November 23rd, 2020
Melanie A. Bachman
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

## RE: Notice of Exempt Modification for T-Mobile: <br> 881541 - T-Mobile Site ID: CT11083Q <br> 700 Grassy Hill Road, Orange, CT 06477 <br> 

Dear Ms. Bachman:
T-Mobile currently maintains nine (9) total antennas at the 110 -foot mount on the existing 140foot Monopole Tower, located at 700 Grassy Hill Road, Orange, CT. The tower is owned by Crown Castle and the property is owned by the Town of Orange. T-Mobile now intends to replace three (3) existing antennas with three (3) new $600 / 700 \mathrm{MHz}$ antennas. T-Mobile is also proposing tower mount modifications as shown on the enclosed mount analysis.

Planned Modifications:
Tower:
Remove and Replace:
(3) LNX 6516DS-A1M Antenna (REMOVE) - (3) RFS-APXVAARR24_43-U-NA20 Antenna 600/700 MHz (REPLACE)
(3) RRUS11 B12 (REMOVE) - (3) Radio 4449 B71/B12 (REPLACE)

Install New:
(3) $15 / 8 "$ Hybrid Fiber Line

Existing to Remain:
(7) $15 / 8$ " Coax
(3) AIR21 KRC118023-1_B2P_B4A Antenna 1900/2100 MHz
(3) TMA

Ground:
Upgrade: Internal upgrade to existing ground cabinet.

Page 2

The facility was approved by the Connecticut Siting Council in Docket No. 262 on January 12,2004 . This approval included conditions which this proposed exempt modification complies with.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §16$50 \mathrm{j}-73$, for construction that constitutes an exempt modification pursuant to R.C.S.A. § $16-50 \mathrm{j}-72(\mathrm{~b})(2)$. In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to James Zeoli, First Selectman, Town of Orange, as the municipality as well as the property owner, and the Zoning Administrator and Enforcement Officer, Jack Demirjian. Crown Castle is the tower owner.

1. The proposed modifications will not result in an increase in the height of the existing tower.
2. The proposed modifications will not require the extension of the site boundary.
3. The proposed modification will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, T-Mobile respectfully submits that the proposed modifications to the above-reference telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,


Richard Zajac
Site Acquisition Specialist
4545 East River Road, Suite 320
Rochester, NY 14586
585-445-5896
richard.zajac@crowncastle.com
Attachments

Melanie A. Bachman

Page 3
cc:
James M. Zeoli, First Selectman
Town of Orange
Town Hall - Selectman's Office
617 Orange Center Road
Orange, CT 06477
203.891.4737

Jack Demirjian, ZEO
Town of Orange
Town Hall - Plan \& Zoning Dept.
617 Orange Center Road
Orange, CT 06477
203.891.4746

Crown Castle, Tower Owner

| From: | $\underline{\text { Zajac, Richard }}$ |
| :--- | :--- |
| To: | $\underline{\text { jzeoli@orange-ct.gov }}$ |
| Subject: | Connecticut Siting Council exempt modification application notification |
| Date: | Monday, November 23, 2020 11:38:00 AM |
| Attachments: | Exempt Modification Application 700 Grassy Hill Rd.pdf. |

Good morning Mr. Zeoli,
Please see the attached application to the Connecticut Siting Council regarding antenna work on the existing cell tower located at 700 Grassy Hill Road in Orange.

Should you have any questions/comments/concerns regarding this application, please do not hesitate to contact me.

Thank you,
RICH ZAJAC
Site Acquisition Specialist
T: (585) 445-5896 M: (607) 346-7212
F: (724) 416-4461
CROWN CASTLE
4545 East River Road, Suite 320
West Henrietta, NY 14586

| From: | $\underline{\text { Zajac, Richard }}$ |
| :--- | :--- |
| To: | "jdemirjian@orange-ct.gov" |
| Subject: | Connecticut Siting Council exempt modification application notification |
| Date: | Monday, November 23, 2020 11:42:00 AM |
| Attachments: | Exempt Modification Application 700 Grassy Hill Rd.pdf. |

Good morning Mr. Demirjian,
Please see the attached application to the Connecticut Siting Council regarding antenna work on the existing cell tower located at 700 Grassy Hill Road in Orange.

Should you have any questions/comments/concerns regarding this application, please do not hesitate to contact me.

Thank you,
RICH ZAJAC
Site Acquisition Specialist
T: (585) 445-5896 M: (607) 346-7212
F: (724) 416-4461
CROWN CASTLE
4545 East River Road, Suite 320
West Henrietta, NY 14586

## Exhibit A

## Original Facility Approval

## Connecticut Siting Council Decisions

\author{
DOCKET NO. 262 - Sprint Spectrum, L.P. d/b/a Sprint \} Connecticut <br> PCS application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a wireless telecommunications facility at 707 Cranberry Lane or off of Grassy Hill Road, Orange, Connecticut. <br> Siting Council <br> January 12, 2004 <br> \section*{Decision and Order}

}

Pursuant to the foregoing Findings of Fact and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, operation, and maintenance of a wireless telecommunications facility including effects on the natural environment; ecological integrity and balance; public health and safety; scenic, historic, and recreational values; forests and parks; air and water purity; and fish and wildlife are not disproportionate either alone or cumulatively with other effects when compared to need, are not in conflict with the policies of the State concerning such effects, and are not sufficient reason to deny the application and therefore directs that a Certificate of Environmental Compatibility and Public Need, as provided by General Statutes $\S 16-50 \mathrm{k}$, be issued to Sprint Spectrum, L.P. d/b/a Sprint PCS (Sprint) for the construction, maintenance and operation of a wireless telecommunications facility at Site C off of Grassy Hill Road, Orange, Connecticut. The Council denies certification of Site A located at 707 Cranberry Lane and Site B located off of Grassy Hill Road, Orange, Connecticut.

The facility shall be constructed, operated, and maintained substantially as specified in the Council's record in this matter, and subject to the following conditions:

1. The tower shall be constructed as a monopole, no taller than necessary to provide the proposed telecommunications services, sufficient to accommodate the antennas of Sprint and other entities, both public and private, but such tower shall not exceed a height of 140 feet above ground level, with a total overall height of 143 feet above ground level including appurtenances. Antennas to be installed on the tower shall be on a T-bar antenna platform or flush mounted.
2. The Certificate Holder shall prepare a D\&M Plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of Connecticut State Agencies. The D\&M Plan shall be submitted to and approved by the Council prior to the commencement of facility construction and shall include:
a) a final site plan(s) of site development to include specifications for the tower, tower location, tower foundation, antennas, equipment building, access road, provisions for underground utilities, utility line, and landscaping; and
b) construction plans for site clearing, water drainage, and erosion and sedimentation control consistent with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as amended.
3. The Certificate Holder shall, prior to the commencement of operation, provide the Council worst-case modeling of electromagnetic radio frequency power densities of all proposed entities'
antennas at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin No. 65, August 1997. The Certificate Holder shall provide a recalculated report of electromagnetic radio frequency power density if and when circumstances in operation cause a change in power density above the levels calculated and provided pursuant to this Decision and Order.
4. Upon the establishment of any new State or federal radio frequency standards applicable to frequencies of this facility, the facility granted herein shall be brought into compliance with such standards.
5. The Certificate Holder shall permit public or private entities to share space on the proposed tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing. The Certificate Holder shall provide reasonable space on the tower for no compensation for any municipal antennas, provided such antennas are compatible with the structural integrity of the tower.
6. If the facility does not initially provide wireless services within one year of completion of construction or ceases to provide wireless services for a period of one year, this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made.
7. Any antenna that becomes obsolete and ceases to function shall be removed within 60 days after such antenna becomes obsolete and ceases to function.
8. Unless otherwise approved by the Council, this Decision and Order shall be void if the facility authorized herein is not operational within one year of the effective date of this Decision and Order or within one year after all appeals to this Decision and Order have been resolved.

