       |             |
| DBXLH-9090C-R2M w/<br>Mount Pipe     | A           | From Leg    | 4.000<br>0'<br>0'                            | 0.000                   | 183'            | No Ice | 14.060                                                 | 6.700                                                 | 0.100       |
| DBXLH-9090C-R2M w/<br>Mount Pipe     | B           | From Leg    | 4.000<br>0'<br>0'                            | 0.000                   | 183'            | No Ice | 14.060                                                 | 6.700                                                 | 0.100       |
| DBXLH-9090C-R2M w/<br>Mount Pipe     | C           | From Leg    | 4.000<br>0'<br>0'                            | 0.000                   | 183'            | No Ice | 14.060                                                 | 6.700                                                 | 0.100       |
| (3) BSA-M65R-BUU-H6 w/<br>Mount Pipe | A           | From Leg    | 4.000<br>0'<br>0'                            | 0.000                   | 183'            | No Ice | 17.790                                                 | 7.650                                                 | 0.124       |
| (3) BSA-M65R-BUU-H6 w/<br>Mount Pipe | B           | From Leg    | 4.000<br>0'<br>0'                            | 0.000                   | 183'            | No Ice | 17.790                                                 | 7.650                                                 | 0.124       |
| (3) BSA-M65R-BUU-H6 w/<br>Mount Pipe | C           | From Leg    | 4.000<br>0'<br>0'                            | 0.000                   | 183'            | No Ice | 17.790                                                 | 7.650                                                 | 0.124       |
| (2) CBC819-DF                        | A           | From Leg    | 4.000<br>0'<br>0'                            | 0.000                   | 183'            | No Ice | 0.447                                                  | 0.070                                                 | 0.004       |
| (2) CBC819-DF                        | B           | From Leg    | 4.000<br>0'<br>0'                            | 0.000                   | 183'            | No Ice | 0.447                                                  | 0.070                                                 | 0.004       |
| (2) CBC819-DF                        | C           | From Leg    | 4.000<br>0'<br>0'                            | 0.000                   | 183'            | No Ice | 0.447                                                  | 0.070                                                 | 0.004       |
| (2) ETD819H-12UB                     | A           | From Leg    | 4.000<br>0'<br>0'                            | 0.000                   | 183'            | No Ice | 1.311                                                  | 0.342                                                 | 0.019       |

|                                                                                                                                          |                                              |  |  |  |  |  |                    |  |  |
|------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|--|--|--|--|--|--------------------|--|--|
| <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            |  |  |

| <i>Description</i> | <i>Face<br/>or<br/>Leg</i> | <i>Offset<br/>Type</i> | <i>Offsets:<br/>Horz<br/>Lateral<br/>Vert<br/>ft<br/>ft<br/>ft</i> | <i>Azimuth<br/>Adjustment<br/><br/>°</i> | <i>Placement<br/><br/>ft</i> |        | <i>C<sub>A</sub>A<sub>A</sub><br/>Front<br/><br/>ft²</i> | <i>C<sub>A</sub>A<sub>A</sub><br/>Side<br/><br/>ft²</i> | <i>Weight<br/><br/>K</i> |
|--------------------|----------------------------|------------------------|--------------------------------------------------------------------|------------------------------------------|------------------------------|--------|----------------------------------------------------------|---------------------------------------------------------|--------------------------|
| (2) ETD819H-12UB   | B                          | From Leg               | 4.000<br>0'<br>0'                                                  | 0.000                                    | 183'                         | No Ice | 1.311                                                    | 0.342                                                   | 0.019                    |
| (2) ETD819H-12UB   | C                          | From Leg               | 4.000<br>0'<br>0'                                                  | 0.000                                    | 183'                         | No Ice | 1.311                                                    | 0.342                                                   | 0.019                    |
| (2) RRUS 32        | A                          | From Leg               | 4.000<br>0'<br>0'                                                  | 0.000                                    | 183'                         | No Ice | 2.857                                                    | 1.777                                                   | 0.055                    |
| (2) RRUS 32        | B                          | From Leg               | 4.000<br>0'<br>0'                                                  | 0.000                                    | 183'                         | No Ice | 2.857                                                    | 1.777                                                   | 0.055                    |
| (2) RRUS 32        | C                          | From Leg               | 4.000<br>0'<br>0'                                                  | 0.000                                    | 183'                         | No Ice | 2.857                                                    | 1.777                                                   | 0.055                    |
| (2) RRUS-11        | A                          | From Leg               | 4.000<br>0'<br>0'                                                  | 0.000                                    | 183'                         | No Ice | 2.784                                                    | 1.187                                                   | 0.048                    |
| (2) RRUS-11        | B                          | From Leg               | 4.000<br>0'<br>0'                                                  | 0.000                                    | 183'                         | No Ice | 2.784                                                    | 1.187                                                   | 0.048                    |
| (2) RRUS-11        | C                          | From Leg               | 4.000<br>0'<br>0'                                                  | 0.000                                    | 183'                         | No Ice | 2.784                                                    | 1.187                                                   | 0.048                    |
| (2) RRUS 32 B2     | A                          | From Leg               | 4.000<br>0'<br>0'                                                  | 0.000                                    | 183'                         | No Ice | 2.731                                                    | 1.668                                                   | 0.053                    |
| (2) RRUS 32 B2     | B                          | From Leg               | 4.000<br>0'<br>0'                                                  | 0.000                                    | 183'                         | No Ice | 2.731                                                    | 1.668                                                   | 0.053                    |
| (2) RRUS 32 B2     | C                          | From Leg               | 4.000<br>0'<br>0'                                                  | 0.000                                    | 183'                         | No Ice | 2.731                                                    | 1.668                                                   | 0.053                    |
| RRUS 4478 B14      | A                          | From Leg               | 4.000<br>0'<br>0'                                                  | 0.000                                    | 183'                         | No Ice | 1.843                                                    | 1.059                                                   | 0.060                    |
| RRUS 4478 B14      | B                          | From Leg               | 4.000<br>0'<br>0'                                                  | 0.000                                    | 183'                         | No Ice | 1.843                                                    | 1.059                                                   | 0.060                    |
| RRUS 4478 B14      | C                          | From Leg               | 4.000<br>0'<br>0'                                                  | 0.000                                    | 183'                         | No Ice | 1.843                                                    | 1.059                                                   | 0.060                    |
| (2) RRUS 32 B66    | A                          | From Leg               | 4.000<br>0'<br>0'                                                  | 0.000                                    | 183'                         | No Ice | 2.743                                                    | 1.668                                                   | 0.053                    |
| (2) RRUS 32 B66    | B                          | From Leg               | 4.000<br>0'<br>0'                                                  | 0.000                                    | 183'                         | No Ice | 2.743                                                    | 1.668                                                   | 0.053                    |
| (2) RRUS 32 B66    | C                          | From Leg               | 4.000<br>0'<br>0'                                                  | 0.000                                    | 183'                         | No Ice | 2.743                                                    | 1.668                                                   | 0.053                    |
| DC6-48-60-18-8C    | A                          | From Leg               | 4.000<br>0'<br>0'                                                  | 0.000                                    | 183'                         | No Ice | 2.737                                                    | 2.737                                                   | 0.026                    |
| DC6-48-60-18-8C    | B                          | From Leg               | 4.000<br>0'<br>0'                                                  | 0.000                                    | 183'                         | No Ice | 2.737                                                    | 2.737                                                   | 0.026                    |

|                                                                                                                                          |                                              |                    |
|------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|--------------------|
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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>° | Placement<br>ft |        | C <sub>A</sub> A <sub>A</sub><br>Front<br>ft <sup>2</sup> | C <sub>A</sub> A <sub>A</sub><br>Side<br>ft <sup>2</sup> | Weight<br>K |
|-----------------------------------------|-------------------|----------------|-------------------------------------------------------|----------------------------|-----------------|--------|-----------------------------------------------------------|----------------------------------------------------------|-------------|
| DC6-48-60-18-8C                         | C                 | From Leg       | 4.000<br>0'<br>0'                                     | 0.000                      | 183'            | No Ice | 2.737                                                     | 2.737                                                    | 0.026       |
| (2) RRUS 11                             | A                 | From Leg       | 4.000<br>0'<br>0'                                     | 0.000                      | 183'            | No Ice | 2.784                                                     | 1.187                                                    | 0.048       |
| (3) RRUS 11                             | B                 | From Leg       | 4.000<br>0'<br>0'                                     | 0.000                      | 183'            | No Ice | 2.784                                                     | 1.187                                                    | 0.048       |
| RRUS 11                                 | C                 | From Leg       | 4.000<br>0'<br>0'                                     | 0.000                      | 183'            | No Ice | 2.784                                                     | 1.187                                                    | 0.048       |
| DC6-48-60-18-8F                         | A                 | From Leg       | 4.000<br>0'<br>0'                                     | 0.000                      | 183'            | No Ice | 1.212                                                     | 1.212                                                    | 0.033       |
| DC6-48-60-18-8F                         | B                 | From Leg       | 4.000<br>0'<br>0'                                     | 0.000                      | 183'            | No Ice | 1.212                                                     | 1.212                                                    | 0.033       |
| DC6-48-60-18-8F                         | C                 | From Leg       | 4.000<br>0'<br>0'                                     | 0.000                      | 183'            | No Ice | 1.212                                                     | 1.212                                                    | 0.033       |
| 6' x 2" Mount Pipe                      | A                 | From Leg       | 2.000<br>0'<br>0'                                     | 0.000                      | 183'            | No Ice | 1.425                                                     | 1.425                                                    | 0.022       |
| 6' x 2" Mount Pipe                      | B                 | From Leg       | 2.000<br>0'<br>0'                                     | 0.000                      | 183'            | No Ice | 1.425                                                     | 1.425                                                    | 0.022       |
| 6' x 2" Mount Pipe                      | C                 | From Leg       | 2.000<br>0'<br>0'                                     | 0.000                      | 183'            | No Ice | 1.425                                                     | 1.425                                                    | 0.022       |
| Horizontal 12.5' x 2.375" Pipe<br>Mount | A                 | From Leg       | 4.000<br>0'<br>0'                                     | 0.000                      | 183'            | No Ice | 2.969                                                     | 2.969                                                    | 0.036       |
| Horizontal 12.5' x 2.375" Pipe<br>Mount | B                 | From Leg       | 4.000<br>0'<br>0'                                     | 0.000                      | 183'            | No Ice | 2.969                                                     | 2.969                                                    | 0.036       |
| Horizontal 12.5' x 2.375" Pipe<br>Mount | C                 | From Leg       | 4.000<br>0'<br>0'                                     | 0.000                      | 183'            | No Ice | 2.969                                                     | 2.969                                                    | 0.036       |
| Sector Mount [SM 502-3]<br>*            | C                 | None           |                                                       | 0.000                      | 183'            | No Ice | 29.820                                                    | 29.820                                                   | 1.673       |
| Pipe Mount [PM 601-1]                   | C                 | From Leg       | 0.500<br>0'<br>0'                                     | 0.000                      | 174'            | No Ice | 1.320                                                     | 1.320                                                    | 0.065       |
| Horizontal 10' x 2" Mount<br>Pipe       | C                 | From Face      | 0.500<br>0'<br>0'                                     | 0.000                      | 174'            | No Ice | 2.375                                                     | 2.375                                                    | 0.037       |
| *<br>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       |
| *<br>X7CQAP-665-VR0 w/ Mount<br>Pipe    | A                 | From Leg       | 4.000<br>0'                                           | 0.000                      | 153'            | No Ice | 8.880                                                     | 6.440                                                    | 0.089       |

|                                                                                                                                          |                                              |  |                    |  |
|------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|--|--------------------|--|
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|                                                                                                                                          | <b>Project</b>                               |  | <b>Date</b>        |  |
|                                                                                                                                          | Crown Castle                                 |  | 16:11:28 09/28/21  |  |
|                                                                                                                                          |                                              |  | <b>Designed by</b> |  |
|                                                                                                                                          |                                              |  | 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>° | Placement<br>ft |        | C <sub>A</sub> A <sub>A</sub><br>Front<br>ft <sup>2</sup> | C <sub>A</sub> A <sub>A</sub><br>Side<br>ft <sup>2</sup> | Weight<br>K |
|------------------------------------|-------------------|----------------|-------------------------------------------------------|----------------------------|-----------------|--------|-----------------------------------------------------------|----------------------------------------------------------|-------------|
| X7CQAP-665-VR0 w/ Mount<br>Pipe    | B                 | From Leg       | -3'<br>4.000<br>0'                                    | 0.000                      | 153'            | No Ice | 8.880                                                     | 6.440                                                    | 0.089       |
| X7CQAP-665-VR0 w/ Mount<br>Pipe    | C                 | From Leg       | -3'<br>4.000<br>0'                                    | 0.000                      | 153'            | No Ice | 8.880                                                     | 6.440                                                    | 0.089       |
| RHSDC-3315-PF-48                   | A                 | From Leg       | -3'<br>4.000<br>0'                                    | 0.000                      | 153'            | No Ice | 3.708                                                     | 2.192                                                    | 0.032       |
| (2) ODU600                         | C                 | From Leg       | -3'<br>4.000<br>0'                                    | 0.000                      | 153'            | No Ice | 0.901                                                     | 0.425                                                    | 0.011       |
| AIR 6449 w/ Mount Pipe             | A                 | From Leg       | -3'<br>4.000<br>0'                                    | 0.000                      | 153'            | No Ice | 5.180                                                     | 2.720                                                    | 0.118       |
| AIR 6449 w/ Mount Pipe             | B                 | From Leg       | -3'<br>4.000<br>0'                                    | 0.000                      | 153'            | No Ice | 5.180                                                     | 2.720                                                    | 0.118       |
| AIR 6449 w/ Mount Pipe             | C                 | From Leg       | -3'<br>4.000<br>0'                                    | 0.000                      | 153'            | No Ice | 5.180                                                     | 2.720                                                    | 0.118       |
| (2) MX06FIT665-02 w/<br>Mount Pipe | A                 | From Leg       | -3'<br>4.000<br>0'                                    | 0.000                      | 153'            | No Ice | 3.210                                                     | 3.330                                                    | 0.083       |
| (2) MX06FIT665-02 w/<br>Mount Pipe | B                 | From Leg       | -3'<br>4.000<br>0'                                    | 0.000                      | 153'            | No Ice | 3.210                                                     | 3.330                                                    | 0.083       |
| (2) MX06FIT665-02 w/<br>Mount Pipe | C                 | From Leg       | -3'<br>4.000<br>0'                                    | 0.000                      | 153'            | No Ice | 3.210                                                     | 3.330                                                    | 0.083       |
| 4449 B5 B13 VZ                     | A                 | From Leg       | -3'<br>4.000<br>0'                                    | 0.000                      | 153'            | No Ice | 1.969                                                     | 1.381                                                    | 0.067       |
| 4449 B5 B13 VZ                     | B                 | From Leg       | -3'<br>4.000<br>0'                                    | 0.000                      | 153'            | No Ice | 1.969                                                     | 1.381                                                    | 0.067       |
| 4449 B5 B13 VZ                     | C                 | From Leg       | -3'<br>4.000<br>0'                                    | 0.000                      | 153'            | No Ice | 1.969                                                     | 1.381                                                    | 0.067       |
| 8843 B2 B66A VZ                    | A                 | From Leg       | -3'<br>4.000<br>0'                                    | 0.000                      | 153'            | No Ice | 1.973                                                     | 1.661                                                    | 0.072       |
| 8843 B2 B66A VZ                    | B                 | From Leg       | -3'<br>4.000<br>0'                                    | 0.000                      | 153'            | No Ice | 1.973                                                     | 1.661                                                    | 0.072       |
| 8843 B2 B66A VZ                    | C                 | From Leg       | -3'<br>4.000<br>0'                                    | 0.000                      | 153'            | No Ice | 1.973                                                     | 1.661                                                    | 0.072       |
| 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]<br>*       | C                 | None           | -3'                                                   | 0.000                      | 153'            | No Ice | 29.820                                                    | 29.820                                                   | 1.673       |
| Pipe Mount [PM 601-1]              | C                 | From Leg       | 0.500<br>0'<br>0'                                     | 0.000                      | 138'            | No Ice | 1.320                                                     | 1.320                                                    | 0.065       |

|                                                                                                                                          |                                              |                    |
|------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|--------------------|
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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 |
|-----------------------------------|-------------------|----------------|-------------------------------------------------------|--------------------------------|---------------------|--------|---------------------------------------------------------------|--------------------------------------------------------------|-----------------|
| Horizontal 10' x 2" Mount<br>Pipe | A                 | From Face      | 0.500<br>0'<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'<br>0'                                     | 0.000                          | 116'                | No Ice | 1.320                                                         | 1.320                                                        | 0.065           |
| *                                 |                   |                |                                                       |                                |                     |        |                                                               |                                                              |                 |

