

**(REVISED)**  
**STRUCTURAL ANALYSIS REPORT**

For

**CT11533B (ANCHOR 2020)**  
**CT533/SAI - ENFIELD**

37 Bacon Road  
Enfield, CT 06082

**Antennas Mounted on the Monopole**

| Controlling Member | Pass/Fail | Stress Ratio |
|--------------------|-----------|--------------|
| Pole Section – L5  | PASS      | 88.1 %       |



Prepared for:



Dated: July 21, 2021 (Rev.3)

June 7, 2021 (Rev.2)

January 13, 2021 (Rev.1)

December 3, 2020

Prepared by:



45 Beechwood Drive  
North Andover, MA 01845  
(P) 978.557.5553 (F) 978.336.5586  
[www.hudsondesigngroupllc.com](http://www.hudsondesigngroupllc.com)



**HUDSON**  
Design Group LLC

### **SCOPE OF WORK:**

Hudson Design Group LLC (HDG) has been authorized by T-Mobile to conduct a structural evaluation of the 179' monopole supporting the proposed T-Mobile's antennas located at elevation 160' above the ground level.

This report represents this office's findings, conclusions and recommendations pertaining to the support of T-Mobile's existing and proposed antennas listed below.

Record drawings of the existing monopole prepared by Sabre Communications Corp. dated July 23, 2003 were obtained for our use. This office conducted an on-site visual survey and tower mapping on April 11, 2012 to record dimensional properties of the existing monopole and its appurtenances.

The following documents were used for our reference:

- Previous structural analysis report prepared by HDG, dated July 16, 2019.
- Previous structural analysis report prepared by HDG, dated July 13, 2020.

### **CONCLUSION SUMMARY:**

Based on our evaluation, we have determined that the existing monopole **is in conformance** with the ANSI/TIA-222-G Standard for the loading considered under the criteria listed in this report. The monopole structure is rated at **88.1 %** - (Pole section L5 from EL.20' to 47.75' Controlling).

### **FOUNDATION SUMMARY:**

Based on our evaluation, we have determined that the existing foundation **is in conformance** with the ANSI/TIA-222-G Standard for the loading considered under the criteria listed in this report. The foundation is rated at **98.2 %** - (Overturning Controlling).



**APPURTENANCES CONFIGURATION:**

| Tenant          | Appurtenances                              | Elev.  | Mount                |
|-----------------|--------------------------------------------|--------|----------------------|
|                 | 10' Omni                                   | 182'   | Side Mount Standoff  |
|                 | Panel Antenna                              | 178.5' | Side Mount Standoff  |
|                 | Box 12"x8"                                 | 177.7' | Side Mount Standoff  |
|                 | 2' Dish                                    | 177.7' | Side Mount Standoff  |
| AT&T            | (1) QS66512-2 Antenna                      | 168'   | Side Mount Standoff  |
| AT&T            | (2) TPA-65R-LCUUUU-H8 Antennas             | 168'   | Side Mount Standoff  |
| AT&T            | (6) RRUS-32 RRH's                          | 168'   | Mount Pipe           |
| AT&T            | (3) RRUS-11RRH's                           | 168'   | Mount Pipe           |
| AT&T            | (2) Squid Surge Arrestor                   | 168'   | Mount Pipe           |
| <b>T-Mobile</b> | <b>(3) APX16DWV-16DWV-S-E-A20 Antennas</b> | 160'   | T - Frame            |
| <b>T-Mobile</b> | <b>(3) APXVAALL18_43-U-NA20 Antennas</b>   | 160'   | T - Frame            |
| <b>T-Mobile</b> | <b>(3) AIR6449 B41 Antennas</b>            | 160'   | T - Frame            |
| <b>T-Mobile</b> | <b>(3) 4449 B71+B85 RRH's</b>              | 160'   | T - Frame            |
| <b>T-Mobile</b> | <b>(3) 4424 B25 RRH's</b>                  | 160'   | T - Frame            |
| <b>T-Mobile</b> | <b>(3) 4415 B66A RRH's</b>                 | 160'   | T - Frame            |
| Verizon         | (6) LPA-80080-4CF Antennas                 | 150'   | Low Profile Platform |
| Verizon         | (3) BXA-171085-8BF Antennas                | 150'   | Low Profile Platform |
| Verizon         | BXA-70063-4CF Antenna                      | 150'   | Low Profile Platform |
| Verizon         | (2) SLCP 2X6014 Antennas                   | 150'   | Low Profile Platform |
| Verizon         | (6) FD9R6004 Diplexers                     | 150'   | Low Profile Platform |

*\*Proposed T-Mobile Appurtenances shown in Bold.*

**T-MOBILE EXISTING /PROPOSED COAX CABLES:**

| Tenant          | Coax Cables                         | Elev. | Mount           |
|-----------------|-------------------------------------|-------|-----------------|
| <b>T-Mobile</b> | <b>(3) 6x12 Hybrid Fiber Cables</b> | 160'  | Inside Monopole |

*\*Proposed T-Mobile Coax Cables shown in Bold.*



**ANALYSIS RESULTS SUMMARY:**

| Component                 | Max. Stress Ratio | Elev. of Component (ft) | Pass/Fail | Comments           |
|---------------------------|-------------------|-------------------------|-----------|--------------------|
| Pole Section-L1           | 85.0 %            | 148.0 – 179.0           | PASS      |                    |
| Pole Section-L2           | 83.4 %            | 117.25 – 148.0          | PASS      |                    |
| Pole Section-L3           | 80.5 %            | 97.25 – 117.25          | PASS      |                    |
| Pole Section-L4           | 82.7 %            | 47.75 – 97.25           | PASS      |                    |
| Pole Section-L5           | <b>88.1 %</b>     | 20.0 – 47.75            | PASS      | <b>Controlling</b> |
| Pole Section-L6           | 77.2 %            | 0.0 – 20.0              | PASS      |                    |
| Base Plate & Anchor Bolts | 69.2 %            | 0.0                     | PASS      |                    |

**FOUNDATION COMPARISON SUMMARY:**

|             | Stress Ratio  | Pass/Fail | Comments           |
|-------------|---------------|-----------|--------------------|
| Bearing     | 87.0 %        | PASS      |                    |
| Overturning | <b>98.2 %</b> | PASS      | <b>Controlling</b> |
| Shear       | 18.4 %        | PASS      |                    |



**HUDSON**  
Design Group LLC

**DESIGN CRITERIA:**

1. EIA/TIA-222-G Structural Standards for Steel Antenna Towers and Antenna Supporting Structures
  - County: Hartford
  - City/Town: Enfield
  - Wind Load: 97 mph
  - Structural Class: II
  - Exposure Category: B
  - Topographic Category: 1
  - Crest Height: 0 ft.
  - Ice Thickness: 1.0 inch
2. Approximate height above grade to proposed antennas: 160'

**ASSUMPTIONS:**

1. The monopole and foundation are properly constructed and maintained. All structural members and their connections are assumed to be in good condition and are free from defects with no deterioration to its member capacities.
2. The appurtenances configuration is as stated in this report. All antennas, coax cables and waveguide cables are assumed to be properly installed and supported as per the manufacturer's requirements.
3. The support mounts and platforms are not analyzed and are considered adequate to support the loading. The analysis is limited to the primary support structure itself.
4. All prior structural modification, if any, are assumed to be as per the data supplied (if available), and installed properly.

**SUPPORT RECOMMENDATIONS:**

HDG recommends that the proposed antennas and RRHs be mounted on the existing T-Frame supported by the monopole.



**HUDSON**  
Design Group LLC



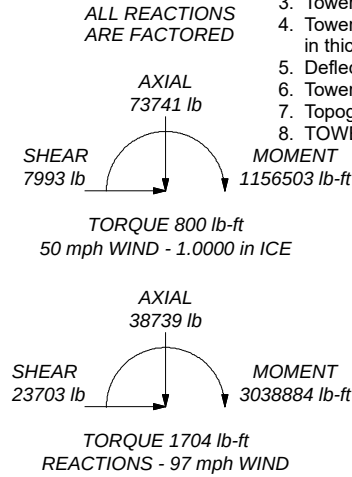
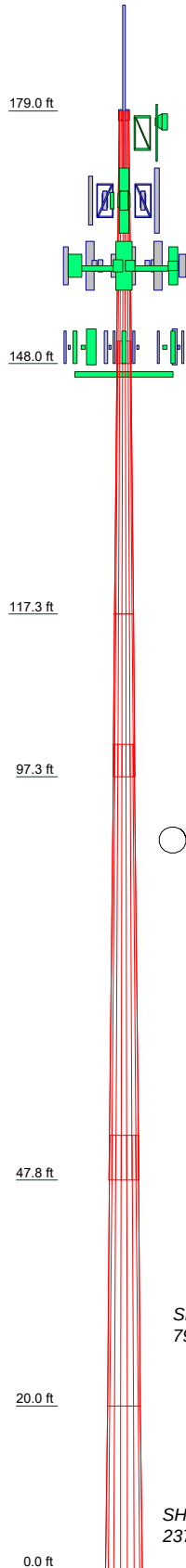
**Photo 1:** Photo illustrating the Monopole with Appurtenances shown.