Pursuant to General Statutes § 16-50p, we hereby direct that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed below, and notice of issuance shall be published in The New Haven Register, the Amity Observer and The Bulletin (Orange).

By this Decision and Order, the Council disposes of the legal rights, duties, and privileges of each party named or admitted to the proceeding in accordance with Section 16-50j-17 of the Regulations of Connecticut State Agencies.

The parties and intervenors to this proceeding are:

## Applicant

Sprint Spectrum, L.P. d/b/a Sprint PCS

## Intervenor

AT\&T Wireless PCS, LLC d/b/a AT\&T Wireless

## Its Representative

Thomas J. Regan, Esquire
Brown Rudnick Berlack Israels LLP
CityPlace I, $38^{\text {th }}$ Floor
185 Asylum Street
Hartford, CT 06103-3402
Its Representative
Christopher B. Fisher, Esq.
Cuddy \& Feder LLP
90 Maple Avenue
White Plains, NY 10601

## Intervenor

Cellco Partnership d/b/a Verison Wireless

## Its Representative

Kenneth C. Baldwin, Esq.
Robinson \& Cole LLP
280 Trumbull Street
Hartford, CT 06103-3597

## 700 GRASSY HILL RD

| Location | 700 GRASSY HILL RD | Mblu | $60 / 6 / 1 \mathrm{~A} / /$ |
| ---: | :--- | ---: | :--- |
| Acct\# | 00182505 | Owner | TOWN OF ORANGE |
| Assessment | $\$ 119,300$ | Appraisal | $\$ 170,400$ |
| PID 5703 | Building Count | 1 |  |

## Current Value

| Appraisal |  |  |  |
| :---: | :---: | :---: | :---: |
| Valuation Year | Improvements | Land | Total |
| 2017 | \$13,500 | \$156,900 | \$170,400 |
| Assessment |  |  |  |
| Valuation Year | Improvements | Land | Total |
| 2017 | \$9,500 | \$109,800 | \$119,300 |

## Owner of Record

| Owner | TOWN OF ORANGE | Sale Price | $\$ 25,000$ |
| :--- | :--- | :--- | :--- |
| Co-Owner |  | Certificate |  |
| Address | 617 ORANGE CENTER ROAD | Book \& Page | $520 / 156$ |
|  | ORANGE, CT 06477 | Sale Date | $05 / 28 / 2004$ |
|  |  | Instrument | 00 |

## Ownership History

| Ownership History |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Owner | Sale Price | Certificate | Book \& Page | Instrument | Sale Date |
| TOWN OF ORANGE | \$25,000 |  | 520/156 | 00 | 05/28/2004 |
| SCHEN JULIA ROGERS \& SAYLOR ELLEN \& | \$0 |  |  |  |  |

## Building Information

Building 1 : Section 1

| Year Built: |  |
| :--- | :---: |
| Living Area: | 0 |
| Replacement Cost <br> Less Depreciation: | $\$ 0$ |
|  | Building Attributes |

Building Photo
Building Photo
(http://images.vgsi.com/photos/OrangeCTPhotos/^00101170/98.JPG)
Building Layout

|  | Field |
| :--- | :--- |
| Style | Description |
| Model |  |
| Stories |  |
| Exterior Wall 1 |  |
| Exterior Wall 2 |  |
| Roof Structure |  |
| Roof Cover |  |
| Interior Wall 1 |  |
| Interior Wall 2 |  |
| Interior Floor 1 |  |
| Interior Floor 2 |  |
| Heat Fuel |  |
| Heat Type |  |
| AC Type |  |
| Bedrooms |  |
| Full Baths |  |
| Half Baths |  |
| Extra Fixtures |  |
| Total Rooms |  |
| Stacks |  |
| Fireplace(s) |  |
| Gasement Floor |  |
| Attic |  |
| Frame |  |
| Traffic |  |
|  |  |

Building Layout
(http://images.vgsi.com/photos/OrangeCTPhotos//Sketches/5703_5703.jps

| Building Sub-Areas (sq ft) | Legend |
| :---: | :---: |
| No Data for Building Sub-Areas |  |

## Extra Features

| Extra Features | Legend |
| :--- | :--- |
| No Data for Extra Features |  |

## Land

| Use Code | 510 E | Size (Acres) | 0.62 |
| :--- | :--- | :--- | :---: |
| Description | Exempt Vac | Frontage |  |
| Zone | RES | Depth |  |
| Neighborhood | 010 | Assessed Value | $\$ 109,800$ |
| Alt Land Appr | No | Appraised Value | $\$ 156,900$ |
| Category |  |  |  |

Outbuildings

| Outbuildings |  |  |  |  |  |  |  |  | Legend |  |
| :--- | :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Code | Description | Sub Code | Sub Description | Size | Value | Bldg \# |  |  |  |  |
| SHD7 | Cell Shed |  |  | 240 UNITS | $\$ 13,500$ |  |  |  |  |  |

## Valuation History

| Appraisal |  |  |  |
| :---: | :---: | :---: | :---: |
| Valuation Year | Improvements | Land | Total |
| 2019 | \$13,500 | \$156,900 | \$170,400 |
| 2018 | \$13,500 | \$156,900 | \$170,400 |
| 2017 | \$13,500 | \$156,900 | \$170,400 |


| Assessment |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- |
|  | Valuation Year | Improvements | Land |  |  |
| 2019 |  | $\$ 9,500$ | $\$ 109,800$ | Total |  |
| 2018 |  | $\$ 9,500$ | $\$ 109,800$ |  |  |
| 2017 | $\$ 9,500$ | $\$ 109,800$ | $\$ 119,300$ |  |  |

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## Google Maps 700 Grassy Hill Rd



Imagery ©2020 Maxar Technologies, New York GIS, USDA Farm Service Agency, Map data ©2020 200 ft


## 700 Grassy Hill Rd

Orange, CT 06477
Building


Directions


Save


Nearby


Send to your phone

## Exhibit C

## Construction Drawings

T. "Mobile".

## T-MOBILE SITE NUMBER: CT11083Q <br> T-MOBILE SITE NAME: CT083/SPRINT/GRASSY HILL <br> T-MOBILE PROJECT:

BUSINESS UNIT \#: SITE ADDRESS: COUNTY: SITE TYPE:
TOWER HEIGHT:

