

**RACHEL A. SCHWARTZMAN**

Please Reply To: Bridgeport  
Writer's Direct Dial: (203) 337-4110  
E-Mail: rschwartzman@cohenandwolf.com

December 22, 2014

Attorney Melanie Bachman  
Acting Executive Director  
Connecticut Siting Council  
Ten Franklin Square  
New Britain, CT 06501

**Re: Notice of Exempt Modification  
Crown Castle USA Inc./T-Mobile equipment upgrade  
Site ID CT11186A  
1455 Forbes Street, East Hartford, CT**

Dear Attorney Bachman:

This office represents T-Mobile Northeast LLC ("T-Mobile") and has been retained to file exempt modification filings with the Connecticut Siting Council on its behalf.

In this case, Crown Castle USA Inc. owns the existing monopole telecommunications tower and related facility at 1455 Forbes Street, East Hartford, CT (41.73154/-72.60775). T-Mobile intends to replace six (6) antennas and related equipment at this existing telecommunications facility in East Hartford ("East Hartford Facility"). Please accept this letter as notification, pursuant to R.C.S.A. §16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R. C.S.A. § 16-50j-73, a copy of this letter is being sent to the East Hartford Mayor Marcia Leclerc, and the property owner, Jessie K. Handel.

The existing East Hartford Facility consists of a 131-foot monopole tower.<sup>1</sup> T-Mobile plans to replace six (6) existing antennas on mount pipes with six (6) new antennas on mount pipes at a centerline of 87 feet. T-Mobile will also remove six (6) tower-mounted amplifiers ("TMAs") and add three (3) new TMAs at the 87-foot centerline. In addition, T-Mobile plans to install fiber cable, reuse existing coax cable routed inside the monopole, and replace an equipment cabinet on an existing concrete pad (See the plans revised to September 22, 2014, attached hereto as **Exhibit A**). The existing East Hartford Facility is structurally capable of supporting T-Mobile's proposed modifications, as indicated in the structural analysis dated October 16, 2014, and attached hereto as **Exhibit B**.

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<sup>1</sup> The East Hartford facility was originally approved as a 110 foot monopole in Docket No. 139. Subsequently, in Petition No. 535 the Council approved a tower extension which would increase the tower to a height of 133 feet, including antennas and appurtenances. "The total height of the facility would be approximately 133 feet AGL with antennas and appurtenances." Petition No. 535 Opinion dated May 21, 2002.

December 22, 2014  
CT1186A  
Page 2

The planned modifications to the East Hartford Facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

1. The proposed modification will not increase the height of the tower. T-Mobile's existing antennas are at a centerline of 87 feet; the replacement antennas and TMAs will be installed at the same 87-foot level. The enclosed tower drawing confirms that the proposed modification will not increase the height of the tower.

2. The proposed modifications will not require an extension on the site boundaries or lease area, as depicted on Sheet A-1 of Exhibit A. T-Mobile's equipment will be located entirely within the existing compound area.

3. The proposed modification to the Facility will not increase the noise levels at the existing facility by six decibels or more.

4. The operation of the replacement antennas and equipment will not increase the total radio frequency (RF) power density, measured at the base of the tower, to a level at or above the applicable standard. According to a Radio Frequency Emissions Analysis Report prepared by EBI dated October 15, 2014, T-Mobile's operations would add 1.59% of the FCC Standard. Therefore, the calculated "worst case" power density for the planned combined operation at the site including all of the proposed antennas would be 92.83% of the FCC Standard as calculated for a mixed frequency site as evidenced by the engineering exhibit attached hereto as **Exhibit C**.<sup>2</sup>

For the foregoing reasons, T-Mobile respectfully submits that the proposed replacement antennas and equipment at the East Hartford Facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Upon acknowledgement of this exempt modification, T-Mobile shall commence construction approximately sixty days from the receipt of the Council's decision.

Sincerely,



Rachel A. Schwartzman, Esq.

cc: Town of East Hartford, Mayor Marcia Leclerc  
Crown Castle USA Inc.  
Jessie K. Handel  
Samuel Simons, T-Mobile Northeast LLC  
Robert Stanford, Vertical Development, LLC

<sup>2</sup> Exhibit C contains mistakenly references the site address as 1441 Forbes Street, East Hartford instead of 1455 Forbes Street, East Hartford. This is merely a typographical error.

# **EXHIBIT A**











| DATE     | DESCRIPTION       | REVISION |
|----------|-------------------|----------|
| 06/22/14 | ISSUED FOR REVIEW | A        |
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| DEPT. | DATE | APP'D | REVISIONS |
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PROJECT NO: CT11186A  
 DRAWN BY: EB  
 CHECKED BY: SM

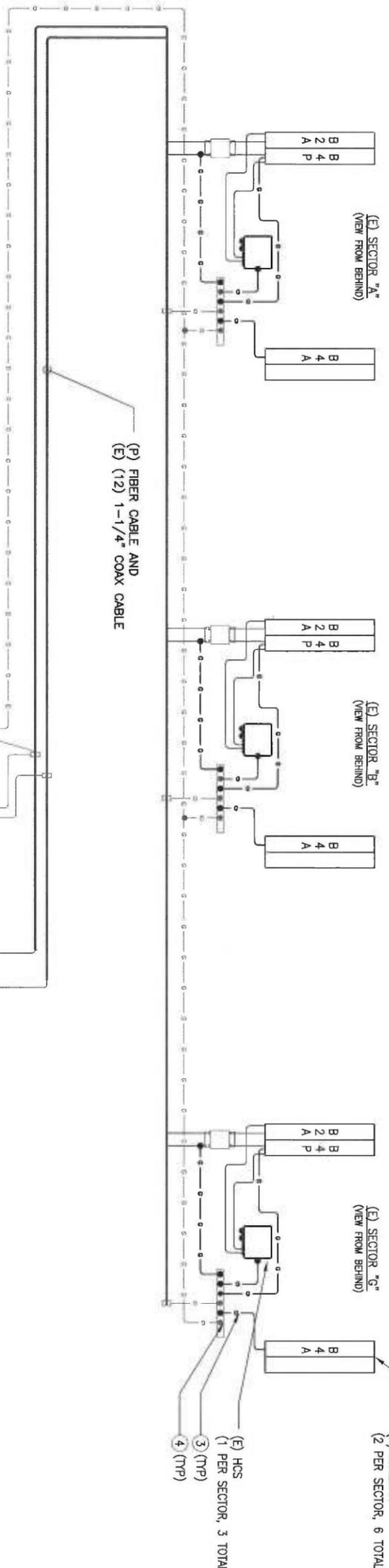
THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF T-MOBILE. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED.

PROFESSIONAL SEAL

SITE NUMBER  
**CT11186A**  
 SITE NAME  
 EAST HARTFORD/HILLS\_1  
 SITE ADDRESS  
 1455 FORBES STREET  
 EAST HARTFORD, CT 06118

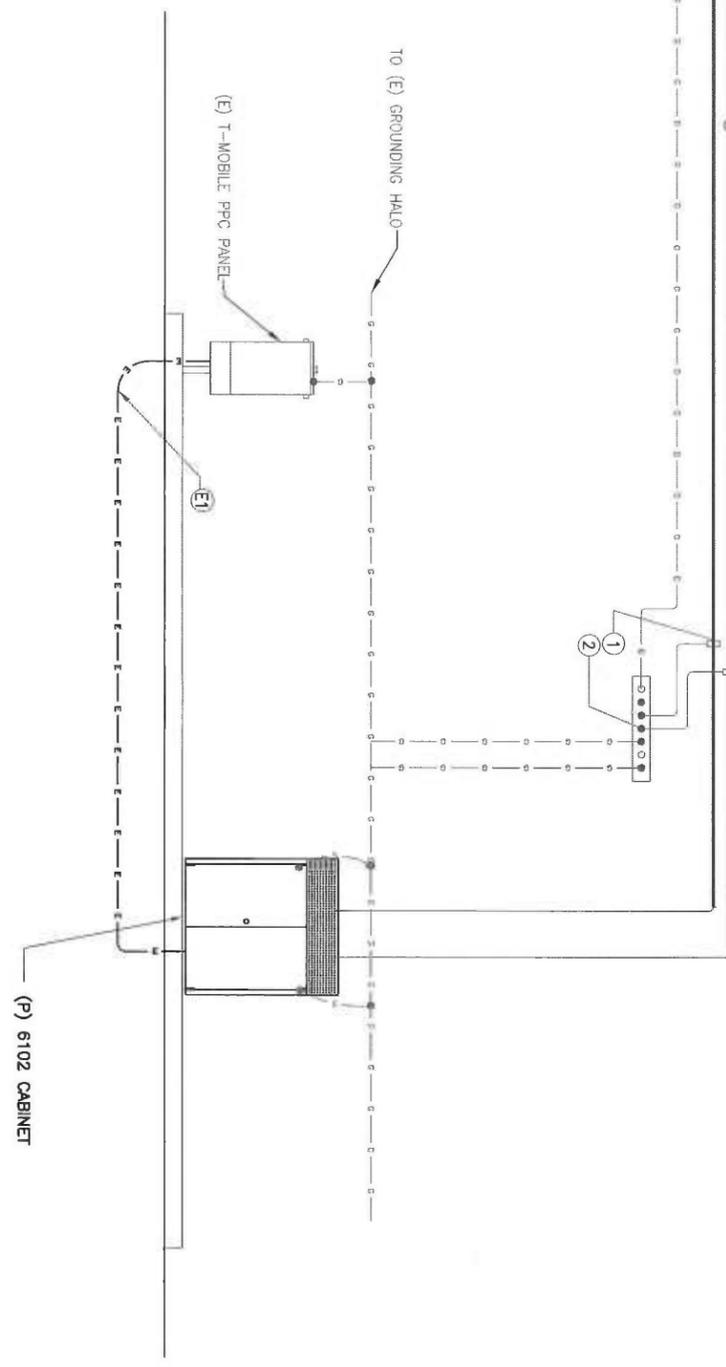
SHEET TITLE  
 GROUNDING AND ONE  
 LINE DIAGRAM  
 COAX/FIBER DIAGRAM

SHEET NUMBER  
**E-1**



| GROUNDING SCHEDULE |  |
|--------------------|--|
| ①                  | (P) FIBER GROUNDING KIT (COMMSCOPE PART #UG12158-15B4-1) |
| ②                  | (E) MGB (BUSSBAR #1)                                     |
| ③                  | GROUND (P) ANTENNA PER MANU. SPECS                       |
| ④                  | (E) SECTOR GROUND BAR                                    |
| CONDUIT SCHEDULE   |  |
| ⑤                  | (E) POWER CONDUIT  |

- NOTES:
- A. PROVIDE #2AWG GROUNDING CONDUCTOR, U.O.M.
  - B. DO NOT INSTALL GROUND KIT AT BEND. DIRECT GROUND WIRE DOWN TO ANTENNA BUSSBAR.
  - C. PROVIDE GROUNDING ELECTRODES IN QUANTITY, TYPE AND SIZE AS INDICATED ON SITE GROUNDING PLAN.
  - D. ADD COAX GROUND KIT CONNECTION TO BUSSBAR WHEN LENGTH OF COAX RUN (FROM EQUIPMENT TO ANTENNA) IS GREATER THAN 20'-0".
  - E. GROUND HCS W/ #2AWG GROUNDING CONDUCTOR ATTACHED TO GOOD GROUND AS DIRECT AND SHORT AS POSSIBLE. USE GREEN STRANDED INSULATED CONDUCTOR TO CONNECT TO BUSSBAR/GROUND HALO OR BARE TINNED SOLD COPPER CONDUCTOR TO CONNECT TO GROUND RING.



GROUNDING AND ONE LINE DIAGRAM  
 SCALE: NTS  
 1  
 E-1





# **EXHIBIT B**



**PAUL J. FORD AND COMPANY**  
**STRUCTURAL ENGINEERS**  
 250 East Broad Street • Suite 1500 • Columbus, Ohio 43215-3708

Date: **October 16, 2014**

Andrew Bazinet  
 Crown Castle USA Inc.  
 46 Broadway  
 Albany, NY 12204

Paul J Ford and Company  
 250 E. Broad Street Suite 600  
 Columbus, OH 43215  
 614.221.6679  
 585.899.3442

**Subject: Structural Analysis Report**

**Carrier Designation:** *T-Mobile Co-Locate*  
**Carrier Site Number:** CT11186A  
**Carrier Site Name:** CT11186A

**Crown Castle Designation:** **Crown Castle BU Number:** 806376  
**Crown Castle Site Name:** HRT 100 943239  
**Crown Castle JDE Job Number:** 210525  
**Crown Castle Work Order Number:** 944244  
**Crown Castle Application Number:** 168170 Rev. 3

**Engineering Firm Designation:** **Paul J Ford and Company Project Number:** 37513-0342.003.7805

**Site Data:** **1455 FORBES STREET, EAST HARTFORD, Hartford County, CT**  
**Latitude 41° 43' 53.3", Longitude -72° 36' 28"**  
**131 Foot - Monopole Tower**

Dear Andrew Bazinet,

Paul J Ford and Company is pleased to submit this "Structural Analysis Report" to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 715505, in accordance with application 168170, revision 3.

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

LC7: Existing + Reserved + Proposed Equipment **Sufficient Capacity**  
 Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

The structural analysis was performed for this tower in accordance with the requirements of the 2005 Connecticut Building Code and the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 80 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

We at Paul J Ford and Company appreciate the opportunity of providing our continuing professional services to you and Crown Castle USA Inc. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted by:

*Seth Tschanen*

Seth Tschanen  
 Structural Engineer



**OCT 16 2014**



PAUL J. FORD AND COMPANY  
STRUCTURAL ENGINEERS

250 East Broad Street • Suite 1500 • Columbus, Ohio 43215-3708

Date: **October 16, 2014**

Andrew Bazinet  
Crown Castle USA Inc.  
46 Broadway  
Albany, NY 12204

Paul J Ford and Company  
250 E. Broad Street Suite 600  
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614.221.6679  
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**Subject: Structural Analysis Report**

**Carrier Designation:**

**T-Mobile Co-Locate**

**Carrier Site Number:**

CT11186A

**Carrier Site Name:**

CT11186A

**Crown Castle Designation:**

**Crown Castle BU Number:**

806376

**Crown Castle Site Name:**

HRT 100 943239

**Crown Castle JDE Job Number:**

210525

**Crown Castle Work Order Number:**

944244

**Crown Castle Application Number:**

168170 Rev. 3

**Engineering Firm Designation:**

**Paul J Ford and Company Project Number:** 37513-0342.003.7805

**Site Data:**

**1455 FORBES STREET, EAST HARTFORD, Hartford County, CT**

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We at *Paul J Ford and Company* appreciate the opportunity of providing our continuing professional services to you and Crown Castle USA Inc. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted by:

Seth Tschanen  
Structural Engineer

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**1) INTRODUCTION**

This tower is a 131 ft Monopole tower designed by VALMONT in January of 1999. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-F.

**2) ANALYSIS CRITERIA**

The structural analysis was performed for this tower in accordance with the requirements of the 2005 Connecticut Building Code and the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 80 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

**Table 1 - Proposed Antenna and Cable Information**

| Mounting Level (ft) | Center Line Elevation (ft) | Number of Antennas | Antenna Manufacturer | Antenna Model                         | Number of Feed Lines | Feed Line Size (in) | Note |
|---------------------|----------------------------|--------------------|----------------------|---------------------------------------|----------------------|---------------------|------|
| 87.0                | 87.0                       | 3                  | ericsson             | ERICSSON AIR 21 B2A B4P w/ Mount Pipe | 1                    | 1-5/8               | -    |
|                     |                            | 3                  | ericsson             | ERICSSON AIR 21 B4A B2P w/ Mount Pipe |                      |                     |      |
|                     |                            | 3                  | ericsson             | KRY 112 144/1                         |                      |                     |      |

**Table 2 - Existing and Reserved Antenna and Cable Information**

| Mounting Level (ft) | Center Line Elevation (ft) | Number of Antennas | Antenna Manufacturer      | Antenna Model                         | Number of Feed Lines         | Feed Line Size (in) | Note           |   |
|---------------------|----------------------------|--------------------|---------------------------|---------------------------------------|------------------------------|---------------------|----------------|---|
| 128.0               | 128.0                      | 3                  | rfs                       | APX18-206517S-C w/ Mount Pipe         | 6                            | 1-5/8               | 1              |   |
|                     |                            | 1                  | tower mounts              | Pipe Mount [PM 601-3]                 |                              |                     |                |   |
| 121.0               | 121.0                      | 1                  | tower mounts              | T-Arm Mount [TA 601-3]                | 1<br>2                       | 3/8<br>3/4          | 2              |   |
|                     | 120.0                      | 3                  | kmw communications        | AM-X-CD-16-65-00T-RET w/ Mount Pipe   |                              |                     |                |   |
|                     |                            | 1                  | raycap                    | DC6-48-60-18-8F                       |                              |                     |                |   |
|                     |                            | 3                  | kathrein                  | 800 10121 w/ Mount Pipe               |                              |                     |                |   |
|                     |                            | 6                  | powerwave technologies    | LGP21401                              |                              |                     |                |   |
| 119.0               | 119.0                      | 6                  | ericsson                  | RRUS-11                               | -                            | -                   | 2              |   |
|                     |                            | 1                  | tower mounts              | Side Arm Mount [SO 102-3]             |                              |                     |                |   |
| 107.0               | 109.0                      | 3                  | alcatel lucent            | RRH2x40-AWS                           | 1                            | 1-5/8               | 2              |   |
|                     |                            | 3                  | antel                     | BXA-171085-8CF-EDIN-2 w/ Mount Pipe   |                              |                     |                |   |
|                     |                            | 3                  | antel                     | BXA-80063/4CF w/ Mount Pipe           |                              |                     |                |   |
|                     |                            | 1                  | rfs celwave               | DB-T1-6Z-8AB-0Z                       |                              |                     |                |   |
|                     |                            | 2                  | adc                       | DUAL BAND 800/1900 FULL BAND MASTHEAD | 12                           | 1-5/8               | 1              |   |
|                     |                            | 1                  | antel                     | BXA-185060/8CFx2 w/ Mount Pipe        |                              |                     |                |   |
|                     |                            | 2                  | antel                     | BXA-185090/8CF w/ Mount Pipe          |                              |                     |                |   |
|                     |                            | 3                  | antel                     | BXA-70063/6CFx4 w/ Mount Pipe         | 6                            | rfs celwave         | FD9R6004/1C-3L |   |
|                     | 6                          | rfs celwave        | FD9R6004/1C-3L            |                                       |                              |                     |                |   |
| 107.0               | 1                          | tower mounts       | Platform Mount (LP 101-1) |                                       |                              |                     |                |   |
| 97.0                | 101.0                      | 2                  | andrew                    | VHLP2.5-11                            | 3<br>3                       | 5/16<br>1/2         | 1              |   |
|                     |                            | 2                  | dragonwave                | HORIZON COMPACT                       |                              |                     |                |   |
|                     | 3                          | kathrein           | 840 10054 w/ Mount Pipe   |                                       |                              |                     |                |   |
|                     | 1                          | motorola           | TIMING 2000               |                                       |                              |                     |                |   |
|                     | 97.0                       | 97.0               | 3                         | samsung telecommunications            | WIMAX DAP HEAD               | 3                   | 1-1/4          | 2 |
|                     |                            |                    | 1                         | tower mounts                          | Platform Mount [LP 602-1]    |                     |                |   |
|                     |                            |                    | 3                         | rfs celwave                           | APXVSP18-C-A20 w/ Mount Pipe | 3                   | 1-1/4          | 2 |
|                     |                            |                    | 3                         | rfs celwave                           | IBC1900BB-1                  |                     |                |   |
| 3                   |                            |                    | rfs celwave               | IBC1900HG-2A                          |                              |                     |                |   |

| Mounting Level (ft) | Center Line Elevation (ft) | Number of Antennas | Antenna Manufacturer | Antenna Model                          | Number of Feed Lines | Feed Line Size (in) | Note |
|---------------------|----------------------------|--------------------|----------------------|--|----------------------|---------------------|------|
| 95.0                | 95.0                       | 3                  | alcatel lucent       | 800MHz 2X50W RRH W/FILTER              | -                    | -                   | 2    |
|                     |                            | 6                  | alcatel lucent       | PCS 1900MHz 4x45W-65MHz                |                      |                     |      |
|                     |                            | 1                  | tower mounts         | Side Arm Mount [SO 101-3]              |                      |                     |      |
| 87.0                | 87.0                       | 3                  | andrew               | ETW190VS12UB                           | -                    | -                   | 3    |
|                     |                            | 6                  | rfs                  | RFS APXV18-206516S-C-A20 w/ Mount Pipe |                      |                     |      |
|                     |                            | 3                  | rfs                  | RFS ATMAA-1412D-1A20                   |                      |                     |      |
|                     |                            | 1                  | tower mounts         | Side Arm Mount [SO 702-3]              | 12                   | 1-1/4               | 1    |

Notes:

- 1) Existing Equipment
- 2) Reserved Equipment
- 3) Equipment To Be Removed

### 3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

| Document                                   | Remarks   | Reference | Source   |
|--|-----------|-----------|----------|
| 4-GEOTECHNICAL REPORTS                     | Dr. Welti | 262381    | CCISITES |
| 4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS   | Valmont   | 262389    | CCISITES |
| 4-TOWER MANUFACTURER DRAWINGS              | Valmont   | 262386    | CCISITES |
| 4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA | PJF       | 3249954   | CCISITES |
| 4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA | PJF       | 3448150   | CCISITES |
| 4-TOWER STRUCTURAL ANALYSIS REPORTS        | Valmont   | 645113    | CCISITES |

#### 3.1) Analysis Method

tnxTower (version 6.0.3.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

#### 3.2) Assumptions

- 1) Monopole was fabricated and installed in accordance with the manufacturer's specifications.
- 2) Monopole has been properly maintained in accordance with manufacturer's specifications.
- 3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
- 4) Monopole was reinforced in conformance with the referenced modification drawings.

This analysis may be affected if any assumptions are not valid or have been made in error. Paul J Ford and Company should be notified to determine the effect on the structural integrity of the tower.