## 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>° | 3 dB<br>Beam<br>Width<br>° | Elevation<br>ft | Outside<br>Diameter<br>ft |        | Aperture<br>Area<br>ft² | Weight<br>K |
|-------------------------|-------------------|-----------------------------|----------------|-------------------------------------------|----------------------------|----------------------------|-----------------|---------------------------|--------|-------------------------|-------------|
| HSX6-59-P3A/B           | C                 | Paraboloid<br>w/Shroud (HP) | From<br>Leg    | 1.000<br>0'<br>0'                         | -90.000                    |                            | 174'            | 6.000                     | No Ice | 28.270                  | 0.320       |
| *                       |                   |                             |                |                                           |                            |                            |                 |                           |        |                         |             |
| Andrew HSX6-59A         | B                 | Paraboloid<br>w/Shroud (HP) | From<br>Leg    | 1.000<br>0'<br>0'                         | 40.000                     |                            | 158'            | 6.000                     | No Ice | 28.300                  | 0.143       |
| *                       |                   |                             |                |                                           |                            |                            |                 |                           |        |                         |             |
| Commscope<br>VHLPX3-11W | C                 | Paraboloid<br>w/Shroud (HP) | From<br>Leg    | 4.000<br>0'<br>-3'                        | 13.000                     |                            | 153'            | 3.283                     | No Ice | 8.467                   | 0.053       |
| *                       |                   |                             |                |                                           |                            |                            |                 |                           |        |                         |             |
| HSX8-59                 | C                 | Paraboloid<br>w/Shroud (HP) | From<br>Leg    | 1.000<br>0'<br>0'                         | -90.000                    |                            | 138'            | 8.875                     | No Ice | 61.862                  | 0.500       |
| *                       |                   |                             |                |                                           |                            |                            |                 |                           |        |                         |             |
| HSX6-59-P3A/B           | B                 | Paraboloid<br>w/Shroud (HP) | From<br>Leg    | 1.000<br>0'<br>0'                         | -60.000                    |                            | 116'            | 6.000                     | No Ice | 28.270                  | 0.320       |
| *                       |                   |                             |                |                                           |                            |                            |                 |                           |        |                         |             |

## Load Combinations

| 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    |

|                                                                                                                                          |                                              |                    |
|------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|--------------------|
| <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>Client</b>                                | 16:11:28 09/28/21  |
|                                                                                                                                          | Crown Castle                                 | <b>Designed by</b> |
|                                                                                                                                          |                                              | Vinayak            |

| Comb.<br>No. | Description                                    |
|--------------|------------------------------------------------|
| 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 |
| 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                |

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

| Comb. No. | Description                     |
|-----------|---------------------------------|
| 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              | 46.340  | -0.811                   | -0.349                   |
|             |                   |                | Max. Compression | 5               | -52.981 | -0.027                   | 0.360                    |
|             |                   |                | Max. Mx          | 49              | -3.581  | 1.813                    | -0.202                   |
|             |                   |                | Max. My          | 59              | -3.915  | 0.714                    | 1.856                    |
|             |                   |                | Max. Vy          | 53              | 3.557   | 1.689                    | 0.696                    |
|             |                   |                | Max. Vx          | 33              | -3.810  | 0.008                    | -1.821                   |
|             |                   | Diagonal       | Max Tension      | 8               | 4.496   | 0.000                    | 0.000                    |
|             |                   |                | Max. Compression | 23              | -5.820  | 0.000                    | 0.000                    |
|             |                   |                | Max. Mx          | 20              | 3.526   | 0.003                    | 0.000                    |
|             |                   |                | Max. My          | 59              | -2.097  | 0.000                    | 0.000                    |
|             |                   |                | Max. Vy          | 20              | -0.003  | 0.000                    | 0.000                    |
|             |                   |                | Max. Vx          | 59              | -0.000  | 0.000                    | 0.000                    |
|             |                   | Top Girt       | Max Tension      | 35              | 0.061   | 0.000                    | 0.000                    |
|             |                   |                | Max. Compression | 59              | -0.082  | 0.000                    | 0.000                    |
|             |                   |                | Max. Mx          | 16              | 0.033   | 0.002                    | 0.000                    |
|             |                   |                | Max. My          | 59              | -0.041  | 0.000                    | -0.000                   |
|             |                   |                | Max. Vy          | 16              | -0.002  | 0.000                    | 0.000                    |
|             |                   |                | Max. Vx          | 59              | 0.000   | 0.000                    | 0.000                    |
|             |                   | Bottom Girt    | Max Tension      | 23              | 1.284   | 0.000                    | 0.000                    |
|             |                   |                | Max. Compression | 54              | -0.078  | 0.000                    | 0.000                    |
|             |                   |                | Max. Mx          | 53              | -0.070  | 0.002                    | 0.000                    |
|             |                   |                | Max. My          | 59              | 0.524   | 0.000                    | -0.000                   |
|             |                   |                | Max. Vy          | 53              | -0.002  | 0.000                    | 0.000                    |
|             |                   |                | Max. Vx          | 59              | 0.000   | 0.000                    | 0.000                    |
|             |                   | Guy A          | Bottom Tension   | 28              | 23.647  |                          |                          |
|             |                   |                | Top Tension      | 28              | 23.838  |                          |                          |
|             |                   |                | Top Cable Vert   | 28              | 19.826  |                          |                          |
|             |                   |                | Top Cable Norm   | 28              | 13.236  |                          |                          |
|             |                   |                | Top Cable Tan    | 28              | 0.042   |                          |                          |
|             |                   |                | Bot Cable Vert   | 28              | -19.437 |                          |                          |
|             |                   |                | Bot Cable Norm   | 28              | 13.467  |                          |                          |
|             |                   |                | Bot Cable Tan    | 28              | 0.166   |                          |                          |
|             |                   | Guy B          | Bottom Tension   | 58              | 24.282  |                          |                          |
|             |                   |                | Top Tension      | 58              | 24.474  |                          |                          |
|             |                   |                | Top Cable Vert   | 58              | 20.349  |                          |                          |
|             |                   |                | Top Cable Norm   | 58              | 13.596  |                          |                          |
|             |                   |                | Top Cable Tan    | 58              | 0.036   |                          |                          |
|             |                   |                | Bot Cable Vert   | 58              | -19.961 |                          |                          |
|             |                   |                | Bot Cable Norm   | 58              | 13.827  |                          |                          |
|             |                   |                | Bot Cable Tan    | 58              | 0.171   |                          |                          |
|             |                   | Guy C          | Bottom Tension   | 18              | 21.665  |                          |                          |
|             |                   |                | Top Tension      | 18              | 21.856  |                          |                          |
|             |                   |                | Top Cable Vert   | 18              | 17.747  |                          |                          |
|             |                   |                | Top Cable Norm   | 18              | 12.756  |                          |                          |
|             |                   |                | Top Cable Tan    | 18              | 0.038   |                          |                          |
|             |                   |                | Bot Cable Vert   | 18              | -17.344 |                          |                          |
|             |                   |                | Bot Cable Norm   | 18              | 12.982  |                          |                          |
|             |                   |                | Bot Cable Tan    | 18              | 0.149   |                          |                          |

|                                                                                                                                          |                                              |                    |
|------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|--------------------|
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|                                                                                                                                          | <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 |
|-------------|-------------------|------------------|------------------|-----------------|---------|--------------------------|--------------------------|
| T2          | 164.818 - 144.818 | Top Guy Pull-Off | Max Tension      | 53              | 12.417  | 0.000                    | 0.000                    |
|             |                   |                  | Max. Compression | 3               | -10.498 | 0.000                    | 0.000                    |
|             |                   |                  | Max. Mx          | 52              | 12.266  | 0.012                    | 0.000                    |
|             |                   |                  | Max. My          | 59              | 0.505   | 0.000                    | -0.000                   |
|             |                   |                  | Max. Vy          | 52              | -0.014  | 0.000                    | 0.000                    |
|             |                   | Torque Arm Top   | Max. Vx          | 59              | 0.000   | 0.000                    | 0.000                    |
|             |                   |                  | Max Tension      | 18              | 14.102  | 0.000                    | 0.000                    |
|             |                   |                  | Max. Compression | 18              | -6.697  | 0.000                    | 0.000                    |
|             |                   |                  | Max. Mx          | 48              | 0.044   | -64.779                  | 0.000                    |
|             |                   |                  | Max. My          | 59              | -3.311  | -33.722                  | -0.000                   |
|             |                   | Leg              | Max. Vy          | 48              | 19.033  | -64.779                  | 0.000                    |
|             |                   |                  | Max. Vx          | 59              | -0.000  | -33.722                  | -0.000                   |
|             |                   |                  | Max Tension      | 15              | 11.463  | -0.881                   | 0.284                    |
|             |                   |                  | Max. Compression | 5               | -52.775 | 0.036                    | -0.415                   |
|             |                   |                  | Max. Mx          | 48              | -1.490  | 1.348                    | 0.143                    |
|             |                   | Diagonal         | Max. My          | 33              | 4.472   | 0.005                    | -1.384                   |
|             |                   |                  | Max. Vy          | 53              | 3.553   | 1.282                    | 0.531                    |
|             |                   |                  | Max. Vx          | 33              | -3.807  | 0.005                    | -1.384                   |
|             |                   |                  | Max Tension      | 18              | 3.471   | 0.000                    | 0.000                    |
|             |                   |                  | Max. Compression | 18              | -3.949  | 0.000                    | 0.000                    |
|             |                   | Top Girt         | Max. Mx          | 20              | -2.387  | 0.001                    | 0.000                    |
|             |                   |                  | Max. My          | 59              | 1.182   | 0.000                    | 0.000                    |
|             |                   |                  | Max. Vy          | 20              | -0.002  | 0.000                    | 0.000                    |
|             |                   |                  | Max. Vx          | 59              | -0.000  | 0.000                    | 0.000                    |
|             |                   |                  | Max Tension      | 33              | 1.279   | 0.000                    | 0.000                    |
|             |                   | Bottom Girt      | Max. Compression | 23              | -0.031  | 0.000                    | 0.000                    |
|             |                   |                  | Max. Mx          | 53              | 1.275   | 0.002                    | 0.000                    |
|             |                   |                  | Max. My          | 59              | 0.593   | 0.000                    | -0.000                   |
|             |                   |                  | Max. Vy          | 53              | -0.002  | 0.000                    | 0.000                    |
|             |                   |                  | Max. Vx          | 59              | 0.000   | 0.000                    | 0.000                    |
| T3          | 144.818 - 124.818 | Leg              | Max Tension      | 58              | 0.701   | 0.000                    | 0.000                    |
|             |                   |                  | Max. Compression | 31              | -0.223  | 0.000                    | 0.000                    |
|             |                   |                  | Max. Mx          | 46              | 0.426   | 0.002                    | 0.000                    |
|             |                   |                  | Max. My          | 59              | 0.586   | 0.000                    | -0.000                   |
|             |                   |                  | Max. Vy          | 46              | -0.002  | 0.000                    | 0.000                    |
|             |                   | Diagonal         | Max. Vx          | 59              | 0.000   | 0.000                    | 0.000                    |
|             |                   |                  | Max Tension      | 1               | 0.000   | 0.000                    | 0.000                    |
|             |                   |                  | Max. Compression | 44              | -48.460 | -0.243                   | -0.167                   |
|             |                   |                  | Max. Mx          | 6               | -29.285 | -1.343                   | 0.428                    |
|             |                   |                  | Max. My          | 61              | -24.055 | 1.124                    | -1.328                   |
|             |                   | Top Girt         | Max. Vy          | 56              | -2.148  | -0.375                   | -0.437                   |
|             |                   |                  | Max. Vx          | 36              | 2.987   | -0.224                   | 0.609                    |
|             |                   |                  | Max Tension      | 11              | 5.022   | 0.000                    | 0.000                    |
|             |                   |                  | Max. Compression | 11              | -5.428  | 0.000                    | 0.000                    |
|             |                   |                  | Max. Mx          | 24              | 2.315   | 0.001                    | 0.000                    |
|             |                   | Bottom Girt      | Max. My          | 59              | -1.955  | 0.000                    | 0.000                    |
|             |                   |                  | Max. Vy          | 24              | -0.002  | 0.000                    | 0.000                    |
|             |                   |                  | Max. Vx          | 59              | -0.000  | 0.000                    | 0.000                    |
|             |                   |                  | Max Tension      | 58              | 0.852   | 0.000                    | 0.000                    |
|             |                   |                  | Max. Compression | 28              | -0.526  | 0.000                    | 0.000                    |
|             |                   | Leg              | Max. Mx          | 46              | 0.332   | 0.002                    | 0.000                    |
|             |                   |                  | Max. My          | 59              | 0.665   | 0.000                    | -0.000                   |
|             |                   |                  | Max. Vy          | 46              | -0.002  | 0.000                    | 0.000                    |
|             |                   |                  | Max. Vx          | 59              | 0.000   | 0.000                    | 0.000                    |
|             |                   |                  | Max Tension      | 2               | 1.786   | 0.000                    | 0.000                    |
|             |                   | Diagonal         | Max. Compression | 36              | -1.433  | 0.000                    | 0.000                    |
|             |                   |                  | Max. Mx          | 60              | -0.624  | 0.002                    | 0.000                    |
|             |                   |                  | Max. My          | 58              | -1.075  | 0.000                    | -0.000                   |
|             |                   |                  | Max. Vy          | 60              | -0.002  | 0.000                    | 0.000                    |
|             |                   |                  | Max. Vx          | 60              | -0.002  | 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>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 | Leg              | Max. Vx          | 58              | 0.000   | 0.000                    | 0.000                    |
|             |                   |                  | Max Tension      | 1               | 0.000   | 0.000                    | 0.000                    |
|             |                   | Diagonal         | Max. Compression | 4               | -48.536 | -0.530                   | -0.263                   |
|             |                   |                  | Max. Mx          | 22              | -43.511 | -1.157                   | -0.447                   |
|             |                   |                  | Max. My          | 2               | -43.551 | -0.038                   | 1.367                    |
|             |                   |                  | Max. Vy          | 56              | -2.152  | 0.946                    | 0.596                    |
|             |                   |                  | Max. Vx          | 36              | 2.993   | 0.128                    | -1.229                   |
|             |                   |                  | Max Tension      | 5               | 3.338   | 0.000                    | 0.000                    |
|             |                   |                  | Max. Compression | 5               | -3.739  | 0.000                    | 0.000                    |
|             |                   |                  | Max. Mx          | 23              | -1.449  | 0.001                    | 0.000                    |
|             |                   |                  | Max. My          | 59              | 0.522   | 0.000                    | 0.000                    |
|             |                   |                  | Max. Vy          | 23              | -0.002  | 0.000                    | 0.000                    |
|             |                   | Top Girt         | Max. Vx          | 59              | -0.000  | 0.000                    | 0.000                    |
|             |                   |                  | Max Tension      | 2               | 0.768   | 0.000                    | 0.000                    |
|             |                   |                  | Max. Compression | 1               | 0.000   | 0.000                    | 0.000                    |
|             |                   |                  | Max. Mx          | 15              | 0.428   | 0.002                    | 0.000                    |
|             |                   |                  | Max. My          | 58              | 0.308   | 0.000                    | -0.000                   |
|             |                   | Bottom Girt      | Max. Vy          | 15              | -0.002  | 0.000                    | 0.000                    |
|             |                   |                  | Max. Vx          | 58              | 0.000   | 0.000                    | 0.000                    |
|             |                   |                  | Max Tension      | 3               | 0.260   | 0.000                    | 0.000                    |
|             |                   |                  | Max. Compression | 21              | -0.106  | 0.000                    | 0.000                    |
|             |                   |                  | Max. Mx          | 2               | 0.189   | 0.002                    | 0.000                    |
|             |                   | Guy A            | Max. My          | 58              | 0.021   | 0.000                    | -0.000                   |
|             |                   |                  | Max. Vy          | 2               | -0.002  | 0.000                    | 0.000                    |
|             |                   |                  | Max. Vx          | 58              | 0.000   | 0.000                    | 0.000                    |
|             |                   |                  | Bottom Tension   | 36              | 14.695  |                          |                          |
|             |                   |                  | Top Tension      | 36              | 14.795  |                          |                          |
|             |                   | Guy B            | Top Cable Vert   | 36              | 11.003  |                          |                          |
|             |                   |                  | Top Cable Norm   | 36              | 9.891   |                          |                          |
|             |                   |                  | Top Cable Tan    | 36              | 0.002   |                          |                          |
|             |                   |                  | Bot Cable Vert   | 36              | -10.759 |                          |                          |
|             |                   |                  | Bot Cable Norm   | 36              | 10.010  |                          |                          |
|             |                   | Guy C            | Bot Cable Tan    | 36              | 0.002   |                          |                          |
|             |                   |                  | Bottom Tension   | 61              | 15.066  |                          |                          |
|             |                   |                  | Top Tension      | 61              | 15.166  |                          |                          |
|             |                   |                  | Top Cable Vert   | 61              | 11.272  |                          |                          |
|             |                   |                  | Top Cable Norm   | 61              | 10.146  |                          |                          |
|             |                   | Top Guy Pull-Off | Top Cable Tan    | 61              | 0.019   |                          |                          |
|             |                   |                  | Bot Cable Vert   | 61              | -11.033 |                          |                          |
|             |                   |                  | Bot Cable Norm   | 61              | 10.258  |                          |                          |
|             |                   |                  | Bot Cable Tan    | 61              | 0.100   |                          |                          |
|             |                   |                  | Bottom Tension   | 11              | 13.561  |                          |                          |
| T5          | 104.818 - 84.8177 | Leg              | Top Tension      | 11              | 13.661  |                          |                          |
|             |                   |                  | Top Cable Vert   | 11              | 9.811   |                          |                          |
|             |                   |                  | Top Cable Norm   | 11              | 9.506   |                          |                          |
|             |                   |                  | Top Cable Tan    | 11              | 0.023   |                          |                          |
|             |                   |                  | Bot Cable Vert   | 11              | -9.565  |                          |                          |
|             |                   |                  | Bot Cable Norm   | 11              | 9.612   |                          |                          |
|             |                   |                  | Bot Cable Tan    | 11              | 0.097   |                          |                          |
|             |                   |                  | Max Tension      | 2               | 4.930   | 0.000                    | 0.000                    |
|             |                   |                  | Max. Compression | 1               | 0.000   | 0.000                    | 0.000                    |
|             |                   |                  | Max. Mx          | 15              | 2.748   | 0.011                    | 0.000                    |
|             |                   |                  | Max. My          | 58              | 1.978   | 0.000                    | -0.000                   |
|             |                   |                  | Max. Vy          | 15              | -0.012  | 0.000                    | 0.000                    |
|             |                   |                  | Max. Vx          | 58              | 0.000   | 0.000                    | 0.000                    |
|             |                   |                  | Max Tension      | 1               | 0.000   | 0.000                    | 0.000                    |
|             |                   |                  | Max. Compression | 3               | -52.514 | 0.375                    | -0.085                   |
|             |                   |                  | Max. Mx          | 56              | -31.873 | 0.771                    | 0.021                    |
|             |                   |                  | Max. My          | 6               | -38.436 | -0.065                   | -0.605                   |