881541 700 GRASSY HLLL RD
ORANGE, CT 06477 NEW HAVEN MONOPOLE 140'-0"

| SITE INFORMATION |  |
| :---: | :---: |
| crown castle usa inc. Stit name: | rogers property |
| SITE ADDRESS: | 700 GRASSY HILL RD |
| county: | new haven |
| MAP/PARCEL \#: | N/A |
| area of Construction: | Existing |
| Lattitude: | $41^{19177.75 "}$ |
| longitude: | -730933.27" |
| Lat/Long type: | NAD83 |
| ground elevation: | $87.0{ }^{\text {² }}$ |
| Current zoning: | town of orange |
| jurisdiction: | Ct-Connecticut sitting council |
| occupancy classification: | U |
| tYpe of Construction: | IIB |
| a.d.a. Compliance: | FACILITY IS UNMANNED AND NOT FOR human habitation |
| PROPERTY OWNER: | $\begin{aligned} & \text { N/A } \\ & \text { N } / A \\ & N / A \end{aligned}$ |
| Tower owner: | CROWN CASTLE <br> 2000 CORPORATE DRIVE <br> CANONSBURG, PA 15317 |
| Carrier/Applicant: | T-MOBILE 12920 SE 38TH STREET bellevue, Wa 98006 |
| Electric provider: | ${ }_{800-722-5584}^{\text {UNITED }}$. |
| telco provider: | AT\&т Moblity NONE |




PROJECT DESCRIPTION
 BROADBAND CONNECTVITY AND CAPA
EXISTING ELIGIBLE WTRELESS FACIITTY.
TOWER SCOPE OF WORK:




GROUND SCOPE OF WORK:

- REMOVE (1) DUS41
- RMOVE (1) XMU
- $\operatorname{INSTALLL}$ (2) BB 6 630



## CROWN CASTLE corporate park drive, sutite 101 <br> Kimley")Horn



T-MOBILE SITE NUMBER: CT11083Q
BU \#: 881541
BU \#: 881541
ROGERS PROPERTY
700 GRASSY HILL RD ORANGE, CT 06477

Existing 140'-0" MONOPOLE
ISSUED FOR:


| SHEET NUMBER: |  |
| :---: | :---: |
| $\square-1$ | 0 |
| REVIION: |  |

crown caste UsA nc. Ste Acturr reourewens.

为
 Nom and为
 and
















CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:






Hooks, UNLESS NOTED OTHERMSE. YELD STRENGTH (Fy) OF STANDARD DEFORMED BARS ARE




R EARTH OR WEATHER:











## Exhibit D

## Structural Analysis Report

Date: June 14, 2019
Heather Simeone
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277

Subject:
Carrier Designation:

## Engineering Firm Designation:

Site Data:

## Structural Analysis Report

T-Mobile Co-Locate Carrier Site Number: Carrier Site Name:

CT11083Q CT083/Sprint/Grassy Hill

## Crown Castle BU Number: 881541

Crown Castle Site Name: Crown Castle JDE Job Number:

ROGERS PROPERTY 559347
Crown Castle Work Order Number: 1755309 Crown Castle Order Number: 479806 Rev. 0

Destek Engineering, LLC. Project Number: 1902113
700 Grassy Hill Road, Orange, New Haven County, CT Latitude $41^{\circ} 17^{\prime} 7.75 "$ ", Longitude $-73^{\circ} 2^{\prime} 33.27 "$
139.5 Foot - Monopole Tower

Dear Heather Simeone,
Destek Engineering, LLC. is pleased to submit this "Structural Analysis Report" to determine the structural integrity of the above mentioned tower.

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

LC7: Proposed Equipment Configuration
Sufficient Capacity, 79.3\%
This analysis utilizes an ultimate 3 -second gust wind speed of 125 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural analysis prepared by: Mehmet Ali Zeytun
Respectfully submitted by:

Ahmet Colakoglu, PE
President


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tnxTower Output

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Additional Calculations

## 1) INTRODUCTION

This tower is a 139.5 ft Monopole tower designed by Engineered Endeavors, Inc. The tower has been modified per reinforcement drawing prepared by B+T Group, in October of 2013. Reinforcement consist of addition of base plate stiffeners.

## 2) ANALYSIS CRITERIA

TIA-222 Revision:
Risk Category:
Wind Speed:
Exposure Category:
Topographic Factor: Ice Thickness (Ultimate):
Wind Speed with Ice:
Service Wind Speed:

TIA-222-H
II
125 mph
C
1
1.5 in

50 mph
60 mph

Table 1 - Proposed Equipment Configuration

| Mounting Level (ft) | Center Line Elevation (ft) | $\begin{gathered} \text { Number } \\ \text { of } \\ \text { Antennas } \end{gathered}$ | Antenna Manufacturer | Antenna Model | Number of Feed Lines | Feed Line Size (in) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 110.0 | 110.0 | 3 | ericsson | ERICSSON AIR 21 B2A B4P w/ Mount Pipe | 10 | 1-5/8 |
|  |  | 3 | ericsson | ERICSSON AIR 21 B4A B2P w/ Mount Pipe |  |  |
|  |  | 3 | ericsson | KRY 112 144/1 |  |  |
|  |  | 3 | ericsson | RADIO 4449 B12/B71 |  |  |
|  |  | 3 | rfs celwave | APXVAARR24_43-UNA20 w/ Mount Pipe |  |  |
|  |  | 1 | site pro 1 | PRK-SFS |  |  |
|  |  | 1 | perfect 10 | PV-PKPB-M |  |  |
|  |  | 1 | tower mounts | T-Arm Mount [TA 602-3] |  |  |

Table 2 - Other Considered Equipment

| Mounting Level (ft) | Center Line Elevation (ft) | $\begin{aligned} & \text { Number } \\ & \text { of } \\ & \text { Antennas } \end{aligned}$ | Antenna Manufacturer | Antenna Model | Number of Feed Lines | Feed Line Size (in) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 136.0 | 140.0 | 3 | ericsson | RRUS 11 B12 | 216 | $\begin{gathered} 3 / 8 \\ 5 / 8 \\ 1-5 / 8 \end{gathered}$ |
|  |  | 3 | ericsson | RRUS12/RRUS A2 |  |  |
|  |  | 6 | powerwave technologies | LGP21401 |  |  |
|  |  | 1 | raycap | DC6-48-60-18-8F |  |  |
|  | 139.0 | 3 | cci antennas | HPA-65R-BUU-H6 w/ Mount Pipe |  |  |
|  |  | 3 | kathrein | 80010121 w/ Mount Pipe |  |  |
|  | 136.0 | 1 | tower mounts | T-Arm Mount [TA 702-3] |  |  |
| 132.0 | 132.0 | 3 | alcatel lucent | 1900MHZ RRH (65MHZ) | - | - |
|  |  | 3 | alcatel lucent | 800MHZ RRH |  |  |
|  |  | 1 | tower mounts | Side Arm Mount [SO 102-3] |  |  |