**4) ANALYSIS RESULTS**

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

| Section No. | Elevation (ft)    | Component Type | Size                  | Critical Element | P (K) | SF*P_allow (K) | % Capacity | Pass / Fail |
|-------------|-------------------|----------------|-----------------------|------------------|-------|----------------|------------|-------------|
| L1          | 131 - 110         | Pole           | TP15.525x10.525x0.188 | 1                | -2    | 483            | 39.1       | Pass        |
| L2          | 110 - 84.5833     | Pole           | TP21.883x15.525x0.25  | 2                | -9    | 905            | 97.3       | Pass        |
| L3          | 84.5833 - 70      | Pole           | TP25.531x21.883x0.378 | 3                | -10   | 1471           | 81.4       | Pass        |
| L4          | 70 - 67.0833      | Pole           | TP25.76x23.775x0.436  | 4                | -12   | 1781           | 79.2       | Pass        |
| L5          | 67.0833 - 44.5833 | Pole           | TP31.388x25.76x0.411  | 5                | -16   | 2066           | 92.6       | Pass        |
| L6          | 44.5833 - 34.08   | Pole           | TP34.015x31.388x0.406 | 6                | -18   | 2135           | 94.8       | Pass        |
| L7          | 34.08 - 18.75     | Pole           | TP37.216x31.972x0.425 | 7                | -21   | 2438           | 95.7       | Pass        |
| L8          | 18.75 - 0         | Pole           | TP41.9x37.216x0.408   | 8                | -24   | 2550           | 99.7       | Pass        |
|             |                   |                |                       |                  |       |                | Summary    |             |
|             |                   |                |                       |                  |       | Pole (L8)      | 99.7       | Pass        |
|             |                   |                |                       |                  |       | Rating =       | 99.7       | Pass        |

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

| Notes | Component                        | Elevation (ft) | % Capacity | Pass / Fail |
|-------|----------------------------------|----------------|------------|-------------|
| 1     | Anchor Rods                      | 0              | 93.0       | Pass        |
| 1     | Base Plate                       | 0              | 66.7       | Pass        |
| 1     | Base Foundation Steel            | 0              | 56.0       | Pass        |
| 1     | Base Foundation Soil Interaction | 0              | 65.0       | Pass        |
| 1     | Flange Connection                | 110            | 30.6       | Pass        |

|   |              |
|---|--------------|
| <b>Structure Rating (max from all components) =</b> | <b>99.7%</b> |
|---|--------------|

Notes:

- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

**APPENDIX A**  
**TNXTOWER OUTPUT**

## Tower Input Data

There is a pole section.

This tower is designed using the TIA/EIA-222-F standard.

The following design criteria apply:

- 1) Tower is located in Hartford County, Connecticut.
- 2) Basic wind speed of 80 mph.
- 3) Nominal ice thickness of 1.250 in.
- 4) Ice thickness is considered to increase with height.
- 5) Ice density of 56 pcf.
- 6) A wind speed of 38 mph is used in combination with ice.
- 7) Temperature drop of 50 °F.
- 8) Deflections calculated using a wind speed of 50 mph.
- 9) A non-linear (P-delta) analysis was used.
- 10) Pressures are calculated at each section.
- 11) Stress ratio used in pole design is 1.333.
- 12) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

## Options

|  |   |   |
|--|---|---|
| Consider Moments - Legs<br>Consider Moments - Horizontals<br>Consider Moments - Diagonals<br>Use Moment Magnification<br>✓ Use Code Stress Ratios<br>✓ Use Code Safety Factors - Guys<br>✓ Escalate Ice<br>Always Use Max Kz<br>Use Special Wind Profile<br>Include Bolts In Member Capacity<br>Leg Bolts Are At Top Of Section<br>Secondary Horizontal Braces Leg<br>Use Diamond Inner Bracing (4 Sided)<br>Add IBC .6D+W Combination | Distribute Leg Loads As Uniform<br>Assume Legs Pinned<br>✓ Assume Rigid Index Plate<br>✓ Use Clear Spans For Wind Area<br>✓ Use Clear Spans For KL/r<br>Retension Guys To Initial Tension<br>✓ Bypass Mast Stability Checks<br>✓ Use Azimuth Dish Coefficients<br>✓ Project Wind Area of Appurt.<br>Autocalc Torque Arm Areas<br>SR Members Have Cut Ends<br>Sort Capacity Reports By Component<br>Triangulate Diamond Inner Bracing<br>Use TIA-222-G Tension Splice Capacity Exemption | Treat Feedline Bundles As Cylinder<br>Use ASCE 10 X-Brace Ly Rules<br>Calculate Redundant Bracing Forces<br>Ignore Redundant Members in FEA<br>SR Leg Bolts Resist Compression<br>All Leg Panels Have Same Allowable<br>Offset Girt At Foundation<br>✓ Consider Feedline Torque<br>Include Angle Block Shear Check<br>Poles<br>✓ Include Shear-Torsion Interaction<br>Always Use Sub-Critical Flow<br>Use Top Mounted Sockets |
|--|---|---|

## 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      | 131.00-110.00   | 21.00                   | 0.00                   | 12                    | 10.525                | 15.525                   | 0.188                   | 0.752                | A572-65<br>(65 ksi)         |
| L2      | 110.00-84.58    | 25.42                   | 0.00                   | 12                    | 15.525                | 21.883                   | 0.250                   | 1.000                | A572-65<br>(65 ksi)         |
| L3      | 84.58-70.00     | 14.58                   | 4.00                   | 12                    | 21.883                | 25.531                   | 0.378                   | 1.512                | Reinf 62.57 ksi<br>(63 ksi) |
| L4      | 70.00-67.08     | 6.92                    | 0.00                   | 12                    | 23.775                | 25.760                   | 0.436                   | 1.743                | Reinf 62.66 ksi<br>(63 ksi) |
| L5      | 67.08-44.58     | 22.50                   | 0.00                   | 12                    | 25.760                | 31.388                   | 0.411                   | 1.644                | Reinf 63.01 ksi<br>(63 ksi) |
| L6      | 44.58-34.08     | 10.50                   | 4.92                   | 12                    | 31.388                | 34.015                   | 0.406                   | 1.625                | Reinf 63.04 ksi<br>(63 ksi) |
| L7      | 34.08-18.75     | 20.25                   | 0.00                   | 12                    | 31.972                | 37.216                   | 0.425                   | 1.702                | Reinf 63.22 ksi<br>(63 ksi) |
| L8      | 18.75-0.00      | 18.75                   |                        | 12                    | 37.216                | 41.900                   | 0.408                   | 1.630                | Reinf 63.30 ksi<br>(63 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> | I <sub>t</sub> /Q <sub>3</sub><br>in <sup>3</sup> | w<br>in | w/t    |
|---------|----------------|-------------------------|----------------------|---------|---------|------------------------|----------------------|---|---------|--------|
| L1      | 10.896         | 6.258                   | 85.346               | 3.701   | 5.452   | 15.654                 | 172.934              | 3.080   | 2.317   | 12.324 |
|         | 16.073         | 9.284                   | 278.754              | 5.491   | 8.042   | 34.662                 | 564.831              | 4.570   | 3.657   | 19.451 |
| L2      | 16.073         | 12.296                  | 366.206              | 5.468   | 8.042   | 45.537                 | 742.033              | 6.052   | 3.491   | 13.963 |
|         | 22.655         | 17.415                  | 1040.235             | 7.745   | 11.335  | 91.769                 | 2107.798             | 8.571   | 5.195   | 20.779 |
| L3      | 22.655         | 26.170                  | 1544.810             | 7.699   | 11.335  | 136.282                | 3130.205             | 12.880  | 4.852   | 12.838 |
|         | 26.432         | 30.610                  | 2471.873             | 9.005   | 13.225  | 186.908                | 5008.685             | 15.065  | 5.829   | 15.425 |
| L4      | 25.802         | 32.749                  | 2276.892             | 8.355   | 12.315  | 184.885                | 4613.601             | 16.118  | 5.204   | 11.941 |
|         | 26.669         | 35.535                  | 2908.837             | 9.066   | 13.344  | 217.993                | 5894.093             | 17.489  | 5.736   | 13.162 |
| L5      | 26.669         | 33.541                  | 2750.982             | 9.075   | 13.344  | 206.163                | 5574.236             | 16.508  | 5.802   | 14.121 |
|         | 32.495         | 40.988                  | 5020.126             | 11.090  | 16.259  | 308.762                | 10172.137            | 20.173  | 7.311   | 17.791 |
| L6      | 32.495         | 40.527                  | 4965.201             | 11.091  | 16.259  | 305.383                | 10060.844            | 19.946  | 7.323   | 18.027 |
|         | 35.215         | 43.963                  | 6338.434             | 12.032  | 17.620  | 359.734                | 12843.386            | 21.637  | 8.027   | 19.76  |
| L7      | 34.419         | 43.210                  | 5488.748             | 11.294  | 16.561  | 331.417                | 11121.691            | 21.267  | 7.428   | 17.463 |
|         | 38.529         | 50.393                  | 8706.480             | 13.171  | 19.278  | 451.626                | 17641.689            | 24.802  | 8.834   | 20.767 |
| L8      | 38.529         | 48.309                  | 8354.470             | 13.178  | 19.278  | 433.367                | 16928.421            | 23.776  | 8.882   | 21.791 |
|         | 43.378         | 54.456                  | 11966.615            | 14.854  | 21.704  | 551.350                | 24247.607            | 26.802  | 10.137  | 24.87  |

| Tower Elevation  | Gusset Area<br>(per face) | Gusset Thickness | Gusset Grade | Adjust. Factor<br>A <sub>f</sub> | Adjust. Factor<br>A <sub>r</sub> | Weight Mult. | Double Angle<br>Stitch Bolt<br>Spacing<br>Diagonals | Double Angle<br>Stitch Bolt<br>Spacing<br>Horizontals |
|------------------|---------------------------|------------------|--------------|----------------------------------|----------------------------------|--------------|---|---|
| ft               | ft <sup>2</sup>           | in               |              |                                  |                                  |              | in  | in  |
| L1 131.00-110.00 |                           |                  |              | 1                                | 1                                | 1            |   |   |
| L2 110.00-84.58  |                           |                  |              | 1                                | 1                                | 1            |   |   |
| L3 84.58-70.00   |                           |                  |              | 1                                | 1                                | 1            |   |   |
| L4 70.00-67.08   |                           |                  |              | 1                                | 1                                | 1            |   |   |
| L5 67.08-44.58   |                           |                  |              | 1                                | 1                                | 1            |   |   |
| L6 44.58-34.08   |                           |                  |              | 1                                | 1                                | 1            |   |   |
| L7 34.08-18.75   |                           |                  |              | 1                                | 1                                | 1            |   |   |
| L8 18.75-0.00    |                           |                  |              | 1                                | 1                                | 1            |   |   |

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

| Description | Face or Leg | Allow Shield | Component Type | Placement | Total Number | Number Per Row | Clear Spacing | Width or Diameter | Perimeter | Weight |
|-------------|-------------|--------------|----------------|-----------|--------------|----------------|---------------|-------------------|-----------|--------|
|             |             |              |                | ft        |              |                | in            | in                | in        | plf    |
| **          |             |              |                |           |              |                |               |                   |           |        |

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

| Description        | Face or Leg | Allow Shield | Component Type     | Placement     | Total Number | C <sub>A</sub> A <sub>A</sub> | Weight |
|--------------------|-------------|--------------|--------------------|---------------|--------------|-------------------------------|--------|
|                    |             |              |                    | ft            |              | ft <sup>2</sup> /ft           | plf    |
| CR 50 1873(1-5/8") | C           | No           | CaAa (Out Of Face) | 128.00 - 0.00 | 4            | No Ice                        | 0.83   |
|                    |             |              |                    |               |              | 1/2" Ice                      | 2.34   |
|                    |             |              |                    |               |              | 1" Ice                        | 4.47   |
|                    |             |              |                    |               |              | 2" Ice                        | 10.55  |
|                    |             |              |                    |               |              | 4" Ice                        | 30.05  |
| CR 50 1873(1-5/8") | C           | No           | CaAa (Out Of Face) | 128.00 - 0.00 | 2            | No Ice                        | 0.83   |
|                    |             |              |                    |               |              | 1/2" Ice                      | 2.34   |
|                    |             |              |                    |               |              | 1" Ice                        | 4.47   |
|                    |             |              |                    |               |              | 2" Ice                        | 10.55  |
|                    |             |              |                    |               |              | 4" Ice                        | 30.05  |
| LDF6-50A(1-1/4")   | C           | No           | CaAa (Out Of Face) | 87.00 - 0.00  | 6            | No Ice                        | 0.66   |
|                    |             |              |                    |               |              | 1/2" Ice                      | 1.91   |
|                    |             |              |                    |               |              | 1" Ice                        | 3.78   |
|                    |             |              |                    |               |              | 2" Ice                        | 9.33   |

| Description               | Face or Leg | Allow Shield | Component Type     | Placement<br>ft | Total Number | C <sub>A</sub> A <sub>A</sub> |      | Weight |
|---------------------------|-------------|--------------|--------------------|-----------------|--------------|-------------------------------|------|--------|
|                           |             |              |                    |                 |              | ft <sup>2</sup> /ft           | plf  |        |
| LDF6-50A(1-1/4")          | C           | No           | CaAa (Out Of Face) | 121.00 - 87.00  | 5            | 4" Ice                        | 0.00 | 27.78  |
|                           |             |              |                    |                 |              | No Ice                        | 0.00 | 0.66   |
|                           |             |              |                    |                 |              | 1/2" Ice                      | 0.00 | 1.91   |
|                           |             |              |                    |                 |              | 1" Ice                        | 0.00 | 3.78   |
|                           |             |              |                    |                 |              | 2" Ice                        | 0.00 | 9.33   |
| LDF6-50A(1-1/4")          | C           | No           | CaAa (Out Of Face) | 121.00 - 87.00  | 1            | 4" Ice                        | 0.00 | 27.78  |
|                           |             |              |                    |                 |              | No Ice                        | 0.16 | 0.66   |
|                           |             |              |                    |                 |              | 1/2" Ice                      | 0.25 | 1.91   |
|                           |             |              |                    |                 |              | 1" Ice                        | 0.35 | 3.78   |
|                           |             |              |                    |                 |              | 2" Ice                        | 0.55 | 9.33   |
| FB-L98B-002-75000(3/8")   | C           | No           | CaAa (Out Of Face) | 121.00 - 0.00   | 1            | 4" Ice                        | 0.95 | 27.78  |
|                           |             |              |                    |                 |              | No Ice                        | 0.00 | 0.06   |
|                           |             |              |                    |                 |              | 1/2" Ice                      | 0.00 | 0.60   |
|                           |             |              |                    |                 |              | 1" Ice                        | 0.00 | 1.76   |
|                           |             |              |                    |                 |              | 2" Ice                        | 0.00 | 5.91   |
| WR-VG86ST-BRD(3/4)        | C           | No           | CaAa (Out Of Face) | 121.00 - 0.00   | 2            | 4" Ice                        | 0.00 | 21.53  |
|                           |             |              |                    |                 |              | No Ice                        | 0.00 | 0.59   |
|                           |             |              |                    |                 |              | 1/2" Ice                      | 0.00 | 1.37   |
|                           |             |              |                    |                 |              | 1" Ice                        | 0.00 | 2.76   |
|                           |             |              |                    |                 |              | 2" Ice                        | 0.00 | 7.37   |
| **<br>HJ7-50A(1-5/8")     | C           | No           | Inside Pole        | 107.00 - 0.00   | 12           | 4" Ice                        | 0.00 | 23.92  |
|                           |             |              |                    |                 |              | No Ice                        | 0.00 | 1.04   |
|                           |             |              |                    |                 |              | 1/2" Ice                      | 0.00 | 1.04   |
|                           |             |              |                    |                 |              | 1" Ice                        | 0.00 | 1.04   |
|                           |             |              |                    |                 |              | 2" Ice                        | 0.00 | 1.04   |
| HB158-1-08U8-S8J18(1-5/8) | C           | No           | CaAa (Out Of Face) | 107.00 - 0.00   | 1            | 4" Ice                        | 0.00 | 1.04   |
|                           |             |              |                    |                 |              | No Ice                        | 0.00 | 1.30   |
|                           |             |              |                    |                 |              | 1/2" Ice                      | 0.00 | 2.81   |
|                           |             |              |                    |                 |              | 1" Ice                        | 0.00 | 4.94   |
|                           |             |              |                    |                 |              | 2" Ice                        | 0.00 | 11.02  |
| **<br>ATCB-B01-005(5/16)  | C           | No           | Inside Pole        | 97.00 - 0.00    | 3            | 4" Ice                        | 0.00 | 30.52  |
|                           |             |              |                    |                 |              | No Ice                        | 0.00 | 0.07   |
|                           |             |              |                    |                 |              | 1/2" Ice                      | 0.00 | 0.07   |
|                           |             |              |                    |                 |              | 1" Ice                        | 0.00 | 0.07   |
|                           |             |              |                    |                 |              | 2" Ice                        | 0.00 | 0.07   |
| FSJ4-50B(1/2")            | C           | No           | Inside Pole        | 97.00 - 0.00    | 2            | 4" Ice                        | 0.00 | 0.07   |
|                           |             |              |                    |                 |              | No Ice                        | 0.00 | 0.14   |
|                           |             |              |                    |                 |              | 1/2" Ice                      | 0.00 | 0.14   |
|                           |             |              |                    |                 |              | 1" Ice                        | 0.00 | 0.14   |
|                           |             |              |                    |                 |              | 2" Ice                        | 0.00 | 0.14   |
| HB114-1-08U4-M5J(1-1/4")  | C           | No           | CaAa (Out Of Face) | 97.00 - 0.00    | 3            | 4" Ice                        | 0.00 | 0.14   |
|                           |             |              |                    |                 |              | No Ice                        | 0.00 | 1.08   |
|                           |             |              |                    |                 |              | 1/2" Ice                      | 0.00 | 2.33   |
|                           |             |              |                    |                 |              | 1" Ice                        | 0.00 | 4.18   |
|                           |             |              |                    |                 |              | 2" Ice                        | 0.00 | 9.73   |
| FSJ4-50B(1/2")            | C           | No           | CaAa (Out Of Face) | 97.00 - 0.00    | 1            | 4" Ice                        | 0.00 | 28.15  |
|                           |             |              |                    |                 |              | No Ice                        | 0.00 | 0.14   |
|                           |             |              |                    |                 |              | 1/2" Ice                      | 0.00 | 0.76   |
|                           |             |              |                    |                 |              | 1" Ice                        | 0.00 | 2.00   |
|                           |             |              |                    |                 |              | 2" Ice                        | 0.00 | 6.30   |
| 2" Rigid Conduit          | C           | No           | CaAa (Out Of Face) | 97.00 - 0.00    | 2            | 4" Ice                        | 0.00 | 22.23  |
|                           |             |              |                    |                 |              | No Ice                        | 0.00 | 0.95   |
|                           |             |              |                    |                 |              | 1/2" Ice                      | 0.00 | 2.48   |
|                           |             |              |                    |                 |              | 1" Ice                        | 0.00 | 4.62   |
|                           |             |              |                    |                 |              | 2" Ice                        | 0.00 | 10.72  |
| **<br>LCF114-50J(1-1/4")  | C           | No           | CaAa (Out Of Face) | 87.00 - 0.00    | 10           | 4" Ice                        | 0.00 | 30.27  |
|                           |             |              |                    |                 |              | No Ice                        | 0.00 | 0.70   |
|                           |             |              |                    |                 |              | 1/2" Ice                      | 0.00 | 1.97   |
|                           |             |              |                    |                 |              | 1" Ice                        | 0.00 | 3.85   |
|                           |             |              |                    |                 |              | 2" Ice                        | 0.00 | 9.45   |
| LCF114-50J(1-1/4")        | C           | No           | CaAa (Out Of Face) | 87.00 - 0.00    | 2            | 4" Ice                        | 0.00 | 27.97  |
|                           |             |              |                    |                 |              | No Ice                        | 0.16 | 0.70   |
|                           |             |              |                    |                 |              | 1/2" Ice                      | 0.26 | 1.97   |
|                           |             |              |                    |                 |              | 1" Ice                        | 0.36 | 3.85   |
|                           |             |              |                    |                 |              | 2" Ice                        | 0.56 | 9.45   |
|                           |             |              |                    |                 |              | 4" Ice                        | 0.96 | 27.97  |

| Description                                  | Face or Leg | Allow Shield | Component Type     | Placement<br>ft | Total Number | C <sub>A</sub> A <sub>A</sub>  |                                 | Weight |
|--|-------------|--------------|--------------------|-----------------|--------------|--------------------------------|---------------------------------|--------|
|  |             |              |                    |                 |              | In Face<br>ft <sup>2</sup> /ft | Out Face<br>ft <sup>2</sup> /ft | plf    |
| MLE Hybrid<br>9Power/18Fiber RL 2( 1<br>5/8) | C           | No           | CaAa (Out Of Face) | 87.00 - 0.00    | 1            | No Ice                         | 0.16                            | 1.07   |
|  |             |              |                    |                 |              | 1/2" Ice                       | 0.26                            | 2.37   |
|  |             |              |                    |                 |              | 1" Ice                         | 0.36                            | 4.28   |
|  |             |              |                    |                 |              | 2" Ice                         | 0.56                            | 9.93   |
|  |             |              |                    |                 |              | 4" Ice                         | 0.96                            | 28.56  |
| **   |             |              |                    |                 |              |                                |                                 |        |
| 1" Flat Reinforcement                        | C           | No           | CaAa (Out Of Face) | 20.50 - 0.00    | 1            | No Ice                         | 0.17                            | 0.11   |
|  |             |              |                    |                 |              | 1/2" Ice                       | 0.28                            | 11.08  |
|  |             |              |                    |                 |              | 1" Ice                         | 0.39                            | 12.51  |
|  |             |              |                    |                 |              | 2" Ice                         | 0.61                            | 16.40  |
|  |             |              |                    |                 |              | 4" Ice                         | 1.06                            | 28.32  |
| 3/4" Flat Reinforcement                      | C           | No           | CaAa (Out Of Face) | 85.83 - 20.50   | 1            | No Ice                         | 0.13                            | 6.00   |
|  |             |              |                    |                 |              | 1/2" Ice                       | 0.24                            | 6.56   |
|  |             |              |                    |                 |              | 1" Ice                         | 0.35                            | 7.47   |
|  |             |              |                    |                 |              | 2" Ice                         | 0.57                            | 10.32  |
|  |             |              |                    |                 |              | 4" Ice                         | 1.01                            | 20.17  |
| 3/4" Flat Reinforcement                      | C           | No           | CaAa (Out Of Face) | 60.50 - 0.00    | 1            | No Ice                         | 0.13                            | 6.00   |
|  |             |              |                    |                 |              | 1/2" Ice                       | 0.24                            | 6.56   |
|  |             |              |                    |                 |              | 1" Ice                         | 0.35                            | 7.47   |
|  |             |              |                    |                 |              | 2" Ice                         | 0.57                            | 10.32  |
|  |             |              |                    |                 |              | 4" Ice                         | 1.01                            | 20.17  |
| **   |             |              |                    |                 |              |                                |                                 |        |