**HUDSON**  
Design Group LLC

## **CALCULATIONS**

|                    |         |         |         |         |         |         |         |
|--------------------|---------|---------|---------|---------|---------|---------|---------|
| Section            | 1       | 2       | 3       | 4       | 5       | 6       |         |
| Length (ft)        | 31.00   | 33.50   | 20.00   | 53.50   | 33.25   | 20.00   |         |
| Number of Sides    | 18      | 18      | 18      | 18      | 18      | 18      |         |
| Thickness (in)     | 0.1875  | 0.2500  | 0.2800  | 0.3125  | 0.3125  | 0.3500  |         |
| Socket Length (ft) | 2.75    |         | 4.00    | 5.50    |         |         |         |
| Top Dia (in)       | 14.4000 | 20.3858 | 27.9400 | 30.9800 | 41.2290 | 48.9500 |         |
| Bot Dia (in)       | 21.3800 | 27.9400 | 32.4400 | 43.1000 | 48.9500 | 53.2300 |         |
| Grade              | A572-65 |         |         |         |         |         |         |
| Weight (lb)        | 1111.3  | 2163.0  | 1809.0  | 6631.9  | 5025.0  | 3836.1  | 20576.4 |



## DESIGNED APPURTENANCE LOADING

| TYPE                                            | ELEVATION | TYPE                                         | ELEVATION |
|-------------------------------------------------|-----------|----------------------------------------------|-----------|
| Omni 3"x20"                                     | 182       | AIR6449 B41 Antenna w/ Mounting Pipe         | 160       |
| Panel Antenna 16"x16"                           | 178.5     |                                              |           |
| Box 12"x8"x3"                                   | 177.7     | 4449 B71+B85 RRH                             | 160       |
| HP2-102                                         | 177.7     | 4449 B71+B85 RRH                             | 160       |
| Pirol 4' Side Mount Standoff (1)                | 176.3     | 4449 B71+B85 RRH                             | 160       |
| 7"x2" Antenna Mount Pipe                        | 176.3     | 4424 B25 RRH                                 | 160       |
| Pirol 4' Side Mount Standoff (1)                | 176.3     | 4424 B25 RRH                                 | 160       |
| Collar Mount                                    | 169.5     | 4424 B25 RRH                                 | 160       |
| Pirol 4' Side Mount Standoff (1)                | 168       | 4415 RRH                                     | 160       |
| Pirol 4' Side Mount Standoff (1)                | 168       | 4415 RRH                                     | 160       |
| Pirol 4' Side Mount Standoff (1)                | 168       | 4415 RRH                                     | 160       |
| RRUS-11 RRH                                     | 168       | Pirol 12' T-Frame                            | 160       |
| RRUS-11 RRH                                     | 168       | Pirol 12' T-Frame                            | 160       |
| RRUS-11 RRH                                     | 168       | Pirol 12' T-Frame                            | 160       |
| Squid Surge Arrestor                            | 168       | LPA-80080/4CF Antenna w/ Mounting Pipe       | 150       |
| QS66512-2 Antenna w/ Mounting Pipe              | 168       |                                              |           |
| TPA-65R-LCUUUU-H8 Antenna w/ Mounting Pipe      | 168       | SLCP 2x6014 Antenna w/ Mounting Pipe         | 150       |
| TPA-65R-LCUUUU-H8 Antenna w/ Mounting Pipe      | 168       | BXA-171085-8BF-EDIN Antenna w/ Mounting Pipe | 150       |
| RRUS-32 RRH                                     | 168       | LPA-80080/4CF Antenna w/ Mounting Pipe       | 150       |
| RRUS-32 RRH                                     | 168       | LPA-80080/4CF Antenna w/ Mounting Pipe       | 150       |
| RRUS-32 RRH                                     | 168       | LPA-80080/4CF Antenna w/ Mounting Pipe       | 150       |
| RRUS-32 RRH                                     | 168       | LPA-80080/4CF Antenna w/ Mounting Pipe       | 150       |
| RRUS-32 RRH                                     | 168       | SLCP 2x6014 Antenna w/ Mounting Pipe         | 150       |
| Squid Surge Arrestor                            | 168       |                                              |           |
| APX16DWV-16DWV-S-E-A20 Antenna w/ Mounting Pipe | 160       | BXA-171085-8BF-EDIN Antenna w/ Mounting Pipe | 150       |
| APX16DWV-16DWV-S-E-A20 Antenna w/ Mounting Pipe | 160       | LPA-80080/4CF Antenna w/ Mounting Pipe       | 150       |
| APX16DWV-16DWV-S-E-A20 Antenna w/ Mounting Pipe | 160       | (2) FD9R6004 Diplexer                        | 150       |
| APXVAALL18_43-U-NA20 Antenna w/ Mounting Pipe   | 160       | (2) FD9R6004 Diplexer                        | 150       |
| APXVAALL18_43-U-NA20 Antenna w/ Mounting Pipe   | 160       | (2) FD9R6004 Diplexer                        | 150       |
| APXVAALL18_43-U-NA20 Antenna w/ Mounting Pipe   | 160       | BXA-70063/4CF Antenna w/ Mounting Pipe       | 150       |
| APXVAALL18_43-U-NA20 Antenna w/ Mounting Pipe   | 160       | BXA-171085-8BF-EDIN Antenna w/ Mounting Pipe | 150       |
| APXVAALL18_43-U-NA20 Antenna w/ Mounting Pipe   | 160       | LPA-80080/4CF Antenna w/ Mounting Pipe       | 150       |
| AIR6449 B41 Antenna w/ Mounting Pipe            | 160       | PIROD 13' Low Profile Platform               | 147       |
| AIR6449 B41 Antenna w/ Mounting Pipe            | 160       |                                              |           |

## MATERIAL STRENGTH

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

## TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 88.1%

**Hudson Design Group**  
 45 Beechwood Drive  
 North Andover, MA  
 Phone: 978.557.5553  
 FAX: 978.336.5586

Job: **CT11533B**

Project: **CT533/SAI - ENFIELD**

Client: T-Mobile - Centerline

Drawn by: ID

App'd:

Code: TIA-222-G

Date: 07/21/21

Scale: NTS

Path:

Dwg No. E-1

Z:\Shared\Stock\STRUCTURAL DEPARTMENT\ANALYSIS SOFTWARE\Tower\Tpa Project\T-Mobile\CT11533B\Rev 3\CT11533B.dwg



|                                                                                                                                          |                                            |                                      |
|------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|--------------------------------------|
| <b>tnxTower</b><br><br><b>Hudson Design Group</b><br>45 Beechwood Drive<br>North Andover, MA<br>Phone: 978.557.5553<br>FAX: 978.336.5586 | <b>Job</b><br><br>CT11533B                 | <b>Page</b><br><br>1 of 9            |
|                                                                                                                                          | <b>Project</b><br><br>CT533/SAI - ENFIELD  | <b>Date</b><br><br>16:43:10 07/21/21 |
|                                                                                                                                          | <b>Client</b><br><br>T-Mobile - Centerline | <b>Designed by</b><br><br>ID         |

## Tower Input Data

The tower is a monopole.

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

The following design criteria apply:

Tower is located in Hartford County, Connecticut.

Basic wind speed of 97 mph.

Structure Class II.

Exposure Category B.

Topographic Category 1.

Crest Height 0.00 ft.

Nominal ice thickness of 1.0000 in.

Ice thickness is considered to increase with height.

Ice density of 56 pcf.

A wind speed of 50 mph is used in combination with ice.

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 60 mph.

A non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

Stress ratio used in pole design is 1.

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

## Tapered Pole Section Geometry

| Section | Elevation<br>ft | Section<br>Length<br>ft | Splice<br>Length<br>ft | Number<br>of<br>Sides | Top<br>Diameter<br>in | Bottom<br>Diameter<br>in | Wall<br>Thickness<br>in | Bend<br>Radius<br>in | Pole Grade          |
|---------|-----------------|-------------------------|------------------------|-----------------------|-----------------------|--------------------------|-------------------------|----------------------|---------------------|
| L1      | 179.00-148.00   | 31.00                   | 2.75                   | 18                    | 14.4000               | 21.3800                  | 0.1875                  | 0.7500               | A572-65<br>(65 ksi) |
| L2      | 148.00-117.25   | 33.50                   | 0.00                   | 18                    | 20.3858               | 27.9400                  | 0.2500                  | 1.0000               | A572-65<br>(65 ksi) |
| L3      | 117.25-97.25    | 20.00                   | 4.00                   | 18                    | 27.9400               | 32.4400                  | 0.2800                  | 1.1200               | A572-65<br>(65 ksi) |
| L4      | 97.25-47.75     | 53.50                   | 5.50                   | 18                    | 30.9800               | 43.1000                  | 0.3125                  | 1.2500               | A572-65<br>(65 ksi) |
| L5      | 47.75-20.00     | 33.25                   | 0.00                   | 18                    | 41.2290               | 48.9500                  | 0.3125                  | 1.2500               | A572-65<br>(65 ksi) |
| L6      | 20.00-0.00      | 20.00                   |                        | 18                    | 48.9500               | 53.2300                  | 0.3500                  | 1.4000               | A572-65<br>(65 ksi) |