| Mounting Level (ft) | Center Line Elevation (ft) | $\left\|\begin{array}{c} \text { Number } \\ \text { of } \\ \text { Antennas } \end{array}\right\|$ | Antenna Manufacturer | Antenna Model | Number of Feed Lines |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 130.0 | 134.0 | 1 | andrew | VHLP2-11 | 433 | $\begin{gathered} 1-1 / 4 \\ 5 / 16 \\ 7983 A \end{gathered}$ |
|  | 132.0 | 1 | dragonwave | A-ANT-23G-2-C |  |  |
|  |  | 3 | argus technologies | LLPX310R w/ Mount Pipe |  |  |
|  | 130.0 | 3 | alcatel lucent | 800 EXTERNAL NOTCH FILTER |  |  |
|  |  | 3 | alcatel lucent | TD-RRH8X20-25 |  |  |
|  |  | 9 | rfs celwave | ACU-A20-N |  |  |
|  |  | 3 | rfs celwave | APXVSPP18-C-A20 w/ Mount Pipe |  |  |
|  |  | 3 | rfs celwave | APXVTM14-ALU-I20 w/ Mount Pipe |  |  |
|  |  | 3 | samsung telecommunications | FDD_R6_RRH |  |  |
|  |  | 1 | tower mounts | Sector Mount [SM 901-3] |  |  |
| 119.0 | 119.0 | 3 | alcatel lucent | RRH2X40-AWS | 112 | $\begin{aligned} & 1-1 / 4 \\ & 1-5 / 8 \end{aligned}$ |
|  |  | 3 | antel | $\begin{gathered} \text { BXA-171063-8BF-EDIN-0 } \\ \text { w/ Mount Pipe } \end{gathered}$ |  |  |
|  |  | 3 | antel | $\begin{aligned} & \text { BXA-70063-6CF-EDIN-0 } \\ & \text { w/ Mount Pipe } \end{aligned}$ |  |  |
|  |  | 6 | decibel | DB846F65ZAXY w/ Mount Pipe |  |  |
|  |  | 3 | rymsa wireless | MG D3-800TX w/ Mount Pipe |  |  |
|  |  | 1 | tower mounts | T-Arm Mount [TA 602-3] |  |  |
| 100.0 | 100.0 | 3 | rfs celwave | APXV18-206517S-C w/ Mount Pipe | 6 | 1-5/8 |
| 75.0 | 77.0 | 1 | lucent | KS24019-L112A | 1 | 1/2 |
|  | 75.0 | 1 | tower mounts | Side Arm Mount [SO 701-1] |  |  |

## 3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

| Document | Remarks | Reference | Source |
| :---: | :---: | :---: | :---: |
| 4-GEOTECHNICAL REPORTS | Dr. Clarence Welti, P.E., P.C., <br> dated 2/16/2004 | 2245154 | CCISITES |
| 4-TOWER FOUNDATION <br> DRAWINGS/DESIGN/SPECS | Engineered Endeavors <br> Incorporated, Proj.\# 12364, <br> dated 8/9/2004 | 2208511 | CCISITES |
| 4-TOWER MANUFACTURER | Engineered Endeavors <br> DRAWINGS | Incorporated, Proj.\# 12364, <br> dated 8/9/2004 | 2207700 |
| 4-MOUNT REINFORCEMENT <br> DESIGN/DRAWINGS/DATA | MasTec Network Solutions, Proj.\# <br> 18545-MOD1, dated 04/26/2019 | 8447364 | CCISITES |
| 4-TOWER REINFORCEMENT <br> DESIGN/DRAWINGS/DATA | B+T GRP, WO\# 661413, <br> dated 10/24/2013 | 4024239 | CCISITES |
| 4-POST-MODIFICATION <br> INSPECTION | SGS, Proj.\# 130629, <br> dated 2/6/2014 | 4432995 | CCISITES |
| 4-TOWER STRUCTURAL | Jacobs Engineering Group, Inc., <br> ANALYSIS REPORTS | 6928837 | CCISITES |

## 3.1) Analysis Method

tnxTower (version 8.0.5.0), 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) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
This analysis may be affected if any assumptions are not valid or have been made in error. Destek Engineering, LLC. should be notified to determine the effect on the structural integrity of the tower.

## 4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

| Section <br> No. | Elevation (ft) | Component <br> Type | Size | Critical <br> Element | P (K) | SF*P_allow <br> (K) | \% <br> Capacity | Pass / Fail |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| L1 | $139.5-93.04$ | Pole | TP26.99x15.5x0.25 | 1 | -12.43 | 1256.07 | 68.5 | Pass |
| L2 | $93.04-46.38$ | Pole | TP37.91x25.5205x0.375 | 2 | -23.49 | 2650.21 | 68.2 | Pass |
| L3 | $46.38-0$ | Pole | TP48.5x35.874x0.375 | 3 | -39.74 | 3518.48 | 79.3 | Pass |
|  |  |  |  |  |  |  | Summary |  |
|  |  |  |  |  |  | Pole (L3) | 79.3 | Pass |
|  |  |  |  |  | Rating $=$ | 79.3 | Pass |  |

Table 5 - Tower Component Stresses vs. Capacity - LC7

| Notes | Component | Elevation (ft) | \% Capacity | Pass / Fail |
| :---: | :---: | :---: | :---: | :---: |
| 1 | Anchor Rods | 0 | 66.1 | Pass |
| 1 | Base Plate | 0 | 69.0 | Pass |
| 1 | Base Foundation | 0 | 42.6 | Pass |
| 1 | Base Foundation <br> Soil Interaction | 0 | 43.5 | Pass |

Structure Rating (max from all components) =

Notes:

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

## 4.1) Recommendations

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

## APPENDIX A

## TNXTOWER OUTPUT



| Destek Engineering, LLC. 1281 Kennestone Cir. Suite 100 |  | ${ }^{\text {Job: }} 881541$ - ROGERS PROPOERTY |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  | Project: 1902113 |  |  |
|  |  | Client: Crown Castle | Drawn by: | App'd: |
|  | Phone: (770) 693-0835 | Code: TIA-222-H | Date: 06/14/19 | Scale: NTS |
|  | FAX: |  |  | Dwg No. E-1 |

## Tower Input Data

The tower is a monopole.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

1) Tower is located in New Haven County, Connecticut.
2) Tower base elevation above sea level: 91.00 ft .
3) Basic wind speed of 125 mph .
4) Risk Category II.
5) Exposure Category C.
6) Simplified Topographic Factor Procedure for wind speed-up calculations is used.
7) Topographic Category: 1.
8) Crest Height: 0.00 ft .
9) Nominal ice thickness of 1.5000 in.
10) Ice thickness is considered to increase with height.
11) Ice density of 56 pcf.
12) A wind speed of 50 mph is used in combination with ice.
13) Temperature drop of $50^{\circ} \mathrm{F}$.
14) Deflections calculated using a wind speed of 60 mph .
15) TIA-222-H Annex S.
16) A non-linear (P-delta) analysis was used.
17) Pressures are calculated at each section.
18) Stress ratio used in pole design is 1.05 .
19) Tower analysis based on target reliabilities in accordance with Annex S.
20) Load Modification Factors used: $\mathrm{K}_{\mathrm{es}}\left(\mathrm{F}_{\mathrm{w}}\right)=0.95$, $\mathrm{K}_{\mathrm{es}}\left(\mathrm{t}_{\mathrm{i}}\right)=0.85$.
21) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