### Feed Line/Linear Appurtenances Section Areas

| Tower Section | Tower Elevation<br>ft | Face | A <sub>R</sub><br>ft <sup>2</sup> | A <sub>F</sub><br>ft <sup>2</sup> | C <sub>A</sub> A <sub>A</sub><br>In Face<br>ft <sup>2</sup> | C <sub>A</sub> A <sub>A</sub><br>Out Face<br>ft <sup>2</sup> | Weight<br>K |
|---------------|-----------------------|------|-----------------------------------|-----------------------------------|---|--|-------------|
| L1            | 131.00-110.00         | A    | 0.000                             | 0.000                             | 0.000   | 0.000  | 0           |
|               |                       | B    | 0.000                             | 0.000                             | 0.000   | 0.000  | 0           |
|               |                       | C    | 0.000                             | 0.000                             | 0.000   | 8.833  | 0           |
| L2            | 110.00-84.58          | A    | 0.000                             | 0.000                             | 0.000   | 0.000  | 0           |
|               |                       | B    | 0.000                             | 0.000                             | 0.000   | 0.000  | 0           |
|               |                       | C    | 0.000                             | 0.000                             | 0.000   | 14.943   | 1           |
| L3            | 84.58-70.00           | A    | 0.000                             | 0.000                             | 0.000   | 0.000  | 0           |
|               |                       | B    | 0.000                             | 0.000                             | 0.000   | 0.000  | 0           |
|               |                       | C    | 0.000                             | 0.000                             | 0.000   | 14.576   | 1           |
| L4            | 70.00-67.08           | A    | 0.000                             | 0.000                             | 0.000   | 0.000  | 0           |
|               |                       | B    | 0.000                             | 0.000                             | 0.000   | 0.000  | 0           |
|               |                       | C    | 0.000                             | 0.000                             | 0.000   | 2.915  | 0           |
| L5            | 67.08-44.58           | A    | 0.000                             | 0.000                             | 0.000   | 0.000  | 0           |
|               |                       | B    | 0.000                             | 0.000                             | 0.000   | 0.000  | 0           |
|               |                       | C    | 0.000                             | 0.000                             | 0.000   | 24.479   | 1           |
| L6            | 44.58-34.08           | A    | 0.000                             | 0.000                             | 0.000   | 0.000  | 0           |
|               |                       | B    | 0.000                             | 0.000                             | 0.000   | 0.000  | 0           |
|               |                       | C    | 0.000                             | 0.000                             | 0.000   | 11.811   | 1           |
| L7            | 34.08-18.75           | A    | 0.000                             | 0.000                             | 0.000   | 0.000  | 0           |
|               |                       | B    | 0.000                             | 0.000                             | 0.000   | 0.000  | 0           |
|               |                       | C    | 0.000                             | 0.000                             | 0.000   | 17.312   | 1           |
| L8            | 18.75-0.00            | A    | 0.000                             | 0.000                             | 0.000   | 0.000  | 0           |
|               |                       | B    | 0.000                             | 0.000                             | 0.000   | 0.000  | 0           |
|               |                       | C    | 0.000                             | 0.000                             | 0.000   | 21.866   | 1           |

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

| Tower Section | Tower Elevation<br>ft | Face or Leg | Ice Thickness<br>in | A <sub>R</sub><br>ft <sup>2</sup> | A <sub>F</sub><br>ft <sup>2</sup> | C <sub>A</sub> A <sub>A</sub><br>In Face<br>ft <sup>2</sup> | C <sub>A</sub> A <sub>A</sub><br>Out Face<br>ft <sup>2</sup> | Weight<br>K |
|---------------|-----------------------|-------------|---------------------|-----------------------------------|-----------------------------------|---|--|-------------|
| L1            | 131.00-110.00         | A           | 1.459               | 0.000                             | 0.000                             | 0.000   | 0.000  | 0           |
|               |                       | B           |                     | 0.000                             | 0.000                             | 0.000   | 0.000  | 0           |
|               |                       | C           |                     | 0.000                             | 0.000                             | 0.000   | 22.549   | 1           |
| L2            | 110.00-84.58          | A           | 1.422               | 0.000                             | 0.000                             | 0.000   | 0.000  | 0           |
|               |                       | B           |                     | 0.000                             | 0.000                             | 0.000   | 0.000  | 0           |
|               |                       | C           |                     | 0.000                             | 0.000                             | 0.000   | 38.396   | 3           |
| L3            | 84.58-70.00           | A           | 1.384               | 0.000                             | 0.000                             | 0.000   | 0.000  | 0           |
|               |                       | B           |                     | 0.000                             | 0.000                             | 0.000   | 0.000  | 0           |

| Tower Section | Tower Elevation<br>ft | Face or Leg | Ice Thickness<br>in | A <sub>R</sub><br>ft <sup>2</sup> | A <sub>F</sub><br>ft <sup>2</sup> | C <sub>AA</sub><br>In Face<br>ft <sup>2</sup> | C <sub>AA</sub><br>Out Face<br>ft <sup>2</sup> | Weight<br>K |
|---------------|-----------------------|-------------|---------------------|-----------------------------------|-----------------------------------|---|--|-------------|
| L4            | 70.00-67.08           | C           | 1.365               | 0.000                             | 0.000                             | 0.000   | 39.244   | 3           |
|               |                       | A           |                     | 0.000                             | 0.000                             | 0.000   | 0.000  | 0           |
|               |                       | B           |                     | 0.000                             | 0.000                             | 0.000   | 0.000  | 0           |
| L5            | 67.08-44.58           | C           | 1.330               | 0.000                             | 0.000                             | 0.000   | 7.849  | 1           |
|               |                       | A           |                     | 0.000                             | 0.000                             | 0.000   | 0.000  | 0           |
|               |                       | B           |                     | 0.000                             | 0.000                             | 0.000   | 0.000  | 0           |
| L6            | 44.58-34.08           | C           | 1.276               | 0.000                             | 0.000                             | 0.000   | 65.769   | 5           |
|               |                       | A           |                     | 0.000                             | 0.000                             | 0.000   | 0.000  | 0           |
|               |                       | B           |                     | 0.000                             | 0.000                             | 0.000   | 0.000  | 0           |
| L7            | 34.08-18.75           | C           | 1.250               | 0.000                             | 0.000                             | 0.000   | 31.175   | 2           |
|               |                       | A           |                     | 0.000                             | 0.000                             | 0.000   | 0.000  | 0           |
|               |                       | B           |                     | 0.000                             | 0.000                             | 0.000   | 0.000  | 0           |
| L8            | 18.75-0.00            | C           | 1.250               | 0.000                             | 0.000                             | 0.000   | 45.574   | 3           |
|               |                       | A           |                     | 0.000                             | 0.000                             | 0.000   | 0.000  | 0           |
|               |                       | B           |                     | 0.000                             | 0.000                             | 0.000   | 0.000  | 0           |
|               |                       | C           |                     | 0.000                             | 0.000                             | 0.000   | 55.720   | 4           |

### Feed Line Center of Pressure

| Section | Elevation<br>ft | CP <sub>X</sub><br>in | CP <sub>Z</sub><br>in | CP <sub>X</sub><br>Ice<br>in | CP <sub>Z</sub><br>Ice<br>in |
|---------|-----------------|-----------------------|-----------------------|------------------------------|------------------------------|
| L1      | 131.00-110.00   | -0.409                | 0.236                 | -0.656                       | 0.379                        |
| L2      | 110.00-84.58    | -0.560                | 0.323                 | -0.935                       | 0.540                        |
| L3      | 84.58-70.00     | -0.862                | 0.498                 | -1.410                       | 0.814                        |
| L4      | 70.00-67.08     | -0.881                | 0.509                 | -1.467                       | 0.847                        |
| L5      | 67.08-44.58     | -0.972                | 0.561                 | -1.641                       | 0.947                        |
| L6      | 44.58-34.08     | -1.034                | 0.597                 | -1.779                       | 1.027                        |
| L7      | 34.08-18.75     | -1.060                | 0.612                 | -1.852                       | 1.069                        |
| L8      | 18.75-0.00      | -1.119                | 0.646                 | -1.965                       | 1.134                        |

### Discrete Tower Loads

| Description                   | Face or Leg | Offset Type | Offsets:<br>Horz Lateral<br>Vert<br>ft<br>ft | Azimuth 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>K                           |                       |
|-------------------------------|-------------|-------------|--|-------------------------|-----------------|--|--|---------------------------------------|-----------------------|
| APX18-206517S-C w/ Mount Pipe | A           | From Face   | 1.00   | 0.000                   | 128.00          | No Ice   | 5.17                                       | 3.17                                  | 0                     |
|                               |             |             | 0  |                         |                 | 1/2" Ice   | 5.62                                       | 3.66                                  | 0                     |
|                               |             |             | 0  |                         |                 | 1" Ice   | 6.08                                       | 4.18                                  | 0                     |
|                               |             |             |  |                         |                 | 2" Ice   | 7.02                                       | 5.27                                  | 0                     |
|                               |             |             |  |                         |                 | 4" Ice   | 9.12                                       | 7.67                                  | 0                     |
| APX18-206517S-C w/ Mount Pipe | B           | From Face   | 1.00   | 0.000                   | 128.00          | No Ice   | 5.17                                       | 3.17                                  | 0                     |
|                               |             |             | 0  |                         |                 | 1/2" Ice   | 5.62                                       | 3.66                                  | 0                     |
|                               |             |             | 0  |                         |                 | 1" Ice   | 6.08                                       | 4.18                                  | 0                     |
|                               |             |             |  |                         |                 | 2" Ice   | 7.02                                       | 5.27                                  | 0                     |
|                               |             |             |  |                         |                 | 4" Ice   | 9.12                                       | 7.67                                  | 0                     |
| APX18-206517S-C w/ Mount Pipe | C           | From Face   | 1.00   | 0.000                   | 128.00          | No Ice   | 5.17                                       | 3.17                                  | 0                     |
|                               |             |             | 0  |                         |                 | 1/2" Ice   | 5.62                                       | 3.66                                  | 0                     |
|                               |             |             | 0  |                         |                 | 1" Ice   | 6.08                                       | 4.18                                  | 0                     |
|                               |             |             |  |                         |                 | 2" Ice   | 7.02                                       | 5.27                                  | 0                     |
|                               |             |             |  |                         |                 | 4" Ice   | 9.12                                       | 7.67                                  | 0                     |
| Pipe Mount [PM 601-3]         | C           | None        |  | 0.000                   | 128.00          | No Ice   | 4.39                                       | 4.39                                  | 0                     |
|                               |             |             |  |                         |                 | 1/2" Ice   | 5.48                                       | 5.48                                  | 0                     |
|                               |             |             |  |                         |                 | 1" Ice   | 6.57                                       | 6.57                                  | 0                     |
|                               |             |             |  |                         |                 | 2" Ice   | 8.75                                       | 8.75                                  | 0                     |
|                               |             |             |  |                         |                 | 4" Ice   | 13.11                                      | 13.11                                 | 1                     |
| **<br>800 10121 w/ Mount Pipe | A           | From Face   | 4.00<br>0<br>-1                              | 0.000                   | 121.00          | No Ice<br>1/2" Ice<br>1" Ice<br>2" Ice<br>4" Ice | 6.03<br>6.71<br>7.30<br>8.50<br>11.04      | 4.95<br>6.02<br>6.81<br>8.46<br>12.10 | 0<br>0<br>0<br>0<br>1 |

| Description                            | Face<br>or<br>Leg | Offset<br>Type | Offsets:              |            | Azimuth<br>Adjustment<br>° | Placement<br>ft | C <sub>AA</sub>          |                         | Weight<br>K |
|--|-------------------|----------------|-----------------------|------------|----------------------------|-----------------|--------------------------|-------------------------|-------------|
|  |                   |                | Horz<br>Lateral<br>ft | Vert<br>ft |                            |                 | Front<br>ft <sup>2</sup> | Side<br>ft <sup>2</sup> |             |
| 800 10121 w/ Mount Pipe                | B                 | From Face      | 4.00                  | 0.000      | 121.00                     | No Ice          | 6.03                     | 4.95                    | 0           |
|  |                   |                | 0                     |            |                            | 1/2" Ice        | 6.71                     | 6.02                    | 0           |
|  |                   |                | -1                    |            |                            | 1" Ice          | 7.30                     | 6.81                    | 0           |
|  |                   |                |                       |            |                            | 2" Ice          | 8.50                     | 8.46                    | 0           |
|  |                   |                |                       |            |                            | 4" Ice          | 11.04                    | 12.10                   | 1           |
| 800 10121 w/ Mount Pipe                | C                 | From Face      | 4.00                  | 0.000      | 121.00                     | No Ice          | 6.03                     | 4.95                    | 0           |
|  |                   |                | 0                     |            |                            | 1/2" Ice        | 6.71                     | 6.02                    | 0           |
|  |                   |                | -1                    |            |                            | 1" Ice          | 7.30                     | 6.81                    | 0           |
|  |                   |                |                       |            |                            | 2" Ice          | 8.50                     | 8.46                    | 0           |
|  |                   |                |                       |            |                            | 4" Ice          | 11.04                    | 12.10                   | 1           |
| (2) LGP21401                           | A                 | From Face      | 4.00                  | 0.000      | 121.00                     | No Ice          | 1.29                     | 0.36                    | 0           |
|  |                   |                | 0                     |            |                            | 1/2" Ice        | 1.45                     | 0.48                    | 0           |
|  |                   |                | -1                    |            |                            | 1" Ice          | 1.61                     | 0.60                    | 0           |
|  |                   |                |                       |            |                            | 2" Ice          | 1.97                     | 0.87                    | 0           |
|  |                   |                |                       |            |                            | 4" Ice          | 2.79                     | 1.52                    | 0           |
| (2) LGP21401                           | B                 | From Face      | 4.00                  | 0.000      | 121.00                     | No Ice          | 1.29                     | 0.36                    | 0           |
|  |                   |                | 0                     |            |                            | 1/2" Ice        | 1.45                     | 0.48                    | 0           |
|  |                   |                | -1                    |            |                            | 1" Ice          | 1.61                     | 0.60                    | 0           |
|  |                   |                |                       |            |                            | 2" Ice          | 1.97                     | 0.87                    | 0           |
|  |                   |                |                       |            |                            | 4" Ice          | 2.79                     | 1.52                    | 0           |
| (2) LGP21401                           | C                 | From Face      | 4.00                  | 0.000      | 121.00                     | No Ice          | 1.29                     | 0.36                    | 0           |
|  |                   |                | 0                     |            |                            | 1/2" Ice        | 1.45                     | 0.48                    | 0           |
|  |                   |                | -1                    |            |                            | 1" Ice          | 1.61                     | 0.60                    | 0           |
|  |                   |                |                       |            |                            | 2" Ice          | 1.97                     | 0.87                    | 0           |
|  |                   |                |                       |            |                            | 4" Ice          | 2.79                     | 1.52                    | 0           |
| AM-X-CD-16-65-00T-RET<br>w/ Mount Pipe | A                 | From Face      | 4.00                  | 0.000      | 121.00                     | No Ice          | 8.50                     | 6.30                    | 0           |
|  |                   |                | 0                     |            |                            | 1/2" Ice        | 9.15                     | 7.48                    | 0           |
|  |                   |                | -1                    |            |                            | 1" Ice          | 9.77                     | 8.37                    | 0           |
|  |                   |                |                       |            |                            | 2" Ice          | 11.03                    | 10.18                   | 0           |
|  |                   |                |                       |            |                            | 4" Ice          | 13.68                    | 14.02                   | 1           |
| AM-X-CD-16-65-00T-RET<br>w/ Mount Pipe | B                 | From Face      | 4.00                  | 0.000      | 121.00                     | No Ice          | 8.50                     | 6.30                    | 0           |
|  |                   |                | 0                     |            |                            | 1/2" Ice        | 9.15                     | 7.48                    | 0           |
|  |                   |                | -1                    |            |                            | 1" Ice          | 9.77                     | 8.37                    | 0           |
|  |                   |                |                       |            |                            | 2" Ice          | 11.03                    | 10.18                   | 0           |
|  |                   |                |                       |            |                            | 4" Ice          | 13.68                    | 14.02                   | 1           |
| AM-X-CD-16-65-00T-RET<br>w/ Mount Pipe | C                 | From Face      | 4.00                  | 0.000      | 121.00                     | No Ice          | 8.50                     | 6.30                    | 0           |
|  |                   |                | 0                     |            |                            | 1/2" Ice        | 9.15                     | 7.48                    | 0           |
|  |                   |                | -1                    |            |                            | 1" Ice          | 9.77                     | 8.37                    | 0           |
|  |                   |                |                       |            |                            | 2" Ice          | 11.03                    | 10.18                   | 0           |
|  |                   |                |                       |            |                            | 4" Ice          | 13.68                    | 14.02                   | 1           |
| DC6-48-60-18-8F                        | A                 | From Face      | 4.00                  | 0.000      | 121.00                     | No Ice          | 2.51                     | 2.51                    | 0           |
|  |                   |                | 0                     |            |                            | 1/2" Ice        | 2.74                     | 2.74                    | 0           |
|  |                   |                | -1                    |            |                            | 1" Ice          | 2.98                     | 2.98                    | 0           |
|  |                   |                |                       |            |                            | 2" Ice          | 3.48                     | 3.48                    | 0           |
|  |                   |                |                       |            |                            | 4" Ice          | 4.58                     | 4.58                    | 0           |
| T-Arm Mount [TA 601-3]                 | C                 | None           |                       | 0.000      | 121.00                     | No Ice          | 10.90                    | 10.90                   | 1           |
|  |                   |                |                       |            |                            | 1/2" Ice        | 14.65                    | 14.65                   | 1           |
|  |                   |                |                       |            |                            | 1" Ice          | 18.40                    | 18.40                   | 1           |
|  |                   |                |                       |            |                            | 2" Ice          | 25.90                    | 25.90                   | 2           |
|  |                   |                |                       |            |                            | 4" Ice          | 40.90                    | 40.90                   | 2           |
| **<br>(2) RRUS-11                      | A                 | From Face      | 4.00                  | 0.000      | 119.00                     | No Ice          | 3.25                     | 1.37                    | 0           |
|  |                   |                | 0                     |            |                            | 1/2" Ice        | 3.49                     | 1.55                    | 0           |
|  |                   |                | 0                     |            |                            | 1" Ice          | 3.74                     | 1.74                    | 0           |
|  |                   |                |                       |            |                            | 2" Ice          | 4.27                     | 2.14                    | 0           |
|  |                   |                |                       |            |                            | 4" Ice          | 5.43                     | 3.04                    | 0           |
| (2) RRUS-11                            | B                 | From Face      | 4.00                  | 0.000      | 119.00                     | No Ice          | 3.25                     | 1.37                    | 0           |
|  |                   |                | 0                     |            |                            | 1/2" Ice        | 3.49                     | 1.55                    | 0           |
|  |                   |                | 0                     |            |                            | 1" Ice          | 3.74                     | 1.74                    | 0           |
|  |                   |                |                       |            |                            | 2" Ice          | 4.27                     | 2.14                    | 0           |
|  |                   |                |                       |            |                            | 4" Ice          | 5.43                     | 3.04                    | 0           |
| (2) RRUS-11                            | C                 | From Face      | 4.00                  | 0.000      | 119.00                     | No Ice          | 3.25                     | 1.37                    | 0           |
|  |                   |                | 0                     |            |                            | 1/2" Ice        | 3.49                     | 1.55                    | 0           |
|  |                   |                | 0                     |            |                            | 1" Ice          | 3.74                     | 1.74                    | 0           |
|  |                   |                |                       |            |                            | 2" Ice          | 4.27                     | 2.14                    | 0           |
|  |                   |                |                       |            |                            | 4" Ice          | 5.43                     | 3.04                    | 0           |