|                                                                                                                                          |                                              |                    |
|------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|--------------------|
| <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 |
|-------------|-------------------|----------------|------------------|-----------------|---------|--------------------------|--------------------------|
| T6          | 84.8177 - 64.8177 | Diagonal       | Max. Vy          | 21              | 1.688   | 0.376                    | -0.096                   |
|             |                   |                | Max. Vx          | 36              | 2.018   | -0.173                   | 0.228                    |
|             |                   |                | Max Tension      | 51              | 3.149   | 0.000                    | 0.000                    |
|             |                   |                | Max. Compression | 51              | -3.417  | 0.000                    | 0.000                    |
|             |                   | Top Girt       | Max. Mx          | 3               | 0.698   | 0.001                    | 0.000                    |
|             |                   |                | Max. My          | 58              | 0.634   | 0.000                    | 0.000                    |
|             |                   |                | Max. Vy          | 3               | -0.002  | 0.000                    | 0.000                    |
|             |                   |                | Max. Vx          | 58              | -0.000  | 0.000                    | 0.000                    |
|             |                   | Bottom Girt    | Max Tension      | 21              | 0.323   | 0.000                    | 0.000                    |
|             |                   |                | Max. Compression | 51              | -0.186  | 0.000                    | 0.000                    |
|             |                   |                | Max. Mx          | 2               | -0.055  | 0.002                    | 0.000                    |
|             |                   |                | Max. My          | 58              | 0.195   | 0.000                    | -0.000                   |
|             |                   | Leg            | Max. Vy          | 2               | -0.002  | 0.000                    | 0.000                    |
|             |                   |                | Max. Vx          | 58              | 0.000   | 0.000                    | 0.000                    |
|             |                   |                | Max Tension      | 6               | 1.535   | 0.000                    | 0.000                    |
|             |                   |                | Max. Compression | 36              | -1.179  | 0.000                    | 0.000                    |
|             |                   | Diagonal       | Max. Mx          | 21              | 0.777   | 0.002                    | 0.000                    |
|             |                   |                | Max. My          | 40              | -0.782  | 0.000                    | 0.000                    |
|             |                   |                | Max. Vy          | 21              | -0.002  | 0.000                    | 0.000                    |
|             |                   |                | Max. Vx          | 40              | -0.000  | 0.000                    | 0.000                    |
|             |                   | Top Girt       | Max Tension      | 1               | 0.000   | 0.000                    | 0.000                    |
|             |                   |                | Max. Compression | 60              | -58.351 | 0.048                    | 0.549                    |
|             |                   |                | Max. Mx          | 26              | -37.565 | -1.311                   | -0.597                   |
|             |                   |                | Max. My          | 6               | -38.091 | -0.005                   | 1.681                    |
|             |                   | Diagonal       | Max. Vy          | 21              | 1.692   | -0.663                   | 0.051                    |
|             |                   |                | Max. Vx          | 59              | 2.185   | 0.229                    | 0.869                    |
|             |                   |                | Max Tension      | 29              | 5.175   | 0.000                    | 0.000                    |
|             |                   |                | Max. Compression | 59              | -5.237  | 0.000                    | 0.000                    |
|             |                   | Top Girt       | Max. Mx          | 35              | 4.308   | 0.002                    | 0.000                    |
|             |                   |                | Max. My          | 59              | -1.958  | 0.000                    | 0.000                    |
|             |                   |                | Max. Vy          | 35              | -0.002  | 0.000                    | 0.000                    |
|             |                   |                | Max. Vx          | 59              | -0.000  | 0.000                    | 0.000                    |
|             |                   | Bottom Girt    | Max Tension      | 6               | 1.003   | 0.000                    | 0.000                    |
|             |                   |                | Max. Compression | 36              | -0.008  | 0.000                    | 0.000                    |
|             |                   |                | Max. Mx          | 19              | 0.232   | 0.002                    | 0.000                    |
|             |                   |                | Max. My          | 40              | 0.279   | 0.000                    | 0.000                    |
|             |                   | Guy A          | Max. Vy          | 19              | -0.002  | 0.000                    | 0.000                    |
|             |                   |                | Max. Vx          | 40              | -0.000  | 0.000                    | 0.000                    |
|             |                   |                | Max Tension      | 35              | 0.782   | 0.000                    | 0.000                    |
|             |                   |                | Max. Compression | 2               | -0.501  | 0.000                    | 0.000                    |
|             |                   | Guy B          | Max. Mx          | 15              | -0.236  | 0.002                    | 0.000                    |
|             |                   |                | Max. My          | 58              | 0.484   | 0.000                    | -0.000                   |
|             |                   |                | Max. Vy          | 15              | -0.002  | 0.000                    | 0.000                    |
|             |                   |                | Max. Vx          | 58              | 0.000   | 0.000                    | 0.000                    |
|             |                   | Guy A          | Bottom Tension   | 31              | 16.152  |                          |                          |
|             |                   |                | Top Tension      | 31              | 16.207  |                          |                          |
|             |                   |                | Top Cable Vert   | 31              | 9.711   |                          |                          |
|             |                   |                | Top Cable Norm   | 31              | 12.976  |                          |                          |
|             |                   | Guy B          | Top Cable Tan    | 31              | 0.018   |                          |                          |
|             |                   |                | Bot Cable Vert   | 31              | -9.556  |                          |                          |
|             |                   |                | Bot Cable Norm   | 31              | 13.021  |                          |                          |
|             |                   |                | Bot Cable Tan    | 31              | 0.091   |                          |                          |
|             |                   | Guy A          | Bottom Tension   | 61              | 16.380  |                          |                          |
|             |                   |                | Top Tension      | 61              | 16.436  |                          |                          |
|             |                   |                | Top Cable Vert   | 61              | 9.847   |                          |                          |
|             |                   |                | Top Cable Norm   | 61              | 13.160  |                          |                          |
|             |                   | Guy B          | Top Cable Tan    | 61              | 0.020   |                          |                          |
|             |                   |                | Bot Cable Vert   | 61              | -9.692  |                          |                          |
|             |                   |                | Bot Cable Norm   | 61              | 13.205  |                          |                          |
|             |                   |                | Bot Cable Tan    | 61              | 0.094   |                          |                          |



|                                                                                                                                          |                                              |                    |
|------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|--------------------|
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|                                                                                                                                          | <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 | Leg            | Max. My          | 41              | -0.195  | 0.000                    | -0.000                   |
|             |                   |                | Max. Vy          | 15              | -0.002  | 0.000                    | 0.000                    |
|             |                   |                | Max. Vx          | 41              | 0.000   | 0.000                    | 0.000                    |
|             |                   |                | Max Tension      | 5               | 3.180   | 0.217                    | -0.506                   |
|             |                   |                | Max. Compression | 35              | -68.765 | 0.348                    | -0.194                   |
|             |                   | Diagonal       | Max. Mx          | 46              | -40.731 | 1.364                    | -0.094                   |
|             |                   |                | Max. My          | 6               | -25.877 | 0.165                    | 1.787                    |
|             |                   |                | Max. Vy          | 22              | 3.986   | -0.823                   | -0.254                   |
|             |                   |                | Max. Vx          | 34              | 4.301   | -0.147                   | -1.338                   |
|             |                   |                | Max Tension      | 2               | 3.666   | 0.000                    | 0.000                    |
|             |                   | Top Girt       | Max. Compression | 6               | -3.574  | 0.000                    | 0.000                    |
|             |                   |                | Max. Mx          | 6               | 2.582   | 0.002                    | 0.000                    |
|             |                   |                | Max. My          | 41              | 1.515   | 0.000                    | 0.000                    |
|             |                   |                | Max. Vy          | 6               | -0.002  | 0.000                    | 0.000                    |
|             |                   |                | Max. Vx          | 41              | -0.000  | 0.000                    | 0.000                    |
|             |                   | Bottom Girt    | Max Tension      | 27              | 0.601   | 0.000                    | 0.000                    |
|             |                   |                | Max. Compression | 6               | -0.394  | 0.000                    | 0.000                    |
|             |                   |                | Max. Mx          | 15              | -0.084  | 0.002                    | 0.000                    |
|             |                   |                | Max. My          | 41              | 0.403   | 0.000                    | -0.000                   |
|             |                   |                | Max. Vy          | 15              | -0.002  | 0.000                    | 0.000                    |
| T10         | 4.81771 - 0       | Leg            | Max. Vx          | 41              | 0.000   | 0.000                    | 0.000                    |
|             |                   |                | Max Tension      | 2               | 1.611   | 0.000                    | 0.000                    |
|             |                   |                | Max. Compression | 1               | 0.000   | 0.000                    | 0.000                    |
|             |                   |                | Max. Mx          | 12              | 0.747   | 0.002                    | 0.000                    |
|             |                   |                | Max. My          | 40              | 1.088   | 0.000                    | -0.000                   |
|             |                   | Horizontal     | Max. Vy          | 12              | -0.002  | 0.000                    | 0.000                    |
|             |                   |                | Max. Vx          | 40              | 0.000   | 0.000                    | 0.000                    |
|             |                   |                | Max Tension      | 40              | 0.000   | 0.000                    | 0.000                    |
|             |                   |                | Max. Compression | 2               | 1.611   | 0.000                    | 0.000                    |
|             |                   |                | Max. Mx          | 1               | 0.000   | 0.000                    | 0.000                    |
|             |                   | Top Girt       | Max. My          | 12              | 0.753   | -0.054                   | -0.108                   |
|             |                   |                | Max. Vy          | 61              | -0.472  | -0.042                   | -0.297                   |
|             |                   |                | Max. Vx          | 40              | -0.006  | 0.843                    | -0.120                   |
|             |                   |                | Max. My          | 6               | -0.367  | 0.373                    | -0.361                   |
|             |                   |                | Max. Vy          | 40              | -1.634  | 0.843                    | -0.120                   |
|             |                   |                | Max. Vx          | 6               | -0.500  | 0.047                    | 0.066                    |
|             |                   |                | Max Tension      | 2               | 10.112  | -0.105                   | 0.255                    |
|             |                   |                | Max. Compression | 1               | 0.000   | 0.000                    | 0.000                    |
|             |                   |                | Max. Mx          | 6               | 6.454   | 0.974                    | -0.281                   |
|             |                   |                | Max. My          | 26              | 7.144   | 0.696                    | -0.315                   |
|             |                   |                | Max. Vy          | 6               | -0.535  | 0.958                    | -0.309                   |
|             |                   |                | Max. Vx          | 31              | 0.127   | -0.579                   | 0.137                    |

## Maximum Reactions

| Location | Condition           | Gov. Load Comb. | Vertical K | Horizontal, X K | Horizontal, Z K |
|----------|---------------------|-----------------|------------|-----------------|-----------------|
| Mast     | Max. Vert           | 2               | 129.120    | -0.045          | 3.372           |
|          | Max. H <sub>x</sub> | 50              | 106.114    | 3.114           | -0.006          |
|          | Max. H <sub>z</sub> | 5               | 117.422    | -0.028          | 3.846           |
|          | Max. M <sub>x</sub> | 1               | 0.000      | -0.011          | 0.011           |
|          | Max. M <sub>z</sub> | 1               | 0.000      | -0.011          | 0.011           |

|                                                                                                                                          |                                              |                    |
|------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|--------------------|
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|                                                                                                                                          | <b>Project</b>                               | <b>Date</b>        |
|                                                                                                                                          | <b>Client</b>                                | 16:11:28 09/28/21  |
|                                                                                                                                          | Crown Castle                                 | <b>Designed by</b> |
|                                                                                                                                          |                                              | Vinayak            |

| Location                                       | Condition           | Gov.<br>Load<br>Comb. | Vertical<br>K | Horizontal, X<br>K | Horizontal, Z<br>K |
|------------------------------------------------|---------------------|-----------------------|---------------|--------------------|--------------------|
| Guy C @ 124 ft<br>Elev 0 ft<br>Azimuth 240 deg | Max. Torsion        | 40                    | 2.027         | 1.814              | -3.151             |
|                                                | Min. Vert           | 1                     | 84.313        | -0.011             | 0.011              |
|                                                | Min. H <sub>x</sub> | 20                    | 105.105       | -3.159             | 0.039              |
|                                                | Min. H <sub>z</sub> | 35                    | 101.009       | -0.002             | -4.049             |
|                                                | Min. M <sub>x</sub> | 1                     | 0.000         | -0.011             | 0.011              |
|                                                | Min. M <sub>z</sub> | 1                     | 0.000         | -0.011             | 0.011              |
|                                                | Min. Torsion        | 29                    | -1.894        | -1.704             | -3.073             |
|                                                | Max. Vert           | 42                    | -1.378        | -0.717             | 0.414              |
|                                                | Max. H <sub>x</sub> | 42                    | -1.378        | -0.717             | 0.414              |
|                                                | Max. H <sub>z</sub> | 7                     | -50.778       | -39.942            | 23.639             |
|                                                | Min. Vert           | 7                     | -50.778       | -39.942            | 23.639             |
|                                                | Min. H <sub>x</sub> | 7                     | -50.778       | -39.942            | 23.639             |
|                                                | Min. H <sub>z</sub> | 42                    | -1.378        | -0.717             | 0.414              |
|                                                | Max. Vert           | 23                    | -1.577        | 0.744              | 0.430              |
| Guy B @ 115 ft<br>Elev 0 ft<br>Azimuth 120 deg | Max. H <sub>x</sub> | 57                    | -58.152       | 42.262             | 24.955             |
|                                                | Max. H <sub>z</sub> | 57                    | -58.152       | 42.262             | 24.955             |
|                                                | Min. Vert           | 57                    | -58.152       | 42.262             | 24.955             |
|                                                | Min. H <sub>x</sub> | 22                    | -1.579        | 0.741              | 0.429              |
|                                                | Min. H <sub>z</sub> | 22                    | -1.579        | 0.741              | 0.429              |
|                                                | Max. Vert           | 2                     | -1.490        | -0.000             | -0.791             |
|                                                | Max. H <sub>x</sub> | 47                    | -25.580       | 0.792              | -21.186            |
|                                                | Max. H <sub>z</sub> | 2                     | -1.490        | -0.000             | -0.791             |
|                                                | Min. Vert           | 27                    | -56.757       | -0.468             | -47.955            |
|                                                | Min. H <sub>x</sub> | 17                    | -29.668       | -0.804             | -24.161            |
| Guy A @ 115 ft<br>Elev 0 ft<br>Azimuth 0 deg   | Min. H <sub>z</sub> | 27                    | -56.757       | -0.468             | -47.955            |

## 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                                        | 84.313        | 0.011                   | -0.011                  | 0.000                                           | 0.000                                           | 0.003            |
| 1.2 Dead+1.0 Wind 0 deg - No<br>Ice+1.0 Guy      | 129.120       | 0.045                   | -3.372                  | 0.000                                           | 0.000                                           | -0.283           |
| 1.2D+1.0W (pattern 1) 0 deg -<br>No Ice+1.0 Guy  | 125.680       | 0.045                   | -1.645                  | 0.000                                           | 0.000                                           | -0.300           |
| 1.2D+1.0W (pattern 2) 0 deg -<br>No Ice+1.0 Guy  | 124.107       | 0.049                   | -3.578                  | 0.000                                           | 0.000                                           | -0.532           |
| 1.2D+1.0W (pattern 3) 0 deg -<br>No Ice+1.0 Guy  | 117.422       | 0.028                   | -3.846                  | 0.000                                           | 0.000                                           | 0.003            |
| 1.2D+1.0W (pattern 4) 0 deg -<br>No Ice+1.0 Guy  | 116.343       | 0.043                   | -3.613                  | 0.000                                           | 0.000                                           | -0.241           |
| 1.2 Dead+1.0 Wind 30 deg - No<br>Ice+1.0 Guy     | 116.346       | 1.814                   | -2.825                  | 0.000                                           | 0.000                                           | 1.455            |
| 1.2D+1.0W (pattern 1) 30 deg -<br>No Ice+1.0 Guy | 113.821       | 1.014                   | -1.408                  | 0.000                                           | 0.000                                           | 1.469            |
| 1.2D+1.0W (pattern 2) 30 deg -<br>No Ice+1.0 Guy | 112.687       | 1.869                   | -2.949                  | 0.000                                           | 0.000                                           | 1.232            |
| 1.2D+1.0W (pattern 3) 30 deg -<br>No Ice+1.0 Guy | 107.837       | 1.887                   | -3.155                  | 0.000                                           | 0.000                                           | 1.707            |
| 1.2D+1.0W (pattern 4) 30 deg -                   | 107.828       | 1.819                   | -2.959                  | 0.000                                           | 0.000                                           | 1.474            |