## Options

Consider Moments - Legs
Consider Moments - Horizontals
Consider Moments - Diagonals
Use Moment Magnification
Use Code Stress Ratios
Use Code Safety Factors - Guys
Escalate Ice
Always Use Max Kz
Use Special Wind Profile
Include Bolts In Member Capacity
Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided)
SR Members Have Cut Ends
SR Members Are Concentric

Distribute Leg Loads As Uniform Assume Legs Pinned
$\checkmark$ Assume Rigid Index Plate
$\checkmark$ Use Clear Spans For Wind Area
Use Clear Spans For KL/r
Retension Guys To Initial Tension
$\checkmark$ Bypass Mast Stability Checks
$\checkmark$ Use Azimuth Dish Coefficients
$\checkmark$ Project Wind Area of Appurt.
Autocalc Torque Arm Areas
Add IBC .6D+W Combination Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Treat Feed Line Bundles As Cylinder Ignore KL/ry For 60 Deg. Angle Legs

Use ASCE 10 X-Brace Ly Rules
Calculate Redundant Bracing Forces
Ignore Redundant Members in FEA
SR Leg Bolts Resist Compression
All Leg Panels Have Same Allowable
Offset Girt At Foundation
$\checkmark$ Consider Feed Line Torque
Include Angle Block Shear Check
Use TIA-222-H Bracing Resist.
Exemption
Use TIA-222-H Tension Splice
Exemption

## Poles

$\sqrt{ }$ Include Shear-Torsion Interaction
Always Use Sub-Critical Flow
Use Top Mounted Sockets
Pole Without Linear Attachments
Pole With Shroud Or No
Appurtenances
Outside and Inside Corner Radii Are
Known

## Tapered Pole Section Geometry

| Section | Elevation | 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 | $139.50-93.04$ | 46.46 | 3.92 | 18 | 15.5000 | 26.9900 | 0.2500 | 0.3750 | A572-65 |
|  |  |  |  |  |  |  |  |  | (65 ksi) |

139.5 Ft Monopole Tower Structural Analysis

Project Number 1902113, Order 479806, Revision 0

| Section | Elevation ft | Section <br> Length ft | Splice <br> Length ft | Number of Sides | Top Diameter in | Bottom Diameter in | Wall Thickness in | Bend Radius in | Pole Grade |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| L2 | 93.04-46.38 | 50.58 | 5.25 | 18 | 25.5205 | 37.9100 | 0.3750 | 0.5625 | $\begin{gathered} \text { A572-65 } \\ (65 \mathrm{ksi}) \end{gathered}$ |
| L3 | 46.38-0.00 | 51.63 |  | 18 | 35.8740 | 48.5000 | 0.3750 | 0.5625 | $\begin{gathered} \text { A572-65 } \\ (65 \mathrm{ksi}) \end{gathered}$ |

Tapered Pole Properties

| Section | Tip Dia. <br> in | Area <br> $i n^{2}$ | $l$ <br> $i n^{4}$ | $r$ <br> in | $C$ <br> $i n$ | $I / C$ <br> $i n^{3}$ | $J$ <br> $i n^{4}$ | $I t / Q$ <br> $i n^{2}$ | $w$ <br> $i n$ | $w / t$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| L1 | 15.7198 | 12.1009 | 355.5445 | 5.4138 | 7.8740 | 45.1542 | 711.5567 | 6.0516 | 2.5080 | 10.032 |
|  | 27.3871 | 21.2182 | 1916.7638 | 9.4927 | 13.7109 | 139.7983 | 3836.0497 | 10.6111 | 4.5302 | 18.121 |
| L2 | 26.8603 | 29.9295 | 2390.8862 | 8.9267 | 12.9644 | 184.4188 | 4784.9184 | 14.9676 | 4.1616 | 11.098 |
|  | 38.4659 | 44.6760 | 7952.1562 | 13.3249 | 19.2583 | 412.9214 | 15914.776 | 22.3423 | 6.3422 | 16.912 |
|  |  |  |  |  |  |  | 0 |  |  |  |
| L3 | 37.7022 | 42.2527 | 6727.0540 | 12.6022 | 18.2240 | 369.1315 | 13462.959 | 21.1304 | 5.9838 | 15.957 |
|  |  |  |  |  |  |  | 7 |  |  |  |
|  | 49.2193 | 57.2808 | 16760.534 | 17.0844 | 24.6380 | 680.2717 | 33543.123 | 28.6458 | 8.2060 | 21.883 |
|  |  |  | 6 |  |  |  | 2 |  |  |  |


| Tower Elevation | Gusset | Gusset | Gusset Grade Adjust. Factor $A_{f}$ | Adjust. Factor $A_{r}$ | Weight Mult. | Double Angle Double Angle Double Angle |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Area (per face) | Thickness |  |  |  | Stitch Bolt Spacing | Stitch Bolt Spacing | Stitch Bolt Spacing |
| ft | $f t^{2}$ | in |  |  |  | Diagonals in | Horizontals in | Redundants in |
| L1 139.50- |  |  | 1 | 1 | 1 |  |  |  |
| 93.04 |  |  |  |  |  |  |  |  |
| L2 93.04- |  |  | 1 | 1 | 1 |  |  |  |
| 46.38 |  |  |  |  |  |  |  |  |
| L3 46.38-0.00 |  |  | 1 | 1 | 1 |  |  |  |

Feed Line/Linear Appurtenances - Entered As Round Or Flat

| Description | Sector | Exclude From Torque Calculation | Componen <br> $t$ <br> Type | Placement ft | Total Number | Number Per Row | Start/En $d$ Position | Width or Diamete $r$ in | Perimete $r$ in | Weight <br> plf |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{gathered} \text { HB114-21U3M12- } \\ \text { XXF(1-1/4) } \end{gathered}$ | A | No | Surface Ar (CaAa) | $\begin{gathered} 130.00- \\ 0.00 \end{gathered}$ | 1 | 1 | $\begin{aligned} & 0.490 \\ & 0.490 \end{aligned}$ | 1.5400 |  | 1.22 |
| 7983A(ELLIPTICAL) | A | No | Surface Ar (CaAa) | $\begin{gathered} 130.00- \\ 0.00 \end{gathered}$ | 1 | 1 | $\begin{aligned} & 0.000 \\ & 0.000 \end{aligned}$ | 0.0000 |  | 0.08 |
| 7983A(ELLIPTICAL) | A | No | $\begin{aligned} & \text { Surface Ar } \\ & (\mathrm{CaAa}) \end{aligned}$ | $\begin{gathered} 130.00- \\ 0.00 \end{gathered}$ | 2 | 2 | $\begin{aligned} & 0.200 \\ & 0.230 \end{aligned}$ | 0.5730 |  | 0.08 |
| 2" Rigid Conduit | A | No | Surface Ar (CaAa) | $\begin{gathered} 130.00- \\ 0.00 \end{gathered}$ | 2 | 2 | $\begin{aligned} & 0.150 \\ & 0.200 \end{aligned}$ | 2.0000 |  | 2.80 |
| $\begin{gathered} \text { HCS } \underset{* * *}{5 / 8)} 12 \text { 4AWG(1- } \end{gathered}$ | B | No | Surface Ar (CaAa) | $\begin{gathered} 110.00- \\ 0.00 \end{gathered}$ | 4 | 4 | $\begin{aligned} & 0.050 \\ & 0.200 \end{aligned}$ | 1.6600 |  | 2.40 |