| Description                               | Face or Leg | Offset Type | Offsets: |         | Azimuth Adjustment | Placement | C <sub>AA</sub> Front | C <sub>AA</sub> Side | Weight |
|---|-------------|-------------|----------|---------|--------------------|-----------|-----------------------|----------------------|--------|
|   |             |             | Horz     | Lateral |                    |           |                       |                      |        |
| Side Arm Mount [SO 102-3]                 | C           | From Face   | 0.00     | 0.000   | 119.00             | 4" Ice    | 5.43                  | 3.04                 | 0      |
|   |             |             |          |         |                    | No Ice    | 3.00                  | 3.00                 | 0      |
|   |             |             |          |         |                    | 1/2" Ice  | 3.48                  | 3.48                 | 0      |
|   |             |             |          |         |                    | 1" Ice    | 3.96                  | 3.96                 | 0      |
|   |             |             |          |         |                    | 2" Ice    | 4.92                  | 4.92                 | 0      |
|   |             |             |          |         |                    | 4" Ice    | 6.84                  | 6.84                 | 0      |
| **  |             |             |          |         |                    |           |                       |                      |        |
| BXA-70063/6CFx4 w/ Mount Pipe             | A           | From Face   | 4.00     | 0.000   | 107.00             | No Ice    | 7.97                  | 5.40                 | 0      |
|   |             |             |          |         |                    | 1/2" Ice  | 8.61                  | 6.55                 | 0      |
|   |             |             |          |         |                    | 1" Ice    | 9.22                  | 7.41                 | 0      |
|   |             |             |          |         |                    | 2" Ice    | 10.46                 | 9.18                 | 0      |
|   |             |             |          |         |                    | 4" Ice    | 13.07                 | 12.93                | 1      |
| BXA-70063/6CFx4 w/ Mount Pipe             | B           | From Face   | 4.00     | 0.000   | 107.00             | No Ice    | 7.97                  | 5.40                 | 0      |
|   |             |             |          |         |                    | 1/2" Ice  | 8.61                  | 6.55                 | 0      |
|   |             |             |          |         |                    | 1" Ice    | 9.22                  | 7.41                 | 0      |
|   |             |             |          |         |                    | 2" Ice    | 10.46                 | 9.18                 | 0      |
|   |             |             |          |         |                    | 4" Ice    | 13.07                 | 12.93                | 1      |
| BXA-70063/6CFx4 w/ Mount Pipe             | C           | From Face   | 4.00     | 0.000   | 107.00             | No Ice    | 7.97                  | 5.40                 | 0      |
|   |             |             |          |         |                    | 1/2" Ice  | 8.61                  | 6.55                 | 0      |
|   |             |             |          |         |                    | 1" Ice    | 9.22                  | 7.41                 | 0      |
|   |             |             |          |         |                    | 2" Ice    | 10.46                 | 9.18                 | 0      |
|   |             |             |          |         |                    | 4" Ice    | 13.07                 | 12.93                | 1      |
| BXA-185090/8CF w/ Mount Pipe              | A           | From Face   | 4.00     | 0.000   | 107.00             | No Ice    | 3.16                  | 3.33                 | 0      |
|   |             |             |          |         |                    | 1/2" Ice  | 3.53                  | 3.94                 | 0      |
|   |             |             |          |         |                    | 1" Ice    | 3.94                  | 4.56                 | 0      |
|   |             |             |          |         |                    | 2" Ice    | 4.83                  | 5.86                 | 0      |
|   |             |             |          |         |                    | 4" Ice    | 6.73                  | 8.84                 | 0      |
| BXA-185090/8CF w/ Mount Pipe              | B           | From Face   | 4.00     | 0.000   | 107.00             | No Ice    | 3.16                  | 3.33                 | 0      |
|   |             |             |          |         |                    | 1/2" Ice  | 3.53                  | 3.94                 | 0      |
|   |             |             |          |         |                    | 1" Ice    | 3.94                  | 4.56                 | 0      |
|   |             |             |          |         |                    | 2" Ice    | 4.83                  | 5.86                 | 0      |
|   |             |             |          |         |                    | 4" Ice    | 6.73                  | 8.84                 | 0      |
| BXA-185060/8CFx2 w/ Mount Pipe            | C           | From Face   | 4.00     | 0.000   | 107.00             | No Ice    | 3.20                  | 3.02                 | 0      |
|   |             |             |          |         |                    | 1/2" Ice  | 3.58                  | 3.64                 | 0      |
|   |             |             |          |         |                    | 1" Ice    | 3.99                  | 4.26                 | 0      |
|   |             |             |          |         |                    | 2" Ice    | 4.88                  | 5.56                 | 0      |
|   |             |             |          |         |                    | 4" Ice    | 6.80                  | 8.46                 | 0      |
| (2) FD9R6004/1C-3L                        | A           | From Face   | 4.00     | 0.000   | 107.00             | No Ice    | 0.37                  | 0.08                 | 0      |
|   |             |             |          |         |                    | 1/2" Ice  | 0.45                  | 0.14                 | 0      |
|   |             |             |          |         |                    | 1" Ice    | 0.54                  | 0.20                 | 0      |
|   |             |             |          |         |                    | 2" Ice    | 0.75                  | 0.34                 | 0      |
|   |             |             |          |         |                    | 4" Ice    | 1.28                  | 0.74                 | 0      |
| (2) FD9R6004/1C-3L                        | B           | From Face   | 4.00     | 0.000   | 107.00             | No Ice    | 0.37                  | 0.08                 | 0      |
|   |             |             |          |         |                    | 1/2" Ice  | 0.45                  | 0.14                 | 0      |
|   |             |             |          |         |                    | 1" Ice    | 0.54                  | 0.20                 | 0      |
|   |             |             |          |         |                    | 2" Ice    | 0.75                  | 0.34                 | 0      |
|   |             |             |          |         |                    | 4" Ice    | 1.28                  | 0.74                 | 0      |
| (2) FD9R6004/1C-3L                        | C           | From Face   | 4.00     | 0.000   | 107.00             | No Ice    | 0.37                  | 0.08                 | 0      |
|   |             |             |          |         |                    | 1/2" Ice  | 0.45                  | 0.14                 | 0      |
|   |             |             |          |         |                    | 1" Ice    | 0.54                  | 0.20                 | 0      |
|   |             |             |          |         |                    | 2" Ice    | 0.75                  | 0.34                 | 0      |
|   |             |             |          |         |                    | 4" Ice    | 1.28                  | 0.74                 | 0      |
| (2) DUAL BAND 800/1900 FULL BAND MASTHEAD | A           | From Face   | 4.00     | 0.000   | 107.00             | No Ice    | 1.55                  | 0.81                 | 0      |
|   |             |             |          |         |                    | 1/2" Ice  | 1.72                  | 0.94                 | 0      |
|   |             |             |          |         |                    | 1" Ice    | 1.90                  | 1.09                 | 0      |
|   |             |             |          |         |                    | 2" Ice    | 2.28                  | 1.40                 | 0      |
|   |             |             |          |         |                    | 4" Ice    | 3.14                  | 2.12                 | 0      |
| BXA-80063/4CF w/ Mount Pipe               | A           | From Face   | 4.00     | 0.000   | 107.00             | No Ice    | 5.40                  | 3.42                 | 0      |
|   |             |             |          |         |                    | 1/2" Ice  | 5.84                  | 4.02                 | 0      |
|   |             |             |          |         |                    | 1" Ice    | 6.30                  | 4.64                 | 0      |
|   |             |             |          |         |                    | 2" Ice    | 7.24                  | 5.92                 | 0      |
|   |             |             |          |         |                    | 4" Ice    | 9.26                  | 8.93                 | 1      |
| BXA-80063/4CF w/ Mount Pipe               | B           | From Face   | 4.00     | 0.000   | 107.00             | No Ice    | 5.40                  | 3.42                 | 0      |
|   |             |             |          |         |                    | 1/2" Ice  | 5.84                  | 4.02                 | 0      |
|   |             |             |          |         |                    | 1" Ice    | 6.30                  | 4.64                 | 0      |

| Description                            | Face<br>or<br>Leg | Offset<br>Type | Offsets:              |            | 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>K |   |
|--|-------------------|----------------|-----------------------|------------|----------------------------|-----------------|---|--|-------------|---|
|  |                   |                | Horz<br>Lateral<br>ft | Vert<br>ft |                            |                 |   |  |             |   |
| BXA-80063/4CF w/ Mount<br>Pipe         | C                 | From Face      | 4.00                  | 0          | 0.000                      | 107.00          | 2" Ice                                      | 7.24                                       | 5.92        | 0 |
|  |                   |                |                       |            |                            |                 | 4" Ice                                      | 9.26                                       | 8.93        | 1 |
|  |                   |                |                       |            |                            |                 | No Ice                                      | 5.40                                       | 3.42        | 0 |
|  |                   |                |                       |            |                            |                 | 1/2" Ice                                    | 5.84                                       | 4.02        | 0 |
|  |                   |                |                       |            |                            |                 | 1" Ice                                      | 6.30                                       | 4.64        | 0 |
| BXA-171085-8CF-EDIN-2<br>w/ Mount Pipe | A                 | From Face      | 4.00                  | 0          | 0.000                      | 107.00          | 2" Ice                                      | 7.24                                       | 5.92        | 0 |
|  |                   |                |                       |            |                            |                 | 4" Ice                                      | 9.26                                       | 8.93        | 1 |
|  |                   |                |                       |            |                            |                 | No Ice                                      | 3.18                                       | 3.35        | 0 |
|  |                   |                |                       |            |                            |                 | 1/2" Ice                                    | 3.56                                       | 3.97        | 0 |
|  |                   |                |                       |            |                            |                 | 1" Ice                                      | 3.96                                       | 4.60        | 0 |
| BXA-171085-8CF-EDIN-2<br>w/ Mount Pipe | B                 | From Face      | 4.00                  | 0          | 0.000                      | 107.00          | 2" Ice                                      | 4.85                                       | 5.89        | 0 |
|  |                   |                |                       |            |                            |                 | 4" Ice                                      | 6.77                                       | 8.89        | 0 |
|  |                   |                |                       |            |                            |                 | No Ice                                      | 3.18                                       | 3.35        | 0 |
|  |                   |                |                       |            |                            |                 | 1/2" Ice                                    | 3.56                                       | 3.97        | 0 |
|  |                   |                |                       |            |                            |                 | 1" Ice                                      | 3.96                                       | 4.60        | 0 |
| BXA-171085-8CF-EDIN-2<br>w/ Mount Pipe | C                 | From Face      | 4.00                  | 0          | 0.000                      | 107.00          | 2" Ice                                      | 4.85                                       | 5.89        | 0 |
|  |                   |                |                       |            |                            |                 | 4" Ice                                      | 6.77                                       | 8.89        | 0 |
|  |                   |                |                       |            |                            |                 | No Ice                                      | 3.18                                       | 3.35        | 0 |
|  |                   |                |                       |            |                            |                 | 1/2" Ice                                    | 3.56                                       | 3.97        | 0 |
|  |                   |                |                       |            |                            |                 | 1" Ice                                      | 3.96                                       | 4.60        | 0 |
| RRH2x40-AWS                            | A                 | From Face      | 4.00                  | 0          | 0.000                      | 107.00          | 2" Ice                                      | 4.85                                       | 5.89        | 0 |
|  |                   |                |                       |            |                            |                 | 4" Ice                                      | 6.77                                       | 8.89        | 0 |
|  |                   |                |                       |            |                            |                 | No Ice                                      | 2.52                                       | 1.59        | 0 |
|  |                   |                |                       |            |                            |                 | 1/2" Ice                                    | 2.75                                       | 1.80        | 0 |
|  |                   |                |                       |            |                            |                 | 1" Ice                                      | 2.99                                       | 2.01        | 0 |
| RRH2x40-AWS                            | B                 | From Face      | 4.00                  | 0          | 0.000                      | 107.00          | 2" Ice                                      | 3.50                                       | 2.46        | 0 |
|  |                   |                |                       |            |                            |                 | 4" Ice                                      | 4.61                                       | 3.48        | 0 |
|  |                   |                |                       |            |                            |                 | No Ice                                      | 2.52                                       | 1.59        | 0 |
|  |                   |                |                       |            |                            |                 | 1/2" Ice                                    | 2.75                                       | 1.80        | 0 |
|  |                   |                |                       |            |                            |                 | 1" Ice                                      | 2.99                                       | 2.01        | 0 |
| RRH2x40-AWS                            | C                 | From Face      | 4.00                  | 0          | 0.000                      | 107.00          | 2" Ice                                      | 3.50                                       | 2.46        | 0 |
|  |                   |                |                       |            |                            |                 | 4" Ice                                      | 4.61                                       | 3.48        | 0 |
|  |                   |                |                       |            |                            |                 | No Ice                                      | 2.52                                       | 1.59        | 0 |
|  |                   |                |                       |            |                            |                 | 1/2" Ice                                    | 2.75                                       | 1.80        | 0 |
|  |                   |                |                       |            |                            |                 | 1" Ice                                      | 2.99                                       | 2.01        | 0 |
| DB-T1-6Z-8AB-0Z                        | C                 | From Face      | 4.00                  | 0          | 0.000                      | 107.00          | 2" Ice                                      | 3.50                                       | 2.46        | 0 |
|  |                   |                |                       |            |                            |                 | 4" Ice                                      | 4.61                                       | 3.48        | 0 |
|  |                   |                |                       |            |                            |                 | No Ice                                      | 5.60                                       | 2.33        | 0 |
|  |                   |                |                       |            |                            |                 | 1/2" Ice                                    | 5.92                                       | 2.56        | 0 |
|  |                   |                |                       |            |                            |                 | 1" Ice                                      | 6.24                                       | 2.79        | 0 |
| Platform Mount (LP 101-1)              | C                 | None           |                       |            | 0.000                      | 107.00          | 2" Ice                                      | 6.91                                       | 3.28        | 0 |
|  |                   |                |                       |            |                            |                 | 4" Ice                                      | 8.37                                       | 4.37        | 0 |
|  |                   |                |                       |            |                            |                 | No Ice                                      | 36.21                                      | 36.21       | 2 |
|  |                   |                |                       |            |                            |                 | 1/2" Ice                                    | 42.82                                      | 42.82       | 2 |
|  |                   |                |                       |            |                            |                 | 1" Ice                                      | 49.43                                      | 49.43       | 3 |
| **Clearwire**<br>TIMING 2000           | A                 | From Face      | 4.00                  | 0          | 0.000                      | 97.00           | 2" Ice                                      | 62.65                                      | 62.65       | 5 |
|  |                   |                |                       |            |                            |                 | 4" Ice                                      | 89.09                                      | 89.09       | 8 |
|  |                   |                |                       |            |                            |                 | No Ice                                      | 0.13                                       | 0.13        | 0 |
|  |                   |                |                       |            |                            |                 | 1/2" Ice                                    | 0.18                                       | 0.18        | 0 |
|  |                   |                |                       |            |                            |                 | 1" Ice                                      | 0.24                                       | 0.24        | 0 |
| 840 10054 w/ Mount Pipe                | A                 | From Face      | 4.00                  | 0          | 0.000                      | 97.00           | 2" Ice                                      | 0.38                                       | 0.38        | 0 |
|  |                   |                |                       |            |                            |                 | 4" Ice                                      | 0.78                                       | 0.78        | 0 |
|  |                   |                |                       |            |                            |                 | No Ice                                      | 5.41                                       | 2.39        | 0 |
|  |                   |                |                       |            |                            |                 | 1/2" Ice                                    | 5.83                                       | 2.92        | 0 |
|  |                   |                |                       |            |                            |                 | 1" Ice                                      | 6.26                                       | 3.47        | 0 |
| 840 10054 w/ Mount Pipe                | B                 | From Face      | 4.00                  | 0          | 0.000                      | 97.00           | 2" Ice                                      | 7.16                                       | 4.61        | 0 |
|  |                   |                |                       |            |                            |                 | 4" Ice                                      | 9.09                                       | 7.32        | 1 |
|  |                   |                |                       |            |                            |                 | No Ice                                      | 5.41                                       | 2.39        | 0 |
|  |                   |                |                       |            |                            |                 | 1/2" Ice                                    | 5.83                                       | 2.92        | 0 |
|  |                   |                |                       |            |                            |                 | 1" Ice                                      | 6.26                                       | 3.47        | 0 |
| 840 10054 w/ Mount Pipe                | C                 | From Face      | 4.00                  | 0          | 0.000                      | 97.00           | 2" Ice                                      | 7.16                                       | 4.61        | 0 |
|  |                   |                |                       |            |                            |                 | 4" Ice                                      | 9.09                                       | 7.32        | 1 |
|  |                   |                |                       |            |                            |                 | No Ice                                      | 5.41                                       | 2.39        | 0 |
|  |                   |                |                       |            |                            |                 | 1/2" Ice                                    | 5.83                                       | 2.92        | 0 |
|  |                   |                |                       |            |                            |                 | 1" Ice                                      | 6.26                                       | 3.47        | 0 |



| Description                           | Face or Leg | Offset Type | Offsets: |         | Azimuth Adjustment | Placement | C <sub>AA</sub> <sub>Front</sub> | C <sub>AA</sub> <sub>Side</sub> | Weight |   |
|---------------------------------------|-------------|-------------|----------|---------|--------------------|-----------|----------------------------------|---------------------------------|--------|---|
|                                       |             |             | Horz     | Lateral |                    |           |                                  |                                 |        |   |
|                                       |             |             | ft       | ft      | °                  | ft        | ft <sup>2</sup>                  | ft <sup>2</sup>                 | K      |   |
|                                       |             |             |          | 0       |                    |           | 1/2" Ice                         | 1.27                            | 0.65   | 0 |
|                                       |             |             |          | 0       |                    |           | 1" Ice                           | 1.43                            | 0.77   | 0 |
|                                       |             |             |          |         |                    |           | 2" Ice                           | 1.76                            | 1.04   | 0 |
|                                       |             |             |          |         |                    |           | 4" Ice                           | 2.53                            | 1.69   | 0 |
| IBC1900BB-1                           | C           | From Face   | 4.00     | 0.000   | 97.00              |           | No Ice                           | 1.13                            | 0.53   | 0 |
|                                       |             |             | 0        |         |                    |           | 1/2" Ice                         | 1.27                            | 0.65   | 0 |
|                                       |             |             | 0        |         |                    |           | 1" Ice                           | 1.43                            | 0.77   | 0 |
|                                       |             |             |          |         |                    |           | 2" Ice                           | 1.76                            | 1.04   | 0 |
|                                       |             |             |          |         |                    |           | 4" Ice                           | 2.53                            | 1.69   | 0 |
| Platform Mount [LP 602-1]             | C           | None        |          | 0.000   | 97.00              |           | No Ice                           | 32.03                           | 32.03  | 1 |
|                                       |             |             |          |         |                    |           | 1/2" Ice                         | 38.71                           | 38.71  | 2 |
|                                       |             |             |          |         |                    |           | 1" Ice                           | 45.39                           | 45.39  | 2 |
|                                       |             |             |          |         |                    |           | 2" Ice                           | 58.75                           | 58.75  | 3 |
|                                       |             |             |          |         |                    |           | 4" Ice                           | 85.47                           | 85.47  | 5 |
| **                                    |             |             |          |         |                    |           |                                  |                                 |        |   |
| (2) PCS 1900MHz 4x45W-65MHz           | A           | From Face   | 4.00     | 0.000   | 95.00              |           | No Ice                           | 2.71                            | 2.61   | 0 |
|                                       |             |             | 0        |         |                    |           | 1/2" Ice                         | 2.95                            | 2.85   | 0 |
|                                       |             |             | 0        |         |                    |           | 1" Ice                           | 3.20                            | 3.09   | 0 |
|                                       |             |             |          |         |                    |           | 2" Ice                           | 3.72                            | 3.61   | 0 |
|                                       |             |             |          |         |                    |           | 4" Ice                           | 4.86                            | 4.74   | 0 |
| (2) PCS 1900MHz 4x45W-65MHz           | B           | From Face   | 4.00     | 0.000   | 95.00              |           | No Ice                           | 2.71                            | 2.61   | 0 |
|                                       |             |             | 0        |         |                    |           | 1/2" Ice                         | 2.95                            | 2.85   | 0 |
|                                       |             |             | 0        |         |                    |           | 1" Ice                           | 3.20                            | 3.09   | 0 |
|                                       |             |             |          |         |                    |           | 2" Ice                           | 3.72                            | 3.61   | 0 |
|                                       |             |             |          |         |                    |           | 4" Ice                           | 4.86                            | 4.74   | 0 |
| (2) PCS 1900MHz 4x45W-65MHz           | B           | From Face   | 4.00     | 0.000   | 95.00              |           | No Ice                           | 2.71                            | 2.61   | 0 |
|                                       |             |             | 0        |         |                    |           | 1/2" Ice                         | 2.95                            | 2.85   | 0 |
|                                       |             |             | 0        |         |                    |           | 1" Ice                           | 3.20                            | 3.09   | 0 |
|                                       |             |             |          |         |                    |           | 2" Ice                           | 3.72                            | 3.61   | 0 |
|                                       |             |             |          |         |                    |           | 4" Ice                           | 4.86                            | 4.74   | 0 |
| 800MHz 2X50W RRH W/FILTER             | A           | From Face   | 4.00     | 0.000   | 95.00              |           | No Ice                           | 2.40                            | 2.25   | 0 |
|                                       |             |             | 0        |         |                    |           | 1/2" Ice                         | 2.61                            | 2.46   | 0 |
|                                       |             |             | 0        |         |                    |           | 1" Ice                           | 2.83                            | 2.68   | 0 |
|                                       |             |             |          |         |                    |           | 2" Ice                           | 3.30                            | 3.13   | 0 |
|                                       |             |             |          |         |                    |           | 4" Ice                           | 4.34                            | 4.15   | 0 |
| 800MHz 2X50W RRH W/FILTER             | B           | From Face   | 4.00     | 0.000   | 95.00              |           | No Ice                           | 2.40                            | 2.25   | 0 |
|                                       |             |             | 0        |         |                    |           | 1/2" Ice                         | 2.61                            | 2.46   | 0 |
|                                       |             |             | 0        |         |                    |           | 1" Ice                           | 2.83                            | 2.68   | 0 |
|                                       |             |             |          |         |                    |           | 2" Ice                           | 3.30                            | 3.13   | 0 |
|                                       |             |             |          |         |                    |           | 4" Ice                           | 4.34                            | 4.15   | 0 |
| 800MHz 2X50W RRH W/FILTER             | C           | From Face   | 4.00     | 0.000   | 95.00              |           | No Ice                           | 2.40                            | 2.25   | 0 |
|                                       |             |             | 0        |         |                    |           | 1/2" Ice                         | 2.61                            | 2.46   | 0 |
|                                       |             |             | 0        |         |                    |           | 1" Ice                           | 2.83                            | 2.68   | 0 |
|                                       |             |             |          |         |                    |           | 2" Ice                           | 3.30                            | 3.13   | 0 |
|                                       |             |             |          |         |                    |           | 4" Ice                           | 4.34                            | 4.15   | 0 |
| Side Arm Mount [SO 101-3]             | C           | None        |          | 0.000   | 95.00              |           | No Ice                           | 7.50                            | 7.50   | 0 |
|                                       |             |             |          |         |                    |           | 1/2" Ice                         | 8.90                            | 8.90   | 0 |
|                                       |             |             |          |         |                    |           | 1" Ice                           | 10.30                           | 10.30  | 0 |
|                                       |             |             |          |         |                    |           | 2" Ice                           | 13.10                           | 13.10  | 1 |
|                                       |             |             |          |         |                    |           | 4" Ice                           | 18.70                           | 18.70  | 1 |
| **                                    |             |             |          |         |                    |           |                                  |                                 |        |   |
| ERICSSON AIR 21 B2A B4P w/ Mount Pipe | A           | From Face   | 4.00     | 0.000   | 87.00              |           | No Ice                           | 6.83                            | 5.64   | 0 |
|                                       |             |             | 0        |         |                    |           | 1/2" Ice                         | 7.35                            | 6.48   | 0 |
|                                       |             |             | 0        |         |                    |           | 1" Ice                           | 7.86                            | 7.26   | 0 |
|                                       |             |             |          |         |                    |           | 2" Ice                           | 8.93                            | 8.86   | 0 |
|                                       |             |             |          |         |                    |           | 4" Ice                           | 11.18                           | 12.29  | 1 |
| ERICSSON AIR 21 B2A B4P w/ Mount Pipe | B           | From Face   | 4.00     | 0.000   | 87.00              |           | No Ice                           | 6.83                            | 5.64   | 0 |
|                                       |             |             | 0        |         |                    |           | 1/2" Ice                         | 7.35                            | 6.48   | 0 |
|                                       |             |             | 0        |         |                    |           | 1" Ice                           | 7.86                            | 7.26   | 0 |
|                                       |             |             |          |         |                    |           | 2" Ice                           | 8.93                            | 8.86   | 0 |
|                                       |             |             |          |         |                    |           | 4" Ice                           | 11.18                           | 12.29  | 1 |
| ERICSSON AIR 21 B2A B4P w/ Mount Pipe | C           | From Face   | 4.00     | 0.000   | 87.00              |           | No Ice                           | 6.83                            | 5.64   | 0 |
|                                       |             |             | 0        |         |                    |           | 1/2" Ice                         | 7.35                            | 6.48   | 0 |
|                                       |             |             | 0        |         |                    |           | 1" Ice                           | 7.86                            | 7.26   | 0 |
|                                       |             |             |          |         |                    |           | 2" Ice                           | 8.93                            | 8.86   | 0 |