|                                                                                                                                          |                                              |                    |
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|                                                                                                                                          | <b>Project</b>                               | <b>Date</b>        |
|                                                                                                                                          | <b>Client</b>                                | <b>Designed by</b> |
|                                                                                                                                          | Crown Castle                                 | 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                                 |               |                         |                         |                                                 |                                                 |                  |
| 1.2 Dead+1.0 Wind 60 deg - No Ice+1.0 Guy      | 99.555        | 2.781                   | -1.618                  | 0.000                                           | 0.000                                           | 1.130            |
| 1.2D+1.0W (pattern 1) 60 deg - No Ice+1.0 Guy  | 98.808        | 1.495                   | -0.875                  | 0.000                                           | 0.000                                           | 1.147            |
| 1.2D+1.0W (pattern 2) 60 deg - No Ice+1.0 Guy  | 98.343        | 2.847                   | -1.656                  | 0.000                                           | 0.000                                           | 0.918            |
| 1.2D+1.0W (pattern 3) 60 deg - No Ice+1.0 Guy  | 97.472        | 2.923                   | -1.697                  | 0.000                                           | 0.000                                           | 0.959            |
| 1.2D+1.0W (pattern 4) 60 deg - No Ice+1.0 Guy  | 97.781        | 2.772                   | -1.613                  | 0.000                                           | 0.000                                           | 1.074            |
| 1.2 Dead+1.0 Wind 90 deg - No Ice+1.0 Guy      | 112.624       | 2.882                   | -0.116                  | 0.000                                           | 0.000                                           | 0.023            |
| 1.2D+1.0W (pattern 1) 90 deg - No Ice+1.0 Guy  | 110.534       | 1.468                   | -0.135                  | 0.000                                           | 0.000                                           | 0.056            |
| 1.2D+1.0W (pattern 2) 90 deg - No Ice+1.0 Guy  | 109.535       | 2.989                   | -0.110                  | 0.000                                           | 0.000                                           | -0.110           |
| 1.2D+1.0W (pattern 3) 90 deg - No Ice+1.0 Guy  | 105.105       | 3.159                   | -0.039                  | 0.000                                           | 0.000                                           | -0.299           |
| 1.2D+1.0W (pattern 4) 90 deg - No Ice+1.0 Guy  | 104.487       | 2.982                   | -0.059                  | 0.000                                           | 0.000                                           | -0.027           |
| 1.2 Dead+1.0 Wind 120 deg - No Ice+1.0 Guy     | 122.788       | 2.559                   | 1.434                   | 0.000                                           | 0.000                                           | 0.814            |
| 1.2D+1.0W (pattern 1) 120 deg - No Ice+1.0 Guy | 119.891       | 1.258                   | 0.681                   | 0.000                                           | 0.000                                           | 0.853            |
| 1.2D+1.0W (pattern 2) 120 deg - No Ice+1.0 Guy | 118.525       | 2.695                   | 1.505                   | 0.000                                           | 0.000                                           | 0.806            |
| 1.2D+1.0W (pattern 3) 120 deg - No Ice+1.0 Guy | 112.477       | 2.885                   | 1.638                   | 0.000                                           | 0.000                                           | 0.533            |
| 1.2D+1.0W (pattern 4) 120 deg - No Ice+1.0 Guy | 110.563       | 2.732                   | 1.536                   | 0.000                                           | 0.000                                           | 0.757            |
| 1.2 Dead+1.0 Wind 150 deg - No Ice+1.0 Guy     | 118.131       | 1.614                   | 2.964                   | 0.000                                           | 0.000                                           | 1.753            |
| 1.2D+1.0W (pattern 1) 150 deg - No Ice+1.0 Guy | 115.462       | 0.772                   | 1.533                   | 0.000                                           | 0.000                                           | 1.780            |
| 1.2D+1.0W (pattern 2) 150 deg - No Ice+1.0 Guy | 114.294       | 1.704                   | 3.073                   | 0.000                                           | 0.000                                           | 1.894            |
| 1.2D+1.0W (pattern 3) 150 deg - No Ice+1.0 Guy | 109.569       | 1.850                   | 3.220                   | 0.000                                           | 0.000                                           | 1.522            |
| 1.2D+1.0W (pattern 4) 150 deg - No Ice+1.0 Guy | 109.135       | 1.737                   | 3.044                   | 0.000                                           | 0.000                                           | 1.683            |
| 1.2 Dead+1.0 Wind 180 deg - No Ice+1.0 Guy     | 104.135       | -0.016                  | 3.839                   | 0.000                                           | 0.000                                           | -0.074           |
| 1.2D+1.0W (pattern 1) 180 deg - No Ice+1.0 Guy | 102.912       | -0.013                  | 2.045                   | 0.000                                           | 0.000                                           | -0.070           |
| 1.2D+1.0W (pattern 2) 180 deg - No Ice+1.0 Guy | 102.335       | -0.027                  | 3.936                   | 0.000                                           | 0.000                                           | 0.189            |
| 1.2D+1.0W (pattern 3) 180 deg - No Ice+1.0 Guy | 101.009       | 0.002                   | 4.049                   | 0.000                                           | 0.000                                           | -0.283           |
| 1.2D+1.0W (pattern 4) 180 deg - No Ice+1.0 Guy | 101.589       | -0.009                  | 3.841                   | 0.000                                           | 0.000                                           | -0.133           |
| 1.2 Dead+1.0 Wind 210 deg - No Ice+1.0 Guy     | 115.719       | -1.623                  | 2.917                   | 0.000                                           | 0.000                                           | -1.920           |
| 1.2D+1.0W (pattern 1) 210 deg - No Ice+1.0 Guy | 113.069       | -0.797                  | 1.515                   | 0.000                                           | 0.000                                           | -1.946           |
| 1.2D+1.0W (pattern 2) 210 deg - No Ice+1.0 Guy | 111.547       | -1.724                  | 3.029                   | 0.000                                           | 0.000                                           | -1.699           |
| 1.2D+1.0W (pattern 3) 210 deg - No Ice+1.0 Guy | 108.401       | -1.814                  | 3.151                   | 0.000                                           | 0.000                                           | -2.027           |
| 1.2D+1.0W (pattern 4) 210 deg - No Ice+1.0 Guy | 107.822       | -1.730                  | 2.984                   | 0.000                                           | 0.000                                           | -1.927           |

|                                                                                                                                          |                                              |                    |
|------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|--------------------|
| <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<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 |
|---------------------------------------------------|---------------|-------------------------|-------------------------|-------------------------------------------------|-------------------------------------------------|------------------|
| 1.2 Dead+1.0 Wind 240 deg -<br>No Ice+1.0 Guy     | 122.073       | -2.472                  | 1.408                   | 0.000                                           | 0.000                                           | -0.978           |
| 1.2D+1.0W (pattern 1) 240 deg<br>- No Ice+1.0 Guy | 119.176       | -1.206                  | 0.677                   | 0.000                                           | 0.000                                           | -1.020           |
| 1.2D+1.0W (pattern 2) 240 deg<br>- No Ice+1.0 Guy | 117.403       | -2.616                  | 1.491                   | 0.000                                           | 0.000                                           | -0.759           |
| 1.2D+1.0W (pattern 3) 240 deg<br>- No Ice+1.0 Guy | 112.326       | -2.777                  | 1.591                   | 0.000                                           | 0.000                                           | -0.913           |
| 1.2D+1.0W (pattern 4) 240 deg<br>- No Ice+1.0 Guy | 109.963       | -2.645                  | 1.508                   | 0.000                                           | 0.000                                           | -0.969           |
| 1.2 Dead+1.0 Wind 270 deg -<br>No Ice+1.0 Guy     | 112.856       | -2.847                  | -0.022                  | 0.000                                           | 0.000                                           | -0.117           |
| 1.2D+1.0W (pattern 1) 270 deg<br>- No Ice+1.0 Guy | 110.658       | -1.434                  | -0.038                  | 0.000                                           | 0.000                                           | -0.162           |
| 1.2D+1.0W (pattern 2) 270 deg<br>- No Ice+1.0 Guy | 109.283       | -2.967                  | 0.002                   | 0.000                                           | 0.000                                           | 0.096            |
| 1.2D+1.0W (pattern 3) 270 deg<br>- No Ice+1.0 Guy | 106.114       | -3.114                  | 0.006                   | 0.000                                           | 0.000                                           | 0.142            |
| 1.2D+1.0W (pattern 4) 270 deg<br>- No Ice+1.0 Guy | 105.052       | -2.946                  | 0.031                   | 0.000                                           | 0.000                                           | -0.052           |
| 1.2 Dead+1.0 Wind 300 deg -<br>No Ice+1.0 Guy     | 103.480       | -2.790                  | -1.571                  | 0.000                                           | 0.000                                           | -1.035           |
| 1.2D+1.0W (pattern 1) 300 deg<br>- No Ice+1.0 Guy | 102.537       | -1.468                  | -0.809                  | 0.000                                           | 0.000                                           | -1.059           |
| 1.2D+1.0W (pattern 2) 300 deg<br>- No Ice+1.0 Guy | 102.044       | -2.866                  | -1.602                  | 0.000                                           | 0.000                                           | -0.905           |
| 1.2D+1.0W (pattern 3) 300 deg<br>- No Ice+1.0 Guy | 100.314       | -2.953                  | -1.701                  | 0.000                                           | 0.000                                           | -0.754           |
| 1.2D+1.0W (pattern 4) 300 deg<br>- No Ice+1.0 Guy | 100.631       | -2.785                  | -1.583                  | 0.000                                           | 0.000                                           | -0.912           |
| 1.2 Dead+1.0 Wind 330 deg -<br>No Ice+1.0 Guy     | 120.093       | -1.743                  | -2.821                  | 0.000                                           | 0.000                                           | -1.741           |
| 1.2D+1.0W (pattern 1) 330 deg<br>- No Ice+1.0 Guy | 117.414       | -0.927                  | -1.383                  | 0.000                                           | 0.000                                           | -1.771           |
| 1.2D+1.0W (pattern 2) 330 deg<br>- No Ice+1.0 Guy | 116.224       | -1.794                  | -2.958                  | 0.000                                           | 0.000                                           | -1.921           |
| 1.2D+1.0W (pattern 3) 330 deg<br>- No Ice+1.0 Guy | 110.776       | -1.855                  | -3.182                  | 0.000                                           | 0.000                                           | -1.498           |
| 1.2D+1.0W (pattern 4) 330 deg<br>- No Ice+1.0 Guy | 110.491       | -1.752                  | -2.980                  | 0.000                                           | 0.000                                           | -1.670           |
| Dead+Wind 0 deg -<br>Service+Guy                  | 84.550        | 0.020                   | -1.106                  | 0.000                                           | 0.000                                           | -0.082           |
| Dead+Wind 30 deg -<br>Service+Guy                 | 84.415        | 0.525                   | -0.873                  | 0.000                                           | 0.000                                           | 0.413            |
| Dead+Wind 60 deg -<br>Service+Guy                 | 84.399        | 0.789                   | -0.461                  | 0.000                                           | 0.000                                           | 0.301            |
| Dead+Wind 90 deg -<br>Service+Guy                 | 84.400        | 0.868                   | -0.017                  | 0.000                                           | 0.000                                           | 0.009            |
| Dead+Wind 120 deg -<br>Service+Guy                | 84.468        | 0.819                   | 0.448                   | 0.000                                           | 0.000                                           | 0.231            |
| Dead+Wind 150 deg -<br>Service+Guy                | 84.578        | 0.524                   | 0.873                   | 0.000                                           | 0.000                                           | 0.479            |
| Dead+Wind 180 deg -<br>Service+Guy                | 84.691        | 0.008                   | 1.081                   | 0.000                                           | 0.000                                           | -0.030           |
| Dead+Wind 210 deg -<br>Service+Guy                | 84.720        | -0.500                  | 0.852                   | 0.000                                           | 0.000                                           | -0.541           |
| Dead+Wind 240 deg -<br>Service+Guy                | 84.704        | -0.776                  | 0.439                   | 0.000                                           | 0.000                                           | -0.285           |
| Dead+Wind 270 deg -<br>Service+Guy                | 84.669        | -0.841                  | 0.005                   | 0.000                                           | 0.000                                           | -0.037           |
| Dead+Wind 300 deg -                               | 84.664        | -0.781                  | -0.462                  | 0.000                                           | 0.000                                           | -0.268           |

|                                                                                                                                          |                |                                              |                    |                   |
|------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------------------------------------|--------------------|-------------------|
| <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>     | 100061.008.01 - FAIRGROUNDS, FL (BU# 846219) | <b>Page</b>        | 35 of 51          |
|                                                                                                                                          | <b>Project</b> |                                              | <b>Date</b>        | 16:11:28 09/28/21 |
|                                                                                                                                          | <b>Client</b>  | Crown Castle                                 | <b>Designed by</b> | 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 |
|---------------------------------------------------|---------------|-------------------------|-------------------------|-------------------------------------------------|-------------------------------------------------|------------------|
| Service+Guy<br>Dead+Wind 330 deg -<br>Service+Guy | 84.589        | -0.494                  | -0.891                  | 0.000                                           | 0.000                                           | -0.485           |

## Solution Summary

| Load<br>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                 | -26.162 | 0.000   | 0.001            | 26.162  | -0.000  | 0.003%  |
| 2             | -1.056                | -31.100 | -46.681 | 1.056            | 31.100  | 46.680  | 0.002%  |
| 3             | -1.056                | -31.100 | -42.250 | 1.056            | 31.100  | 42.249  | 0.002%  |
| 4             | -1.199                | -31.100 | -43.792 | 1.199            | 31.100  | 43.791  | 0.002%  |
| 5             | -0.675                | -31.100 | -41.529 | 0.675            | 31.100  | 41.528  | 0.002%  |
| 6             | -0.883                | -31.100 | -41.718 | 0.883            | 31.100  | 41.717  | 0.002%  |
| 7             | 19.742                | -30.985 | -38.455 | -19.742          | 30.985  | 38.455  | 0.001%  |
| 8             | 17.725                | -30.985 | -34.961 | -17.725          | 30.985  | 34.960  | 0.002%  |
| 9             | 18.286                | -30.985 | -36.167 | -18.286          | 30.985  | 36.166  | 0.002%  |
| 10            | 18.073                | -30.985 | -34.154 | -18.073          | 30.985  | 34.153  | 0.002%  |
| 11            | 17.592                | -30.985 | -34.219 | -17.592          | 30.985  | 34.218  | 0.003%  |
| 12            | 35.330                | -30.865 | -20.160 | -35.329          | 30.865  | 20.159  | 0.001%  |
| 13            | 32.196                | -30.865 | -18.351 | -32.196          | 30.865  | 18.350  | 0.001%  |
| 14            | 33.170                | -30.865 | -18.913 | -33.169          | 30.865  | 18.912  | 0.001%  |
| 15            | 31.674                | -30.865 | -18.086 | -31.674          | 30.865  | 18.086  | 0.001%  |
| 16            | 31.200                | -30.865 | -17.834 | -31.199          | 30.865  | 17.834  | 0.001%  |
| 17            | 40.453                | -30.985 | 1.201   | -40.453          | 30.985  | -1.201  | 0.002%  |
| 18            | 36.990                | -30.985 | 1.201   | -36.990          | 30.985  | -1.201  | 0.002%  |
| 19            | 38.087                | -30.985 | 1.319   | -38.086          | 30.985  | -1.318  | 0.003%  |
| 20            | 36.171                | -30.985 | 0.783   | -36.169          | 30.985  | -0.782  | 0.003%  |
| 21            | 35.606                | -30.985 | 1.031   | -35.606          | 30.985  | -1.030  | 0.002%  |
| 22            | 36.341                | -31.100 | 22.051  | -36.340          | 31.100  | -22.050 | 0.002%  |
| 23            | 33.097                | -31.100 | 20.178  | -33.096          | 31.100  | -20.177 | 0.002%  |
| 24            | 34.131                | -31.100 | 20.939  | -34.130          | 31.100  | -20.939 | 0.003%  |
| 25            | 32.543                | -31.100 | 19.434  | -32.541          | 31.100  | -19.433 | 0.003%  |
| 26            | 32.124                | -31.100 | 19.460  | -32.123          | 31.100  | -19.459 | 0.002%  |
| 27            | 22.378                | -30.972 | 38.582  | -22.377          | 30.972  | -38.581 | 0.002%  |
| 28            | 20.309                | -30.972 | 34.999  | -20.308          | 30.972  | -34.999 | 0.002%  |
| 29            | 21.010                | -30.972 | 36.292  | -21.009          | 30.972  | -36.291 | 0.002%  |
| 30            | 19.968                | -30.972 | 34.385  | -19.967          | 30.972  | -34.384 | 0.002%  |
| 31            | 19.896                | -30.972 | 34.299  | -19.896          | 30.972  | -34.299 | 0.001%  |
| 32            | 0.569                 | -30.844 | 45.681  | -0.570           | 30.844  | -45.681 | 0.002%  |
| 33            | 0.569                 | -30.844 | 41.258  | -0.571           | 30.844  | -41.257 | 0.002%  |
| 34            | 0.797                 | -30.844 | 42.780  | -0.798           | 30.844  | -42.780 | 0.001%  |
| 35            | 0.267                 | -30.844 | 40.834  | -0.269           | 30.844  | -40.834 | 0.002%  |
| 36            | 0.426                 | -30.844 | 40.820  | -0.427           | 30.844  | -40.819 | 0.002%  |
| 37            | -20.474               | -30.959 | 37.879  | 20.473           | 30.959  | -37.879 | 0.001%  |
| 38            | -18.456               | -30.959 | 34.385  | 18.456           | 30.959  | -34.384 | 0.002%  |
| 39            | -18.949               | -30.959 | 35.528  | 18.948           | 30.959  | -35.527 | 0.002%  |
| 40            | -18.650               | -30.959 | 33.807  | 18.649           | 30.959  | -33.806 | 0.002%  |
| 41            | -18.254               | -30.959 | 33.709  | 18.253           | 30.959  | -33.708 | 0.003%  |
| 42            | -35.170               | -31.079 | 20.920  | 35.169           | 31.079  | -20.919 | 0.002%  |
| 43            | -32.023               | -31.079 | 19.103  | 32.023           | 31.079  | -19.103 | 0.002%  |
| 44            | -32.927               | -31.079 | 19.624  | 32.926           | 31.079  | -19.624 | 0.002%  |
| 45            | -31.635               | -31.079 | 18.673  | 31.634           | 31.079  | -18.673 | 0.003%  |
| 46            | -31.080               | -31.079 | 18.518  | 31.079           | 31.079  | -18.517 | 0.002%  |
| 47            | -40.765               | -30.959 | -2.006  | 40.765           | 30.959  | 2.007   | 0.002%  |
| 48            | -37.302               | -30.959 | -2.006  | 37.302           | 30.959  | 2.007   | 0.002%  |
| 49            | -38.309               | -30.959 | -2.151  | 38.308           | 30.959  | 2.152   | 0.003%  |