## Feed Line/Linear Appurtenances - Entered As Area

| Description | $\begin{gathered} \text { Face } \\ \text { or } \\ \text { Leg } \end{gathered}$ | Allow Shield | Exclude From <br> Torque Calculation | $\begin{gathered} \text { Componen } \\ t \\ \text { Type } \end{gathered}$ | Placement ft | Total Number |  | $C_{A} A_{A}$ $f t^{2} / f t$ | Weight <br> plf |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Safety Line 3/8 | C | No | No | CaAa (Out Of Face) | 139.50-0.00 | 1 | No Ice 1/2" Ice 1" Ice | $\begin{aligned} & 0.04 \\ & 0.14 \\ & 0.24 \end{aligned}$ | $\begin{aligned} & 0.22 \\ & 0.75 \\ & 1.28 \end{aligned}$ |


| Description | Face or Leg | Allow <br> Shield | Exclude From Torque Calculation | $\begin{gathered} \text { Componen } \\ t \\ \text { Type } \end{gathered}$ | Placement <br> ft | Total Number |  | $C_{A} A_{A}$ $f t^{2} / f t$ | Weight plf |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  | 2" Ice | 0.44 | 2.34 |
| ***136'*** |  |  |  |  |  |  |  |  |  |
| LDF7-50A(1-5/8) |  |  |  |  |  |  | 1/2" Ice | 0.00 | 0.82 |
|  |  |  |  |  |  |  | 1" Ice | 0.00 | 0.82 |
|  |  |  |  |  |  |  | 2" Ice | 0.00 | 0.82 |
| $\begin{aligned} & \text { FB-L98B-002- } \\ & 75000(3 / 8) \end{aligned}$ | B | No | No | Inside Pole | 136.00-0.00 | 2 | No Ice | 0.00 | 0.06 |
|  |  |  |  |  |  |  | $1 / 2 \text { " Ice }$ | $0.00$ | $0.06$ |
|  |  |  |  |  |  |  | 1 " Ice | 0.00 | 0.06 |
|  |  |  |  |  |  |  | 2 " Ice | 0.00 | 0.06 |
| WR-VG82STBRDA(5/8) | B | No | No | Inside Pole | 136.00-0.00 | 1 | No Ice | 0.00 | 0.31 |
|  |  |  |  |  |  |  | 1/2" Ice | 0.00 | 0.31 |
|  |  |  |  |  |  |  | 1 " Ice | 0.00 | 0.31 |
|  |  |  |  |  |  |  | 2" Ice | 0.00 | 0.31 |
| 2" Rigid Conduit | B | No | No | Inside Pole | 136.00-0.00 | 1 | No Ice | 0.00 | 2.80 |
|  |  |  |  |  |  |  | 1/2" Ice | 0.00 | 2.80 |
|  |  |  |  |  |  |  | 1 " Ice | 0.00 | 2.80 |
|  |  |  |  |  |  |  | 2 Ice | 0.00 | 2.80 |
| ***130' *** |  |  |  |  |  |  |  |  |  |
| $\begin{gathered} \text { HB114-1-0813U4- } \\ \text { M5J(1-1/4) } \end{gathered}$ | A | No | No | Inside Pole | 130.00-0.00 | 3 | No Ice | 0.00 | 1.20 |
|  |  |  |  |  |  |  | 1/2" Ice | 0.00 | 1.20 |
|  |  |  |  |  |  |  | 1 " Ice | 0.00 | 1.20 |
|  |  |  |  |  |  |  | 2" Ice | 0.00 | 1.20 |
| 9207(5/16) | A | No | No | Inside Pole | 130.00-0.00 | 3 | No Ice | 0.00 | 0.06 |
|  |  |  |  |  |  |  | 1/2" Ice | 0.00 | 0.06 |
|  |  |  |  |  |  |  | 1 " Ice | 0.00 | 0.06 |
|  |  |  |  |  |  |  | 2 Ice | 0.00 | 0.06 |
| ***119' ** |  |  |  |  |  |  |  |  |  |
| 561(1-5/8) | A | No | No | Inside Pole | 119.00-0.00 | 12 | No Ice | 0.00 | 1.35 |
|  |  |  |  |  |  |  | 1/2" Ice | 0.00 | 1.35 |
|  |  |  |  |  |  |  | 1" Ice | 0.00 | 1.35 |
|  |  |  |  |  |  |  | 2" Ice | 0.00 | 1.35 |
| LDF6-50A(1-1/4) | A | No | No | Inside Pole | 119.00-0.00 | 1 | No lce | 0.00 | 0.60 |
|  |  |  |  |  |  |  | $1 / 2 \text { " Ice }$ | 0.00 | 0.60 |
|  |  |  |  |  |  |  | 1 " Ice | 0.00 | 0.60 |
|  |  |  |  |  |  |  | 2" Ice | 0.00 | 0.60 |
|  |  |  |  |  |  |  |  |  |  |
| LDF7-50A(1-5/8) | B | No | No | Inside Pole | 110.00-0.00 | 6 |  |  | 0.82 |
|  |  |  |  |  |  |  | $1 / 2^{\prime \prime} \text { Ice }$ | 0.00 | 0.82 |
|  |  |  |  |  |  |  | 1 " Ice | 0.00 | 0.82 |
|  |  |  |  |  |  |  | 2" Ice | 0.00 | 0.82 |
| ***100' *** 0 |  |  |  |  |  |  |  |  |  |
| CR 50 1873(1-5/8) | B | No | No | Inside Pole | 100.00-0.00 | 6 |  | 0.00 | 0.83 |
|  |  |  |  |  |  |  | $1 / 2^{\prime \prime} \text { Ice }$ | 0.00 | 0.83 |
|  |  |  |  |  |  |  | 1 " Ice | 0.00 | 0.83 |
|  |  |  |  |  |  |  | 2 ' Ice | 0.00 | 0.83 |
| ***75 ** |  |  |  |  |  |  |  |  |  |
| LDF4-50A(1/2) | B | No | No | Inside Pole | 75.00-0.00 | 1 |  | 0.00 | 0.15 |
|  |  |  |  |  |  |  | 1/2" Ice | 0.00 | 0.15 |
|  |  |  |  |  |  |  | 1 " Ice | 0.00 | 0.15 |
|  |  |  |  |  |  |  | 2 " Ice | 0.00 | 0.15 |
| *** |  |  |  |  |  |  |  |  |  |