| Description                              | Face<br>or<br>Leg | Offset<br>Type | Offsets:              |            | Azimuth<br>Adjustment<br>° | Placement<br>ft | C <sub>AA</sub>          |                         | Weight<br>K |
|--|-------------------|----------------|-----------------------|------------|----------------------------|-----------------|--------------------------|-------------------------|-------------|
|  |                   |                | Horz<br>Lateral<br>ft | Vert<br>ft |                            |                 | Front<br>ft <sup>2</sup> | Side<br>ft <sup>2</sup> |             |
| ERICSSON AIR 21 B4A<br>B2P w/ Mount Pipe | A                 | From Face      | 4.00                  | 0.000      | 87.00                      | 4" Ice          | 11.18                    | 12.29                   | 1           |
|  |                   |                |                       |            |                            | No Ice          | 6.82                     | 5.63                    | 0           |
|  |                   |                |                       |            |                            | 1/2" Ice        | 7.34                     | 6.47                    | 0           |
|  |                   |                |                       |            |                            | 1" Ice          | 7.85                     | 7.25                    | 0           |
|  |                   |                |                       |            |                            | 2" Ice          | 8.92                     | 8.85                    | 0           |
| ERICSSON AIR 21 B4A<br>B2P w/ Mount Pipe | B                 | From Face      | 4.00                  | 0.000      | 87.00                      | 4" Ice          | 11.17                    | 12.28                   | 1           |
|  |                   |                |                       |            |                            | No Ice          | 6.82                     | 5.63                    | 0           |
|  |                   |                |                       |            |                            | 1/2" Ice        | 7.34                     | 6.47                    | 0           |
|  |                   |                |                       |            |                            | 1" Ice          | 7.85                     | 7.25                    | 0           |
|  |                   |                |                       |            |                            | 2" Ice          | 8.92                     | 8.85                    | 0           |
| ERICSSON AIR 21 B4A<br>B2P w/ Mount Pipe | C                 | From Face      | 4.00                  | 0.000      | 87.00                      | 4" Ice          | 11.17                    | 12.28                   | 1           |
|  |                   |                |                       |            |                            | No Ice          | 6.82                     | 5.63                    | 0           |
|  |                   |                |                       |            |                            | 1/2" Ice        | 7.34                     | 6.47                    | 0           |
|  |                   |                |                       |            |                            | 1" Ice          | 7.85                     | 7.25                    | 0           |
|  |                   |                |                       |            |                            | 2" Ice          | 8.92                     | 8.85                    | 0           |
| KRY 112 144/1                            | A                 | From Face      | 4.00                  | 0.000      | 87.00                      | 4" Ice          | 11.17                    | 12.28                   | 1           |
|  |                   |                |                       |            |                            | No Ice          | 0.41                     | 0.20                    | 0           |
|  |                   |                |                       |            |                            | 1/2" Ice        | 0.50                     | 0.27                    | 0           |
|  |                   |                |                       |            |                            | 1" Ice          | 0.59                     | 0.35                    | 0           |
|  |                   |                |                       |            |                            | 2" Ice          | 0.81                     | 0.53                    | 0           |
| KRY 112 144/1                            | B                 | From Face      | 4.00                  | 0.000      | 87.00                      | 4" Ice          | 1.36                     | 1.00                    | 0           |
|  |                   |                |                       |            |                            | No Ice          | 0.41                     | 0.20                    | 0           |
|  |                   |                |                       |            |                            | 1/2" Ice        | 0.50                     | 0.27                    | 0           |
|  |                   |                |                       |            |                            | 1" Ice          | 0.59                     | 0.35                    | 0           |
|  |                   |                |                       |            |                            | 2" Ice          | 0.81                     | 0.53                    | 0           |
| KRY 112 144/1                            | C                 | From Face      | 4.00                  | 0.000      | 87.00                      | 4" Ice          | 1.36                     | 1.00                    | 0           |
|  |                   |                |                       |            |                            | No Ice          | 0.41                     | 0.20                    | 0           |
|  |                   |                |                       |            |                            | 1/2" Ice        | 0.50                     | 0.27                    | 0           |
|  |                   |                |                       |            |                            | 1" Ice          | 0.59                     | 0.35                    | 0           |
|  |                   |                |                       |            |                            | 2" Ice          | 0.81                     | 0.53                    | 0           |
| Side Arm Mount [SO 702-3]                | C                 | None           |                       |            | 87.00                      | 4" Ice          | 1.36                     | 1.00                    | 0           |
|  |                   |                |                       |            |                            | No Ice          | 3.22                     | 3.22                    | 0           |
|  |                   |                |                       |            |                            | 1/2" Ice        | 4.15                     | 4.15                    | 0           |
|  |                   |                |                       |            |                            | 1" Ice          | 5.08                     | 5.08                    | 0           |
|  |                   |                |                       |            |                            | 2" Ice          | 6.94                     | 6.94                    | 0           |
|  |                   |                |                       |            |                            | 4" Ice          | 10.66                    | 10.66                   | 0           |

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### Dishes

| Description | Face<br>or<br>Leg | Dish<br>Type                | Offset<br>Type | Offsets:              |            | 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>K |
|-------------|-------------------|-----------------------------|----------------|-----------------------|------------|----------------------------|----------------------------|-----------------|---------------------------|-------------------------------------|-------------|
|             |                   |                             |                | Horz<br>Lateral<br>ft | Vert<br>ft |                            |                            |                 |                           |                                     |             |
| VHLP2.5-11  | A                 | Paraboloid<br>w/Shroud (HP) | From<br>Leg    | 1.00                  | 0.000      | 97.00                      |                            | 2.92            | No Ice                    | 6.68                                | 0           |
|             |                   |                             |                |                       |            |                            |                            |                 | 1/2" Ice                  | 7.07                                | 0           |
|             |                   |                             |                |                       |            |                            |                            |                 | 1" Ice                    | 7.46                                | 0           |
|             |                   |                             |                |                       |            |                            |                            |                 | 2" Ice                    | 8.23                                | 0           |
|             |                   |                             |                |                       |            |                            |                            |                 | 4" Ice                    | 9.78                                | 0           |
| VHLP2.5-11  | B                 | Paraboloid<br>w/Shroud (HP) | From<br>Leg    | 1.00                  | 0.000      | 97.00                      |                            | 2.92            | No Ice                    | 6.68                                | 0           |
|             |                   |                             |                |                       |            |                            |                            |                 | 1/2" Ice                  | 7.07                                | 0           |
|             |                   |                             |                |                       |            |                            |                            |                 | 1" Ice                    | 7.46                                | 0           |
|             |                   |                             |                |                       |            |                            |                            |                 | 2" Ice                    | 8.23                                | 0           |
|             |                   |                             |                |                       |            |                            |                            |                 | 4" Ice                    | 9.78                                | 0           |

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### Tower Pressures - No Ice

$G_H = 1.690$

| Section Elevation<br><i>ft</i> | <i>z</i><br><i>ft</i> | $K_Z$ | $q_z$<br><i>psf</i> | $A_G$<br><i>ft<sup>2</sup></i> | <i>F a c e</i> | $A_F$<br><i>ft<sup>2</sup></i> | $A_R$<br><i>ft<sup>2</sup></i> | $A_{leg}$<br><i>ft<sup>2</sup></i> | Leg %  | $C_{AA}$<br>In Face<br><i>ft<sup>2</sup></i> | $C_{AA}$<br>Out Face<br><i>ft<sup>2</sup></i> |
|--------------------------------|-----------------------|-------|---------------------|--------------------------------|----------------|--------------------------------|--------------------------------|------------------------------------|--------|--|---|
| L1 131.00-110.00               | 119.83                | 1.445 | 23.68               | 22.794                         | A              | 0.000                          | 22.794                         | 22.794                             | 100.00 | 0.000  | 0.000   |
|                                |                       |       |                     |                                | B              | 0.000                          | 22.794                         | 100.00                             | 0.000  | 0.000  |   |
|                                |                       |       |                     |                                | C              | 0.000                          | 22.794                         | 100.00                             | 0.000  | 8.833  |   |
| L2 110.00-84.58                | 96.57                 | 1.359 | 22.27               | 39.616                         | A              | 0.000                          | 39.616                         | 39.616                             | 100.00 | 0.000  | 0.000   |
|                                |                       |       |                     |                                | B              | 0.000                          | 39.616                         | 100.00                             | 0.000  | 0.000  |   |
|                                |                       |       |                     |                                | C              | 0.000                          | 39.616                         | 100.00                             | 0.000  | 14.943                                       |   |
| L3 84.58-70.00                 | 77.10                 | 1.274 | 20.88               | 28.811                         | A              | 0.000                          | 28.811                         | 28.811                             | 100.00 | 0.000  | 0.000   |
|                                |                       |       |                     |                                | B              | 0.000                          | 28.811                         | 100.00                             | 0.000  | 0.000  |   |
|                                |                       |       |                     |                                | C              | 0.000                          | 28.811                         | 100.00                             | 0.000  | 14.576                                       |   |
| L4 70.00-67.08                 | 68.53                 | 1.232 | 20.19               | 6.159                          | A              | 0.000                          | 6.159                          | 6.159                              | 100.00 | 0.000  | 0.000   |
|                                |                       |       |                     |                                | B              | 0.000                          | 6.159                          | 100.00                             | 0.000  | 0.000  |   |
|                                |                       |       |                     |                                | C              | 0.000                          | 6.159                          | 100.00                             | 0.000  | 2.915  |   |
| L5 67.08-44.58                 | 55.46                 | 1.16  | 19.00               | 53.576                         | A              | 0.000                          | 53.576                         | 53.576                             | 100.00 | 0.000  | 0.000   |
|                                |                       |       |                     |                                | B              | 0.000                          | 53.576                         | 100.00                             | 0.000  | 0.000  |   |
|                                |                       |       |                     |                                | C              | 0.000                          | 53.576                         | 100.00                             | 0.000  | 24.479                                       |   |
| L6 44.58-34.08                 | 39.26                 | 1.051 | 17.22               | 28.623                         | A              | 0.000                          | 28.623                         | 28.623                             | 100.00 | 0.000  | 0.000   |
|                                |                       |       |                     |                                | B              | 0.000                          | 28.623                         | 100.00                             | 0.000  | 0.000  |   |
|                                |                       |       |                     |                                | C              | 0.000                          | 28.623                         | 100.00                             | 0.000  | 11.811                                       |   |
| L7 34.08-18.75                 | 26.27                 | 1     | 16.38               | 45.008                         | A              | 0.000                          | 45.008                         | 45.008                             | 100.00 | 0.000  | 0.000   |
|                                |                       |       |                     |                                | B              | 0.000                          | 45.008                         | 100.00                             | 0.000  | 0.000  |   |
|                                |                       |       |                     |                                | C              | 0.000                          | 45.008                         | 100.00                             | 0.000  | 17.312                                       |   |
| L8 18.75-0.00                  | 9.19                  | 1     | 16.38               | 61.810                         | A              | 0.000                          | 61.810                         | 61.810                             | 100.00 | 0.000  | 0.000   |
|                                |                       |       |                     |                                | B              | 0.000                          | 61.810                         | 100.00                             | 0.000  | 0.000  |   |
|                                |                       |       |                     |                                | C              | 0.000                          | 61.810                         | 100.00                             | 0.000  | 21.866                                       |   |

### Tower Pressure - With Ice

$G_H = 1.690$

| Section Elevation<br><i>ft</i> | <i>z</i><br><i>ft</i> | $K_Z$ | $q_z$<br><i>psf</i> | $t_z$<br><i>in</i> | $A_G$<br><i>ft<sup>2</sup></i> | <i>F a c e</i> | $A_F$<br><i>ft<sup>2</sup></i> | $A_R$<br><i>ft<sup>2</sup></i> | $A_{leg}$<br><i>ft<sup>2</sup></i> | Leg %  | $C_{AA}$<br>In Face<br><i>ft<sup>2</sup></i> | $C_{AA}$<br>Out Face<br><i>ft<sup>2</sup></i> |
|--------------------------------|-----------------------|-------|---------------------|--------------------|--------------------------------|----------------|--------------------------------|--------------------------------|------------------------------------|--------|--|---|
| L1 131.00-110.00               | 119.83                | 1.445 | 5.23                | 1.459              | 27.901                         | A              | 0.000                          | 27.901                         | 27.901                             | 100.00 | 0.000  | 0.000   |
|                                |                       |       |                     |                    |                                | B              | 0.000                          | 27.901                         | 100.00                             | 0.000  | 0.000  |   |
|                                |                       |       |                     |                    |                                | C              | 0.000                          | 27.901                         | 100.00                             | 0.000  | 22.549                                       |   |
| L2 110.00-84.58                | 96.57                 | 1.359 | 4.92                | 1.422              | 45.640                         | A              | 0.000                          | 45.640                         | 45.640                             | 100.00 | 0.000  | 0.000   |
|                                |                       |       |                     |                    |                                | B              | 0.000                          | 45.640                         | 100.00                             | 0.000  | 0.000  |   |
|                                |                       |       |                     |                    |                                | C              | 0.000                          | 45.640                         | 100.00                             | 0.000  | 38.396                                       |   |
| L3 84.58-70.00                 | 77.10                 | 1.274 | 4.61                | 1.384              | 32.174                         | A              | 0.000                          | 32.174                         | 32.174                             | 100.00 | 0.000  | 0.000   |
|                                |                       |       |                     |                    |                                | B              | 0.000                          | 32.174                         | 100.00                             | 0.000  | 0.000  |   |
|                                |                       |       |                     |                    |                                | C              | 0.000                          | 32.174                         | 100.00                             | 0.000  | 39.244                                       |   |
| L4 70.00-67.08                 | 68.53                 | 1.232 | 4.46                | 1.365              | 6.832                          | A              | 0.000                          | 6.832                          | 6.832                              | 100.00 | 0.000  | 0.000   |
|                                |                       |       |                     |                    |                                | B              | 0.000                          | 6.832                          | 100.00                             | 0.000  | 0.000  |   |
|                                |                       |       |                     |                    |                                | C              | 0.000                          | 6.832                          | 100.00                             | 0.000  | 7.849  |   |
| L5 67.08-44.58                 | 55.46                 | 1.16  | 4.20                | 1.330              | 58.565                         | A              | 0.000                          | 58.565                         | 58.565                             | 100.00 | 0.000  | 0.000   |
|                                |                       |       |                     |                    |                                | B              | 0.000                          | 58.565                         | 100.00                             | 0.000  | 0.000  |   |
|                                |                       |       |                     |                    |                                | C              | 0.000                          | 58.565                         | 100.00                             | 0.000  | 65.769                                       |   |
| L6 44.58-34.08                 | 39.26                 | 1.051 | 3.80                | 1.276              | 30.857                         | A              | 0.000                          | 30.857                         | 30.857                             | 100.00 | 0.000  | 0.000   |
|                                |                       |       |                     |                    |                                | B              | 0.000                          | 30.857                         | 100.00                             | 0.000  | 0.000  |   |
|                                |                       |       |                     |                    |                                | C              | 0.000                          | 30.857                         | 100.00                             | 0.000  | 31.175                                       |   |
| L7 34.08-18.75                 | 26.27                 | 1     | 3.62                | 1.250              | 48.269                         | A              | 0.000                          | 48.269                         | 48.269                             | 100.00 | 0.000  | 0.000   |
|                                |                       |       |                     |                    |                                | B              | 0.000                          | 48.269                         | 100.00                             | 0.000  | 0.000  |   |
|                                |                       |       |                     |                    |                                | C              | 0.000                          | 48.269                         | 100.00                             | 0.000  | 45.574                                       |   |
| L8 18.75-0.00                  | 9.19                  | 1     | 3.62                | 1.250              | 65.716                         | A              | 0.000                          | 65.716                         | 65.716                             | 100.00 | 0.000  | 0.000   |
|                                |                       |       |                     |                    |                                | B              | 0.000                          | 65.716                         | 100.00                             | 0.000  | 0.000  |   |
|                                |                       |       |                     |                    |                                | C              | 0.000                          | 65.716                         | 100.00                             | 0.000  | 55.720                                       |   |

### Tower Pressure - Service

$G_H = 1.690$

| Section<br>Elevation<br><br>ft | z<br><br>ft | $K_z$ | $q_z$<br><br>psf | $A_G$<br><br>ft <sup>2</sup> | F<br>a<br>c<br>e | $A_F$<br><br>ft <sup>2</sup> | $A_R$<br><br>ft <sup>2</sup> | $A_{leg}$<br><br>ft <sup>2</sup> | Leg<br>% | $C_{AA}$<br>In<br>Face<br>ft <sup>2</sup> | $C_{AA}$<br>Out<br>Face<br>ft <sup>2</sup> |
|--------------------------------|-------------|-------|------------------|------------------------------|------------------|------------------------------|------------------------------|----------------------------------|----------|---|--|
| L1 131.00-<br>110.00           | 119.83      | 1.445 | 9.25             | 22.794                       | A                | 0.000                        | 22.794                       | 22.794                           | 100.00   | 0.000                                     | 0.000                                      |
|                                |             |       |                  |                              | B                | 0.000                        | 22.794                       | 100.00                           | 0.000    | 0.000                                     |  |
|                                |             |       |                  |                              | C                | 0.000                        | 22.794                       | 100.00                           | 0.000    | 8.833                                     |  |
| L2 110.00-<br>84.58            | 96.57       | 1.359 | 8.70             | 39.616                       | A                | 0.000                        | 39.616                       | 39.616                           | 100.00   | 0.000                                     | 0.000                                      |
|                                |             |       |                  |                              | B                | 0.000                        | 39.616                       | 100.00                           | 0.000    | 0.000                                     |  |
|                                |             |       |                  |                              | C                | 0.000                        | 39.616                       | 100.00                           | 0.000    | 14.943                                    |  |
| L3 84.58-70.00                 | 77.10       | 1.274 | 8.16             | 28.811                       | A                | 0.000                        | 28.811                       | 28.811                           | 100.00   | 0.000                                     | 0.000                                      |
|                                |             |       |                  |                              | B                | 0.000                        | 28.811                       | 100.00                           | 0.000    | 0.000                                     |  |
|                                |             |       |                  |                              | C                | 0.000                        | 28.811                       | 100.00                           | 0.000    | 14.576                                    |  |
| L4 70.00-67.08                 | 68.53       | 1.232 | 7.89             | 6.159                        | A                | 0.000                        | 6.159                        | 6.159                            | 100.00   | 0.000                                     | 0.000                                      |
|                                |             |       |                  |                              | B                | 0.000                        | 6.159                        | 100.00                           | 0.000    | 0.000                                     |  |
|                                |             |       |                  |                              | C                | 0.000                        | 6.159                        | 100.00                           | 0.000    | 2.915                                     |  |
| L5 67.08-44.58                 | 55.46       | 1.16  | 7.42             | 53.576                       | A                | 0.000                        | 53.576                       | 53.576                           | 100.00   | 0.000                                     | 0.000                                      |
|                                |             |       |                  |                              | B                | 0.000                        | 53.576                       | 100.00                           | 0.000    | 0.000                                     |  |
|                                |             |       |                  |                              | C                | 0.000                        | 53.576                       | 100.00                           | 0.000    | 24.479                                    |  |
| L6 44.58-34.08                 | 39.26       | 1.051 | 6.73             | 28.623                       | A                | 0.000                        | 28.623                       | 28.623                           | 100.00   | 0.000                                     | 0.000                                      |
|                                |             |       |                  |                              | B                | 0.000                        | 28.623                       | 100.00                           | 0.000    | 0.000                                     |  |
|                                |             |       |                  |                              | C                | 0.000                        | 28.623                       | 100.00                           | 0.000    | 11.811                                    |  |
| L7 34.08-18.75                 | 26.27       | 1     | 6.40             | 45.008                       | A                | 0.000                        | 45.008                       | 45.008                           | 100.00   | 0.000                                     | 0.000                                      |
|                                |             |       |                  |                              | B                | 0.000                        | 45.008                       | 100.00                           | 0.000    | 0.000                                     |  |
|                                |             |       |                  |                              | C                | 0.000                        | 45.008                       | 100.00                           | 0.000    | 17.312                                    |  |
| L8 18.75-0.00                  | 9.19        | 1     | 6.40             | 61.810                       | A                | 0.000                        | 61.810                       | 61.810                           | 100.00   | 0.000                                     | 0.000                                      |
|                                |             |       |                  |                              | B                | 0.000                        | 61.810                       | 100.00                           | 0.000    | 0.000                                     |  |
|                                |             |       |                  |                              | C                | 0.000                        | 61.810                       | 100.00                           | 0.000    | 21.866                                    |  |

### Load Combinations

| Comb.<br>No. | Description                 |
|--------------|-----------------------------|
| 1            | Dead Only                   |
| 2            | Dead+Wind 0 deg - No Ice    |
| 3            | Dead+Wind 30 deg - No Ice   |
| 4            | Dead+Wind 60 deg - No Ice   |
| 5            | Dead+Wind 90 deg - No Ice   |
| 6            | Dead+Wind 120 deg - No Ice  |
| 7            | Dead+Wind 150 deg - No Ice  |
| 8            | Dead+Wind 180 deg - No Ice  |
| 9            | Dead+Wind 210 deg - No Ice  |
| 10           | Dead+Wind 240 deg - No Ice  |
| 11           | Dead+Wind 270 deg - No Ice  |
| 12           | Dead+Wind 300 deg - No Ice  |
| 13           | Dead+Wind 330 deg - No Ice  |
| 14           | Dead+Ice+Temp               |
| 15           | Dead+Wind 0 deg+Ice+Temp    |
| 16           | Dead+Wind 30 deg+Ice+Temp   |
| 17           | Dead+Wind 60 deg+Ice+Temp   |
| 18           | Dead+Wind 90 deg+Ice+Temp   |
| 19           | Dead+Wind 120 deg+Ice+Temp  |
| 20           | Dead+Wind 150 deg+Ice+Temp  |
| 21           | Dead+Wind 180 deg+Ice+Temp  |
| 22           | Dead+Wind 210 deg+Ice+Temp  |
| 23           | Dead+Wind 240 deg+Ice+Temp  |
| 24           | Dead+Wind 270 deg+Ice+Temp  |
| 25           | Dead+Wind 300 deg+Ice+Temp  |
| 26           | Dead+Wind 330 deg+Ice+Temp  |
| 27           | Dead+Wind 0 deg - Service   |
| 28           | Dead+Wind 30 deg - Service  |
| 29           | Dead+Wind 60 deg - Service  |
| 30           | Dead+Wind 90 deg - Service  |
| 31           | Dead+Wind 120 deg - Service |
| 32           | Dead+Wind 150 deg - Service |

| Comb. No. | Description                 |
|-----------|-----------------------------|
| 33        | Dead+Wind 180 deg - Service |
| 34        | Dead+Wind 210 deg - Service |
| 35        | Dead+Wind 240 deg - Service |
| 36        | Dead+Wind 270 deg - Service |
| 37        | Dead+Wind 300 deg - Service |
| 38        | Dead+Wind 330 deg - Service |