|                                                                                                                                          |                                              |                    |
|------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|--------------------|
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|                                                                                                                                          | <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 |         |
| 50         | -36.469               | -30.959 | -1.331  | 36.469           | 30.959  | 1.332   | 0.002%  |
| 51         | -35.896               | -30.959 | -1.743  | 35.895           | 30.959  | 1.743   | 0.002%  |
| 52         | -37.034               | -30.844 | -22.637 | 37.034           | 30.844  | 22.637  | 0.001%  |
| 53         | -33.801               | -30.844 | -20.770 | 33.800           | 30.844  | 20.770  | 0.001%  |
| 54         | -34.771               | -30.844 | -21.594 | 34.771           | 30.844  | 21.593  | 0.001%  |
| 55         | -33.069               | -30.844 | -19.785 | 33.068           | 30.844  | 19.786  | 0.002%  |
| 56         | -32.751               | -30.844 | -19.973 | 32.750           | 30.844  | 19.974  | 0.002%  |
| 57         | -22.671               | -30.972 | -39.570 | 22.671           | 30.972  | 39.569  | 0.002%  |
| 58         | -20.602               | -30.972 | -35.987 | 20.602           | 30.972  | 35.986  | 0.002%  |
| 59         | -21.371               | -30.972 | -37.240 | 21.371           | 30.972  | 37.239  | 0.002%  |
| 60         | -20.124               | -30.972 | -35.100 | 20.124           | 30.972  | 35.099  | 0.002%  |
| 61         | -20.141               | -30.972 | -35.204 | 20.141           | 30.972  | 35.203  | 0.002%  |
| 62         | -0.287                | -26.197 | -12.707 | 0.287            | 26.197  | 12.706  | 0.001%  |
| 63         | 5.374                 | -26.165 | -10.468 | -5.374           | 26.165  | 10.467  | 0.002%  |
| 64         | 9.617                 | -26.133 | -5.488  | -9.617           | 26.133  | 5.488   | 0.001%  |
| 65         | 11.012                | -26.165 | 0.327   | -11.012          | 26.165  | -0.327  | 0.001%  |
| 66         | 9.892                 | -26.197 | 6.002   | -9.892           | 26.197  | -6.002  | 0.002%  |
| 67         | 6.091                 | -26.162 | 10.502  | -6.091           | 26.162  | -10.502 | 0.002%  |
| 68         | 0.155                 | -26.127 | 12.435  | -0.155           | 26.127  | -12.434 | 0.001%  |
| 69         | -5.573                | -26.158 | 10.311  | 5.573            | 26.158  | -10.311 | 0.002%  |
| 70         | -9.574                | -26.191 | 5.695   | 9.573            | 26.191  | -5.694  | 0.002%  |
| 71         | -11.097               | -26.158 | -0.546  | 11.096           | 26.158  | 0.546   | 0.001%  |
| 72         | -10.081               | -26.127 | -6.162  | 10.081           | 26.127  | 6.162   | 0.001%  |
| 73         | -6.171                | -26.162 | -10.771 | 6.171            | 26.162  | 10.771  | 0.002%  |

## Non-Linear Convergence Results

| Load Combination | Converged? | Number of Cycles | Displacement Tolerance | Force Tolerance |
|------------------|------------|------------------|------------------------|-----------------|
| 1                | Yes        | 9                | 0.00000001             | 0.00006399      |
| 2                | Yes        | 21               | 0.00000001             | 0.00005885      |
| 3                | Yes        | 20               | 0.00000001             | 0.00006381      |
| 4                | Yes        | 20               | 0.00000001             | 0.00007878      |
| 5                | Yes        | 20               | 0.00000001             | 0.00007020      |
| 6                | Yes        | 20               | 0.00000001             | 0.00008561      |
| 7                | Yes        | 20               | 0.00000001             | 0.00005315      |
| 8                | Yes        | 19               | 0.00000001             | 0.00005688      |
| 9                | Yes        | 19               | 0.00000001             | 0.00007093      |
| 10               | Yes        | 19               | 0.00000001             | 0.00007361      |
| 11               | Yes        | 19               | 0.00000001             | 0.00009484      |
| 12               | Yes        | 15               | 0.00000001             | 0.00007791      |
| 13               | Yes        | 14               | 0.00000001             | 0.00008020      |
| 14               | Yes        | 15               | 0.00000001             | 0.00006402      |
| 15               | Yes        | 15               | 0.00000001             | 0.00007546      |
| 16               | Yes        | 15               | 0.00000001             | 0.00008169      |
| 17               | Yes        | 19               | 0.00000001             | 0.00006869      |
| 18               | Yes        | 18               | 0.00000001             | 0.00006273      |
| 19               | Yes        | 18               | 0.00000001             | 0.00008553      |
| 20               | Yes        | 18               | 0.00000001             | 0.00009399      |
| 21               | Yes        | 19               | 0.00000001             | 0.00006976      |
| 22               | Yes        | 20               | 0.00000001             | 0.00006809      |
| 23               | Yes        | 19               | 0.00000001             | 0.00006721      |
| 24               | Yes        | 19               | 0.00000001             | 0.00008700      |
| 25               | Yes        | 19               | 0.00000001             | 0.00008771      |
| 26               | Yes        | 20               | 0.00000001             | 0.00005923      |
| 27               | Yes        | 20               | 0.00000001             | 0.00006139      |

|                                                                                                                                          |                                              |                    |
|------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|--------------------|
| <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>Client</b>                                | 16:11:28 09/28/21  |
|                                                                                                                                          | Crown Castle                                 | <b>Designed by</b> |
|                                                                                                                                          |                                              | Vinayak            |

|    |     |    |            |            |
|----|-----|----|------------|------------|
| 28 | Yes | 19 | 0.00000001 | 0.00006578 |
| 29 | Yes | 19 | 0.00000001 | 0.00008267 |
| 30 | Yes | 19 | 0.00000001 | 0.00008203 |
| 31 | Yes | 20 | 0.00000001 | 0.00005438 |
| 32 | Yes | 19 | 0.00000001 | 0.00005266 |
| 33 | Yes | 16 | 0.00000001 | 0.00007628 |
| 34 | Yes | 16 | 0.00000001 | 0.00005435 |
| 35 | Yes | 18 | 0.00000001 | 0.00006848 |
| 36 | Yes | 19 | 0.00000001 | 0.00005857 |
| 37 | Yes | 20 | 0.00000001 | 0.00005505 |
| 38 | Yes | 19 | 0.00000001 | 0.00005939 |
| 39 | Yes | 19 | 0.00000001 | 0.00007066 |
| 40 | Yes | 19 | 0.00000001 | 0.00007957 |
| 41 | Yes | 19 | 0.00000001 | 0.00009882 |
| 42 | Yes | 20 | 0.00000001 | 0.00006630 |
| 43 | Yes | 19 | 0.00000001 | 0.00006530 |
| 44 | Yes | 19 | 0.00000001 | 0.00008147 |
| 45 | Yes | 19 | 0.00000001 | 0.00008849 |
| 46 | Yes | 20 | 0.00000001 | 0.00005750 |
| 47 | Yes | 19 | 0.00000001 | 0.00007479 |
| 48 | Yes | 18 | 0.00000001 | 0.00007061 |
| 49 | Yes | 18 | 0.00000001 | 0.00008893 |
| 50 | Yes | 19 | 0.00000001 | 0.00005343 |
| 51 | Yes | 19 | 0.00000001 | 0.00007516 |
| 52 | Yes | 16 | 0.00000001 | 0.00005737 |
| 53 | Yes | 15 | 0.00000001 | 0.00005011 |
| 54 | Yes | 15 | 0.00000001 | 0.00007503 |
| 55 | Yes | 16 | 0.00000001 | 0.00008245 |
| 56 | Yes | 16 | 0.00000001 | 0.00006069 |
| 57 | Yes | 20 | 0.00000001 | 0.00006882 |
| 58 | Yes | 19 | 0.00000001 | 0.00007416 |
| 59 | Yes | 19 | 0.00000001 | 0.00009413 |
| 60 | Yes | 19 | 0.00000001 | 0.00008730 |
| 61 | Yes | 20 | 0.00000001 | 0.00005935 |
| 62 | Yes | 14 | 0.00000001 | 0.00004874 |
| 63 | Yes | 13 | 0.00000001 | 0.00006856 |
| 64 | Yes | 13 | 0.00000001 | 0.00005037 |
| 65 | Yes | 13 | 0.00000001 | 0.00005211 |
| 66 | Yes | 13 | 0.00000001 | 0.00006864 |
| 67 | Yes | 13 | 0.00000001 | 0.00006973 |
| 68 | Yes | 13 | 0.00000001 | 0.00006341 |
| 69 | Yes | 13 | 0.00000001 | 0.00007449 |
| 70 | Yes | 13 | 0.00000001 | 0.00007359 |
| 71 | Yes | 13 | 0.00000001 | 0.00005546 |
| 72 | Yes | 13 | 0.00000001 | 0.00005004 |
| 73 | Yes | 13 | 0.00000001 | 0.00007008 |

## Maximum Tower Deflections - Service Wind

| Section No. | Elevation<br>ft   | Horz. Deflection<br>in | Gov. Load Comb. | Tilt<br>° | Twist<br>° |
|-------------|-------------------|------------------------|-----------------|-----------|------------|
| T1          | 184.818 - 164.818 | 2.384                  | 72              | 0.138     | 0.147      |
| T2          | 164.818 - 144.818 | 1.794                  | 72              | 0.082     | 0.146      |
| T3          | 144.818 - 124.818 | 1.554                  | 68              | 0.056     | 0.252      |
| T4          | 124.818 - 104.818 | 1.315                  | 68              | 0.039     | 0.292      |
| T5          | 104.818 - 84.8177 | 1.263                  | 62              | 0.012     | 0.262      |
| T6          | 84.8177 - 64.8177 | 1.315                  | 62              | 0.035     | 0.245      |
| T7          | 64.8177 - 44.8177 | 1.580                  | 62              | 0.028     | 0.227      |
| T8          | 44.8177 - 24.8177 | 1.583                  | 62              | 0.048     | 0.195      |

|                                                                                                                                          |                                              |                    |
|------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|--------------------|
| <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   | Horz. Deflection<br>in | Gov. Load Comb. | Tilt<br>° | Twist<br>° |
|-------------|-------------------|------------------------|-----------------|-----------|------------|
| T9          | 24.8177 - 4.81771 | 1.099                  | 62              | 0.138     | 0.146      |
| T10         | 4.81771 - 0       | 0.198                  | 62              | 0.190     | 0.075      |

### 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              | 2.384            | 0.138     | 0.147      | 33120                     |
| 183'            | DBXLH-9090C-R2M w/ Mount Pipe | 72              | 2.322            | 0.132     | 0.144      | 33120                     |
| 174'            | HSX6-59-P3A/B                 | 72              | 2.029            | 0.105     | 0.134      | 15308                     |
| 167'4-3/32"     | Guy                           | 72              | 1.849            | 0.088     | 0.139      | 9605                      |
| 158'            | Andrew HSX6-59A               | 72              | 1.683            | 0.070     | 0.176      | 14808                     |
| 153'            | X7CQAP-665-VR0 w/ Mount Pipe  | 72              | 1.624            | 0.064     | 0.205      | 34979                     |
| 150'            | Commscope VHLPX3-11W          | 68              | 1.599            | 0.061     | 0.223      | 56462                     |
| 138'            | HSX8-59                       | 68              | 1.472            | 0.050     | 0.278      | 62413                     |
| 124'2-7/16"     | Guy                           | 68              | 1.310            | 0.038     | 0.292      | 14520                     |
| 116'            | HSX6-59-P3A/B                 | 68              | 1.272            | 0.025     | 0.284      | 26704                     |
| 84'2-7/16"      | Guy                           | 62              | 1.321            | 0.035     | 0.244      | 12090                     |

### 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 | 14.021                 | 3               | 0.672     | 0.798      |
| T2          | 164.818 - 144.818 | 11.903                 | 3               | 0.469     | 0.794      |
| T3          | 144.818 - 124.818 | 11.340                 | 2               | 0.343     | 1.181      |
| T4          | 124.818 - 104.818 | 10.710                 | 2               | 0.288     | 1.320      |
| T5          | 104.818 - 84.8177 | 10.938                 | 6               | 0.231     | 1.173      |
| T6          | 84.8177 - 64.8177 | 11.074                 | 6               | 0.189     | 1.038      |
| T7          | 64.8177 - 44.8177 | 11.460                 | 6               | 0.150     | 0.918      |
| T8          | 44.8177 - 24.8177 | 10.258                 | 6               | 0.475     | 0.748      |
| T9          | 24.8177 - 4.81771 | 6.674                  | 6               | 0.902     | 0.541      |
| T10         | 4.81771 - 0       | 1.177                  | 6               | 1.142     | 0.290      |

### 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               | 14.021           | 0.672     | 0.798      | 8577                      |
| 183'            | DBXLH-9090C-R2M w/ Mount Pipe | 3               | 13.797           | 0.652     | 0.787      | 8577                      |
| 174'            | HSX6-59-P3A/B                 | 3               | 12.742           | 0.555     | 0.751      | 3964                      |
| 167'4-3/32"     | Guy                           | 3               | 12.098           | 0.491     | 0.770      | 2481                      |
| 158'            | Andrew HSX6-59A               | 2               | 11.541           | 0.418     | 0.905      | 3083                      |
| 153'            | X7CQAP-665-VR0 w/ Mount Pipe  | 2               | 11.464           | 0.386     | 1.012      | 4382                      |

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

| Elevation   | Appurtenance         | Gov. Load Comb. | Deflection | Tilt  | Twist | Radius of Curvature |
|-------------|----------------------|-----------------|------------|-------|-------|---------------------|
| ft          |                      |                 | in         | °     | °     | ft                  |
| 150'        | Commscope VHLPX3-11W | 2               | 11.427     | 0.369 | 1.078 | 4114                |
| 138'        | HSX8-59              | 2               | 11.135     | 0.315 | 1.274 | 4051                |
| 124'2-7/16" | Guy                  | 2               | 10.698     | 0.287 | 1.318 | 3321                |
| 116'        | HSX6-59-P3A/B        | 2               | 10.622     | 0.268 | 1.270 | 4811                |
| 84'2-7/16"  | Guy                  | 6               | 11.085     | 0.188 | 1.035 | 3361                |

## Bolt Design Data

| 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       |
|-------------|-----------------|------------------------|------------|-----------------|-----------------|----------------------------|------------------------------|-------------------------|-----------------|----------------|
| T1          | 184.818         | Diagonal               | A325X      | 0.500           | 1               | 5.820                      | 9.777                        | 0.595                   | ✓               | Gusset Bearing |
|             |                 | Top Girt               | A325X      | 0.500           | 1               | 0.082                      | 7.016                        | 0.012                   | ✓               | Member Bearing |
|             |                 | Bottom Girt            | A325X      | 0.500           | 1               | 1.284                      | 5.919                        | 0.217                   | ✓               | Member Bearing |
|             |                 | Top Guy                | A325N      | 0.625           | 2               | 6.208                      | 11.061                       | 0.561                   | ✓               | Gusset Bearing |
|             |                 | Pull-Off@167.341       |            |                 |                 |                            |                              |                         |                 |                |
| T2          | 164.818         | Torque Arm Top@167.341 | A325N      | 0.875           | 2               | 7.051                      | 13.200                       | 0.534                   | ✓               | Gusset Bearing |
|             |                 | Leg                    | A325X      | 0.750           | 4               | 4.398                      | 30.101                       | 0.146                   | ✓               | Bolt Tension   |
|             |                 | Diagonal               | A325X      | 0.500           | 1               | 3.471                      | 5.919                        | 0.586                   | ✓               | Member Bearing |
|             |                 | Top Girt               | A325X      | 0.500           | 1               | 1.279                      | 5.919                        | 0.216                   | ✓               | Member Bearing |
|             |                 | Bottom Girt            | A325X      | 0.500           | 1               | 0.914                      | 5.919                        | 0.154                   | ✓               | Member Bearing |
| T3          | 144.818         | Leg                    | A325X      | 0.750           | 4               | 3.177                      | 30.101                       | 0.106                   | ✓               | Bolt Tension   |
|             |                 | Diagonal               | A325X      | 0.500           | 1               | 5.021                      | 5.919                        | 0.848                   | ✓               | Member Bearing |
|             |                 | Top Girt               | A325X      | 0.500           | 1               | 0.852                      | 5.919                        | 0.144                   | ✓               | Member Bearing |
|             |                 | Bottom Girt            | A325X      | 0.500           | 1               | 1.786                      | 5.919                        | 0.302                   | ✓               | Member Bearing |
| T4          | 124.818         | Leg                    | A325X      | 0.750           | 4               | 4.039                      | 30.101                       | 0.134                   | ✓               | Bolt Tension   |
|             |                 | Diagonal               | A325X      | 0.500           | 1               | 3.338                      | 5.919                        | 0.564                   | ✓               | Member Bearing |
|             |                 | Top Girt               | A325X      | 0.500           | 1               | 0.841                      | 5.919                        | 0.142                   | ✓               | Member Bearing |
|             |                 | Bottom Girt            | A325X      | 0.500           | 1               | 0.841                      | 5.919                        | 0.142                   | ✓               | Member Bearing |
|             |                 | Top Guy                | A325N      | 0.750           | 2               | 2.465                      | 12.130                       | 0.203                   | ✓               | Gusset Bearing |
| T5          | 104.818         | Pull-Off@124.203       |            |                 |                 |                            |                              |                         |                 |                |
|             |                 | Leg                    | A325X      | 0.750           | 4               | 3.752                      | 30.101                       | 0.125                   | ✓               | Bolt Tension   |
|             |                 | Diagonal               | A325X      | 0.500           | 1               | 3.149                      | 5.919                        | 0.532                   | ✓               | Member Bearing |
|             |                 | Top Girt               | A325X      | 0.500           | 1               | 0.910                      | 5.919                        | 0.154                   | ✓               | Member Bearing |
|             |                 | Bottom Girt            | A325X      | 0.500           | 1               | 1.535                      | 5.919                        | 0.259                   | ✓               | Member Bearing |
| T6          | 84.8177         | Leg                    | A325X      | 0.750           | 4               | 4.377                      | 30.101                       | 0.145                   | ✓               | Bolt Tension   |
|             |                 | Diagonal               | A325X      | 0.500           | 1               | 5.175                      | 5.919                        | 0.874                   | ✓               | Member Bearing |
|             |                 | Top Girt               | A325X      | 0.500           | 1               | 1.011                      | 5.919                        | 0.171                   | ✓               | Member Bearing |
|             |                 | Bottom Girt            | A325X      | 0.500           | 1               | 1.011                      | 5.919                        | 0.171                   | ✓               | Member Bearing |
|             |                 | Top Guy                | A325N      | 0.750           | 2               | 3.222                      | 12.130                       | 0.266                   | ✓               | Gusset Bearing |
|             |                 | Pull-Off@84.203        |            |                 |                 |                            |                              |                         |                 |                |