## Tapered Pole Properties

| Section | Tip Dia.<br>in | Area<br>in <sup>2</sup> | I<br>in <sup>4</sup> | r<br>in | C<br>in | I/C<br>in <sup>3</sup> | J<br>in <sup>4</sup> | It/Q<br>in <sup>2</sup> | w<br>in | w/t    |
|---------|----------------|-------------------------|----------------------|---------|---------|------------------------|----------------------|-------------------------|---------|--------|
| L1      | 14.5932        | 8.4582                  | 215.8525             | 5.0454  | 7.3152  | 29.5074                | 431.9890             | 4.2299                  | 2.2044  | 11.757 |
|         | 21.6809        | 12.6122                 | 715.6361             | 7.5233  | 10.8610 | 65.8902                | 1432.2138            | 6.3073                  | 3.4329  | 18.309 |
| L2      | 21.2914        | 15.9778                 | 818.4486             | 7.1482  | 10.3560 | 79.0314                | 1637.9742            | 7.9904                  | 3.1479  | 12.592 |
|         | 28.3325        | 21.9720                 | 2128.4000            | 9.8300  | 14.1935 | 149.9558               | 4259.6006            | 10.9881                 | 4.4774  | 17.91  |
| L3      | 28.3278        | 24.5820                 | 2376.0684            | 9.8193  | 14.1935 | 167.4052               | 4755.2632            | 12.2933                 | 4.4246  | 15.802 |
|         | 32.8972        | 28.5812                 | 3734.6553            | 11.4168 | 16.4795 | 226.6240               | 7474.2248            | 14.2933                 | 5.2166  | 18.631 |

|                                                                                                                                          |                |                       |                    |                   |
|------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------------|--------------------|-------------------|
| <b>tnxTower</b><br><br><b>Hudson Design Group</b><br>45 Beechwood Drive<br>North Andover, MA<br>Phone: 978.557.5553<br>FAX: 978.336.5586 | <b>Job</b>     | CT11533B              | <b>Page</b>        | 2 of 9            |
|                                                                                                                                          | <b>Project</b> | CT533/SAI - ENFIELD   | <b>Date</b>        | 16:43:10 07/21/21 |
|                                                                                                                                          | <b>Client</b>  | T-Mobile - Centerline | <b>Designed by</b> | ID                |

| Section | Tip Dia.<br>in | Area<br>in <sup>2</sup> | I<br>in <sup>4</sup> | r<br>in | C<br>in | I/C<br>in <sup>3</sup> | J<br>in <sup>4</sup> | It/Q<br>in <sup>2</sup> | w<br>in | w/t    |
|---------|----------------|-------------------------|----------------------|---------|---------|------------------------|----------------------|-------------------------|---------|--------|
| L4      | 32.3299        | 30.4183                 | 3614.3443            | 10.8870 | 15.7378 | 229.6595               | 7233.4444            | 15.2121                 | 4.9025  | 15.688 |
|         | 43.7167        | 42.4399                 | 9816.2392            | 15.1896 | 21.8948 | 448.3366               | 19645.3948           | 21.2240                 | 7.0356  | 22.514 |
| L5      | 43.1137        | 40.5841                 | 8584.0143            | 14.5254 | 20.9443 | 409.8488               | 17179.3236           | 20.2959                 | 6.7063  | 21.46  |
|         | 49.6569        | 48.2423                 | 14418.1031           | 17.2663 | 24.8666 | 579.8180               | 28855.1778           | 24.1257                 | 8.0652  | 25.809 |
| L6      | 49.6511        | 53.9897                 | 16110.9528           | 17.2530 | 24.8666 | 647.8953               | 32243.1048           | 27.0000                 | 7.9992  | 22.855 |
|         | 53.9972        | 58.7444                 | 20753.2805           | 18.7724 | 27.0408 | 767.4791               | 41533.8687           | 29.3778                 | 8.7525  | 25.007 |

| Tower<br>Elevation | Gusset<br>Area<br>(per face) | Gusset<br>Thickness | Gusset Grade | Adjust. Factor<br>A <sub>f</sub> | Adjust.<br>Factor<br>A <sub>r</sub> | Weight Mult. | Double Angle<br>Stitch Bolt<br>Spacing<br>Diagonals<br>in | Double Angle<br>Stitch Bolt<br>Spacing<br>Horizontals<br>in | Double Angle<br>Stitch Bolt<br>Spacing<br>Redundants<br>in |
|--------------------|------------------------------|---------------------|--------------|----------------------------------|-------------------------------------|--------------|-----------------------------------------------------------|-------------------------------------------------------------|------------------------------------------------------------|
| ft                 | ft <sup>2</sup>              | in                  |              |                                  |                                     |              |                                                           |                                                             |                                                            |
| L1                 |                              |                     |              | 1                                | 1                                   | 1            |                                                           |                                                             |                                                            |
| 179.00-148.00      |                              |                     |              |                                  |                                     |              |                                                           |                                                             |                                                            |
| L2                 |                              |                     |              | 1                                | 1                                   | 1            |                                                           |                                                             |                                                            |
| 148.00-117.25      |                              |                     |              |                                  |                                     |              |                                                           |                                                             |                                                            |
| L3                 |                              |                     |              | 1                                | 1                                   | 1            |                                                           |                                                             |                                                            |
| 117.25-97.25       |                              |                     |              |                                  |                                     |              |                                                           |                                                             |                                                            |
| L4 97.25-47.75     |                              |                     |              | 1                                | 1                                   | 1            |                                                           |                                                             |                                                            |
| L5 47.75-20.00     |                              |                     |              | 1                                | 1                                   | 1            |                                                           |                                                             |                                                            |
| L6 20.00-0.00      |                              |                     |              | 1                                | 1                                   | 1            |                                                           |                                                             |                                                            |

## Monopole Base Plate Data

| Base Plate Data       |             |
|-----------------------|-------------|
| Base plate is square  |             |
| Base plate is grouted | √           |
| Anchor bolt grade     | A615        |
| Anchor bolt size      | 2.2500 in   |
| Number of bolts       | 16          |
| Embedment length      | 67.1300 in  |
| f <sub>c</sub>        | 4 ksi       |
| Grout space           | 3.0000 in   |
| Base plate grade      | A572-60     |
| Base plate thickness  | 2.0000 in   |
| Bolt circle diameter  | 60.0000 in  |
| Outer diameter        | 65.0000 in  |
| Inner diameter        | 40.0000 in  |
| Base plate type       | Plain Plate |

## Feed Line/Linear Appurtenances - Entered As Area

| 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>plf        |
|--------------------------------------------------|-------------------|-----------------|------------------------------------------|-------------------|-----------------|-----------------|------------------------------|------------------------------------------------------|----------------------|
| 6X12 HYBRID<br>FIBER CABLES<br>(T-Mobile)<br>*** | A                 | No              | Yes                                      | Inside Pole       | 160.00 - 8.00   | 3               | No Ice<br>1/2" Ice<br>1" Ice | 0.00<br>0.00<br>0.00                                 | 2.18<br>2.18<br>2.18 |
| HCC12-50J (1/2<br>AIR)                           | A                 | No              | Yes                                      | Inside Pole       | 179.00 - 8.00   | 5               | No Ice<br>1/2" Ice<br>1" Ice | 0.00<br>0.00<br>0.00                                 | 0.25<br>0.25<br>0.25 |
| LCF78-50J (7/8<br>FOAM)                          | A                 | No              | Yes                                      | Inside Pole       | 179.00 - 8.00   | 1               | No Ice<br>1/2" Ice<br>1" Ice | 0.00<br>0.00<br>0.00                                 | 0.53<br>0.53<br>0.53 |

|                                                                                                                                          |                |                       |                    |                   |
|------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------------|--------------------|-------------------|
| <b>tnxTower</b><br><br><b>Hudson Design Group</b><br>45 Beechwood Drive<br>North Andover, MA<br>Phone: 978.557.5553<br>FAX: 978.336.5586 | <b>Job</b>     | CT11533B              | <b>Page</b>        | 3 of 9            |
|                                                                                                                                          | <b>Project</b> | CT533/SAI - ENFIELD   | <b>Date</b>        | 16:43:10 07/21/21 |
|                                                                                                                                          | <b>Client</b>  | T-Mobile - Centerline | <b>Designed by</b> | ID                |