### Maximum Member Forces

| Section No. | Elevation ft      | Component Type | Condition        | Gov. Load Comb. | Force K | Major Axis Moment kip-ft | Minor Axis Moment kip-ft |
|-------------|-------------------|----------------|------------------|-----------------|---------|--------------------------|--------------------------|
| L1          | 131 - 110         | Pole           | Max Tension      | 8               | 0       | 0                        | 0                        |
|             |                   |                | Max. Compression | 14              | -7      | 1                        | 0                        |
|             |                   |                | Max. Mx          | 11              | -2      | 58                       | 0                        |
|             |                   |                | Max. My          | 8               | -2      | 0                        | -58                      |
|             |                   |                | Max. Vy          | 11              | -5      | 58                       | 0                        |
|             |                   |                | Max. Vx          | 8               | 5       | 0                        | -58                      |
|             |                   |                | Max. Torque      | 9               |         |                          | 0                        |
| L2          | 110 - 84.5833     | Pole           | Max Tension      | 1               | 0       | 0                        | 0                        |
|             |                   |                | Max. Compression | 14              | -28     | 3                        | 0                        |
|             |                   |                | Max. Mx          | 11              | -9      | 378                      | 3                        |
|             |                   |                | Max. My          | 2               | -9      | 3                        | 382                      |
|             |                   |                | Max. Vy          | 11              | -18     | 378                      | 3                        |
|             |                   |                | Max. Vx          | 8               | 18      | -2                       | -381                     |
|             |                   |                | Max. Torque      | 11              |         |                          | -2                       |
| L3          | 84.5833 - 70      | Pole           | Max Tension      | 1               | 0       | 0                        | 0                        |
|             |                   |                | Max. Compression | 14              | -32     | 5                        | -1                       |
|             |                   |                | Max. Mx          | 11              | -10     | 573                      | 5                        |
|             |                   |                | Max. My          | 8               | -10     | -3                       | -578                     |
|             |                   |                | Max. Vy          | 11              | -19     | 573                      | 5                        |
|             |                   |                | Max. Vx          | 8               | 19      | -3                       | -578                     |
|             |                   |                | Max. Torque      | 11              |         |                          | -2                       |
| L4          | 70 - 67.0833      | Pole           | Max Tension      | 1               | 0       | 0                        | 0                        |
|             |                   |                | Max. Compression | 14              | -35     | 7                        | -2                       |
|             |                   |                | Max. Mx          | 11              | -12     | 708                      | 6                        |
|             |                   |                | Max. My          | 8               | -12     | -4                       | -714                     |
|             |                   |                | Max. Vy          | 11              | -20     | 708                      | 6                        |
|             |                   |                | Max. Vx          | 8               | 20      | -4                       | -714                     |
|             |                   |                | Max. Torque      | 11              |         |                          | -1                       |
| L5          | 67.0833 - 44.5833 | Pole           | Max Tension      | 1               | 0       | 0                        | 0                        |
|             |                   |                | Max. Compression | 14              | -45     | 12                       | -5                       |
|             |                   |                | Max. Mx          | 11              | -16     | 1180                     | 9                        |
|             |                   |                | Max. My          | 8               | -16     | -6                       | -1189                    |
|             |                   |                | Max. Vy          | 11              | -22     | 1180                     | 9                        |
|             |                   |                | Max. Vx          | 8               | 22      | -6                       | -1189                    |
|             |                   |                | Max. Torque      | 11              |         |                          | -1                       |
| L6          | 44.5833 - 34.08   | Pole           | Max Tension      | 1               | 0       | 0                        | 0                        |
|             |                   |                | Max. Compression | 14              | -47     | 14                       | -6                       |
|             |                   |                | Max. Mx          | 11              | -18     | 1306                     | 9                        |
|             |                   |                | Max. My          | 8               | -18     | -6                       | -1316                    |
|             |                   |                | Max. Vy          | 11              | -23     | 1306                     | 9                        |
|             |                   |                | Max. Vx          | 8               | 23      | -6                       | -1316                    |
|             |                   |                | Max. Torque      | 11              |         |                          | -1                       |
| L7          | 34.08 - 18.75     | Pole           | Max Tension      | 1               | 0       | 0                        | 0                        |
|             |                   |                | Max. Compression | 14              | -57     | 19                       | -9                       |
|             |                   |                | Max. Mx          | 11              | -23     | 1789                     | 12                       |
|             |                   |                | Max. My          | 8               | -23     | -8                       | -1802                    |
|             |                   |                | Max. Vy          | 11              | -25     | 1789                     | 12                       |
|             |                   |                | Max. Vx          | 8               | 25      | -8                       | -1802                    |
|             |                   |                | Max. Torque      | 11              |         |                          | -1                       |
| L8          | 18.75 - 0         | Pole           | Max Tension      | 1               | 0       | 0                        | 0                        |
|             |                   |                | Max. Compression | 14              | -65     | 25                       | -13                      |
|             |                   |                | Max. Mx          | 11              | -28     | 2274                     | 14                       |
|             |                   |                | Max. My          | 8               | -28     | -9                       | -2289                    |
|             |                   |                | Max. Vy          | 11              | -27     | 2274                     | 14                       |

| Section No. | Elevation ft | Component Type | Condition   | Gov. Load Comb. | Force K | Major Axis Moment kip-ft | Minor Axis Moment kip-ft |
|-------------|--------------|----------------|-------------|-----------------|---------|--------------------------|--------------------------|
|             |              |                | Max. Vx     | 8               | 27      | -9                       | -2289                    |
|             |              |                | Max. Torque | 11              |         |                          | -1                       |

### Maximum Reactions

| Location | Condition           | Gov. Load Comb. | Vertical K | Horizontal, X K | Horizontal, Z K |
|----------|---------------------|-----------------|------------|-----------------|-----------------|
| Pole     | Max. Vert           | 14              | 65         | 0               | 0               |
|          | Max. H <sub>x</sub> | 11              | 28         | 27              | 0               |
|          | Max. H <sub>z</sub> | 2               | 28         | 0               | 27              |
|          | Max. M <sub>x</sub> | 2               | 2281       | 0               | 27              |
|          | Max. M <sub>z</sub> | 5               | 2260       | -27             | 0               |
|          | Max. Torsion        | 4               | 1          | -23             | 13              |
|          | Min. Vert           | 8               | 28         | 0               | -27             |
|          | Min. H <sub>x</sub> | 5               | 28         | -27             | 0               |
|          | Min. H <sub>z</sub> | 8               | 28         | 0               | -27             |
|          | Min. M <sub>x</sub> | 8               | -2289      | 0               | -27             |
|          | Min. M <sub>z</sub> | 11              | -2274      | 27              | 0               |
|          | Min. Torsion        | 11              | -1         | 27              | 0               |

### Tower Mast Reaction Summary

| Load Combination            | Vertical K | Shear <sub>x</sub> K | Shear <sub>z</sub> K | Overturning Moment, M <sub>x</sub> kip-ft | Overturning Moment, M <sub>z</sub> kip-ft | Torque kip-ft |
|-----------------------------|------------|----------------------|----------------------|---|---|---------------|
| Dead Only                   | 28         | 0                    | 0                    | 1   | 3   | 0             |
| Dead+Wind 0 deg - No Ice    | 28         | 0                    | -27                  | -2281                                     | 22  | -1            |
| Dead+Wind 30 deg - No Ice   | 28         | 13                   | -23                  | -1972                                     | -1122                                     | -1            |
| Dead+Wind 60 deg - No Ice   | 28         | 23                   | -13                  | -1134                                     | -1954                                     | -1            |
| Dead+Wind 90 deg - No Ice   | 28         | 27                   | 0                    | 9   | -2260                                     | -1            |
| Dead+Wind 120 deg - No Ice  | 28         | 23                   | 14                   | 1159                                      | -1955                                     | 0             |
| Dead+Wind 150 deg - No Ice  | 28         | 13                   | 23                   | 1987                                      | -1135                                     | 0             |
| Dead+Wind 180 deg - No Ice  | 28         | 0                    | 27                   | 2289                                      | -9  | 0             |
| Dead+Wind 210 deg - No Ice  | 28         | -13                  | 23                   | 1984                                      | 1125                                      | 1             |
| Dead+Wind 240 deg - No Ice  | 28         | -23                  | 13                   | 1138                                      | 1964                                      | 1             |
| Dead+Wind 270 deg - No Ice  | 28         | -27                  | 0                    | -14                                       | 2274                                      | 1             |
| Dead+Wind 300 deg - No Ice  | 28         | -23                  | -14                  | -1153                                     | 1970                                      | 1             |
| Dead+Wind 330 deg - No Ice  | 28         | -13                  | -23                  | -1982                                     | 1146                                      | 0             |
| Dead+Ice+Temp               | 65         | 0                    | 0                    | 13  | 25  | 0             |
| Dead+Wind 0 deg+Ice+Temp    | 65         | 0                    | -9                   | -784                                      | 30  | 0             |
| Dead+Wind 30 deg+Ice+Temp   | 65         | 4                    | -8                   | -676                                      | -369                                      | 0             |
| Dead+Wind 60 deg+Ice+Temp   | 65         | 8                    | -4                   | -384                                      | -660                                      | 0             |
| Dead+Wind 90 deg+Ice+Temp   | 65         | 9                    | 0                    | 15  | -766                                      | 0             |
| Dead+Wind 120 deg+Ice+Temp  | 65         | 8                    | 4                    | 415                                       | -660                                      | 0             |
| Dead+Wind 150 deg+Ice+Temp  | 65         | 4                    | 8                    | 705                                       | -373                                      | 0             |
| Dead+Wind 180 deg+Ice+Temp  | 65         | 0                    | 9                    | 810                                       | 22  | 0             |
| Dead+Wind 210 deg+Ice+Temp  | 65         | -4                   | 8                    | 704                                       | 418                                       | 0             |
| Dead+Wind 240 deg+Ice+Temp  | 65         | -8                   | 4                    | 410                                       | 710                                       | 0             |
| Dead+Wind 270 deg+Ice+Temp  | 65         | -9                   | 0                    | 8   | 818                                       | 0             |
| Dead+Wind 300 deg+Ice+Temp  | 65         | -8                   | -4                   | -389                                      | 712                                       | 0             |
| Dead+Wind 330 deg+Ice+Temp  | 65         | -4                   | -8                   | -679                                      | 424                                       | 0             |
| Dead+Wind 0 deg - Service   | 28         | 0                    | -10                  | -892                                      | 11  | 0             |
| Dead+Wind 30 deg - Service  | 28         | 5                    | -9                   | -771                                      | -437                                      | 0             |
| Dead+Wind 60 deg - Service  | 28         | 9                    | -5                   | -443                                      | -763                                      | 0             |
| Dead+Wind 90 deg - Service  | 28         | 10                   | 0                    | 4   | -882                                      | 0             |
| Dead+Wind 120 deg - Service | 28         | 9                    | 5                    | 454                                       | -763                                      | 0             |
| Dead+Wind 150 deg - Service | 28         | 5                    | 9                    | 778                                       | -442                                      | 0             |
| Dead+Wind 180 deg - Service | 28         | 0                    | 11                   | 897                                       | -1  | 0             |
| Dead+Wind 210 deg - Service | 28         | -5                   | 9                    | 777                                       | 442                                       | 0             |
| Dead+Wind 240 deg - Service | 28         | -9                   | 5                    | 446                                       | 771                                       | 0             |
| Dead+Wind 270 deg - Service | 28         | -10                  | 0                    | -5  | 892                                       | 0             |
| Dead+Wind 300 deg - Service | 28         | -9                   | -5                   | -451                                      | 773                                       | 0             |
| Dead+Wind 330 deg - Service | 28         | -5                   | -9                   | -775                                      | 451                                       | 0             |

### Solution Summary

| Load Comb. | Sum of Applied Forces |         |         | Sum of Reactions |         |         | % Error |
|------------|-----------------------|---------|---------|------------------|---------|---------|---------|
|            | PX<br>K               | PY<br>K | PZ<br>K | PX<br>K          | PY<br>K | PZ<br>K |         |
| 1          | 0                     | -28     | 0       | 0                | 28      | 0       | 0.001%  |
| 2          | 0                     | -28     | -27     | 0                | 28      | 27      | 0.012%  |
| 3          | 13                    | -28     | -23     | -13              | 28      | 23      | 0.000%  |
| 4          | 23                    | -28     | -13     | -23              | 28      | 13      | 0.000%  |
| 5          | 27                    | -28     | 0       | -27              | 28      | 0       | 0.012%  |
| 6          | 23                    | -28     | 14      | -23              | 28      | -14     | 0.000%  |
| 7          | 13                    | -28     | 23      | -13              | 28      | -23     | 0.000%  |
| 8          | 0                     | -28     | 27      | 0                | 28      | -27     | 0.012%  |
| 9          | -13                   | -28     | 23      | 13               | 28      | -23     | 0.000%  |
| 10         | -23                   | -28     | 13      | 23               | 28      | -13     | 0.000%  |
| 11         | -27                   | -28     | 0       | 27               | 28      | 0       | 0.006%  |
| 12         | -23                   | -28     | -14     | 23               | 28      | 14      | 0.000%  |
| 13         | -13                   | -28     | -23     | 13               | 28      | 23      | 0.000%  |
| 14         | 0                     | -65     | 0       | 0                | 65      | 0       | 0.001%  |
| 15         | 0                     | -65     | -9      | 0                | 65      | 9       | 0.002%  |
| 16         | 4                     | -65     | -8      | -4               | 65      | 8       | 0.002%  |
| 17         | 8                     | -65     | -4      | -8               | 65      | 4       | 0.002%  |
| 18         | 9                     | -65     | 0       | -9               | 65      | 0       | 0.002%  |
| 19         | 8                     | -65     | 4       | -8               | 65      | -4      | 0.002%  |
| 20         | 4                     | -65     | 8       | -4               | 65      | -8      | 0.002%  |
| 21         | 0                     | -65     | 9       | 0                | 65      | -9      | 0.002%  |
| 22         | -4                    | -65     | 8       | 4                | 65      | -8      | 0.001%  |
| 23         | -8                    | -65     | 4       | 8                | 65      | -4      | 0.001%  |
| 24         | -9                    | -65     | 0       | 9                | 65      | 0       | 0.002%  |
| 25         | -8                    | -65     | -4      | 8                | 65      | 4       | 0.002%  |
| 26         | -4                    | -65     | -8      | 4                | 65      | 8       | 0.001%  |
| 27         | 0                     | -28     | -10     | 0                | 28      | 10      | 0.006%  |
| 28         | 5                     | -28     | -9      | -5               | 28      | 9       | 0.004%  |
| 29         | 9                     | -28     | -5      | -9               | 28      | 5       | 0.004%  |
| 30         | 10                    | -28     | 0       | -10              | 28      | 0       | 0.006%  |
| 31         | 9                     | -28     | 5       | -9               | 28      | -5      | 0.004%  |
| 32         | 5                     | -28     | 9       | -5               | 28      | -9      | 0.004%  |
| 33         | 0                     | -28     | 11      | 0                | 28      | -11     | 0.006%  |
| 34         | -5                    | -28     | 9       | 5                | 28      | -9      | 0.004%  |
| 35         | -9                    | -28     | 5       | 9                | 28      | -5      | 0.004%  |
| 36         | -10                   | -28     | 0       | 10               | 28      | 0       | 0.006%  |
| 37         | -9                    | -28     | -5      | 9                | 28      | 5       | 0.002%  |
| 38         | -5                    | -28     | -9      | 5                | 28      | 9       | 0.004%  |

### Non-Linear Convergence Results

| Load Combination | Converged? | Number of Cycles | Displacement Tolerance | Force Tolerance |
|------------------|------------|------------------|------------------------|-----------------|
| 1                | Yes        | 6                | 0.0000001              | 0.0000001       |
| 2                | Yes        | 17               | 0.00010891             | 0.00013923      |
| 3                | Yes        | 23               | 0.0000001              | 0.00009087      |
| 4                | Yes        | 23               | 0.0000001              | 0.00009381      |
| 5                | Yes        | 17               | 0.00010911             | 0.00014848      |
| 6                | Yes        | 23               | 0.0000001              | 0.00009241      |
| 7                | Yes        | 23               | 0.0000001              | 0.00009463      |
| 8                | Yes        | 17               | 0.00010888             | 0.00011211      |
| 9                | Yes        | 23               | 0.0000001              | 0.00009366      |
| 10               | Yes        | 23               | 0.0000001              | 0.00009075      |
| 11               | Yes        | 18               | 0.00006101             | 0.00012377      |
| 12               | Yes        | 23               | 0.0000001              | 0.00009628      |
| 13               | Yes        | 23               | 0.0000001              | 0.00009378      |
| 14               | Yes        | 15               | 0.0000001              | 0.00002671      |
| 15               | Yes        | 20               | 0.00010839             | 0.00008785      |
| 16               | Yes        | 20               | 0.00010809             | 0.00013364      |
| 17               | Yes        | 20               | 0.00010808             | 0.00013674      |
| 18               | Yes        | 20               | 0.00010844             | 0.00008498      |
| 19               | Yes        | 20               | 0.00010797             | 0.00014202      |
| 20               | Yes        | 20               | 0.00010794             | 0.00014069      |

|    |     |    |            |            |
|----|-----|----|------------|------------|
| 21 | Yes | 20 | 0.00010825 | 0.00008969 |
| 22 | Yes | 21 | 0.00006356 | 0.00009302 |
| 23 | Yes | 21 | 0.00006357 | 0.00009082 |
| 24 | Yes | 20 | 0.00010823 | 0.00009027 |
| 25 | Yes | 20 | 0.00010787 | 0.00014871 |
| 26 | Yes | 21 | 0.00006363 | 0.00009067 |
| 27 | Yes | 17 | 0.00011677 | 0.00006230 |
| 28 | Yes | 18 | 0.00006534 | 0.00013167 |
| 29 | Yes | 18 | 0.00006534 | 0.00014445 |
| 30 | Yes | 17 | 0.00011679 | 0.00006624 |
| 31 | Yes | 18 | 0.00006531 | 0.00013318 |
| 32 | Yes | 18 | 0.00006530 | 0.00014349 |
| 33 | Yes | 17 | 0.00011673 | 0.00006147 |
| 34 | Yes | 18 | 0.00006530 | 0.00014338 |
| 35 | Yes | 18 | 0.00006530 | 0.00013045 |
| 36 | Yes | 17 | 0.00011674 | 0.00007045 |
| 37 | Yes | 19 | 0.00000001 | 0.00008705 |
| 38 | Yes | 18 | 0.00006529 | 0.00013926 |

### Maximum Tower Deflections - Service Wind

| Section No. | Elevation<br>ft   | Horz. Deflection<br>in | Gov. Load Comb. | Tilt<br>° | Twist<br>° |
|-------------|-------------------|------------------------|-----------------|-----------|------------|
| L1          | 131 - 110         | 44.36                  | 38              | 3.056     | 0.008      |
| L2          | 110 - 84.5833     | 31.14                  | 38              | 2.867     | 0.007      |
| L3          | 84.5833 - 70      | 17.70                  | 38              | 2.082     | 0.004      |
| L4          | 74 - 67.0833      | 13.42                  | 38              | 1.776     | 0.003      |
| L5          | 67.0833 - 44.5833 | 10.93                  | 38              | 1.638     | 0.002      |
| L6          | 44.5833 - 34.08   | 4.72                   | 33              | 1.010     | 0.001      |
| L7          | 39 - 18.75        | 3.63                   | 33              | 0.863     | 0.001      |
| L8          | 18.75 - 0         | 0.82                   | 33              | 0.425     | 0.000      |

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

| Elevation<br>ft | Appurtenance                          | Gov. Load Comb. | Deflection<br>in | Tilt<br>° | Twist<br>° | Radius of Curvature<br>ft |
|-----------------|---------------------------------------|-----------------|------------------|-----------|------------|---------------------------|
| 128.00          | APX18-206517S-C w/ Mount Pipe         | 38              | 42.42            | 3.045     | 0.008      | 11865                     |
| 121.00          | 800 10121 w/ Mount Pipe               | 38              | 37.95            | 3.008     | 0.007      | 5932                      |
| 119.00          | (2) RRUS-11                           | 38              | 36.68            | 2.992     | 0.007      | 4943                      |
| 107.00          | BXA-70063/6CFx4 w/ Mount Pipe         | 38              | 29.36            | 2.801     | 0.006      | 2549                      |
| 101.00          | VHLP2.5-11                            | 38              | 25.93            | 2.636     | 0.006      | 2124                      |
| 97.00           | TIMING 2000                           | 38              | 23.76            | 2.508     | 0.005      | 1907                      |
| 95.00           | (2) PCS 1900MHz 4x45W-65MHz           | 38              | 22.71            | 2.441     | 0.005      | 1815                      |
| 87.00           | ERICSSON AIR 21 B2A B4P w/ Mount Pipe | 38              | 18.79            | 2.164     | 0.004      | 1533                      |

### Maximum Tower Deflections - Design Wind

| Section No. | Elevation<br>ft   | Horz. Deflection<br>in | Gov. Load Comb. | Tilt<br>° | Twist<br>° |
|-------------|-------------------|------------------------|-----------------|-----------|------------|
| L1          | 131 - 110         | 112.78                 | 8               | 7.780     | 0.021      |
| L2          | 110 - 84.5833     | 79.25                  | 8               | 7.301     | 0.017      |
| L3          | 84.5833 - 70      | 45.12                  | 13              | 5.308     | 0.009      |
| L4          | 74 - 67.0833      | 34.23                  | 13              | 4.530     | 0.006      |
| L5          | 67.0833 - 44.5833 | 27.89                  | 13              | 4.177     | 0.005      |
| L6          | 44.5833 - 34.08   | 12.05                  | 13              | 2.577     | 0.002      |
| L7          | 39 - 18.75        | 9.26                   | 13              | 2.202     | 0.002      |
| L8          | 18.75 - 0         | 2.09                   | 13              | 1.084     | 0.001      |

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

| Elevation<br>ft | Appurtenance                             | Gov.<br>Load<br>Comb. | Deflection<br>in | Tilt<br>° | Twist<br>° | Radius of<br>Curvature<br>ft |
|-----------------|--|-----------------------|------------------|-----------|------------|------------------------------|
| 128.00          | APX18-206517S-C w/ Mount Pipe            | 8                     | 107.88           | 7.752     | 0.020      | 4846                         |
| 121.00          | 800 10121 w/ Mount Pipe                  | 8                     | 96.53            | 7.658     | 0.019      | 2422                         |
| 119.00          | (2) RRUS-11                              | 8                     | 93.32            | 7.617     | 0.019      | 2017                         |
| 107.00          | BXA-70063/6CFx4 w/ Mount Pipe            | 8                     | 74.73            | 7.134     | 0.016      | 1034                         |
| 101.00          | VHLP2.5-11                               | 8                     | 66.03            | 6.715     | 0.015      | 857                          |
| 97.00           | TIMING 2000                              | 13                    | 60.51            | 6.391     | 0.013      | 768                          |
| 95.00           | (2) PCS 1900MHz 4x45W-65MHz              | 13                    | 57.85            | 6.220     | 0.013      | 730                          |
| 87.00           | ERICSSON AIR 21 B2A B4P w/<br>Mount Pipe | 13                    | 47.89            | 5.517     | 0.010      | 614                          |