Feed Line/Linear Appurtenances Section Areas

| Tower <br> Sectio | Tower <br> Elevation <br> $n$ | ft |  | $A_{R}$ | $A_{F}$ | $C_{A} A_{A}$ <br> $\operatorname{In}$ Face <br> $f t^{2}$ | $C_{A} A_{A}$ <br> Out Face |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| L1 | $139.50-93.04$ | A | 0.000 | 0.000 | 24.711 | 0.000 | Weight |
|  |  | B | 0.000 | 0.000 | 11.261 | 0.000 | 0.84 |
|  |  | C | 0.000 | 0.000 | 0.000 | 1.742 | 0.63 |
| L2 | $93.04-46.38$ | A | 0.000 | 0.000 | 31.197 | 0.000 | 1.29 |
|  |  | B | 0.000 | 0.000 | 30.982 | 0.000 | 1.29 |

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| Tower <br> Sectio | Tower <br> Elevation <br> $n$ | Ftace | $A_{R}$ | $A_{F}$ | $C_{A} A_{A}$ <br> In Face | $C_{A} A_{A}$ <br> Out Face | Weight |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | $f t^{2}$ | $f t^{2}$ | $f t^{2}$ | $f t^{2}$ | K |
|  |  | C | 0.000 | 0.000 | 0.000 | 1.750 | 0.01 |
|  | $46.38-0.00$ | A | 0.000 | 0.000 | 31.010 | 0.000 | 1.28 |
|  |  | B | 0.000 | 0.000 | 30.796 | 0.000 | 1.29 |
|  |  | C | 0.000 | 0.000 | 0.000 | 1.739 | 0.01 |

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

\begin{tabular}{|c|c|c|c|c|c|c|c|c|}
\hline \begin{tabular}{l}
Tower Sectio \\
n
\end{tabular} \& Tower Elevation ft \& \[
\begin{gathered}
\text { Face } \\
\text { or } \\
\text { Leg }
\end{gathered}
\] \& Ice Thickness in \& AR

$f t^{2}$ \& AF

$f t^{2}$ \& $C_{A} A_{A}$ In Face $f^{2}$ \& $$
\begin{gathered}
C_{A} A_{A} \\
\text { Out Face } \\
{f t^{2}}^{2}
\end{gathered}
$$ \& Weight

K <br>
\hline \multirow[t]{3}{*}{L1} \& \multirow[t]{3}{*}{139.50-93.04} \& A \& \multirow[t]{3}{*}{1.444} \& 0.000 \& 0.000 \& 77.493 \& 0.000 \& 1.60 <br>
\hline \& \& B \& \& 0.000 \& 0.000 \& 20.199 \& 0.000 \& 0.83 <br>
\hline \& \& C \& \& 0.000 \& 0.000 \& 0.000 \& 15.158 \& 0.08 <br>
\hline \multirow[t]{3}{*}{L2} \& \multirow[t]{3}{*}{93.04-46.38} \& A \& \multirow[t]{3}{*}{1.372} \& 0.000 \& 0.000 \& 97.831 \& 0.000 \& 2.26 <br>
\hline \& \& B \& \& 0.000 \& 0.000 \& 55.570 \& 0.000 \& 1.84 <br>
\hline \& \& C \& \& 0.000 \& 0.000 \& 0.000 \& 15.223 \& 0.08 <br>
\hline \multirow[t]{3}{*}{L3} \& \multirow[t]{3}{*}{46.38-0.00} \& A \& \multirow[t]{3}{*}{1.231} \& 0.000 \& 0.000 \& 94.250 \& 0.000 \& 2.17 <br>
\hline \& \& B \& \& 0.000 \& 0.000 \& 54.405 \& 0.000 \& 1.80 <br>
\hline \& \& C \& \& 0.000 \& 0.000 \& 0.000 \& 14.467 \& 0.08 <br>
\hline
\end{tabular}

|  |  | Feed Line Center of Pressure |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Elevation | $C P_{x}$ | $C P_{z}$ | $C P_{x}$ | $C P_{z}$ |  |
| Section | ft | in | in | $I c e$ | in |  |
|  | ine |  |  |  |  |  |
|  | $139.50-93.04$ | -0.1420 | -2.8203 | -1.2857 | -2.6359 |  |
| L1 | $93.04-46.38$ | 1.4657 | -3.5960 | -0.3604 | -3.4911 |  |
| L2 | $46.38-0.00$ | 1.6093 | -3.9516 | -0.3808 | -4.0499 |  |
| L3 |  |  |  |  |  |  |

Note: For pole sections, center of pressure calculations do not consider feed line shielding.

## Shielding Factor Ka

| Tower Section | Feed Line Record No. | Description | Feed Line Segment Elev. | Ka No lce | $\begin{aligned} & K_{a} \\ & \text { Ice } \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| L1 | 9 | HB114-21U3M12-XXXF(1- <br> 1/4) | $\begin{aligned} & 93.04- \\ & 130.00 \end{aligned}$ | 1.0000 | 1.0000 |
| L1 | 11 | 7983A(ELLIPTICAL) | $\begin{aligned} & 93.04- \\ & 130.00 \end{aligned}$ | 1.0000 | 1.0000 |
| L1 | 12 | 7983A(ELLIPTICAL) | $\begin{aligned} & 93.04- \\ & 130.00 \end{aligned}$ | 1.0000 | 1.0000 |
| L1 | 13 | 2" Rigid Conduit | $\begin{aligned} & 93.04- \\ & 130.00 \end{aligned}$ | 1.0000 | 1.0000 |
| L1 | 20 | HCS 6X12 4AWG(1-5/8) | $\begin{aligned} & 93.04- \\ & 110.00 \end{aligned}$ | 1.0000 | 1.0000 |
| L2 | 9 | HB114-21U3M12-XXXF(1- <br> 1/4) | $\begin{array}{r} 46.38- \\ 93.04 \end{array}$ | 1.0000 | 1.0000 |
| L2 | 11 | 7983A(ELLIPTICAL) | $\begin{array}{r} 46.38- \\ 93.04 \end{array}$ | 1.0000 | 1.0000 |
| L2 | 12 | 7983A(ELLIPTICAL) | $\begin{array}{r} 46.38- \\ 93.04 \end{array}$ | 1.0000 | 1.0000 |
| L2 | 13 | 2" Rigid Conduit | $\begin{array}{r} 46.38- \\ 93.04 \end{array}$ | 1.0000 | 1.0000 |

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139.5 Ft Monopole Tower Structural Analysis

| Tower <br> Section | Feed Line <br> Record No. | Description | Feed Line <br> Segment <br> Elev. | $K_{a}$ <br> No Ice | $K_{a}$ <br> Ice |
| ---: | ---: | ---: | ---: | ---: | ---: |
| L2 | 20 | HCS 6X12 4AWG(1-5/8) | $46.38-$ <br> 93.04 | 1.0000 | 1.0000 |