| 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>plf |
|--------------------------|-------------------|-----------------|------------------------------------------|-------------------|-----------------|-----------------|----------|------------------------------------------------------|---------------|
| FLC 158-50J (1 5/8 FOAM) | A                 | No              | Yes                                      | Inside Pole       | 168.00 - 8.00   | 6               | No Ice   | 0.00                                                 | 0.92          |
|                          |                   |                 |                                          |                   |                 |                 | 1/2" Ice | 0.00                                                 | 0.92          |
|                          |                   |                 |                                          |                   |                 |                 | 1" Ice   | 0.00                                                 | 0.92          |
| FLC 158-50J (1 5/8 FOAM) | A                 | No              | Yes                                      | Inside Pole       | 168.00 - 8.00   | 1               | No Ice   | 0.00                                                 | 0.92          |
|                          |                   |                 |                                          |                   |                 |                 | 1/2" Ice | 0.00                                                 | 0.92          |
|                          |                   |                 |                                          |                   |                 |                 | 1" Ice   | 0.00                                                 | 0.92          |
| DC Cable                 | A                 | No              | Yes                                      | Inside Pole       | 168.00 - 8.00   | 2               | No Ice   | 0.00                                                 | 1.70          |
|                          |                   |                 |                                          |                   |                 |                 | 1/2" Ice | 0.00                                                 | 1.70          |
|                          |                   |                 |                                          |                   |                 |                 | 1" Ice   | 0.00                                                 | 1.70          |
| HCC12-50J (1/2 AIR)      | A                 | No              | Yes                                      | Inside Pole       | 168.00 - 8.00   | 1               | No Ice   | 0.00                                                 | 0.25          |
|                          |                   |                 |                                          |                   |                 |                 | 1/2" Ice | 0.00                                                 | 0.25          |
|                          |                   |                 |                                          |                   |                 |                 | 1" Ice   | 0.00                                                 | 0.25          |
| FLC 158-50J (1 5/8 FOAM) | A                 | No              | Yes                                      | Inside Pole       | 157.00 - 8.00   | 6               | No Ice   | 0.00                                                 | 0.92          |
|                          |                   |                 |                                          |                   |                 |                 | 1/2" Ice | 0.00                                                 | 0.92          |
|                          |                   |                 |                                          |                   |                 |                 | 1" Ice   | 0.00                                                 | 0.92          |
| FLC 158-50J (1 5/8 FOAM) | A                 | No              | Yes                                      | Inside Pole       | 150.00 - 8.00   | 12              | No Ice   | 0.00                                                 | 0.92          |
|                          |                   |                 |                                          |                   |                 |                 | 1/2" Ice | 0.00                                                 | 0.92          |
|                          |                   |                 |                                          |                   |                 |                 | 1" Ice   | 0.00                                                 | 0.92          |
| FLC 158-50J (1 5/8 FOAM) | A                 | No              | Yes                                      | Inside Pole       | 168.00 - 8.00   | 1               | No Ice   | 0.00                                                 | 0.92          |
|                          |                   |                 |                                          |                   |                 |                 | 1/2" Ice | 0.00                                                 | 0.92          |
|                          |                   |                 |                                          |                   |                 |                 | 1" Ice   | 0.00                                                 | 0.92          |
| DC Cable                 | A                 | No              | Yes                                      | Inside Pole       | 168.00 - 8.00   | 2               | No Ice   | 0.00                                                 | 1.70          |
|                          |                   |                 |                                          |                   |                 |                 | 1/2" Ice | 0.00                                                 | 1.70          |
|                          |                   |                 |                                          |                   |                 |                 | 1" Ice   | 0.00                                                 | 1.70          |

## Discrete Tower Loads

| 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>lb                  |
|----------------------------------|-------------------|----------------|-------------------------------------------------------|----------------------------|-----------------|------------------------------|-----------------------------------------------------------|----------------------------------------------------------|-------------------------------|
| Pirol 4' Side Mount Standoff (1) | A                 | From Leg       | 2.00<br>0.00<br>0.00                                  | 0.0000                     | 176.30          | No Ice<br>1/2" Ice<br>1" Ice | 2.72<br>4.91<br>7.10                                      | 2.72<br>4.91<br>7.10                                     | 50.00<br>89.00<br>128.00      |
| Pirol 4' Side Mount Standoff (1) | B                 | From Leg       | 2.00<br>0.00<br>0.00                                  | 0.0000                     | 176.30          | No Ice<br>1/2" Ice<br>1" Ice | 2.72<br>4.91<br>7.10                                      | 2.72<br>4.91<br>7.10                                     | 50.00<br>89.00<br>128.00      |
| Omni 3"X20'                      | A                 | From Leg       | 4.00<br>0.00<br>0.00                                  | 0.0000                     | 182.00          | No Ice<br>1/2" Ice<br>1" Ice | 6.00<br>8.03<br>10.08                                     | 6.00<br>8.03<br>10.08                                    | 50.00<br>93.17<br>149.01      |
| Panel Antenna 16"x16"            | A                 | From Leg       | 4.00<br>0.00<br>0.00                                  | 0.0000                     | 178.50          | No Ice<br>1/2" Ice<br>1" Ice | 2.13<br>2.31<br>2.50                                      | 0.44<br>0.55<br>0.66                                     | 10.00<br>22.57<br>37.61       |
| Box 12"x8"x3"                    | B                 | From Leg       | 4.00<br>0.00<br>0.00                                  | 0.0000                     | 177.70          | No Ice<br>1/2" Ice<br>1" Ice | 0.80<br>0.91<br>1.04                                      | 0.32<br>0.40<br>0.49                                     | 10.00<br>15.83<br>23.35       |
| 7"x2" Antenna Mount Pipe         | B                 | From Leg       | 4.00<br>0.00<br>0.00                                  | 0.0000                     | 176.30          | No Ice<br>1/2" Ice<br>1" Ice | 1.66<br>2.39<br>2.83                                      | 1.66<br>2.39<br>2.83                                     | 26.00<br>38.58<br>55.84       |
| *****                            |                   |                |                                                       |                            |                 |                              |                                                           |                                                          |                               |
| PiROD 13' Low Profile Platform   | A                 | None           |                                                       | 0.0000                     | 147.00          | No Ice<br>1/2" Ice<br>1" Ice | 15.70<br>20.10<br>24.50                                   | 15.70<br>20.10<br>24.50                                  | 1300.00<br>1765.00<br>2230.00 |
| LPA-80080/4CF Antenna w/         | A                 | From Face      | 4.00                                                  | 0.0000                     | 150.00          | No Ice                       | 3.11                                                      | 6.82                                                     | 33.90                         |

|                                                                                                                                          |                |  |                       |  |                    |  |                   |  |
|------------------------------------------------------------------------------------------------------------------------------------------|----------------|--|-----------------------|--|--------------------|--|-------------------|--|
| <b>tnxTower</b><br><br><b>Hudson Design Group</b><br>45 Beechwood Drive<br>North Andover, MA<br>Phone: 978.557.5553<br>FAX: 978.336.5586 | <b>Job</b>     |  | CT11533B              |  | <b>Page</b>        |  | 4 of 9            |  |
|                                                                                                                                          | <b>Project</b> |  | CT533/SAI - ENFIELD   |  | <b>Date</b>        |  | 16:43:10 07/21/21 |  |
|                                                                                                                                          | <b>Client</b>  |  | T-Mobile - Centerline |  | <b>Designed by</b> |  | ID                |  |