|                                                                                                                                          |                                              |                    |
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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         | 1<br>Leg       | A325X      | 0.750           | 4               | 4.863                      | 30.101                       | 0.162 ✓                 | 1.05            | Bolt Tension   |
|             |                 | Diagonal       | A325X      | 0.500           | 1               | 3.531                      | 5.919                        | 0.596 ✓                 | 1.05            | Member Bearing |
|             |                 | Top Girt       | A325X      | 0.500           | 1               | 1.305                      | 5.919                        | 0.220 ✓                 | 1.05            | Member Bearing |
|             |                 | Bottom Girt    | A325X      | 0.500           | 1               | 1.305                      | 5.919                        | 0.220 ✓                 | 1.05            | Member Bearing |
| T8          | 44.8177         | Leg            | A325X      | 0.750           | 4               | 6.278                      | 30.101                       | 0.209 ✓                 | 1.05            | Bolt Tension   |
|             |                 | Diagonal       | A325X      | 0.500           | 1               | 2.458                      | 7.016                        | 0.350 ✓                 | 1.05            | Member Bearing |
|             |                 | Top Girt       | A325X      | 0.500           | 1               | 1.313                      | 5.919                        | 0.222 ✓                 | 1.05            | Member Bearing |
|             |                 | Bottom Girt    | A325X      | 0.500           | 1               | 1.313                      | 5.919                        | 0.222 ✓                 | 1.05            | Member Bearing |
| T9          | 24.8177         | Leg            | A325X      | 0.750           | 4               | 5.730                      | 30.101                       | 0.190 ✓                 | 1.05            | Bolt Tension   |
|             |                 | Diagonal       | A325X      | 0.500           | 1               | 3.666                      | 5.919                        | 0.619 ✓                 | 1.05            | Member Bearing |
|             |                 | Top Girt       | A325X      | 0.500           | 1               | 1.191                      | 5.919                        | 0.201 ✓                 | 1.05            | Member Bearing |
|             |                 | Bottom Girt    | A325X      | 0.500           | 1               | 1.611                      | 5.919                        | 0.272 ✓                 | 1.05            | Member Bearing |
| T10         | 4.81771         | Leg            | A325X      | 0.750           | 4               | 4.286                      | 30.101                       | 0.142 ✓                 | 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)<br>(372) | 3/4 EHS  | 8.745                | 58.300             | 22.359            | 36.729                    | 0.952         | 1.564 ✓     |
|             | 167'4-3/32" (A)<br>(373) | 3/4 EHS  | 8.745                | 58.300             | 23.838            | 36.729                    | 0.952         | 1.467 ✓     |
|             | 167'4-3/32" (B)<br>(368) | 3/4 EHS  | 8.745                | 58.300             | 24.474            | 36.729                    | 0.952         | 1.429 ✓     |
|             | 167'4-3/32" (B)<br>(369) | 3/4 EHS  | 8.745                | 58.300             | 22.824            | 36.729                    | 0.952         | 1.533 ✓     |
|             | 167'4-3/32" (C)<br>(361) | 3/4 EHS  | 8.745                | 58.300             | 21.461            | 36.729                    | 0.952         | 1.630 ✓     |
|             | 167'4-3/32" (C)<br>(362) | 3/4 EHS  | 8.745                | 58.300             | 21.856            | 36.729                    | 0.952         | 1.600 ✓     |
| T4          | 124'2-7/16" (A)<br>(381) | 5/8 EHS  | 4.240                | 42.400             | 14.796            | 26.712                    | 0.952         | 1.719 ✓     |
|             | 124'2-7/16" (B)<br>(380) | 5/8 EHS  | 4.240                | 42.400             | 15.166            | 26.712                    | 0.952         | 1.677 ✓     |
|             | 124'2-7/16" (C)<br>(376) | 5/8 EHS  | 4.240                | 42.400             | 13.661            | 26.712                    | 0.952         | 1.862 ✓     |
| T6          | 84'2-7/16" (A)<br>(387)  | 9/16 EHS | 3.500                | 35.000             | 16.207            | 22.050                    | 0.952         | 1.296 ✓     |
|             | 84'2-7/16" (B)<br>(386)  | 9/16 EHS | 3.500                | 35.000             | 16.436            | 22.050                    | 0.952         | 1.278 ✓     |
|             | 84'2-7/16" (C)<br>(382)  | 9/16 EHS | 3.500                | 35.000             | 15.438            | 22.050                    | 0.952         | 1.360 ✓     |

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

## Compression Checks

### Leg 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 2.5 EH  | 20'         | 2'4-29/3 2"          | 31.3<br>K=1.00 | 2.254                | -52.981             | 94.407               | 0.561 <sup>1</sup><br>✓         |
| T2          | 164.818 - 144.818 | ROHN 2.5 STD | 20'         | 2'4-29/3 2"          | 30.5<br>K=1.00 | 1.704                | -50.427             | 71.637               | 0.704 <sup>1</sup><br>✓         |
| T3          | 144.818 - 124.818 | ROHN 2.5 STD | 20'         | 2'4-29/3 2"          | 61.0<br>K=2.00 | 1.704                | -46.789             | 58.406               | 0.801 <sup>1</sup><br>✓         |
| T4          | 124.818 - 104.818 | ROHN 2.5 STD | 20'         | 2'4-29/3 2"          | 61.0<br>K=2.00 | 1.704                | -48.536             | 58.406               | 0.831 <sup>1</sup><br>✓         |
| T5          | 104.818 - 84.8177 | ROHN 2.5 EH  | 20'         | 2'4-29/3 2"          | 62.6<br>K=2.00 | 2.254                | -50.476             | 76.170               | 0.663 <sup>1</sup><br>✓         |
| T6          | 84.8177 - 64.8177 | ROHN 2.5 EH  | 20'         | 2'4-29/3 2"          | 62.6<br>K=2.00 | 2.254                | -57.387             | 76.170               | 0.753 <sup>1</sup><br>✓         |
| T7          | 64.8177 - 44.8177 | ROHN 2.5 EH  | 20'         | 2'4-29/3 2"          | 62.6<br>K=2.00 | 2.254                | -74.734             | 76.170               | 0.981 <sup>1</sup><br>✓         |
| T8          | 44.8177 - 24.8177 | ROHN 2.5 EH  | 20'         | 2'4-29/3 2"          | 62.6<br>K=2.00 | 2.254                | -75.820             | 76.170               | 0.995 <sup>1</sup><br>✓         |
| T9          | 24.8177 - 4.81771 | ROHN 2.5 EH  | 20'         | 2'4-29/3 2"          | 62.6<br>K=2.00 | 2.254                | -67.420             | 76.170               | 0.885 <sup>1</sup><br>✓         |
| 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                | -51.576             | 99.313               | 0.519 <sup>1</sup><br>✓         |

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

### Diagonal 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 11GA | 3'8-5/8" | 3'8-5/8"             | 91.1<br>K=1.00 | 0.520                | -5.820              | 10.887               | 0.535 <sup>1</sup><br>✓         |
| 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                | -3.949              | 6.208                | 0.636 <sup>1</sup><br>✓         |
| 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                | -5.428              | 6.208                | 0.874 <sup>1</sup><br>✓         |
| 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                | -3.739              | 6.208                | 0.602 <sup>1</sup><br>✓         |
| 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                | -3.417              | 6.208                | 0.550 <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                | -5.237              | 6.208                | 0.844 <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                | -3.724              | 6.208                | 0.600 <sup>1</sup><br>✓         |

|                                                                                                                                          |                                              |                    |
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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>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>$\frac{P_u}{\phi P_n}$ |
|-------------|-------------------|-----------------|----------|----------------------|----------------|----------------------|---------------------|----------------------|---------------------------------|
| 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                | -2.458              | 6.208                | 0.396 <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                | -3.574              | 6.208                | 0.576 <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                | -0.946              | 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                | -0.082              | 7.049                | 0.012 <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                | -0.914              | 7.049                | 0.130 <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                | -0.839              | 7.049                | 0.119 <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                | -0.841              | 7.049                | 0.119 <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                | -0.910              | 7.049                | 0.129 <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                | -1.011              | 7.049                | 0.143 <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                | -1.305              | 7.049                | 0.185 <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                | -1.313              | 7.049                | 0.186 <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                | -1.191              | 7.049                | 0.169 <sup>1</sup><br>✓         |
| T10         | 4.81771 - 0       | L4x4x1/4        | 3'5"    | 3'2-1/8"             | 84.0<br>K=1.75 | 1.940                | -0.946              | 53.019               | 0.018 <sup>1</sup><br>✓         |

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

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

### Bottom Girt Design Data (Compression)

| Section No. | Elevation         | Size            | L    | L <sub>u</sub> | Kl/r           | A               | P <sub>u</sub> | φP <sub>n</sub> | Ratio                   |
|-------------|-------------------|-----------------|------|----------------|----------------|-----------------|----------------|-----------------|-------------------------|
|             | ft                |                 | ft   | ft             |                | in <sup>2</sup> | K              | K               | $\frac{P_u}{\phi P_n}$  |
| T1          | 184.818 - 164.818 | ROHN 1.5 x 16GA | 3'5" | 3'2-1/8"       | 74.7<br>K=1.00 | 0.263           | -0.918         | 7.049           | 0.130 <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           | -0.914         | 7.049           | 0.130 <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           | -1.433         | 7.049           | 0.203 <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           | -0.841         | 7.049           | 0.119 <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           | -1.179         | 7.049           | 0.167 <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           | -1.011         | 7.049           | 0.143 <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           | -1.305         | 7.049           | 0.185 <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           | -1.313         | 7.049           | 0.186 <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           | -1.191         | 7.049           | 0.169 <sup>1</sup><br>✓ |

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

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

| Section No. | Elevation         | Size                                                          | L    | L <sub>u</sub> | Kl/r            | A               | P <sub>u</sub> | φP <sub>n</sub> | Ratio                  |
|-------------|-------------------|---------------------------------------------------------------|------|----------------|-----------------|-----------------|----------------|-----------------|------------------------|
|             | ft                |                                                               | ft   | ft             |                 | in <sup>2</sup> | K              | K               | $\frac{P_u}{\phi P_n}$ |
| T1          | 184.818 - 164.818 | 2L2x2x1/4x3/8                                                 | 3'5" | 3'2-1/8"       | 104.8<br>K=1.00 | 1.880           | -10.498        | 43.618          | 0.241 <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           | -0.054         | 3.074           | 0.018 <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         | Size          | M <sub>ux</sub> | φM <sub>nx</sub> | Ratio                        | M <sub>uy</sub> | φM <sub>ny</sub> | 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 | 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                        |

|                                                                                                                                          |                |                                              |                    |                   |
|------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------------------------------------|--------------------|-------------------|
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|                                                                                                                                          | <b>Project</b> |                                              | <b>Date</b>        | 16:11:28 09/28/21 |
|                                                                                                                                          | <b>Client</b>  | Crown Castle                                 | <b>Designed by</b> | Vinayak           |

| 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>$\frac{M_{uy}}{\phi M_{ny}}$ |
|-------------|-----------------|------|--------------------|-------------------------|---------------------------------------|--------------------|-------------------------|---------------------------------------|
|-------------|-----------------|------|--------------------|-------------------------|---------------------------------------|--------------------|-------------------------|---------------------------------------|

### 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.<br>Stress<br>Ratio | Allow.<br>Stress<br>Ratio | Criteria |
|-------------|----------------------|---------------|---------------------------------|---------------------------------------|---------------------------------------|--------------------------|---------------------------|----------|
| T1          | 184.818 -<br>164.818 | 2L2x2x1/4x3/8 | 0.241                           | 0.000                                 | 0.000                                 | 0.241 <sup>1</sup><br>✓  | 1.050                     | 4.8.1 ✓  |
| T6          | 84.8177 -<br>64.8177 | 4 1/2x3/8     | 0.018                           | 0.000                                 | 0.000                                 | 0.018 <sup>1</sup><br>✓  | 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 -<br>164.818 (363) | C15x33.9 | 3'5"    | 3'3-9/16'   | 43.8<br>'<br>K=1.00 | 9.960                | -6.504     | 291.753         | 0.022                           |
| T1          | 184.818 -<br>164.818 (364) | C15x33.9 | 3'5"    | 3'3-9/16'   | 43.8<br>'<br>K=1.00 | 9.960                | -4.967     | 291.753         | 0.017                           |
| T1          | 184.818 -<br>164.818 (370) | C15x33.9 | 3'5"    | 3'3-9/16'   | 43.8<br>'<br>K=1.00 | 9.960                | -5.446     | 291.753         | 0.019                           |
| T1          | 184.818 -<br>164.818 (371) | C15x33.9 | 3'5"    | 3'3-9/16'   | 43.8<br>'<br>K=1.00 | 9.960                | -6.697     | 291.753         | 0.023                           |
| T1          | 184.818 -<br>164.818 (374) | C15x33.9 | 3'5"    | 3'3-9/16'   | 43.8<br>'<br>K=1.00 | 9.960                | -4.780     | 291.753         | 0.016                           |
| T1          | 184.818 -<br>164.818 (375) | C15x33.9 | 3'5"    | 3'3-9/16'   | 43.8<br>'<br>K=1.00 | 9.960                | -4.835     | 291.753         | 0.017                           |

### 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 -<br>164.818 (363) | C15x33.9 | -57.419            | 136.080                 | 0.422                                 | -0.000             | 12.595                  | 0.000                                 |
| T1          | 184.818 -<br>164.818 (364) | C15x33.9 | -63.010            | 136.080                 | 0.463                                 | 0.000              | 12.595                  | 0.000                                 |
| T1          | 184.818 -<br>164.818 (370) | C15x33.9 | -64.115            | 136.080                 | 0.471                                 | -0.000             | 12.595                  | 0.000                                 |
| T1          | 184.818 -<br>164.818 (371) | C15x33.9 | -58.922            | 136.080                 | 0.433                                 | 0.000              | 12.595                  | 0.000                                 |
| T1          | 184.818 -<br>164.818 (374) | C15x33.9 | -64.167            | 136.080                 | 0.472                                 | -0.000             | 12.595                  | 0.000                                 |
| T1          | 184.818 -                  | C15x33.9 | -62.934            | 136.080                 | 0.462                                 | 0.000              | 12.595                  | 0.000                                 |

|                                                                                                                                          |                |                                              |                    |                   |
|------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------------------------------------|--------------------|-------------------|
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|                                                                                                                                          | <b>Project</b> |                                              | <b>Date</b>        | 16:11:28 09/28/21 |
|                                                                                                                                          | <b>Client</b>  | Crown Castle                                 | <b>Designed by</b> | Vinayak           |

| 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>$\frac{M_{uy}}{\phi M_{ny}}$ |
|-------------|-----------------|------|--------------------|-------------------------|---------------------------------------|--------------------|-------------------------|---------------------------------------|
|             | 164.818 (375)   |      |                    |                         |                                       |                    |                         |                                       |

### 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. Stress Ratio | Allow. Stress Ratio | Criteria |
|-------------|-------------------------|----------|---------------------------------|---------------------------------------|---------------------------------------|--------------------|---------------------|----------|
| T1          | 184.818 - 164.818 (363) | C15x33.9 | 0.022                           | 0.422                                 | 0.000                                 | 0.433<br>✓         | 1.050               | 4.8.1 ✓  |
| T1          | 184.818 - 164.818 (364) | C15x33.9 | 0.017                           | 0.463                                 | 0.000                                 | 0.472<br>✓         | 1.050               | 4.8.1 ✓  |
| T1          | 184.818 - 164.818 (370) | C15x33.9 | 0.019                           | 0.471                                 | 0.000                                 | 0.480<br>✓         | 1.050               | 4.8.1 ✓  |
| T1          | 184.818 - 164.818 (371) | C15x33.9 | 0.023                           | 0.433                                 | 0.000                                 | 0.444<br>✓         | 1.050               | 4.8.1 ✓  |
| T1          | 184.818 - 164.818 (374) | C15x33.9 | 0.016                           | 0.472                                 | 0.000                                 | 0.480<br>✓         | 1.050               | 4.8.1 ✓  |
| T1          | 184.818 - 164.818 (375) | C15x33.9 | 0.017                           | 0.462                                 | 0.000                                 | 0.471<br>✓         | 1.050               | 4.8.1 ✓  |