**Compression Checks**

**Pole Design Data**

| Section<br>No. | Elevation<br>ft          | Size                  | L<br>ft | L <sub>u</sub><br>ft | Kl/r | F <sub>a</sub><br>ksi | A<br>in <sup>2</sup> | Actual<br>P<br>K | Allow.<br>P <sub>a</sub><br>K | Ratio<br>$\frac{P}{P_a}$ |
|----------------|--------------------------|-----------------------|---------|----------------------|------|-----------------------|----------------------|------------------|-------------------------------|--------------------------|
| L1             | 131 - 110 (1)            | TP15.525x10.525x0.188 | 21.00   | 0.00                 | 0.0  | 39.00                 | 9.284                | -2               | 362                           | 0.005                    |
| L2             | 110 - 84.5833<br>(2)     | TP21.883x15.525x0.25  | 25.42   | 0.00                 | 0.0  | 39.00                 | 17.415               | -9               | 679                           | 0.013                    |
| L3             | 84.5833 - 70 (3)         | TP25.531x21.883x0.378 | 14.58   | 0.00                 | 0.0  | 37.54                 | 29.392               | -10              | 1103                          | 0.009                    |
| L4             | 70 - 67.0833 (4)         | TP25.76x23.775x0.436  | 6.92    | 0.00                 | 0.0  | 37.60                 | 35.535               | -12              | 1336                          | 0.009                    |
| L5             | 67.0833 -<br>44.5833 (5) | TP31.388x25.76x0.411  | 22.50   | 0.00                 | 0.0  | 37.81                 | 40.987               | -16              | 1550                          | 0.011                    |
| L6             | 44.5833 - 34.08<br>(6)   | TP34.015x31.388x0.406 | 10.50   | 0.00                 | 0.0  | 37.82                 | 42.354               | -18              | 1602                          | 0.011                    |
| L7             | 34.08 - 18.75 (7)        | TP37.216x31.972x0.425 | 20.25   | 0.00                 | 0.0  | 37.93                 | 48.218               | -21              | 1829                          | 0.012                    |
| L8             | 18.75 - 0 (8)            | TP41.9x37.216x0.408   | 18.75   | 0.00                 | 0.0  | 37.98                 | 50.358               | -24              | 1913                          | 0.013                    |

**Pole Bending Design Data**

| Section<br>No. | Elevation<br>ft          | Size                  | Actual<br>M <sub>x</sub><br>kip-ft | Actual<br>f <sub>bx</sub><br>ksi | Allow.<br>F <sub>bx</sub><br>ksi | Ratio<br>$\frac{f_{bx}}{F_{bx}}$ | Actual<br>M <sub>y</sub><br>kip-ft | Actual<br>f <sub>by</sub><br>ksi | Allow.<br>F <sub>by</sub><br>ksi | Ratio<br>$\frac{f_{by}}{F_{by}}$ |
|----------------|--------------------------|-----------------------|------------------------------------|----------------------------------|----------------------------------|----------------------------------|------------------------------------|----------------------------------|----------------------------------|----------------------------------|
| L1             | 131 - 110 (1)            | TP15.525x10.525x0.188 | 58                                 | 20.07                            | 39.00                            | 0.515                            | 0                                  | 0.00                             | 39.00                            | 0.000                            |
| L2             | 110 - 84.5833<br>(2)     | TP21.883x15.525x0.25  | 383                                | 50.03                            | 39.00                            | 1.283                            | 0                                  | 0.00                             | 39.00                            | 0.000                            |
| L3             | 84.5833 - 70<br>(3)      | TP25.531x21.883x0.378 | 579                                | 40.37                            | 37.54                            | 1.075                            | 0                                  | 0.00                             | 37.54                            | 0.000                            |
| L4             | 70 - 67.0833<br>(4)      | TP25.76x23.775x0.436  | 715                                | 39.35                            | 37.60                            | 1.047                            | 0                                  | 0.00                             | 37.60                            | 0.000                            |
| L5             | 67.0833 -<br>44.5833 (5) | TP31.388x25.76x0.411  | 1190                               | 46.27                            | 37.81                            | 1.224                            | 0                                  | 0.00                             | 37.81                            | 0.000                            |
| L6             | 44.5833 -<br>34.08 (6)   | TP34.015x31.388x0.406 | 1317                               | 47.35                            | 37.82                            | 1.252                            | 0                                  | 0.00                             | 37.82                            | 0.000                            |
| L7             | 34.08 - 18.75<br>(7)     | TP37.216x31.972x0.425 | 1651                               | 47.95                            | 37.93                            | 1.264                            | 0                                  | 0.00                             | 37.93                            | 0.000                            |
| L8             | 18.75 - 0 (8)            | TP41.9x37.216x0.408   | 1961                               | 49.95                            | 37.98                            | 1.315                            | 0                                  | 0.00                             | 37.98                            | 0.000                            |

### Pole Shear Design Data

| Section No. | Elevation<br>ft          | Size                  | Actual<br>V<br>K | Actual<br>f <sub>v</sub><br>ksi | Allow.<br>F <sub>v</sub><br>ksi | Ratio<br>f <sub>v</sub> /<br>F <sub>v</sub> | Actual<br>T<br>kip-ft | Actual<br>f <sub>vt</sub><br>ksi | Allow.<br>F <sub>vt</sub><br>ksi | Ratio<br>f <sub>vt</sub> /<br>F <sub>vt</sub> |
|-------------|--------------------------|-----------------------|------------------|---------------------------------|---------------------------------|---|-----------------------|----------------------------------|----------------------------------|---|
| L1          | 131 - 110 (1)            | TP15.525x10.525x0.188 | 5                | 0.56                            | 26.00                           | 0.044                                       | 0                     | 0.05                             | 26.00                            | 0.002   |
| L2          | 110 - 84.5833<br>(2)     | TP21.883x15.525x0.25  | 18               | 1.04                            | 26.00                           | 0.081                                       | 1                     | 0.05                             | 26.00                            | 0.002   |
| L3          | 84.5833 - 70<br>(3)      | TP25.531x21.883x0.378 | 19               | 0.65                            | 25.03                           | 0.053                                       | 1                     | 0.03                             | 25.03                            | 0.001   |
| L4          | 70 - 67.0833<br>(4)      | TP25.76x23.775x0.436  | 20               | 0.56                            | 25.06                           | 0.046                                       | 1                     | 0.02                             | 25.06                            | 0.001   |
| L5          | 67.0833 -<br>44.5833 (5) | TP31.388x25.76x0.411  | 22               | 0.55                            | 25.20                           | 0.044                                       | 1                     | 0.01                             | 25.20                            | 0.000   |
| L6          | 44.5833 -<br>34.08 (6)   | TP34.015x31.388x0.406 | 23               | 0.54                            | 25.22                           | 0.044                                       | 0                     | 0.01                             | 25.22                            | 0.000   |
| L7          | 34.08 - 18.75<br>(7)     | TP37.216x31.972x0.425 | 25               | 0.51                            | 25.29                           | 0.041                                       | 0                     | 0.00                             | 25.29                            | 0.000   |
| L8          | 18.75 - 0 (8)            | TP41.9x37.216x0.408   | 26               | 0.51                            | 25.32                           | 0.041                                       | 0                     | 0.00                             | 25.32                            | 0.000   |

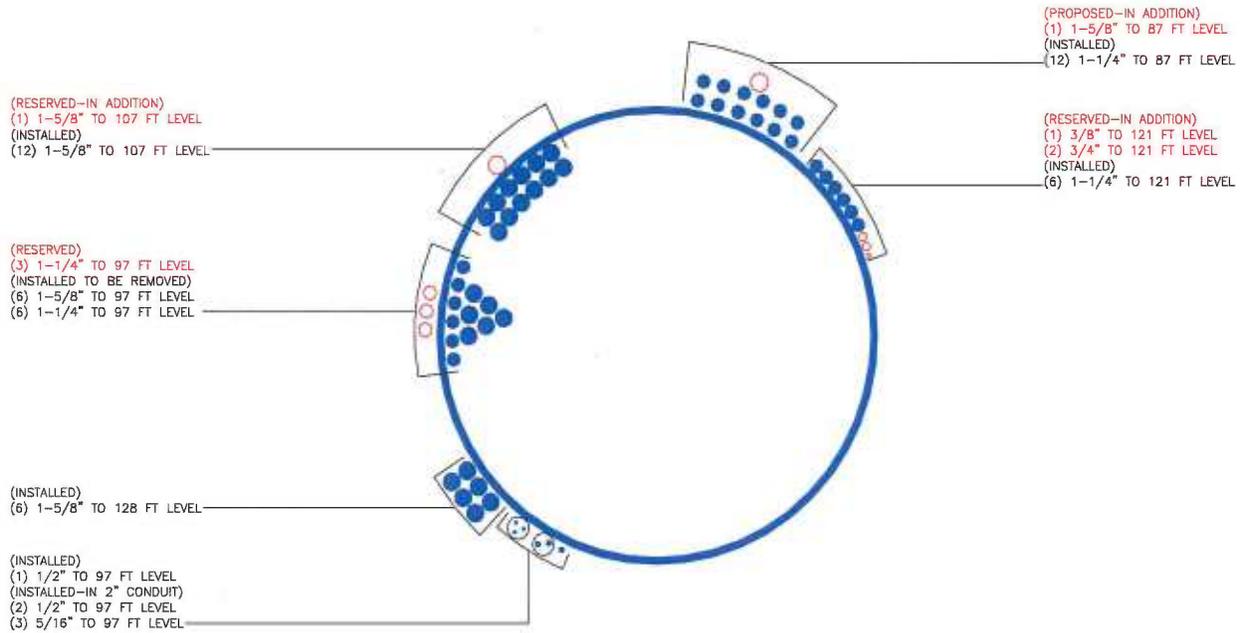
### Pole Interaction Design Data

| Section No. | Elevation<br>ft          | Ratio          | Ratio           | Ratio           | Ratio          | Ratio           | Comb.<br>Stress<br>Ratio | Allow.<br>Stress<br>Ratio | Criteria  |
|-------------|--------------------------|----------------|-----------------|-----------------|----------------|-----------------|--------------------------|---------------------------|-----------|
|             |                          | P              | f <sub>bx</sub> | f <sub>by</sub> | f <sub>v</sub> | f <sub>vt</sub> |                          |                           |           |
|             |                          | P <sub>a</sub> | F <sub>bx</sub> | F <sub>by</sub> | F <sub>v</sub> | F <sub>vt</sub> |                          |                           |           |
| L1          | 131 - 110 (1)            | 0.005          | 0.515           | 0.000           | 0.044          | 0.002           | 0.521 ✓                  | 1.333                     | H1-3+VT ✓ |
| L2          | 110 - 84.5833<br>(2)     | 0.013          | 1.283           | 0.000           | 0.081          | 0.002           | 1.298 ✓                  | 1.333                     | H1-3+VT ✓ |
| L3          | 84.5833 - 70<br>(3)      | 0.009          | 1.075           | 0.000           | 0.053          | 0.001           | 1.086 ✓                  | 1.333                     | H1-3+VT ✓ |
| L4          | 70 - 67.0833<br>(4)      | 0.009          | 1.047           | 0.000           | 0.046          | 0.001           | 1.056 ✓                  | 1.333                     | H1-3+VT ✓ |
| L5          | 67.0833 -<br>44.5833 (5) | 0.011          | 1.224           | 0.000           | 0.044          | 0.000           | 1.235 ✓                  | 1.333                     | H1-3+VT ✓ |
| L6          | 44.5833 -<br>34.08 (6)   | 0.011          | 1.252           | 0.000           | 0.044          | 0.000           | 1.263 ✓                  | 1.333                     | H1-3+VT ✓ |
| L7          | 34.08 - 18.75<br>(7)     | 0.012          | 1.264           | 0.000           | 0.041          | 0.000           | 1.276 ✓                  | 1.333                     | H1-3+VT ✓ |
| L8          | 18.75 - 0 (8)            | 0.013          | 1.315           | 0.000           | 0.041          | 0.000           | 1.328 ✓                  | 1.333                     | H1-3+VT ✓ |

### Section Capacity Table

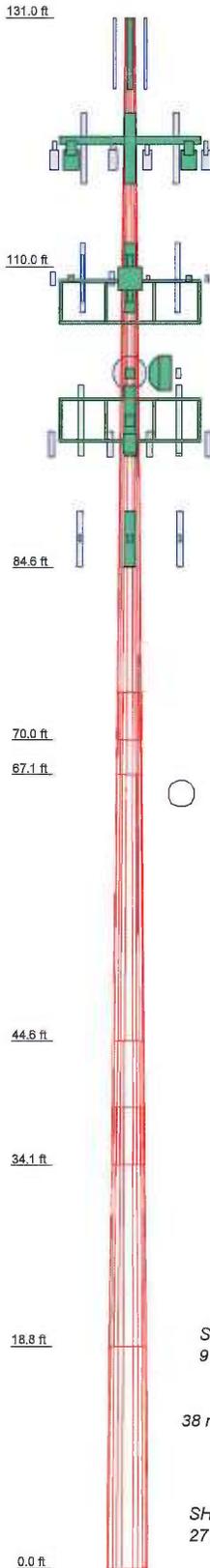
| Section No. | Elevation<br>ft      | Component<br>Type | Size                  | Critical<br>Element | P<br>K | SF*P <sub>allow</sub><br>K | %<br>Capacity | Pass<br>Fail |
|-------------|----------------------|-------------------|-----------------------|---------------------|--------|----------------------------|---------------|--------------|
| L1          | 131 - 110            | Pole              | TP15.525x10.525x0.188 | 1                   | -2     | 483                        | 39.1          | Pass         |
| L2          | 110 - 84.5833        | Pole              | TP21.883x15.525x0.25  | 2                   | -9     | 905                        | 97.3          | Pass         |
| L3          | 84.5833 - 70         | Pole              | TP25.531x21.883x0.378 | 3                   | -10    | 1471                       | 81.4          | Pass         |
| L4          | 70 - 67.0833         | Pole              | TP25.76x23.775x0.436  | 4                   | -12    | 1781                       | 79.2          | Pass         |
| L5          | 67.0833 -<br>44.5833 | Pole              | TP31.388x25.76x0.411  | 5                   | -16    | 2066                       | 92.6          | Pass         |
| L6          | 44.5833 - 34.08      | Pole              | TP34.015x31.388x0.406 | 6                   | -18    | 2135                       | 94.8          | Pass         |
| L7          | 34.08 - 18.75        | Pole              | TP37.216x31.972x0.425 | 7                   | -21    | 2438                       | 95.7          | Pass         |
| L8          | 18.75 - 0            | Pole              | TP41.9x37.216x0.408   | 8                   | -24    | 2550                       | 99.7          | Pass         |
| Summary     |                      |                   |                       |                     |        |                            |               |              |
| Pole (L8)   |                      |                   |                       |                     |        |                            | 99.7          | Pass         |
| RATING =    |                      |                   |                       |                     |        |                            | 99.7          | Pass         |

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



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

| Section            | 1       | 2       | 3               | 4               | 5               | 6               | 7               | 8               |
|--------------------|---------|---------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Length (ft)        | 21.00   | 25.42   | 14.58           | 6.92            | 22.50           | 10.50           | 20.25           | 18.75           |
| Number of Sides    | 12      | 12      | 12              | 12              | 12              | 12              | 12              | 12              |
| Thickness (in)     | 0.188   | 0.250   | 0.378           | 0.436           | 0.411           | 0.406           | 0.425           | 0.408           |
| Socket Length (ft) |         |         | 4.00            |                 |                 | 4.92            |                 |                 |
| Top Dia (in)       | 10.525  | 15.525  | 21.883          | 23.775          | 25.760          | 31.388          | 31.972          | 37.216          |
| Bot Dia (in)       | 15.525  | 21.883  | 25.531          | 25.760          | 31.388          | 34.015          | 37.216          | 41.900          |
| Grade              | A572-65 | A572-65 | Reinf 62.87 ksi | Reinf 62.86 ksi | Reinf 63.01 ksi | Reinf 63.04 ksi | Reinf 63.22 ksi | Reinf 63.30 ksi |
| Weight (K)         | 0.6     | 1.3     | 1.4             | 0.8             | 2.9             | 1.5             | 3.2             | 3.3             |



### DESIGNED APPURTENANCE LOADING

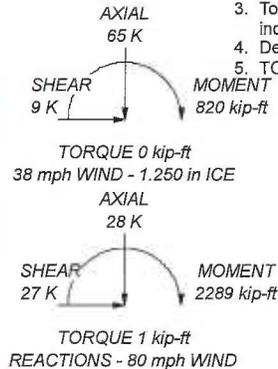
| TYPE                                      | ELEVATION | TYPE                                  | ELEVATION |
|---|-----------|---------------------------------------|-----------|
| APX18-206517S-C w/ Mount Pipe             | 128       | Platform Mount (LP 101-1)             | 107       |
| APX18-206517S-C w/ Mount Pipe             | 128       | TIMING 2000                           | 97        |
| APX18-206517S-C w/ Mount Pipe             | 128       | 840 10054 w/ Mount Pipe               | 97        |
| Pipe Mount [PM 601-3]                     | 128       | 840 10054 w/ Mount Pipe               | 97        |
| 800 10121 w/ Mount Pipe                   | 121       | 840 10054 w/ Mount Pipe               | 97        |
| 800 10121 w/ Mount Pipe                   | 121       | WIMAX DAP HEAD                        | 97        |
| 800 10121 w/ Mount Pipe                   | 121       | WIMAX DAP HEAD                        | 97        |
| (2) LGP21401                              | 121       | WIMAX DAP HEAD                        | 97        |
| (2) LGP21401                              | 121       | HORIZON COMPACT                       | 97        |
| (2) LGP21401                              | 121       | HORIZON COMPACT                       | 97        |
| AM-X-CD-16-65-00T-RET w/ Mount Pipe       | 121       | APXVSP18-C-A20 w/ Mount Pipe          | 97        |
| AM-X-CD-16-65-00T-RET w/ Mount Pipe       | 121       | APXVSP18-C-A20 w/ Mount Pipe          | 97        |
| AM-X-CD-16-65-00T-RET w/ Mount Pipe       | 121       | APXVSP18-C-A20 w/ Mount Pipe          | 97        |
| AM-X-CD-16-65-00T-RET w/ Mount Pipe       | 121       | IBC1900HG-2A                          | 97        |
| AM-X-CD-16-65-00T-RET w/ Mount Pipe       | 121       | IBC1900HG-2A                          | 97        |
| DC6-48-60-18-8F                           | 121       | IBC1900HG-2A                          | 97        |
| T-Arm Mount [TA 601-3]                    | 121       | IBC1900BB-1                           | 97        |
| (2) RRUS-11                               | 119       | IBC1900BB-1                           | 97        |
| (2) RRUS-11                               | 119       | IBC1900BB-1                           | 97        |
| (2) RRUS-11                               | 119       | Platform Mount (LP 602-1)             | 97        |
| Side Arm Mount [SO 102-3]                 | 119       | VHLP2.5-11                            | 97        |
| BXA-70063/6CFx4 w/ Mount Pipe             | 107       | VHLP2.5-11                            | 97        |
| BXA-70063/6CFx4 w/ Mount Pipe             | 107       | PCS 1900MHz 4x45W-65MHz               | 95        |
| BXA-70063/6CFx4 w/ Mount Pipe             | 107       | 800MHz 2X50W RRH W/FILTER             | 95        |
| BXA-185090/8CF w/ Mount Pipe              | 107       | 800MHz 2X50W RRH W/FILTER             | 95        |
| BXA-185090/8CF w/ Mount Pipe              | 107       | 800MHz 2X50W RRH W/FILTER             | 95        |
| BXA-185090/8CF w/ Mount Pipe              | 107       | 800MHz 2X50W RRH W/FILTER             | 95        |
| BXA-185090/8CF w/ Mount Pipe              | 107       | Side Arm Mount [SO 101-3]             | 95        |
| BXA-185090/8CF w/ Mount Pipe              | 107       | (2) PCS 1900MHz 4x45W-65MHz           | 95        |
| (2) FD9R6004/1C-3L                        | 107       | (2) PCS 1900MHz 4x45W-65MHz           | 95        |
| (2) FD9R6004/1C-3L                        | 107       | ERICSSON AIR 21 B2A B4P w/ Mount Pipe | 87        |
| (2) FD9R6004/1C-3L                        | 107       | ERICSSON AIR 21 B2A B4P w/ Mount Pipe | 87        |
| (2) DUAL BAND 800/1900 FULL BAND MASTHEAD | 107       | ERICSSON AIR 21 B4A B2P w/ Mount Pipe | 87        |
| BXA-80063/4CF w/ Mount Pipe               | 107       | ERICSSON AIR 21 B4A B2P w/ Mount Pipe | 87        |
| BXA-80063/4CF w/ Mount Pipe               | 107       | ERICSSON AIR 21 B4A B2P w/ Mount Pipe | 87        |
| BXA-80063/4CF w/ Mount Pipe               | 107       | ERICSSON AIR 21 B4A B2P w/ Mount Pipe | 87        |
| BXA-171085-8CF-EDIN-2 w/ Mount Pipe       | 107       | KRY 112 144/1                         | 87        |
| BXA-171085-8CF-EDIN-2 w/ Mount Pipe       | 107       | KRY 112 144/1                         | 87        |
| BXA-171085-8CF-EDIN-2 w/ Mount Pipe       | 107       | KRY 112 144/1                         | 87        |
| BXA-171085-8CF-EDIN-2 w/ Mount Pipe       | 107       | Side Arm Mount [SO 702-3]             | 87        |
| RRH2x40-AWS                               | 107       | ERICSSON AIR 21 B2A B4P w/ Mount Pipe | 87        |
| RRH2x40-AWS                               | 107       | ERICSSON AIR 21 B2A B4P w/ Mount Pipe | 87        |
| RRH2x40-AWS                               | 107       | ERICSSON AIR 21 B2A B4P w/ Mount Pipe | 87        |
| DB-T1-6Z-8AB-0Z                           | 107       |                                       |           |

### MATERIAL STRENGTH

| GRADE           | Fy     | Fu     | GRADE           | Fy     | Fu     |
|-----------------|--------|--------|-----------------|--------|--------|
| A572-65         | 65 ksi | 80 ksi | Reinf 63.04 ksi | 63 ksi | 79 ksi |
| Reinf 62.57 ksi | 63 ksi | 79 ksi | Reinf 63.22 ksi | 63 ksi | 80 ksi |
| Reinf 62.66 ksi | 63 ksi | 79 ksi | Reinf 63.30 ksi | 63 ksi | 80 ksi |
| Reinf 63.01 ksi | 63 ksi | 79 ksi |                 |        |        |

### TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 1.25 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 99.7%



|                            |   |                                |        |
|----------------------------|---|--------------------------------|--------|
|                            | <b>Paul J Ford and Company</b>  |                                |        |
|                            | 250 E. Broad Street Suite 600<br>Columbus, OH 43215<br>Phone: 614.221.6679<br>FAX: 614.448.4105 |                                |        |
|                            | Job: <b>131' Monopole / East Hartford, CT</b>   |                                |        |
|                            | Project: <b>37512-1659.003.7805 / BU# 806376</b>  |                                |        |
|                            | Client: <b>Crown Castle</b>   | Drawn by: <b>Seth Tschanen</b> | App'd: |
| Code: <b>TIA/EIA-222-F</b> | Date: <b>10/16/14</b>   | Scale: <b>NTS</b>              |        |
| Path:                      |   | Dwg No. <b>E-1</b>             |        |