| 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>lb |
|-----------------------------------------------------|-------------------|----------------|-------------------------------------------------------|----------------------------|-----------------|----------|-----------------------------------------------------------|----------------------------------------------------------|--------------|
| Mounting Pipe                                       |                   |                | 6.00                                                  |                            |                 | 1/2" Ice | 3.58                                                      | 7.65                                                     | 82.91        |
|                                                     |                   |                | 0.00                                                  |                            |                 | 1" Ice   | 4.02                                                      | 8.35                                                     | 138.07       |
| BXA-70063/4CF Antenna w/<br>Mounting Pipe           | A                 | From Face      | 4.00                                                  | 0.0000                     | 150.00          | No Ice   | 5.19                                                      | 3.87                                                     | 31.90        |
|                                                     |                   |                | 4.00                                                  |                            |                 | 1/2" Ice | 5.68                                                      | 4.67                                                     | 76.58        |
|                                                     |                   |                | 0.00                                                  |                            |                 | 1" Ice   | 6.14                                                      | 5.34                                                     | 127.26       |
| BXA-171085-8BF-EDIN<br>Antenna w/ Mounting Pipe     | A                 | From Face      | 4.00                                                  | 0.0000                     | 150.00          | No Ice   | 3.41                                                      | 3.58                                                     | 32.90        |
|                                                     |                   |                | 0.00                                                  |                            |                 | 1/2" Ice | 3.88                                                      | 4.38                                                     | 67.56        |
|                                                     |                   |                | 0.00                                                  |                            |                 | 1" Ice   | 4.32                                                      | 5.06                                                     | 107.91       |
| LPA-80080/4CF Antenna w/<br>Mounting Pipe           | A                 | From Face      | 4.00                                                  | 0.0000                     | 150.00          | No Ice   | 3.11                                                      | 6.82                                                     | 33.90        |
|                                                     |                   |                | -6.00                                                 |                            |                 | 1/2" Ice | 3.58                                                      | 7.65                                                     | 82.91        |
|                                                     |                   |                | 0.00                                                  |                            |                 | 1" Ice   | 4.02                                                      | 8.35                                                     | 138.07       |
| LPA-80080/4CF Antenna w/<br>Mounting Pipe           | B                 | From Face      | 4.00                                                  | 0.0000                     | 150.00          | No Ice   | 3.11                                                      | 6.82                                                     | 33.90        |
|                                                     |                   |                | 6.00                                                  |                            |                 | 1/2" Ice | 3.58                                                      | 7.65                                                     | 82.91        |
|                                                     |                   |                | 0.00                                                  |                            |                 | 1" Ice   | 4.02                                                      | 8.35                                                     | 138.07       |
| SLCP 2x6014 Antenna w/<br>Mounting Pipe             | B                 | From Face      | 4.00                                                  | 0.0000                     | 150.00          | No Ice   | 6.85                                                      | 6.70                                                     | 41.90        |
|                                                     |                   |                | 4.00                                                  |                            |                 | 1/2" Ice | 7.35                                                      | 7.55                                                     | 108.28       |
|                                                     |                   |                | 0.00                                                  |                            |                 | 1" Ice   | 7.82                                                      | 8.27                                                     | 181.58       |
| BXA-171085-8BF-EDIN<br>Antenna w/ Mounting Pipe     | B                 | From Face      | 4.00                                                  | 0.0000                     | 150.00          | No Ice   | 3.41                                                      | 3.58                                                     | 32.90        |
|                                                     |                   |                | 0.00                                                  |                            |                 | 1/2" Ice | 3.88                                                      | 4.38                                                     | 67.56        |
|                                                     |                   |                | 0.00                                                  |                            |                 | 1" Ice   | 4.32                                                      | 5.06                                                     | 107.91       |
| LPA-80080/4CF Antenna w/<br>Mounting Pipe           | B                 | From Face      | 4.00                                                  | 0.0000                     | 150.00          | No Ice   | 3.11                                                      | 6.82                                                     | 33.90        |
|                                                     |                   |                | -6.00                                                 |                            |                 | 1/2" Ice | 3.58                                                      | 7.65                                                     | 82.91        |
|                                                     |                   |                | 0.00                                                  |                            |                 | 1" Ice   | 4.02                                                      | 8.35                                                     | 138.07       |
| LPA-80080/4CF Antenna w/<br>Mounting Pipe           | C                 | From Face      | 4.00                                                  | 0.0000                     | 150.00          | No Ice   | 3.11                                                      | 6.82                                                     | 33.90        |
|                                                     |                   |                | 6.00                                                  |                            |                 | 1/2" Ice | 3.58                                                      | 7.65                                                     | 82.91        |
|                                                     |                   |                | 0.00                                                  |                            |                 | 1" Ice   | 4.02                                                      | 8.35                                                     | 138.07       |
| SLCP 2x6014 Antenna w/<br>Mounting Pipe             | C                 | From Face      | 4.00                                                  | 0.0000                     | 150.00          | No Ice   | 6.85                                                      | 6.70                                                     | 41.90        |
|                                                     |                   |                | 4.00                                                  |                            |                 | 1/2" Ice | 7.35                                                      | 7.55                                                     | 108.28       |
|                                                     |                   |                | 0.00                                                  |                            |                 | 1" Ice   | 7.82                                                      | 8.27                                                     | 181.58       |
| BXA-171085-8BF-EDIN<br>Antenna w/ Mounting Pipe     | C                 | From Face      | 4.00                                                  | 0.0000                     | 150.00          | No Ice   | 3.41                                                      | 3.58                                                     | 32.90        |
|                                                     |                   |                | 0.00                                                  |                            |                 | 1/2" Ice | 3.88                                                      | 4.38                                                     | 67.56        |
|                                                     |                   |                | 0.00                                                  |                            |                 | 1" Ice   | 4.32                                                      | 5.06                                                     | 107.91       |
| LPA-80080/4CF Antenna w/<br>Mounting Pipe           | C                 | From Face      | 4.00                                                  | 0.0000                     | 150.00          | No Ice   | 3.11                                                      | 6.82                                                     | 33.90        |
|                                                     |                   |                | -6.00                                                 |                            |                 | 1/2" Ice | 3.58                                                      | 7.65                                                     | 82.91        |
|                                                     |                   |                | 0.00                                                  |                            |                 | 1" Ice   | 4.02                                                      | 8.35                                                     | 138.07       |
| (2) FD9R6004 Diplexer                               | A                 | From Face      | 4.00                                                  | 0.0000                     | 150.00          | No Ice   | 0.31                                                      | 0.08                                                     | 2.60         |
|                                                     |                   |                | 0.00                                                  |                            |                 | 1/2" Ice | 0.39                                                      | 0.12                                                     | 4.90         |
|                                                     |                   |                | 0.00                                                  |                            |                 | 1" Ice   | 0.47                                                      | 0.17                                                     | 8.29         |
| (2) FD9R6004 Diplexer                               | B                 | From Face      | 4.00                                                  | 0.0000                     | 150.00          | No Ice   | 0.31                                                      | 0.08                                                     | 2.60         |
|                                                     |                   |                | 0.00                                                  |                            |                 | 1/2" Ice | 0.39                                                      | 0.12                                                     | 4.90         |
|                                                     |                   |                | 0.00                                                  |                            |                 | 1" Ice   | 0.47                                                      | 0.17                                                     | 8.29         |
| (2) FD9R6004 Diplexer                               | C                 | From Face      | 4.00                                                  | 0.0000                     | 150.00          | No Ice   | 0.31                                                      | 0.08                                                     | 2.60         |
|                                                     |                   |                | 0.00                                                  |                            |                 | 1/2" Ice | 0.39                                                      | 0.12                                                     | 4.90         |
|                                                     |                   |                | 0.00                                                  |                            |                 | 1" Ice   | 0.47                                                      | 0.17                                                     | 8.29         |
| ****                                                |                   |                |                                                       |                            |                 |          |                                                           |                                                          |              |
| Pirol 12' T-Frame                                   | A                 | From Face      | 0.00                                                  | 0.0000                     | 160.00          | No Ice   | 12.20                                                     | 12.20                                                    | 360.00       |
|                                                     |                   |                | 0.00                                                  |                            |                 | 1/2" Ice | 17.60                                                     | 17.60                                                    | 490.00       |
|                                                     |                   |                | 0.00                                                  |                            |                 | 1" Ice   | 23.00                                                     | 23.00                                                    | 620.00       |
| Pirol 12' T-Frame                                   | B                 | From Face      | 0.00                                                  | 0.0000                     | 160.00          | No Ice   | 12.20                                                     | 12.20                                                    | 360.00       |
|                                                     |                   |                | 0.00                                                  |                            |                 | 1/2" Ice | 17.60                                                     | 17.60                                                    | 490.00       |
|                                                     |                   |                | 0.00                                                  |                            |                 | 1" Ice   | 23.00                                                     | 23.00                                                    | 620.00       |
| Pirol 12' T-Frame                                   | C                 | From Face      | 0.00                                                  | 0.0000                     | 160.00          | No Ice   | 12.20                                                     | 12.20                                                    | 360.00       |
|                                                     |                   |                | 0.00                                                  |                            |                 | 1/2" Ice | 17.60                                                     | 17.60                                                    | 490.00       |
|                                                     |                   |                | 0.00                                                  |                            |                 | 1" Ice   | 23.00                                                     | 23.00                                                    | 620.00       |
| APX16DWV-16DWV-S-E-A<br>20 Antenna w/ Mounting Pipe | A                 | From Face      | 4.00                                                  | 0.0000                     | 160.00          | No Ice   | 6.78                                                      | 3.57                                                     | 62.90        |
|                                                     |                   |                | -6.00                                                 |                            |                 | 1/2" Ice | 7.26                                                      | 4.41                                                     | 111.74       |
|                                                     |                   |                | 0.00                                                  |                            |                 | 1" Ice   | 7.73                                                      | 5.13                                                     | 167.12       |

|                                                                                                                                          |                |                       |                    |                   |
|------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------------|--------------------|-------------------|
| <b>tnxTower</b><br><br><b>Hudson Design Group</b><br>45 Beechwood Drive<br>North Andover, MA<br>Phone: 978.557.5553<br>FAX: 978.336.5586 | <b>Job</b>     | CT11533B              | <b>Page</b>        | 5 of 9            |
|                                                                                                                                          | <b>Project</b> | CT533/SAI - ENFIELD   | <b>Date</b>        | 16:43:10 07/21/21 |
|                                                                                                                                          | <b>Client</b>  | T-Mobile - Centerline | <b>Designed by</b> | ID                |