### Tension Checks

### Leg Design Data (Tension)

| 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'     | 2'4-29/32"  | 31.3 | 2.254                | 46.340     | 101.409         | 0.457 <sup>1</sup><br>✓         |
| T2          | 164.818 - 144.818 | ROHN 2.5 STD | 20'     | 7-3/8"      | 7.8  | 1.704                | 11.463     | 76.682          | 0.149 <sup>1</sup><br>✓         |
| T7          | 64.8177 - 44.8177 | ROHN 2.5 EH  | 20'     | 1-3/8"      | 1.5  | 2.254                | 13.971     | 101.409         | 0.138 <sup>1</sup><br>✓         |
| T8          | 44.8177 - 24.8177 | ROHN 2.5 EH  | 20'     | 2'4-29/32"  | 31.3 | 2.254                | 14.043     | 101.409         | 0.138 <sup>1</sup><br>✓         |
| T9          | 24.8177 - 4.81771 | ROHN 2.5 EH  | 20'     | 7-3/8"      | 8.0  | 2.254                | 3.180      | 101.409         | 0.031 <sup>1</sup><br>✓         |

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

### Diagonal Design Data (Tension)

|                                                                                                                                          |                                              |                    |
|------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|--------------------|
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|                                                                                                                                          | <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 11GA | 3'8-5/8" | 3'8-5/8"             | 91.1 | 0.520                | 4.496               | 16.856               | 0.267 <sup>1</sup>              |
| T2          | 164.818 - 144.818 | ROHN 1.5 x 16GA | 3'8-5/8" | 3'8-5/8"             | 87.5 | 0.263                | 3.471               | 9.932                | 0.349 <sup>1</sup>              |
| T3          | 144.818 - 124.818 | ROHN 1.5 x 16GA | 3'8-5/8" | 3'8-5/8"             | 87.5 | 0.263                | 5.021               | 9.932                | 0.506 <sup>1</sup>              |
| T4          | 124.818 - 104.818 | ROHN 1.5 x 16GA | 3'8-5/8" | 3'8-5/8"             | 87.5 | 0.263                | 3.338               | 9.932                | 0.336 <sup>1</sup>              |
| T5          | 104.818 - 84.8177 | ROHN 1.5 x 16GA | 3'8-5/8" | 3'8-5/8"             | 87.5 | 0.263                | 3.149               | 9.932                | 0.317 <sup>1</sup>              |
| T6          | 84.8177 - 64.8177 | ROHN 1.5 x 16GA | 3'8-5/8" | 3'8-5/8"             | 87.5 | 0.263                | 5.175               | 9.932                | 0.521 <sup>1</sup>              |
| T7          | 64.8177 - 44.8177 | ROHN 1.5 x 16GA | 3'8-5/8" | 3'8-5/8"             | 87.5 | 0.263                | 3.531               | 9.932                | 0.356 <sup>1</sup>              |
| T8          | 44.8177 - 24.8177 | ROHN 1.5 x 16GA | 3'8-5/8" | 3'8-5/8"             | 87.5 | 0.263                | 1.999               | 9.932                | 0.201 <sup>1</sup>              |
| T9          | 24.8177 - 4.81771 | ROHN 1.5 x 16GA | 3'8-5/8" | 3'8-5/8"             | 87.5 | 0.263                | 3.666               | 9.932                | 0.369 <sup>1</sup>              |

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

### Horizontal 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>$\frac{P_u}{\phi P_n}$ |
|-------------|-----------------|----------|---------|----------------------|------|----------------------|---------------------|----------------------|---------------------------------|
| T10         | 4.81771 - 0     | L4x4x1/4 | 10-1/4" | 7-3/8"               | 5.9  | 1.940                | 0.946               | 62.856               | 0.015 <sup>1</sup>              |

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

### Top 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                | 0.061               | 9.932                | 0.006 <sup>1</sup>              |
| T2          | 164.818 - 144.818 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7 | 0.263                | 1.279               | 9.932                | 0.129 <sup>1</sup>              |
| T3          | 144.818 - 124.818 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7 | 0.263                | 0.852               | 9.932                | 0.086 <sup>1</sup>              |
| T4          | 124.818 - 104.818 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7 | 0.263                | 0.841               | 9.932                | 0.085 <sup>1</sup>              |
| T5          | 104.818 - 84.8177 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7 | 0.263                | 0.910               | 9.932                | 0.092 <sup>1</sup>              |
| T6          | 84.8177 -         | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7 | 0.263                | 1.011               | 9.932                | 0.102 <sup>1</sup>              |

|                                                                                                                                          |                                              |                    |
|------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|--------------------|
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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>$\frac{P_u}{\phi P_n}$ |
|-------------|-------------------|-----------------|---------|----------------------|------|----------------------|---------------------|----------------------|---------------------------------|
| T7          | 64.8177 - 44.8177 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7 | 0.263                | 1.305               | 9.932                | 0.131 <sup>1</sup> ✓            |
| T8          | 44.8177 - 24.8177 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7 | 0.263                | 1.313               | 9.932                | 0.132 <sup>1</sup> ✓            |
| T9          | 24.8177 - 4.8177  | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7 | 0.263                | 1.191               | 9.932                | 0.120 <sup>1</sup> ✓            |
| T10         | 4.8177 - 0        | L4x4x1/4        | 3'5"    | 3'2-1/8"             | 30.5 | 1.940                | 10.113              | 62.856               | 0.161 <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                | 1.284               | 9.932                | 0.129 <sup>1</sup> ✓            |
| T2          | 164.818 - 144.818 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7 | 0.263                | 0.914               | 9.932                | 0.092 <sup>1</sup> ✓            |
| T3          | 144.818 - 124.818 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7 | 0.263                | 1.786               | 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                | 0.841               | 9.932                | 0.085 <sup>1</sup> ✓            |
| T5          | 104.818 - 84.8177 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7 | 0.263                | 1.535               | 9.932                | 0.155 <sup>1</sup> ✓            |
| T6          | 84.8177 - 64.8177 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7 | 0.263                | 1.011               | 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                | 1.305               | 9.932                | 0.131 <sup>1</sup> ✓            |
| T8          | 44.8177 - 24.8177 | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7 | 0.263                | 1.313               | 9.932                | 0.132 <sup>1</sup> ✓            |
| T9          | 24.8177 - 4.8177  | ROHN 1.5 x 16GA | 3'5"    | 3'2-1/8"             | 74.7 | 0.263                | 1.611               | 9.932                | 0.162 <sup>1</sup> ✓            |

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

### 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                | 12.417              | 49.101               | 0.253 <sup>1</sup>              |
| T4          | 124.818 -         | 2L 'a' > 18.358 in - 367<br>4 1/2x3/8 | 3'5"    | 3'2-1/8"             | 352.2 | 1.688                | 4.930               | 54.675               | 0.090 <sup>1</sup>              |

|                                                                                                                                          |                |                                              |                    |                   |
|------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------------------------------------|--------------------|-------------------|
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|                                                                                                                                          | <b>Project</b> |                                              | <b>Date</b>        | 16:11:28 09/28/21 |
|                                                                                                                                          | <b>Client</b>  | Crown Castle                                 | <b>Designed by</b> | 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>$\frac{P_u}{\phi P_n}$ |
|-------------|---------------------------------|-----------|---------|----------------------|-------|----------------------|---------------------|----------------------|---------------------------------|
| T6          | 104.818<br>84.8177 -<br>64.8177 | 4 1/2x3/8 | 3'5"    | 3'2-1/8"             | 352.2 | 1.688                | 6.444               | 54.675               | 0.118 <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 -<br>164.818 | 2L2x2x1/4x3/8 | 0.000                     | 2.001                      | 0.000                                 | 0.000                     | 3.392                      | 0.000                                 |
| T4          | 124.818 -<br>104.818 | 4 1/2x3/8     | 0.000                     | 5.126                      | 0.000                                 | 0.000                     | 0.427                      | 0.000                                 |
| T6          | 84.8177 -<br>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.<br>Stress<br>Ratio | Allow.<br>Stress<br>Ratio | Criteria |
|-------------|----------------------|---------------|---------------------------------|---------------------------------------|---------------------------------------|--------------------------|---------------------------|----------|
| T1          | 184.818 -<br>164.818 | 2L2x2x1/4x3/8 | 0.253                           | 0.000                                 | 0.000                                 | 0.253 <sup>1</sup>       | 1.050                     | 4.8.1 ✓  |
| T4          | 124.818 -<br>104.818 | 4 1/2x3/8     | 0.090                           | 0.000                                 | 0.000                                 | 0.090 <sup>1</sup>       | 1.050                     | 4.8.1 ✓  |
| T6          | 84.8177 -<br>64.8177 | 4 1/2x3/8     | 0.118                           | 0.000                                 | 0.000                                 | 0.118 <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>$\frac{P_u}{\phi P_n}$ |
|-------------|----------------------------|----------|---------|----------------------|------|----------------------|---------------------|----------------------|---------------------------------|
| T1          | 184.818 -<br>164.818 (363) | C15x33.9 | 3'5"    | 3'3-9/16'            | 43.8 | 7.170                | 1.437               | 311.895              | 0.005                           |
| T1          | 184.818 -<br>164.818 (364) | C15x33.9 | 3'5"    | 3'3-9/16'            | 43.8 | 7.170                | 4.445               | 311.895              | 0.014                           |
| T1          | 184.818 -<br>164.818 (370) | C15x33.9 | 3'5"    | 3'3-9/16'            | 43.8 | 7.170                | 4.581               | 311.895              | 0.015                           |
| T1          | 184.818 -<br>164.818 (371) | C15x33.9 | 3'5"    | 3'3-9/16'            | 43.8 | 7.170                | 1.131               | 311.895              | 0.004                           |
| T1          | 184.818 -                  | C15x33.9 | 3'5"    | 3'3-9/16'            | 43.8 | 7.170                | 0.044               | 311.895              | 0.000                           |

|                                                                                                                                          |                                              |                    |
|------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|--------------------|
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|                                                                                                                                          | <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          | 164.818 (374)<br>184.818 -<br>164.818 (375) | C15x33.9 | 3'5"    | 3'3-9/16'            | 43.8 | 7.170                | 4.755               | 311.895              | 0.015                           |

### 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 -<br>164.818 (363) | C15x33.9 | -60.468                   | 136.080                    | 0.444                                 | -0.000                    | 12.595                     | 0.000                                 |
| T1          | 184.818 -<br>164.818 (364) | C15x33.9 | -54.971                   | 136.080                    | 0.404                                 | -0.000                    | 12.595                     | 0.000                                 |
| T1          | 184.818 -<br>164.818 (370) | C15x33.9 | -55.785                   | 136.080                    | 0.410                                 | 0.000                     | 12.595                     | 0.000                                 |
| T1          | 184.818 -<br>164.818 (371) | C15x33.9 | -58.507                   | 136.080                    | 0.430                                 | 0.000                     | 12.595                     | 0.000                                 |
| T1          | 184.818 -<br>164.818 (374) | C15x33.9 | -64.779                   | 136.080                    | 0.476                                 | 0.000                     | 12.595                     | 0.000                                 |
| T1          | 184.818 -<br>164.818 (375) | C15x33.9 | -52.708                   | 136.080                    | 0.387                                 | 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 -<br>164.818 (363) | C15x33.9 | 0.005                           | 0.444                                 | 0.000                                 | 0.447<br>✓               | 1.050                     | 4.8.1 ✓  |
| T1          | 184.818 -<br>164.818 (364) | C15x33.9 | 0.014                           | 0.404                                 | 0.000                                 | 0.411<br>✓               | 1.050                     | 4.8.1 ✓  |
| T1          | 184.818 -<br>164.818 (370) | C15x33.9 | 0.015                           | 0.410                                 | 0.000                                 | 0.417<br>✓               | 1.050                     | 4.8.1 ✓  |
| T1          | 184.818 -<br>164.818 (371) | C15x33.9 | 0.004                           | 0.430                                 | 0.000                                 | 0.432<br>✓               | 1.050                     | 4.8.1 ✓  |
| T1          | 184.818 -<br>164.818 (374) | C15x33.9 | 0.000                           | 0.476                                 | 0.000                                 | 0.476<br>✓               | 1.050                     | 4.8.1 ✓  |
| T1          | 184.818 -<br>164.818 (375) | C15x33.9 | 0.015                           | 0.387                                 | 0.000                                 | 0.395<br>✓               | 1.050                     | 4.8.1 ✓  |

### Section Capacity Table

| Section No. | Elevation<br>ft   | Component Type | Size         | Critical Element | P<br>K  | φP <sub>allow</sub><br>K | %<br>Capacity | Pass<br>Fail |
|-------------|-------------------|----------------|--------------|------------------|---------|--------------------------|---------------|--------------|
| T1          | 184.818 - 164.818 | Leg            | ROHN 2.5 EH  | 3                | -52.981 | 99.127                   | 53.4          | Pass         |
| T2          | 164.818 - 144.818 | Leg            | ROHN 2.5 STD | 59               | -50.427 | 75.218                   | 67.0          | Pass         |

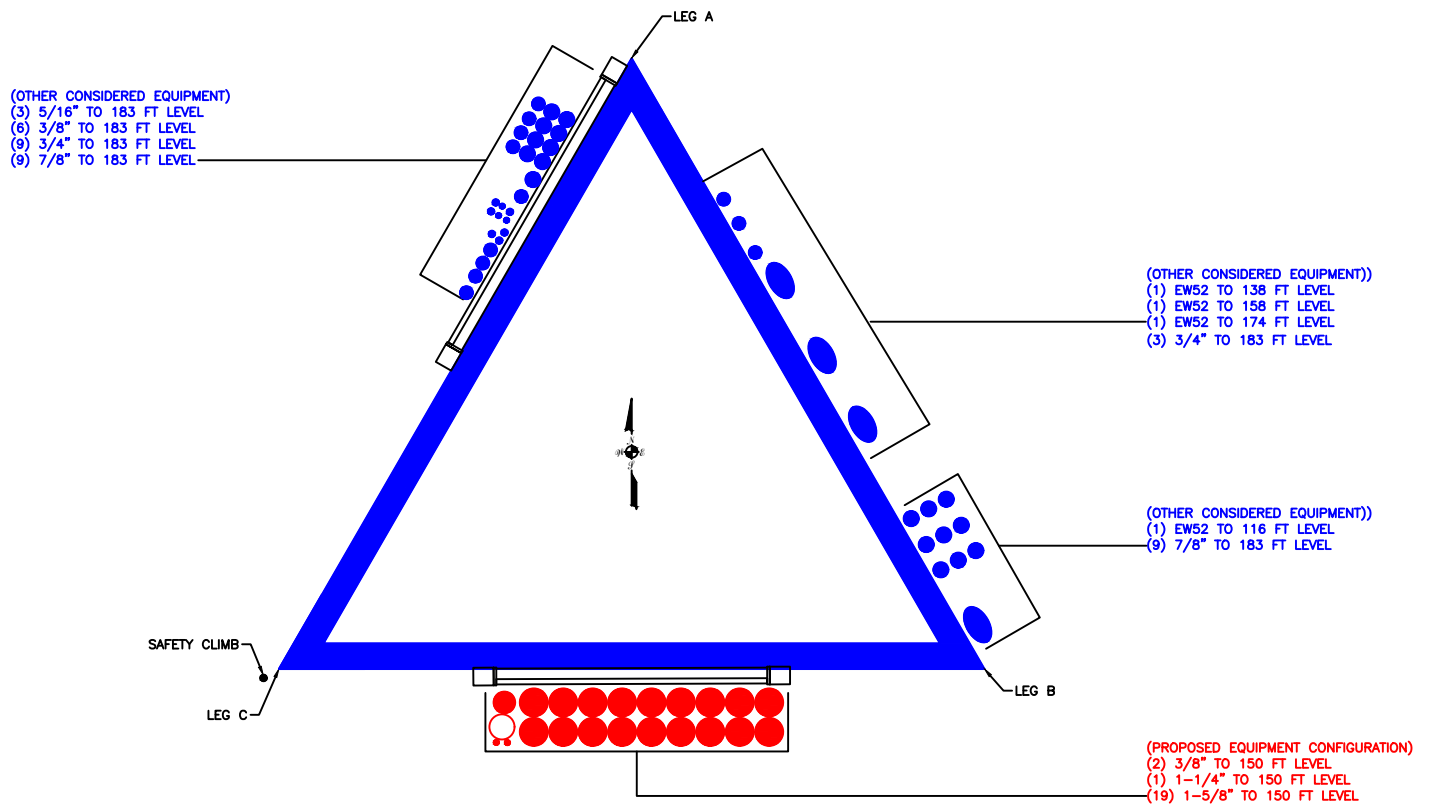
|                                                                                                                                          |                |                                              |                    |                   |
|---------------------------------------------------------------------------------------------------------------------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