## Stiffened or Unstiffened, UngROUTed, Circular Base Plate - Any Rod Material

### TIA Rev F

#### Site Data

|                    |       |
|--------------------|-------|
| BU#: 806376        |       |
| Site Name:         |       |
| App #:             |       |
| Pole Manufacturer: | Other |

| Reactions |      |         |
|-----------|------|---------|
| Moment:   | 2289 | ft-kips |
| Axial:    | 28   | kips    |
| Shear:    | 27   | kips    |

If No stiffeners, Criteria: AISC ASD <-Only Applicable to Unstiffened Cases

| Anchor Rod Data |        |     |
|-----------------|--------|-----|
| Qty:            | 12     |     |
| Diam:           | 2.25   | in  |
| Rod Material:   | A615-J |     |
| Strength (Fu):  | 100    | ksi |
| Yield (Fy):     | 75     | ksi |
| Bolt Circle:    | 49.88  | in  |

#### Anchor Rod Results

|                          |   |
|--------------------------|---|
| Maximum Rod Tension:     | 181.2 Kips                                    |
| Allowable Tension:       | 195.0 Kips                                    |
| Anchor Rod Stress Ratio: | 93.0% <span style="color: green;">Pass</span> |

|             |
|-------------|
| Rigid       |
| Service ASD |
| Fty*ASIF    |

| Plate Data        |       |     |
|-------------------|-------|-----|
| Diam:             | 55.88 | in  |
| Thick:            | 2.5   | in  |
| Grade:            | 60    | ksi |
| Single-Rod B-eff: | 11.23 | in  |

#### Base Plate Results

|                          |   |
|--------------------------|---|
| Base Plate Stress:       | 40.0 ksi                                      |
| Allowable Plate Stress:  | 60.0 ksi                                      |
| Base Plate Stress Ratio: | 66.7% <span style="color: green;">Pass</span> |

#### Flexural Check

|              |
|--------------|
| Rigid        |
| Service ASD  |
| 0.75*Fy*ASIF |
| Y.L. Length: |
| 27.06        |

| Stiffener Data (Welding at both sides) |   |               |
|--|---|---------------|
| Config:                                | 0 | *             |
| Weld Type:                             |   |               |
| Groove Depth:                          |   | in **         |
| Groove Angle:                          |   | degrees       |
| Fillet H. Weld:                        |   | <-- Disregard |
| Fillet V. Weld:                        |   | in            |
| Width:                                 |   | in            |
| Height:                                |   | in            |
| Thick:                                 |   | in            |
| Notch:                                 |   | in            |
| Grade:                                 |   | ksi           |
| Weld str.:                             |   | ksi           |

n/a

#### Stiffener Results

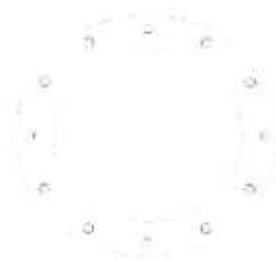
|                                       |     |
|---------------------------------------|-----|
| Horizontal Weld :                     | n/a |
| Vertical Weld:                        | n/a |
| Plate Flex+Shear, fb/Fb+(fv/Fv)^2:    | n/a |
| Plate Tension+Shear, ft/Ft+(fv/Fv)^2: | n/a |
| Plate Comp. (AISC Bracket):           | n/a |

#### Pole Results

|                            |     |
|----------------------------|-----|
| Pole Punching Shear Check: | n/a |
|----------------------------|-----|

| Pole Data          |       |              |
|--------------------|-------|--------------|
| Diam:              | 41.9  | in           |
| Thick:             | 0.344 | in           |
| Grade:             | 65    | ksi          |
| # of Sides:        | 12    | "0" IF Round |
| Fu                 | 80    | ksi          |
| Reinf. Fillet Weld | 0     | "0" if None  |

| Stress Increase Factor |       |
|------------------------|-------|
| ASIF:                  | 1.333 |



\* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

\*\* Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Foundation Loads:

Pole weight or tower leg compression = 28 (kips)  
 Horizontal load at top of pier = 27 (kips)  
 Overturning moment at top of pier = 2289 (ft-kips)

Design criteria:

Safety factor against overturning = 1.5

Soil Properties:

Soil density = 115 (pcf)  
 Allowable soil bearing = 5 (ksf)  
 Depth to water table = 12 (ft)

Dimensions:

Pier shape (round or square) R ("R" or "S")  
 Pier width = 6 (ft)  
 Pier height above grade = 0.5 (ft)  
 depth to bottom of footing = 8 (ft)  
 Footing thickness = 3 (ft)  
 Footing width = 22 (ft)  
 Footing length = 22 (ft)

Concrete:

Concrete strength = 3 (ksi)  
 Rebar strength = 60 (ksi)  
 ultimate load factor = 1.3

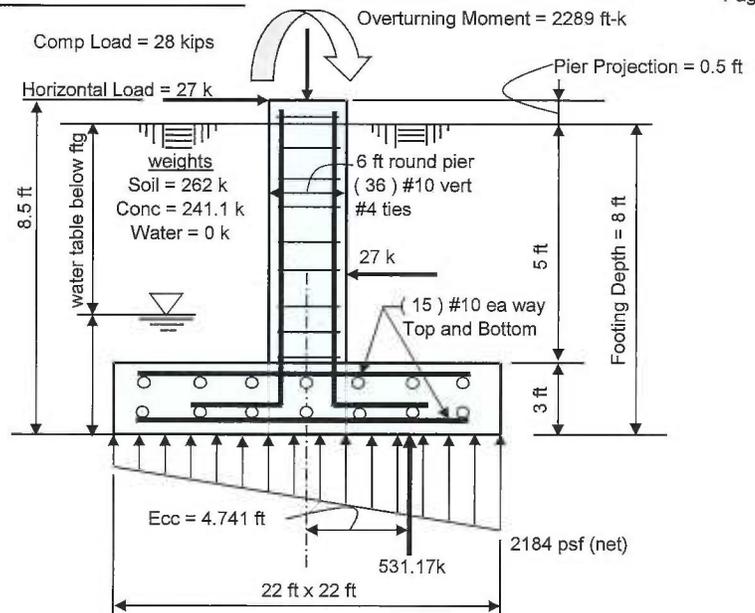
Reinforcing Steel:

Pad  
 minimum cover over rebar = 3 inches  
 size of pad rebar = #10 bar  
 quantity of pad rebar = 15 (ea direction)

Reinforcing Steel:

Pier  
 size of vert rebar in pier = #10 bar  
 vertical rebar quantity = 36  
 size of pier ties = #4 bar  
 minimum cover over rebar = 3 inches

Total volume of concrete = 59.5 cu yd



| Summary of analysis results  |  |
|--|--|
| Maximum Net Soil Bearing = 2.184 ksf<br>Allowable Net Soil Bearing = 5 ksf<br><b>Soil Bearing Stress Ratio = 0.44 Okay</b>   | Ult Bending Shear Capacity = 110 psi<br>Ult Bending Shear Stress = 30 psi<br><b>Bending Shear Stress Ratio = 0.27 Okay</b> |
| Ftg Overturning Resistance = 5843 ft-kips<br>Overturning Moment = 2519 ft-kips<br>Required Overturning Safety Factor = 1.5<br>Overturning Safety Factor = 2.32<br><b>Ratio = 0.65 Okay</b> | Pad Bending Moment Capacity = 2595 ft-k<br>Pad Bending Moment = 1081 ft-k<br><b>Bending Moment Stress Ratio = 0.42 OK</b>  |

```

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## General Information:

File Name: g:\tower\375\_crown\_castle\2013\37513-0342 bu 806376\wo 944244 ... \37513-0342.003.7805.col

Project: 37512-1659

Column:

Code: ACI 318-08

Engineer: DSK

Units: English

Run Option: Investigation

Run Axis: X-axis

Slenderness: Not considered

Column Type: Structural

## Material Properties:

f'c = 3 ksi

Ec = 3122.02 ksi

Ultimate strain = 0.003 in/in

Betal = 0.85

fy = 60 ksi

Es = 29000 ksi

## Section:

Circular: Diameter = 72 in

Gross section area, Ag = 4071.5 in<sup>2</sup>

Ix = 1.31917e+006 in<sup>4</sup>

rx = 18 in

Xo = 0 in

Iy = 1.31917e+006 in<sup>4</sup>

ry = 18 in

Yo = 0 in

## Reinforcement:

Bar Set: ASTM A615

| Size | Diam (in) | Area (in <sup>2</sup> ) | Size | Diam (in) | Area (in <sup>2</sup> ) | Size | Diam (in) | Area (in <sup>2</sup> ) |
|------|-----------|-------------------------|------|-----------|-------------------------|------|-----------|-------------------------|
| # 3  | 0.38      | 0.11                    | # 4  | 0.50      | 0.20                    | # 5  | 0.63      | 0.31                    |
| # 6  | 0.75      | 0.44                    | # 7  | 0.88      | 0.60                    | # 8  | 1.00      | 0.79                    |
| # 9  | 1.13      | 1.00                    | # 10 | 1.27      | 1.27                    | # 11 | 1.41      | 1.56                    |
| # 14 | 1.69      | 2.25                    | # 18 | 2.26      | 4.00                    |      |           |                         |

Confinement: Tied; #3 ties with #10 bars, #4 with larger bars.  
phi(a) = 0.8, phi(b) = 0.9, phi(c) = 0.65

Layout: Circular

Pattern: All Sides Equal (Cover to longitudinal reinforcement)

Total steel area: As = 45.72 in<sup>2</sup> at rho = 1.12%

Minimum clear spacing = 4.37 in

36 #10 Cover = 3 in

## Factored Loads and Moments with Corresponding Capacities:

| No. | Pu<br>kip | Mux<br>k-ft | PhiMnx<br>k-ft | PhiMn/Mu | NA depth<br>in | Dt depth<br>in | eps_t   | Phi   |
|-----|-----------|-------------|----------------|----------|----------------|----------------|---------|-------|
| 1   | 28.00     | 3241.88     | 5788.38        | 1.786    | 15.56          | 68.37          | 0.01018 | 0.900 |

\*\*\* End of output \*\*\*

# Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev F

## Site Data

BU#: 806376  
 Site Name:  
 App #:

Pole Manufacturer: Other

## Bolt Data

|                 |       |               |       |
|-----------------|-------|---------------|-------|
| Qty:            | 10    | Bolt Fu:      | 120   |
| Diameter (in.): | 1     | Bolt Fy:      | 92    |
| Bolt Material:  | A325  | Bolt Fty:     | 44.00 |
| N/A:            | 75    | <-- Disregard |       |
| N/A:            | 55    | <-- Disregard |       |
| Circle (in.):   | 19.45 |               |       |

## Plate Data

|                   |       |     |
|-------------------|-------|-----|
| Diam:             | 21.95 | in  |
| Thick, t:         | 1.375 | in  |
| Grade (Fy):       | 50    | ksi |
| Strength, Fu:     | 65    | ksi |
| Single-Rod B-eff: | 4.99  | in  |

## Stiffener Data (Welding at Both Sides)

|                 |   |               |
|-----------------|---|---------------|
| Config:         | 0 | *             |
| Weld Type:      |   |               |
| Groove Depth:   |   | in **         |
| Groove Angle:   |   | degrees       |
| Fillet H. Weld: |   | <-- Disregard |
| Fillet V. Weld: |   | in            |
| Width:          |   | in            |
| Height:         |   | in            |
| Thick:          |   | in            |
| Notch:          |   | in            |
| Grade:          |   | ksi           |
| Weld str.:      |   | ksi           |

## Pole Data

|                    |        |              |
|--------------------|--------|--------------|
| Diam:              | 15.53  | in           |
| Thick:             | 0.1875 | in           |
| Grade:             | 65     | ksi          |
| # of Sides:        | 12     | "0" IF Round |
| Fu                 | 80     | ksi          |
| Reinf. Fillet Weld | 0      | "0" if None  |

## Stress Increase Factor

ASIF: 1.333

## Reactions

|            |     |         |
|------------|-----|---------|
| Moment:    | 58  | ft-kips |
| Axial:     | 2   | kips    |
| Shear:     | 5   | kips    |
| Elevation: | 110 | feet    |

If No stiffeners, Criteria: AISC ASD <--Only Applicable to Unstiffened Cases

## Flange Bolt Results

|                                    |            |                    |
|------------------------------------|------------|--------------------|
| Bolt Tension Capacity, B:          | 46.07 kips |                    |
| Max Bolt directly applied T:       | 14.11 Kips |                    |
| Min. PL "tc" for B cap. w/o Pry:   | 1.286 in   |                    |
| Min PL "treq" for actual T w/ Pry: | 0.533 in   |                    |
| Min PL "t1" for actual T w/o Pry:  | 0.712 in   |                    |
| T allowable w/o Prying:            | 46.07 kips | $\alpha' < 0$ case |
| Prying Force, Q:                   | 0.00 kips  |                    |
| Total Bolt Tension=T+Q:            | 14.11 kips |                    |
| Non-Prying Bolt Stress Ratio, T/B: | 30.6% Pass |                    |

|             |
|-------------|
| Rigid       |
| Service ASD |
| Fty*ASIF    |

## Exterior Flange Plate Results

|  |            |                    |
|--|------------|--------------------|
| Flexural Check                         |            | Rigid              |
| Compression Side Plate Stress:         | 11.1 ksi   | Service ASD        |
| Allowable Plate Stress:                | 50.0 ksi   | 0.75*Fy*ASIF       |
| Compression Plate Stress Ratio:        | 22.2% Pass | Comp. Y.L. Length: |
| No Prying                              |            | 11.71              |
| Tension Side Stress Ratio, (treq/t)^2: | 15.0% Pass |                    |

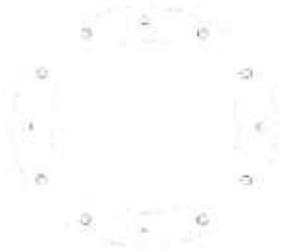
n/a

## Stiffener Results

|                                       |     |
|---------------------------------------|-----|
| Horizontal Weld :                     | n/a |
| Vertical Weld:                        | n/a |
| Plate Flex+Shear, fb/Fb+(fv/Fv)^2:    | n/a |
| Plate Tension+Shear, ft/Ft+(fv/Fv)^2: | n/a |
| Plate Comp. (AISC Bracket):           | n/a |

## Pole Results

Pole Punching Shear Check: n/a



\* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

\*\* Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

# **EXHIBIT C**

RADIO FREQUENCY EMISSIONS ANALYSIS REPORT  
EVALUATION OF HUMAN EXPOSURE POTENTIAL  
TO NON-IONIZING EMISSIONS

T-Mobile Existing Facility

Site ID: CT11186A

East Hartford / Hills\_1  
1441 Forbes Street  
East Hartford, CT 06118

**October 15, 2014**

**EBI Project Number: 62132825**

October 15, 2014

T-Mobile USA  
Attn: Jason Overbey, RF Manager  
35 Griffin Road South  
Bloomfield, CT 06002

Re: Emissions Values for Site: **CT11186A - East Hartford / Hills\_1**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **1441 Forbes Street, East Hartford, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ( $\mu\text{W}/\text{cm}^2$ ). The number of  $\mu\text{W}/\text{cm}^2$  calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ( $\mu\text{W}/\text{cm}^2$ ). The general population exposure limit for the cellular band is  $567 \mu\text{W}/\text{cm}^2$ , and the general population exposure limit for the PCS band is  $1000 \mu\text{W}/\text{cm}^2$ . Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

## CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **1441 Forbes Street, East Hartford, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, the actual antenna pattern gain value in the direction of the sample area was used. For this report the sample point is a 6 foot person standing at the base of the tower

For all calculations, all equipment was calculated using the following assumptions:

- 1) 2 GSM channels (1935.000 MHz—to 1945.000 MHz) were considered for each sector of the proposed installation.
- 2) 2 UMTS channels (2110.000 MHz to 2120.000 MHz / 2140.000 MHz to 2145.000 MHz) were considered for each sector of the proposed installation
- 3) 2 LTE channels (2110.000 MHz to 2120.000 MHz / 2140.000 MHz to 2145.000 MHz) were considered for each sector of the proposed installation
- 4) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
- 5) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The actual gain in this direction was used per the manufactures supplied specifications.
- 6) The antenna used in this modeling is the Ericsson AIR21 for LTE, UMTS and GSM. This is based on feedback from the carrier with regards to anticipated antenna selection. This antenna has a 15.6 dBd gain value at its main lobe. Actual antenna gain values were used for all calculations as per the manufacturers specifications

- 7) The antenna mounting height centerline of the proposed antennas is **87 feet** above ground level (AGL)
- 8) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

All calculation were done with respect to uncontrolled / general public threshold limits

|              |   |
|--------------|---|
| Site ID      | CT11186A - East Hartford / Hills_1          |
| Site Address | 1441 Forbes Street, East Hartford, CT 06118 |
| Site Type    | Monopole                                    |

| Sector 1       |              |                 |          |                |            |                               |                    |                 |   |                     |                 |            |                 |                 |                                   |                     |                          |
|----------------|--------------|-----------------|----------|----------------|------------|-------------------------------|--------------------|-----------------|---|---------------------|-----------------|------------|-----------------|-----------------|-----------------------------------|---------------------|--------------------------|
| Antenna Number | Antenna Make | Antenna Model   | Status   | Frequency Band | Technology | Power Out Per Channel (Watts) | Number of Channels | Composite Power | Antenna Gain in direction of sample point (dBd) | Antenna Height (ft) | analysis height | Cable Size | Cable Loss (dB) | Additional Loss | ERP                               | Power Density Value | Power Density Percentage |
| 1a             | Ericsson     | AIR21 B4A/B2P   | Active   | AWS - 2100 MHz | LTE        | 60                            | 2                  | 120             | -3.95   | 87                  | 81              | None       | 0               | 0               | 48.326044                         | 2.647995            | 0.26%                    |
| 1b             | Ericsson     | AIR21 B4A/B2P   | Not Used | -              | -          | -                             | -                  | 0               | -3.95   | 87                  | 81              | None       | 0               | 0               | 0                                 | 0                   | 0.00%                    |
| 2a             | Ericsson     | AIR21 B2A / B4P | Active   | PCS - 1950 MHz | GSM / UMTS | 30                            | 2                  | 60              | -3.95   | 87                  | 81              | 1-5/8"     | 0               | 0               | 24.163022                         | 1.323998            | 0.13%                    |
| 2B             | Ericsson     | AIR21 B2A / B4P | Passive  | AWS - 2100 MHz | UMTS       | 30                            | 2                  | 60              | -3.95   | 87                  | 81              | 1-5/8"     | 0               | 0               | 24.163022                         | 1.323998            | 0.13%                    |
|                |              |                 |          |                |            |                               |                    |                 |   |                     |                 |            |                 |                 | Sector total Power Density Value: |                     | 0.53%                    |
| Sector 2       |              |                 |          |                |            |                               |                    |                 |   |                     |                 |            |                 |                 |                                   |                     |                          |
| Antenna Number | Antenna Make | Antenna Model   | Status   | Frequency Band | Technology | Power Out Per Channel (Watts) | Number of Channels | Composite Power | Antenna Gain in direction of sample point (dBd) | Antenna Height (ft) | analysis height | Cable Size | Cable Loss (dB) | Additional Loss | ERP                               | Power Density Value | Power Density Percentage |
| 1a             | Ericsson     | AIR21 B4A/B2P   | Active   | AWS - 2100 MHz | LTE        | 60                            | 2                  | 120             | -3.95   | 87                  | 81              | None       | 0               | 0               | 48.326044                         | 2.647995            | 0.26%                    |
| 1b             | Ericsson     | AIR21 B4A/B2P   | Not Used | -              | -          | -                             | -                  | 0               | -3.95   | 87                  | 81              | None       | 0               | 0               | 0                                 | 0                   | 0.00%                    |
| 2a             | Ericsson     | AIR21 B2A / B4P | Active   | PCS - 1950 MHz | GSM / UMTS | 30                            | 2                  | 60              | -3.95   | 87                  | 81              | 1-5/8"     | 0               | 0               | 24.163022                         | 1.323998            | 0.13%                    |
| 2B             | Ericsson     | AIR21 B2A / B4P | Passive  | AWS - 2100 MHz | UMTS       | 30                            | 2                  | 60              | -3.95   | 87                  | 81              | 1-5/8"     | 0               | 0               | 24.163022                         | 1.323998            | 0.13%                    |
|                |              |                 |          |                |            |                               |                    |                 |   |                     |                 |            |                 |                 | Sector total Power Density Value: |                     | 0.53%                    |
| Sector 3       |              |                 |          |                |            |                               |                    |                 |   |                     |                 |            |                 |                 |                                   |                     |                          |
| Antenna Number | Antenna Make | Antenna Model   | Status   | Frequency Band | Technology | Power Out Per Channel (Watts) | Number of Channels | Composite Power | Antenna Gain in direction of sample point (dBd) | Antenna Height (ft) | analysis height | Cable Size | Cable Loss (dB) | Additional Loss | ERP                               | Power Density Value | Power Density Percentage |
| 1a             | Ericsson     | AIR21 B4A/B2P   | Active   | AWS - 2100 MHz | LTE        | 60                            | 2                  | 120             | -3.95   | 87                  | 81              | None       | 0               | 0               | 48.326044                         | 2.647995            | 0.26%                    |
| 1b             | Ericsson     | AIR21 B4A/B2P   | Not Used | -              | -          | -                             | -                  | 0               | -3.95   | 87                  | 81              | None       | 0               | 0               | 0                                 | 0                   | 0.00%                    |
| 2a             | Ericsson     | AIR21 B2A / B4P | Active   | PCS - 1950 MHz | GSM / UMTS | 30                            | 2                  | 60              | -3.95   | 87                  | 81              | 1-5/8"     | 0               | 0               | 24.163022                         | 1.323998            | 0.13%                    |
| 2B             | Ericsson     | AIR21 B2A / B4P | Passive  | AWS - 2100 MHz | UMTS       | 30                            | 2                  | 60              | -3.95   | 87                  | 81              | 1-5/8"     | 0               | 0               | 24.163022                         | 1.323998            | 0.13%                    |
|                |              |                 |          |                |            |                               |                    |                 |   |                     |                 |            |                 |                 | Sector total Power Density Value: |                     | 0.53%                    |

| Site Composite MPE %    |               |
|-------------------------|---------------|
| Carrier                 | MPE %         |
| T-Mobile                | 1.59%         |
| Sprint                  | 18.52%        |
| Clearwire               | 1.91%         |
| AT&T                    | 24.54%        |
| Verizon Wireless        | 46.27%        |
| <b>Total Site MPE %</b> | <b>92.83%</b> |

## Summary

All calculations performed for this analysis yielded results that were within the allowable limits for general public exposure to RF Emissions.

The anticipated Maximum Composite contributions from the T-Mobile facility are **1.59% (0.53% from each sector)** of the allowable FCC established general public limit considering all three sectors simultaneously sampled at the ground level.

The anticipated composite MPE value for this site assuming all carriers present is **92.83%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were within the allowable 100% threshold standard per the federal government.



Scott Heffernan  
RF Engineering Director

**EBI Consulting**  
21 B Street  
Burlington, MA 01803