| 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>AA</sub><br>Front<br>ft <sup>2</sup> | C <sub>AA</sub><br>Side<br>ft <sup>2</sup> | Weight<br>lb               |
|-----------------------------------------------------|-------------------|----------------|-------------------------------------------------------|----------------------------|-----------------|------------------------------|---------------------------------------------|--------------------------------------------|----------------------------|
| APX16DWV-16DWV-S-E-A<br>20 Antenna w/ Mounting Pipe | B                 | From Face      | 4.00<br>-6.00<br>0.00                                 | 0.0000                     | 160.00          | No Ice<br>1/2" Ice<br>1" Ice | 6.78<br>7.26<br>7.73                        | 3.57<br>4.41<br>5.13                       | 62.90<br>111.74<br>167.12  |
| APX16DWV-16DWV-S-E-A<br>20 Antenna w/ Mounting Pipe | C                 | From Face      | 4.00<br>-6.00<br>0.00                                 | 0.0000                     | 160.00          | No Ice<br>1/2" Ice<br>1" Ice | 6.78<br>7.26<br>7.73                        | 3.57<br>4.41<br>5.13                       | 62.90<br>111.74<br>167.12  |
| APXVAALL18_43-U-NA20<br>Antenna w/ Mounting Pipe    | A                 | From Face      | 4.00<br>0.00<br>0.00                                  | 0.0000                     | 160.00          | No Ice<br>1/2" Ice<br>1" Ice | 15.14<br>15.87<br>16.56                     | 8.06<br>9.35<br>10.49                      | 135.20<br>242.16<br>358.17 |
| APXVAALL18_43-U-NA20<br>Antenna w/ Mounting Pipe    | B                 | From Face      | 4.00<br>0.00<br>0.00                                  | 0.0000                     | 160.00          | No Ice<br>1/2" Ice<br>1" Ice | 15.14<br>15.87<br>16.56                     | 8.06<br>9.35<br>10.49                      | 135.20<br>242.16<br>358.17 |
| APXVAALL18_43-U-NA20<br>Antenna w/ Mounting Pipe    | C                 | From Face      | 4.00<br>0.00<br>0.00                                  | 0.0000                     | 160.00          | No Ice<br>1/2" Ice<br>1" Ice | 15.14<br>15.87<br>16.56                     | 8.06<br>9.35<br>10.49                      | 135.20<br>242.16<br>358.17 |
| AIR6449 B41 Antenna w/<br>Mounting Pipe             | A                 | From Face      | 4.00<br>6.00<br>0.00                                  | 0.0000                     | 160.00          | No Ice<br>1/2" Ice<br>1" Ice | 6.42<br>7.00<br>7.50                        | 3.89<br>4.62<br>5.22                       | 124.90<br>179.59<br>240.17 |
| AIR6449 B41 Antenna w/<br>Mounting Pipe             | B                 | From Face      | 4.00<br>6.00<br>0.00                                  | 0.0000                     | 160.00          | No Ice<br>1/2" Ice<br>1" Ice | 6.42<br>7.00<br>7.50                        | 3.89<br>4.62<br>5.22                       | 124.90<br>179.59<br>240.17 |
| AIR6449 B41 Antenna w/<br>Mounting Pipe             | C                 | From Face      | 4.00<br>6.00<br>0.00                                  | 0.0000                     | 160.00          | No Ice<br>1/2" Ice<br>1" Ice | 6.42<br>7.00<br>7.50                        | 3.89<br>4.62<br>5.22                       | 124.90<br>179.59<br>240.17 |
| 4449 B71+B85 RRH                                    | A                 | From Face      | 3.00<br>0.75<br>0.00                                  | 0.0000                     | 160.00          | No Ice<br>1/2" Ice<br>1" Ice | 1.97<br>2.15<br>2.33                        | 1.40<br>1.56<br>1.72                       | 74.00<br>92.48<br>113.77   |
| 4449 B71+B85 RRH                                    | B                 | From Face      | 3.00<br>0.75<br>0.00                                  | 0.0000                     | 160.00          | No Ice<br>1/2" Ice<br>1" Ice | 1.97<br>2.15<br>2.33                        | 1.40<br>1.56<br>1.72                       | 74.00<br>92.48<br>113.77   |
| 4449 B71+B85 RRH                                    | C                 | From Face      | 3.00<br>0.75<br>0.00                                  | 0.0000                     | 160.00          | No Ice<br>1/2" Ice<br>1" Ice | 1.97<br>2.15<br>2.33                        | 1.40<br>1.56<br>1.72                       | 74.00<br>92.48<br>113.77   |
| 4424 B25 RRH                                        | A                 | From Face      | 3.00<br>-0.75<br>0.00                                 | 0.0000                     | 160.00          | No Ice<br>1/2" Ice<br>1" Ice | 1.86<br>2.03<br>2.20                        | 1.32<br>1.47<br>1.62                       | 88.00<br>105.87<br>126.50  |
| 4424 B25 RRH                                        | B                 | From Face      | 3.00<br>-0.75<br>0.00                                 | 0.0000                     | 160.00          | No Ice<br>1/2" Ice<br>1" Ice | 1.86<br>2.03<br>2.20                        | 1.32<br>1.47<br>1.62                       | 88.00<br>105.87<br>126.50  |
| 4424 B25 RRH                                        | C                 | From Face      | 3.00<br>-0.75<br>0.00                                 | 0.0000                     | 160.00          | No Ice<br>1/2" Ice<br>1" Ice | 1.86<br>2.03<br>2.20                        | 1.32<br>1.47<br>1.62                       | 88.00<br>105.87<br>126.50  |
| 4415 RRH                                            | A                 | From Face      | 3.00<br>-6.00<br>0.00                                 | 0.0000                     | 160.00          | No Ice<br>1/2" Ice<br>1" Ice | 1.64<br>1.80<br>1.97                        | 0.68<br>0.79<br>0.91                       | 44.00<br>56.41<br>71.18    |
| 4415 RRH                                            | B                 | From Face      | 3.00<br>-6.00<br>0.00                                 | 0.0000                     | 160.00          | No Ice<br>1/2" Ice<br>1" Ice | 1.64<br>1.80<br>1.97                        | 0.68<br>0.79<br>0.91                       | 44.00<br>56.41<br>71.18    |
| 4415 RRH                                            | C                 | From Face      | 3.00<br>-6.00<br>0.00                                 | 0.0000                     | 160.00          | No Ice<br>1/2" Ice<br>1" Ice | 1.64<br>1.80<br>1.97                        | 0.68<br>0.79<br>0.91                       | 44.00<br>56.41<br>71.18    |
| *****                                               |                   |                |                                                       |                            |                 |                              |                                             |                                            |                            |
| Pirod 4' Side Mount Standoff<br>(1)                 | A                 | From Face      | 2.00<br>0.00<br>0.00                                  | 0.0000                     | 168.00          | No Ice<br>1/2" Ice<br>1" Ice | 2.72<br>4.91<br>7.10                        | 2.72<br>4.91<br>7.10                       | 50.00<br>89.00<br>128.00   |
| Pirod 4' Side Mount Standoff<br>(1)                 | B                 | From Face      | 2.00<br>0.00                                          | 0.0000                     | 168.00          | No Ice<br>1/2" Ice           | 2.72<br>4.91                                | 2.72<br>4.91                               | 50.00<br>89.00             |

|                                                                                                                                          |                |                       |                    |                   |
|------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------------|--------------------|-------------------|
| <b>tnxTower</b><br><br><b>Hudson Design Group</b><br>45 Beechwood Drive<br>North Andover, MA<br>Phone: 978.557.5553<br>FAX: 978.336.5586 | <b>Job</b>     | CT11533B              | <b>Page</b>        | 6 of 9            |
|                                                                                                                                          | <b>Project</b> | CT533/SAI - ENFIELD   | <b>Date</b>        | 16:43:10 07/21/21 |
|                                                                                                                                          | <b>Client</b>  | T-Mobile - Centerline | <b>Designed by</b> | ID                |

| 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>lb                       |
|-----------------------------------------------|-------------------|----------------|-------------------------------------------------------|----------------------------|-----------------|----------------------------------------|-----------------------------------------------------------|----------------------------------------------------------|------------------------------------|
| Pirod 4' Side Mount Standoff<br>(1)           | C                 | From Face      | 0.00<br>2.00<br>0.00<br>0.00                          | 0.0000                     | 168.00          | 1" Ice<br>No Ice<br>1/2" Ice<br>1" Ice | 7.10<br>2.72<br>4.91<br>7.10                              | 7.10<br>2.72<br>4.91<br>7.10                             | 128.00<br>50.00<br>89.00<br>128.00 |
| RRUS-11 RRH                                   | A                 | From Face      | 0.00<br>2.00<br>0.00<br>0.00                          | 0.0000                     | 168.00          | No Ice<br>1/2" Ice<br>1" Ice           | 2.79<br>3.00<br>3.21                                      | 1.19<br>1.34<br>1.50                                     | 51.00<br>71.87<br>95.78            |
| RRUS-11 RRH                                   | B                 | From Face      | 0.00<br>2.00<br>0.00<br>0.00                          | 0.0000                     | 168.00          | No Ice<br>1/2" Ice<br>1" Ice           | 2.79<br>3.00<br>3.21                                      | 1.19<br>1.34<br>1.50                                     | 51.00<br>71.87<br>95.78            |
| RRUS-11 RRH                                   | C                 | From Face      | 0.00<br>2.00<br>0.00<br>0.00                          | 0.0000                     | 168.00          | No Ice<br>1/2" Ice<br>1" Ice           | 2.79<br>3.00<br>3.21                                      | 1.19<br>1.34<br>1.50                                     | 51.00<br>71.87<br>95.78            |
| Squid Surge Arrestor                          | C                 | From Leg       | 0.00<br>1.00<br>0.00<br>0.00                          | 0.0000                     | 168.00          | No Ice<br>1/2" Ice<br>1" Ice           | 0.81<br>1.30<br>1.48                                      | 0.81<br>1.30<br>1.48                                     | 33.00<br>48.38<br>66.11            |
| Collar Mount                                  | C                 | None           | 0.00                                                  | 0.0000                     | 169.50          | No Ice<br>1/2" Ice<br>1" Ice           | 1.40<br>2.40<br>3.40                                      | 1.40<br>2.40<br>3.40                                     | 20.00<br>35.00<br>50.00            |
| *****                                         |                   |                |                                                       |                            |                 |                                        |                                                           |                                                          |                                    |
| QS66512-2 Antenna w/<br>Mounting Pipe         | A                 | From Face      | 0.00<br>4.00<br>0.00<br>0.00                          | 0.0000                     | 168.00          | No Ice<br>1/2" Ice<br>1" Ice           | 8.13<br>8.59<br>9.05                                      | 8.22<br>9.19<br>10.02                                    | 132.90<br>205.99<br>287.01         |
| TPA-65R-LCUUUU-H8<br>Antenna w/ Mounting Pipe | B                 | From Face      | 0.00<br>4.00<br>0.00<br>0.00                          | 0.0000                     | 168.00          | No Ice<br>1/2" Ice<br>1" Ice           | 13.30<br>13.90<br>14.50                                   | 10.72<br>12.15<br>13.43                                  | 104.20<br>204.76<br>315.30         |
| TPA-65R-LCUUUU-H8<br>Antenna w/ Mounting Pipe | C                 | From Face      | 0.00<br>4.00<br>0.00<br>0.00                          | 0.0000                     | 168.00          | No Ice<br>1/2" Ice<br>1" Ice           | 13.30<br>13.90<br>14.50                                   | 10.72<br>12.15<br>13.43                                  | 104.20<br>204.76<br>315.30         |
| RRUS-32 RRH                                   | A                 | From Face      | 0.00<br>2.00<br>0.00<br>0.00                          | 0.0000                     | 168.00          | No Ice<br>1/2" Ice<br>1" Ice           | 2.74<br>2.96<br>3.19                                      | 1.67<br>1.86<br>2.05                                     | 60.00<br>81.11<br>105.42           |
| RRUS-32 RRH                                   | B                 | From Face      | 0.00<br>2.00<br>0.00<br>0.00                          | 0.0000                     | 168.00          | No Ice<br>1/2" Ice<br>1" Ice           | 2.74<br>2.96<br>3.19                                      | 1.67<br>1.86<br>2.05                                     | 60.00<br>81.11<br>105.42           |
| RRUS-32 RRH                                   | C                 | From Face      | 0.00<br>2.00<br>0.00<br>0.00                          | 0.0000                     | 168.00          | No Ice<br>1/2" Ice<br>1" Ice           | 2.74<br>2.96<br>3.19                                      | 1.67<br>1.86<br>2.05                                     | 60.00<br>81.11<br>105.42           |
| RRUS-32 RRH                                   | A                 | From Face      | 0.00<br>2.00<br>0.00<br>0.00                          | 0.0000                     | 168.00          | No Ice<br>1/2" Ice<br>1" Ice           | 2.74<br>2.96<br>3.19                                      | 1.67<br>1.86<br>2.05                                     | 60.00<br>81.11<br>105.42           |
| RRUS-32 RRH                                   | B                 | From Face      | 0.00<br>2.00<br>0.00<br>0.00                          | 0.0000                     | 168.00          | No Ice<br>1/2" Ice<br>1" Ice           | 2.74<br>2.96<br>3.19                                      | 1.67<br>1.86<br>2.05                                     | 60.00<br>81.11<br>105.42           |
| RRUS-32 RRH                                   | C                 | From Face      | 0.00<br>2.00<br>0.00<br>0.00                          | 0.0000                     | 168.00          | No Ice<br>1/2" Ice<br>1" Ice           | 2.74<br>2.96<br>3.19                                      | 1.67<br>1.86<br>2.05                                     | 60.00<br>81.11<br>105.42           |
| Squid Surge Arrestor                          | C                 | From Leg       | 0.00<br>1.00<br>0.00<br>0.00                          | 0.0000                     | 168.00          | No Ice<br>1/2" Ice<br>1" Ice           | 0.81<br>1.30<br>1.48                                      | 0.81<br>1.30<br>1.48                                     | 33.00<br>48.38<br>66.11            |