| Section No. | Elevation ft      | Component Type              | Size            | Critical Element | P K     | $\sigma P_{allow}$ K | % Capacity    | Pass Fail |
|-------------|-------------------|-----------------------------|-----------------|------------------|---------|----------------------|---------------|-----------|
| T3          | 144.818 - 124.818 | Leg                         | ROHN 2.5 STD    | 115              | -46.789 | 61.326               | 76.3          | Pass      |
| T4          | 124.818 - 104.818 | Leg                         | ROHN 2.5 STD    | 150              | -48.536 | 61.326               | 79.1          | Pass      |
| T5          | 104.818 - 84.8177 | Leg                         | ROHN 2.5 EH     | 183              | -50.476 | 79.978               | 63.1          | Pass      |
| T6          | 84.8177 - 64.8177 | Leg                         | ROHN 2.5 EH     | 214              | -57.387 | 79.978               | 71.8          | Pass      |
| T7          | 64.8177 - 44.8177 | Leg                         | ROHN 2.5 EH     | 249              | -74.734 | 79.978               | 93.4          | Pass      |
| T8          | 44.8177 - 24.8177 | Leg                         | ROHN 2.5 EH     | 282              | -75.820 | 79.978               | 94.8          | Pass      |
| T9          | 24.8177 - 4.81771 | Leg                         | ROHN 2.5 EH     | 314              | -67.420 | 79.978               | 84.3          | Pass      |
| T10         | 4.81771 - 0       | Leg                         | ROHN 2.5 EH     | 346              | -51.576 | 104.279              | 49.5          | Pass      |
| T1          | 184.818 - 164.818 | Diagonal                    | ROHN 1.5 x 11GA | 10               | -5.820  | 11.431               | 50.9          | Pass      |
| T2          | 164.818 - 144.818 | Diagonal                    | ROHN 1.5 x 16GA | 109              | -3.949  | 6.519                | 60.6          | Pass      |
| T3          | 144.818 - 124.818 | Diagonal                    | ROHN 1.5 x 16GA | 126              | -5.428  | 6.519                | 83.3          | Pass      |
| T4          | 124.818 - 104.818 | Diagonal                    | ROHN 1.5 x 16GA | 176              | -3.739  | 6.519                | 57.4          | Pass      |
| T5          | 104.818 - 84.8177 | Diagonal                    | ROHN 1.5 x 16GA | 190              | -3.417  | 6.519                | 52.4          | Pass      |
| T6          | 84.8177 - 64.8177 | Diagonal                    | ROHN 1.5 x 16GA | 242              | -5.237  | 6.519                | 80.3          | Pass      |
| T7          | 64.8177 - 44.8177 | Diagonal                    | ROHN 1.5 x 16GA | 278              | -3.724  | 6.519                | 57.1          | Pass      |
| T8          | 44.8177 - 24.8177 | Diagonal                    | ROHN 1.5 x 16GA | 291              | -2.458  | 6.519                | 37.7          | Pass      |
| T9          | 24.8177 - 4.81771 | Diagonal                    | ROHN 1.5 x 16GA | 330              | -3.574  | 6.519                | 54.8          | Pass      |
| T10         | 4.81771 - 0       | Horizontal                  | L4x4x1/4        | 352              | -0.943  | 61.857               | 8.0           | Pass      |
| T1          | 184.818 - 164.818 | Top Girt                    | ROHN 1.5 x 16GA | 4                | -0.082  | 7.401                | 1.1           | Pass      |
| T2          | 164.818 - 144.818 | Top Girt                    | ROHN 1.5 x 16GA | 62               | -0.914  | 7.401                | 12.4          | Pass      |
| T3          | 144.818 - 124.818 | Top Girt                    | ROHN 1.5 x 16GA | 120              | -0.839  | 7.401                | 11.3          | Pass      |
| T4          | 124.818 - 104.818 | Top Girt                    | ROHN 1.5 x 16GA | 152              | -0.841  | 7.401                | 11.4          | Pass      |
| T5          | 104.818 - 84.8177 | Top Girt                    | ROHN 1.5 x 16GA | 185              | -0.910  | 7.401                | 12.3          | Pass      |
| T6          | 84.8177 - 64.8177 | Top Girt                    | ROHN 1.5 x 16GA | 217              | -1.011  | 7.401                | 13.7          | Pass      |
| T7          | 64.8177 - 44.8177 | Top Girt                    | ROHN 1.5 x 16GA | 251              | -1.305  | 7.401                | 17.6          | Pass      |
| T8          | 44.8177 - 24.8177 | Top Girt                    | ROHN 1.5 x 16GA | 284              | -1.313  | 7.401                | 17.7          | Pass      |
| T9          | 24.8177 - 4.81771 | Top Girt                    | ROHN 1.5 x 16GA | 317              | -1.191  | 7.401                | 16.1          | Pass      |
| T10         | 4.81771 - 0       | Top Girt                    | L4x4x1/4        | 349              | 10.113  | 65.999               | 15.3          | Pass      |
| T1          | 184.818 - 164.818 | Bottom Girt                 | ROHN 1.5 x 16GA | 8                | -0.918  | 7.401                | 12.4          | Pass      |
| T2          | 164.818 - 144.818 | Bottom Girt                 | ROHN 1.5 x 16GA | 65               | -0.914  | 7.401                | 12.4          | Pass      |
| T3          | 144.818 - 124.818 | Bottom Girt                 | ROHN 1.5 x 16GA | 123              | -1.433  | 7.401                | 19.4          | Pass      |
| T4          | 124.818 - 104.818 | Bottom Girt                 | ROHN 1.5 x 16GA | 155              | -0.841  | 7.401                | 11.4          | Pass      |
| T5          | 104.818 - 84.8177 | Bottom Girt                 | ROHN 1.5 x 16GA | 189              | -1.179  | 7.401                | 15.9          | Pass      |
| T6          | 84.8177 - 64.8177 | Bottom Girt                 | ROHN 1.5 x 16GA | 220              | -1.011  | 7.401                | 13.7          | Pass      |
| T7          | 64.8177 - 44.8177 | Bottom Girt                 | ROHN 1.5 x 16GA | 254              | -1.305  | 7.401                | 17.6          | Pass      |
| T8          | 44.8177 - 24.8177 | Bottom Girt                 | ROHN 1.5 x 16GA | 287              | -1.313  | 7.401                | 17.7          | Pass      |
| T9          | 24.8177 - 4.81771 | Bottom Girt                 | ROHN 1.5 x 16GA | 320              | -1.191  | 7.401                | 16.1          | Pass      |
| T1          | 184.818 - 164.818 | Guy A@167.341               | 3/4             | 373              | 23.838  | 36.729               | 64.9          | Pass      |
| T4          | 124.818 - 104.818 | Guy A@124.203               | 5/8             | 381              | 14.796  | 26.712               | 55.4          | Pass      |
| T6          | 84.8177 - 64.8177 | Guy A@84.2031               | 9/16            | 387              | 16.207  | 22.050               | 73.5          | Pass      |
| T1          | 184.818 - 164.818 | Guy B@167.341               | 3/4             | 368              | 24.474  | 36.729               | 66.6          | Pass      |
| T4          | 124.818 - 104.818 | Guy B@124.203               | 5/8             | 380              | 15.166  | 26.712               | 56.8          | Pass      |
| T6          | 84.8177 - 64.8177 | Guy B@84.2031               | 9/16            | 386              | 16.436  | 22.050               | 74.5          | Pass      |
| T1          | 184.818 - 164.818 | Guy C@167.341               | 3/4             | 362              | 21.856  | 36.729               | 59.5          | Pass      |
| T4          | 124.818 - 104.818 | Guy C@124.203               | 5/8             | 376              | 13.661  | 26.712               | 51.1          | Pass      |
| T6          | 84.8177 - 64.8177 | Guy C@84.2031               | 9/16            | 382              | 15.438  | 22.050               | 70.0          | Pass      |
| T1          | 184.818 - 164.818 | Top Guy<br>Pull-Off@167.341 | 2L2x2x1/4x3/8   | 367              | 12.417  | 51.556               | 24.1          | Pass      |
| T4          | 124.818 - 104.818 | Top Guy<br>Pull-Off@124.203 | 4 1/2x3/8       | 377              | 4.930   | 57.409               | 8.6           | Pass      |
| T6          | 84.8177 - 64.8177 | Top Guy<br>Pull-Off@84.203  | 4 1/2x3/8       | 383              | 6.444   | 57.409               | 11.2          | Pass      |
| T1          | 184.818 - 164.818 | Torque Arm<br>Top@167.341   | C15x33.9        | 370              | -5.446  | 306.341              | 45.8          | Pass      |
|             |                   |                             |                 |                  |         |                      | Summary       |           |
|             |                   |                             |                 |                  |         |                      | Leg (T8)      | Pass      |
|             |                   |                             |                 |                  |         |                      | Diagonal (T3) | Pass      |

|                                                                                                                                          |                                              |                    |
|------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|--------------------|
| <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>        |
|                                                                                                                                          | 100061.008.01 - FAIRGROUNDS, FL (BU# 846219) | 51 of 51           |
|                                                                                                                                          | <b>Project</b>                               | <b>Date</b>        |
|                                                                                                                                          | <b>Client</b>                                | <b>Designed by</b> |
|                                                                                                                                          | Crown Castle                                 | Vinayak            |

| Section No. | Elevation ft | Component Type | Size | Critical Element | P K | $\emptyset P_{allow}$ K | % Capacity  | Pass Fail   |
|-------------|--------------|----------------|------|------------------|-----|-------------------------|-------------|-------------|
|             |              |                |      |                  |     | Horizontal (T10)        | 8.0         | Pass        |
|             |              |                |      |                  |     | Top Girt (T8)           | 17.7        | Pass        |
|             |              |                |      |                  |     | Bottom Girt (T3)        | 19.4        | Pass        |
|             |              |                |      |                  |     | Guy A (T6)              | 73.5        | Pass        |
|             |              |                |      |                  |     | Guy B (T6)              | 74.5        | Pass        |
|             |              |                |      |                  |     | Guy C (T6)              | 70.0        | Pass        |
|             |              |                |      |                  |     | Top Guy Pull-Off (T1)   | 24.1        | Pass        |
|             |              |                |      |                  |     | Torque Arm Top (T1)     | 45.8        | Pass        |
|             |              |                |      |                  |     | Bolt Checks             | 83.3        | Pass        |
|             |              |                |      |                  |     | <b>RATING =</b>         | <b>94.8</b> | <b>Pass</b> |

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



BUSINESS UNIT: 846219

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

## Pier and Pad Foundation



BU # : 846219  
 Site Name: Fairgrounds, FL  
 App. Number: 567455 Rev# 1

TIA-222 Revision: H  
 Tower Type: Guyed

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

| Superstructure Analysis Reactions         |         |         |
|-------------------------------------------|---------|---------|
| Compression, $P_{comp}$ :                 | 129     | 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)       | 55.16    | 4.00   | 6.9%    | Pass  |
| Bearing Pressure (ksf)         | 7.56     | 2.68   | 33.8%   | Pass  |
| Overturning (kip*ft)           | 453.43   | 22.67  | 5.0%    | Pass  |
| Pier Flexure (Comp.) (kip*ft)  | 197.21   | 16.00  | 7.7%    | Pass  |
|                                |          |        |         |       |
| Pier Compression (kip)         | 1909.44  | 131.88 | 6.6%    | Pass  |
| Pad Flexure (kip*ft)           | 191.18   | 88.11  | 43.9%   | Pass  |
| Pad Shear - 1-way (kips)       | 117.85   | 34.71  | 28.1%   | Pass  |
| Pad Shear - 2-way (Comp) (ksi) | 0.164    | 0.050  | 29.2%   | Pass  |
| Flexural 2-way (Comp) (kip*ft) | 140.86   | 9.60   | 6.5%    | Pass  |
|                                |          |        |         |       |

\*Rating per TIA-222-H Section 15.5

|                     |       |
|---------------------|-------|
| Structural Rating*: | 43.9% |
| Soil Rating*:       | 33.8% |

<--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: 567455 Rev# 1  
 Location: B3

TIA-222 Revision: H

| Design Reactions                         |        |      |
|------------------------------------------|--------|------|
| Shear, <b>S:</b>                         | 49.00  | kips |
| Uplift, <b>Ua:</b>                       | 58.00  | kips |
| Resultant Force, <b>Rf:</b>              | 75.93  | 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> | 49.8   | 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):             | 244.48   | 49.00  | 19.1%   | Pass  |
| Uplift Capacity (kips):              | 212.16   | 58.00  | 26.0%   | Pass  |
| Lateral Flexural Capacity (ft*kips): | 759.00   | 119.44 | 15.0%   | Pass  |
| Uplift Flexural Capacity (ft*kips):  | 593.53   | 141.38 | 22.7%   | Pass  |
| Anchor Shaft (kips):                 | 98.17    | 75.93  | 73.7%   | Pass  |

\*Rating per TIA-222-H Section 15.5

|                      |       |
|----------------------|-------|
| Anchor Shaft Rating: | 73.7% |
| Structural Rating:   | 22.7% |
| Soil Rating:         | 26.0% |

|                               |   |    |
|-------------------------------|---|----|
| 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

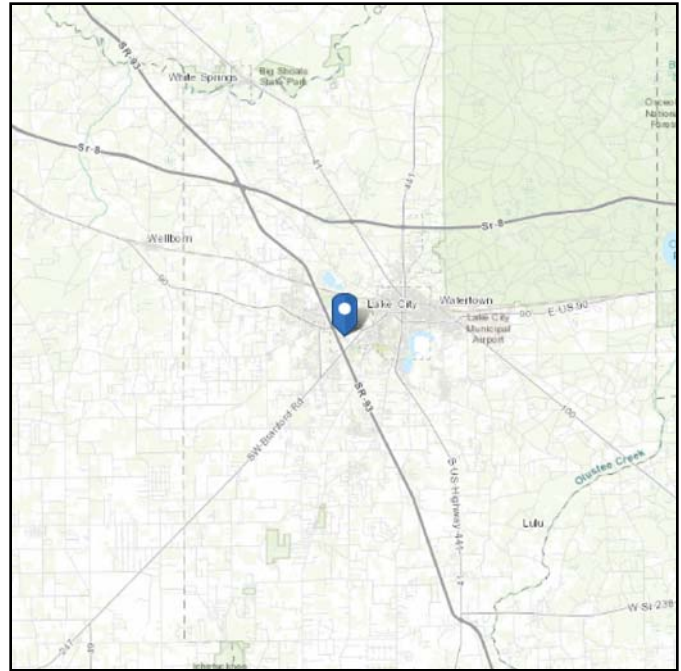
**Risk Category:** II**Soil Class:**

D - Default (see  
Section 11.4.3)

**Elevation:** 155.97 ft (NAVD 88)

**Latitude:** 30.174008

**Longitude:** -82.680519



## 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 Sep 28 2021

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

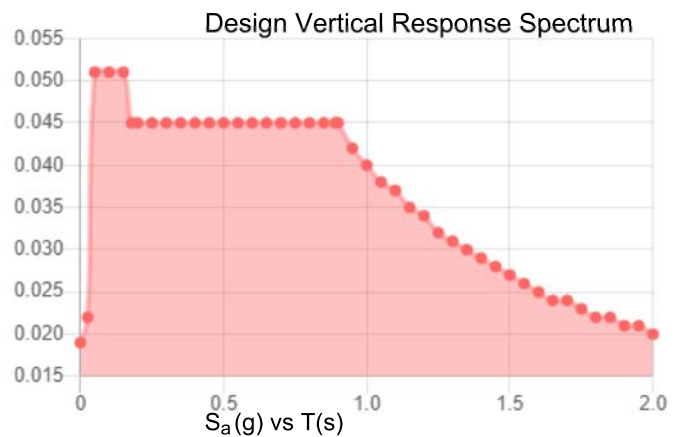
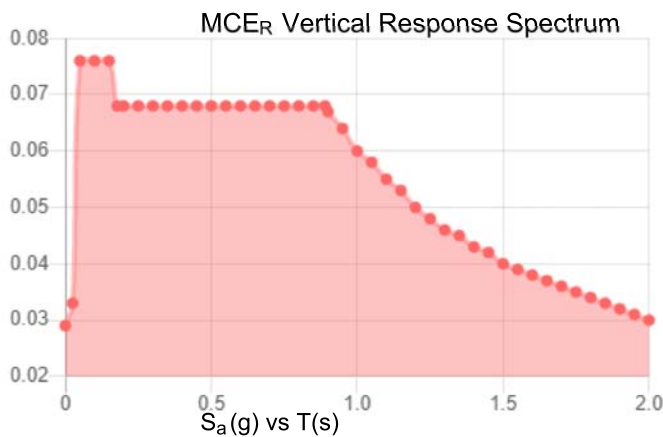
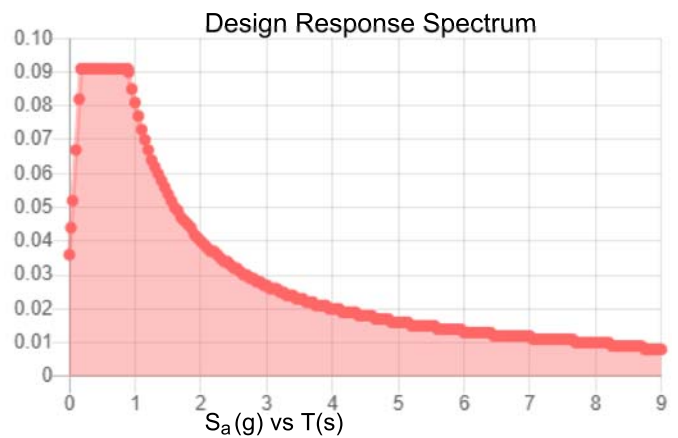
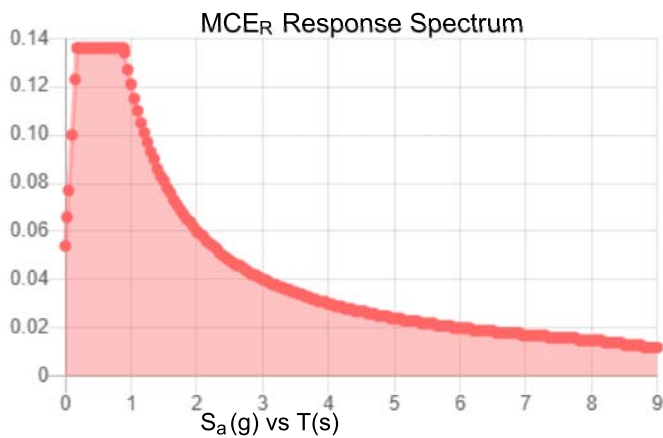
Site is in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

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

**Results:**

|            |       |                    |       |
|------------|-------|--------------------|-------|
| $S_S$ :    | 0.085 | $S_{D1}$ :         | 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 Sep 28 2021

**Date Source:**

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

## Ice

---

**Results:**

Ice Thickness: 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 Sep 28 2021

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

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 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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