|                                                                                                                                          |                |                       |                    |                   |
|------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------------|--------------------|-------------------|
| <b>tnxTower</b><br><br><b>Hudson Design Group</b><br>45 Beechwood Drive<br>North Andover, MA<br>Phone: 978.557.5553<br>FAX: 978.336.5586 | <b>Job</b>     | CT11533B              | <b>Page</b>        | 7 of 9            |
|                                                                                                                                          | <b>Project</b> | CT533/SAI - ENFIELD   | <b>Date</b>        | 16:43:10 07/21/21 |
|                                                                                                                                          | <b>Client</b>  | T-Mobile - Centerline | <b>Designed by</b> | ID                |

## 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>ft <sup>2</sup>         | Weight<br>lb            |
|-------------|-------------------|-----------------------------|----------------|-------------------------------------------|----------------------------|----------------------------|-----------------|---------------------------|---------------------------------------------|-------------------------|
| HP2-102     | B                 | Paraboloid<br>w/Shroud (HP) | From<br>Leg    | 4.00<br>0.00<br>0.00                      | 0.0000                     |                            | 177.70          | 2.00                      | No Ice 3.14<br>1/2" Ice 3.41<br>1" Ice 3.67 | 25.00<br>42.49<br>59.98 |

## Base Plate Design Data

| Plate<br>Thickness | Number<br>of Anchor<br>Bolts | Anchor Bolt<br>Size | Actual<br>Allowable<br>Ratio<br>Bolt<br>Tension<br>lb | Actual<br>Allowable<br>Ratio<br>Concrete<br>Stress<br>ksi | Actual<br>Allowable<br>Ratio<br>Plate<br>Stress<br>ksi | Actual<br>Allowable<br>Ratio<br>Stiffener<br>Stress<br>ksi | Controlling<br>Condition | Critical<br>Ratio                                                                             |
|--------------------|------------------------------|---------------------|-------------------------------------------------------|-----------------------------------------------------------|--------------------------------------------------------|------------------------------------------------------------|--------------------------|-----------------------------------------------------------------------------------------------|
| in                 |                              | in                  |                                                       |                                                           |                                                        |                                                            |                          |                                                                                               |
| 2.0000             | 16                           | 2.2500              | 115376.00<br>201288.96<br>0.57                        | 2.004<br>4.080<br>0.49                                    | 37.367<br>54.000<br>0.69                               |                                                            | Plate                    | 0.69<br> |

## Compression Checks

## Pole Design Data

| Section<br>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>lb | φP <sub>n</sub><br>lb | Ratio<br>$\frac{P_u}{\phi P_n}$ |
|----------------|-----------------------|-----------------------|---------|----------------------|-------|----------------------|----------------------|-----------------------|---------------------------------|
| L1             | 179 - 148 (1)         | TP21.38x14.4x0.1875   | 31.00   | 179.00               | 325.9 | 11.0483              | -17978.20            | 23496.10              | 0.765                           |
| L2             | 148 - 117.25<br>(2)   | TP27.94x20.3858x0.25  | 33.50   | 179.00               | 218.5 | 21.9720              | -10917.00            | 103955.00             | 0.105                           |
| L3             | 117.25 - 97.25<br>(3) | TP32.44x27.94x0.28    | 20.00   | 179.00               | 193.6 | 27.7814              | -13633.70            | 167517.00             | 0.081                           |
| L4             | 97.25 - 47.75<br>(4)  | TP43.1x30.98x0.3125   | 53.50   | 179.00               | 145.7 | 41.2040              | -24103.80            | 438765.00             | 0.055                           |
| L5             | 47.75 - 20 (5)        | TP48.95x41.229x0.3125 | 33.25   | 179.00               | 124.4 | 48.2423              | -33214.90            | 704204.00             | 0.047                           |
| L6             | 20 - 0 (6)            | TP53.23x48.95x0.35    | 20.00   | 179.00               | 114.4 | 58.7444              | -38730.10            | 1013630.00            | 0.038                           |

## Pole Bending Design Data

| Section<br>No. | Elevation<br>ft     | Size                 | M <sub>ux</sub><br>lb-ft | φM <sub>nx</sub><br>lb-ft | Ratio<br>$\frac{M_{ux}}{\phi M_{nx}}$ | M <sub>uy</sub><br>lb-ft | φM <sub>ny</sub><br>lb-ft | Ratio<br>$\frac{M_{uy}}{\phi M_{ny}}$ |
|----------------|---------------------|----------------------|--------------------------|---------------------------|---------------------------------------|--------------------------|---------------------------|---------------------------------------|
| L1             | 179 - 148 (1)       | TP21.38x14.4x0.1875  | 26440.25                 | 312657.50                 | 0.085                                 | 0.00                     | 312657.50                 | 0.000                                 |
| L2             | 148 - 117.25<br>(2) | TP27.94x20.3858x0.25 | 658229.17                | 903508.33                 | 0.729                                 | 0.00                     | 903508.33                 | 0.000                                 |
| L3             | 117.25 - 97.25      | TP32.44x27.94x0.28   | 930466.67                | 1286833.33                | 0.723                                 | 0.00                     | 1286833.33                | 0.000                                 |

|                                                                                                                                          |                |                       |                    |                   |
|------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------------|--------------------|-------------------|
| <b>tnxTower</b><br><br><b>Hudson Design Group</b><br>45 Beechwood Drive<br>North Andover, MA<br>Phone: 978.557.5553<br>FAX: 978.336.5586 | <b>Job</b>     | CT11533B              | <b>Page</b>        | 8 of 9            |
|                                                                                                                                          | <b>Project</b> | CT533/SAI - ENFIELD   | <b>Date</b>        | 16:43:10 07/21/21 |
|                                                                                                                                          | <b>Client</b>  | T-Mobile - Centerline | <b>Designed by</b> | ID                |

| Section No. | Elevation<br>ft       | Size                  | $M_{ux}$<br>lb-ft | $\phi M_{nx}$<br>lb-ft | Ratio<br>$\frac{M_{ux}}{\phi M_{nx}}$ | $M_{uy}$<br>lb-ft | $\phi M_{ny}$<br>lb-ft | Ratio<br>$\frac{M_{uy}}{\phi M_{ny}}$ |
|-------------|-----------------------|-----------------------|-------------------|------------------------|---------------------------------------|-------------------|------------------------|---------------------------------------|
| L4          | (3)<br>97.25 - 47.75  | TP43.1x30.98x0.3125   | 1852200.00        | 2400266.67             | 0.772                                 | 0.00              | 2400266.67             | 0.000                                 |
| L5          | (4)<br>47.75 - 20 (5) | TP48.95x41.229x0.3125 | 2575616.67        | 3089500.00             | 0.834                                 | 0.00              | 3089500.00             | 0.000                                 |
| L6          | 20 - 0 (6)            | TP53.23x48.95x0.35    | 3038883.33        | 4143691.67             | 0.733                                 | 0.00              | 4143691.67             | 0.000                                 |

### Pole Shear Design Data

| Section No. | Elevation<br>ft       | Size                  | Actual<br>$V_u$<br>lb | $\phi V_n$<br>lb | Ratio<br>$\frac{V_u}{\phi V_n}$ | Actual<br>$T_u$<br>lb-ft | $\phi T_n$<br>lb-ft | Ratio<br>$\frac{T_u}{\phi T_n}$ |
|-------------|-----------------------|-----------------------|-----------------------|------------------|---------------------------------|--------------------------|---------------------|---------------------------------|
| L1          | 179 - 148 (1)         | TP21.38x14.4x0.1875   | 4551.80               | 417047.00        | 0.011                           | 640.21                   | 627031.67           | 0.001                           |
| L2          | 148 - 117.25<br>(2)   | TP27.94x20.3858x0.25  | 16511.60              | 794310.00        | 0.021                           | 1594.97                  | 1811691.67          | 0.001                           |
| L3          | 117.25 - 97.25<br>(3) | TP32.44x27.94x0.28    | 17567.00              | 1002040.00       | 0.018                           | 1588.60                  | 2580300.00          | 0.001                           |
| L4          | 97.25 - 47.75<br>(4)  | TP43.1x30.98x0.3125   | 20782.60              | 1404460.00       | 0.015                           | 1577.09                  | 4811866.67          | 0.000                           |
| L5          | 47.75 - 20 (5)        | TP48.95x41.229x0.3125 | 22649.20              | 1542320.00       | 0.015                           | 1573.75                  | 6192558.00          | 0.000                           |
| L6          | 20 - 0 (6)            | TP53.23x48.95x0.35    | 23716.70              | 1903000.00       | 0.012                           | 1573.26                  | 8305824.67          | 0.000                           |

### Pole Interaction Design Data

| Section No. | Elevation<br>ft       | Ratio<br>$P_u$<br>$\phi P_n$ | Ratio<br>$M_{ux}$<br>$\phi M_{nx}$ | Ratio<br>$M_{uy}$<br>$\phi M_{ny}$ | Ratio<br>$V_u$<br>$\phi V_n$ | Ratio<br>$T_u$<br>$\phi T_n$ | Comb.<br>Stress<br>Ratio | Allow.<br>Stress<br>Ratio | Criteria |
|-------------|-----------------------|------------------------------|------------------------------------|------------------------------------|------------------------------|------------------------------|--------------------------|---------------------------|----------|
| L1          | 179 - 148 (1)         | 0.765                        | 0.085                              | 0.000                              | 0.011                        | 0.001                        | 0.850                    | 1.000                     | 4.8.2 ✓  |
| L2          | 148 - 117.25<br>(2)   | 0.105                        | 0.729                              | 0.000                              | 0.021                        | 0.001                        | 0.834                    | 1.000                     | 4.8.2 ✓  |
| L3          | 117.25 - 97.25<br>(3) | 0.081                        | 0.723                              | 0.000                              | 0.018                        | 0.001                        | 0.805                    | 1.000                     | 4.8.2 ✓  |
| L4          | 97.25 - 47.75<br>(4)  | 0.055                        | 0.772                              | 0.000                              | 0.015                        | 0.000                        | 0.827                    | 1.000                     | 4.8.2 ✓  |
| L5          | 47.75 - 20 (5)        | 0.047                        | 0.834                              | 0.000                              | 0.015                        | 0.000                        | 0.881                    | 1.000                     | 4.8.2 ✓  |
| L6          | 20 - 0 (6)            | 0.038                        | 0.733                              | 0.000                              | 0.012                        | 0.000                        | 0.772                    | 1.000                     | 4.8.2 ✓  |



|                                                                                                                                          |                |                       |                    |                   |
|------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------------|--------------------|-------------------|
| <b>tnxTower</b><br><br><b>Hudson Design Group</b><br>45 Beechwood Drive<br>North Andover, MA<br>Phone: 978.557.5553<br>FAX: 978.336.5586 | <b>Job</b>     | CT11533B              | <b>Page</b>        | 9 of 9            |
|                                                                                                                                          | <b>Project</b> | CT533/SAI - ENFIELD   | <b>Date</b>        | 16:43:10 07/21/21 |
|                                                                                                                                          | <b>Client</b>  | T-Mobile - Centerline | <b>Designed by</b> | ID                |

## Section Capacity Table

| Section No. | Elevation ft   | Component Type | Size                  | Critical Element | P lb      | $\phi P_{allow}$ lb | % Capacity      | Pass Fail        |
|-------------|----------------|----------------|-----------------------|------------------|-----------|---------------------|-----------------|------------------|
| L1          | 179 - 148      | Pole           | TP21.38x14.4x0.1875   | 1                | -17978.20 | 23496.10            | 85.0            | Pass             |
| L2          | 148 - 117.25   | Pole           | TP27.94x20.3858x0.25  | 2                | -10917.00 | 103955.00           | 83.4            | Pass             |
| L3          | 117.25 - 97.25 | Pole           | TP32.44x27.94x0.28    | 3                | -13633.70 | 167517.00           | 80.5            | Pass             |
| L4          | 97.25 - 47.75  | Pole           | TP43.1x30.98x0.3125   | 4                | -24103.80 | 438765.00           | 82.7            | Pass             |
| L5          | 47.75 - 20     | Pole           | TP48.95x41.229x0.3125 | 5                | -33214.90 | 704204.00           | 88.1            | Pass             |
| L6          | 20 - 0         | Pole           | TP53.23x48.95x0.35    | 6                | -38730.10 | 1013630.00          | 77.2            | Pass             |
|             |                |                |                       |                  |           |                     | Summary         |                  |
|             |                |                |                       |                  |           |                     | Pole (L5)       | 88.1 Pass        |
|             |                |                |                       |                  |           |                     | Base Plate      | 69.2 Pass        |
|             |                |                |                       |                  |           |                     | <b>RATING =</b> | <b>88.1 Pass</b> |

# Monopole Pier and Pad Foundation

TIA-222 Revision: **G**

| Design Reactions          |          |         |
|---------------------------|----------|---------|
| Shear, <b>S:</b>          | 23.703   | kips    |
| Moment, <b>M:</b>         | 3038.884 | ft-kips |
| Tower Height, <b>H:</b>   | 179      | ft      |
| Tower Weight, <b>Wt:</b>  | 38.739   | kips    |
| Base Diameter, <b>BD:</b> | 4.44     | ft      |

| Foundation Dimensions       |      |     |
|-----------------------------|------|-----|
| Depth, <b>D:</b>            | 5.5  | ft  |
| Pad Width, <b>W:</b>        | 23   | ft  |
| Neglected Depth, <b>N:</b>  | 0    | ft  |
| Thickness, <b>T:</b>        | 2.00 | ft  |
| Pier Diameter, <b>Pd:</b>   | 7.00 | ft  |
| Ext. Above Grade, <b>E:</b> | 1.00 | ft  |
| BP Dist. Above Pier:        | 3    | in. |
| Clear Cover, <b>Cc:</b>     | 3.0  | in  |

| Soil Properties                               |       |     |
|-----------------------------------------------|-------|-----|
| Soil Unit Weight, <b><math>\gamma</math>:</b> | 0.100 | kcf |
| Ult. Bearing Capacity, <b>Bc:</b>             | 4.0   | ksf |
| Angle of Friction, <b><math>\Phi</math>:</b>  | 30    | deg |
| Cohesion, <b>Co:</b>                          | 0.000 | ksf |
| Passive Pressure, <b>Pp:</b>                  | 0.000 | ksf |
| Base Friction, <b><math>\mu</math>:</b>       | 0.40  |     |

| Material Properties                                 |       |     |
|-----------------------------------------------------|-------|-----|
| Rebar Yield Strength, <b>Fy:</b>                    | 60000 | psi |
| Concrete Strength, <b>F'c:</b>                      | 4000  | psi |
| Concrete Unit Weight, <b><math>\delta c</math>:</b> | 0.150 | kcf |
| Seismic Zone, <b>z:</b>                             | 1     |     |

| Rebar Properties                 |     |    |
|----------------------------------|-----|----|
| Pier Rebar Size, <b>Sp:</b>      | 8   |    |
| Pier Rebar Quantity, <b>mp:</b>  | 36  | 36 |
| Pad Rebar Size, <b>Spad:</b>     | 8   |    |
| Pad Rebar Quantity, <b>mpad:</b> | 144 | 16 |
| Pier Tie Size, <b>St:</b>        | 4   | 3  |
| Tie Quantity, <b>mt:</b>         | 6   | 6  |

| Design Checks                      |                           |                   |              |
|------------------------------------|---------------------------|-------------------|--------------|
|                                    | Capacity/<br>Availability | Demand/<br>Limits | Check        |
| <i>Req'd Pier Diam.(ft)</i>        | 7                         | 5.94              | <b>OK</b>    |
| <i>Overturning (ft-kips)</i>       | 3094.90                   | 3038.88           | <b>98.2%</b> |
| <i>Shear Capacity (kips)</i>       | 128.86                    | 23.70             | <b>18.4%</b> |
| <i>Bearing (ksf)</i>               | 3.00                      | 2.61              | <b>87.0%</b> |
| <i>Pad Shear - 1-way (kips)</i>    | 536.77                    | 328.80            | <b>61.3%</b> |
| <i>Pad Shear - 2-way (kips)</i>    | 1276.94                   | 76.26             | <b>6.0%</b>  |
| <i>Pad Moment Capacity (k-ft)</i>  | 8632.59                   | 1217.11           | <b>14.1%</b> |
| <i>Pier Moment Capacity (k-ft)</i> | 9815.92                   | 3145.55           | <b>32.0%</b> |