Discrete Tower Loads

| Description | $\begin{gathered} \text { Face } \\ \text { or } \\ \text { Leg } \end{gathered}$ | Offset <br> Type | Offsets: Horz Lateral Vert ft ft ft | Azimuth Adjustmen $t$ | Placement |  | $C_{A} A_{A}$ Front $f t^{2}$ | $C_{A} A_{A}$ Side <br> $f t^{2}$ | Weight |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| ***136' *** |  |  |  |  |  |  |  |  |  |
| 80010121 w/ Mount Pipe | A | From Leg | 4.00 | 0.0000 | 136.00 | No Ice | 5.39 | 4.60 | 0.07 |
|  |  |  | 0.00 |  |  | 1/2" | 5.81 | 5.35 | 0.11 |
|  |  |  | 3.00 |  |  | Ice | 6.23 | 6.05 | 0.17 |
|  |  |  |  |  |  | 1" Ice <br> 2" Ice | 7.10 | 7.48 | 0.30 |
| 80010121 w/ Mount Pipe | B | From Leg | 4.00 | 0.0000 | 136.00 | No Ice | 5.39 | 4.60 | 0.07 |
|  |  |  | 0.00 |  |  | 1/2" | 5.81 | 5.35 | 0.11 |
|  |  |  | 3.00 |  |  | Ice | 6.23 | 6.05 | 0.17 |
|  |  |  |  |  |  | 1" Ice | 7.10 | 7.48 | 0.30 |
|  |  |  |  |  |  | 2" Ice |  |  |  |
| 80010121 w/ Mount Pipe | C | From Leg | 4.00 | 0.0000 | 136.00 | No Ice | 5.39 | 4.60 | 0.07 |
|  |  |  | 0.00 |  |  | 1/2" | 5.81 | 5.35 | 0.11 |
|  |  |  | 3.00 |  |  | Ice | 6.23 | 6.05 | 0.17 |
|  |  |  |  |  |  | 1" Ice | 7.10 | 7.48 | 0.30 |
|  |  |  |  |  |  | 2" Ice |  |  |  |
| HPA-65R-BUU-H6 w/ Mount Pipe | A | From Leg | 4.00 | 0.0000 | 136.00 | No Ice | 9.22 | 6.25 | 0.07 |
|  |  |  | 0.00 |  |  | 1/2" | 9.98 | 6.96 | 0.14 |
|  |  |  | 3.00 |  |  | Ice | 10.76 | 7.70 | 0.22 |
|  |  |  |  |  |  | 1" Ice | 12.36 | 9.22 | 0.42 |
|  |  |  |  |  |  | 2" Ice |  |  |  |
| HPA-65R-BUU-H6 w/ Mount Pipe | B | From Leg | 4.00 | 0.0000 | 136.00 | No Ice | 9.22 | 6.25 | 0.07 |
|  |  |  | 0.00 |  |  | 1/2" | 9.98 | 6.96 | 0.14 |
|  |  |  | 3.00 |  |  | Ice | 10.76 | 7.70 | 0.22 |
|  |  |  |  |  |  | 1" Ice | 12.36 | 9.22 | 0.42 |
|  |  |  |  |  |  | 2" Ice |  |  |  |
| HPA-65R-BUU-H6 w/ Mount Pipe | C | From Leg | 4.00 | 0.0000 | 136.00 | No Ice | 9.22 | 6.25 | 0.07 |
|  |  |  | 0.00 |  |  | 1/2" | 9.98 | 6.96 | 0.14 |
|  |  |  | 3.00 |  |  | Ice | 10.76 | 7.70 | 0.22 |
|  |  |  |  |  |  | 1" Ice | 12.36 | 9.22 | 0.42 |
|  |  |  |  |  |  | 2" Ice |  |  |  |
| (2) LGP21401 | A | From Leg | 4.00 | 0.0000 | 136.00 | No Ice | 1.10 | 0.21 | 0.01 |
|  |  |  | 0.00 |  |  | 1/2" | 1.24 | 0.27 | 0.02 |
|  |  |  | 4.00 |  |  | Ice | 1.38 | 0.35 | 0.03 |
|  |  |  |  |  |  | 1" Ice | 1.69 | 0.52 | 0.05 |
|  |  |  |  |  |  | 2" Ice |  |  |  |
| (2) LGP21401 | B | From Leg | 4.00 | 0.0000 | 136.00 | No Ice | 1.10 | 0.21 | 0.01 |
|  |  |  | 0.00 |  |  | 1/2" | 1.24 | 0.27 | 0.02 |
|  |  |  | 4.00 |  |  | Ice | 1.38 | 0.35 | 0.03 |
|  |  |  |  |  |  | 1" Ice | 1.69 | 0.52 | 0.05 |
|  |  |  |  |  |  | 2" Ice |  |  |  |
| (2) LGP21401 | C | From Leg | 4.00 | 0.0000 | 136.00 | No Ice | 1.10 | 0.21 | 0.01 |
|  |  |  | 0.00 |  |  | 1/2" | 1.24 | 0.27 | 0.02 |
|  |  |  | 4.00 |  |  | Ice | 1.38 | 0.35 | 0.03 |
|  |  |  |  |  |  | 1" Ice | 1.69 | 0.52 | 0.05 |
|  |  |  |  |  |  | 2" Ice |  |  |  |
| RRUS 11 B12 | A | From Leg | 4.00 | 0.0000 | 136.00 | No Ice | 2.83 | 1.18 | 0.05 |
|  |  |  | 0.00 |  |  | 1/2" | 3.04 | 1.33 | 0.07 |
|  |  |  | 4.00 |  |  | Ice | 3.26 | 1.48 | 0.10 |
|  |  |  |  |  |  | 1" Ice | 3.71 | 1.83 | 0.15 |
|  |  |  |  |  |  | 2" Ice |  |  |  |

\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|}
\hline Description \& \[
\begin{gathered}
\text { Face } \\
\text { or } \\
\text { Leg }
\end{gathered}
\] \& \begin{tabular}{l}
Offset \\
Type
\end{tabular} \& \begin{tabular}{l}
Offsets: \\
Horz \\
Lateral Vert ft ft ft
\end{tabular} \& Azimuth Adjustmen \(t\) \& Placement

ft \& \& $C_{A} A_{A}$ Front

$$
f t^{2}
$$ \& $C_{A} A_{A}$ Side

$$
f t^{2}
$$ \& Weight

K <br>
\hline \multirow[t]{4}{*}{RRUS 11 B12} \& \multirow[t]{4}{*}{B} \& \multirow[t]{4}{*}{From Leg} \& 4.00 \& \multirow[t]{4}{*}{0.0000} \& \multirow[t]{4}{*}{136.00} \& No Ice \& 2.83 \& 1.18 \& 0.05 <br>
\hline \& \& \& 0.00 \& \& \& 1/2" \& 3.04 \& 1.33 \& 0.07 <br>
\hline \& \& \& \multirow[t]{2}{*}{4.00} \& \& \& Ice \& 3.26 \& 1.48 \& 0.10 <br>

\hline \& \& \& \& \& \& $$
\begin{aligned}
& \text { 1" Ice } \\
& \text { 2" Ice }
\end{aligned}
$$ \& 3.71 \& 1.83 \& 0.15 <br>

\hline \multirow[t]{4}{*}{RRUS 11 B12} \& \multirow[t]{4}{*}{C} \& \multirow[t]{4}{*}{From Leg} \& 4.00 \& \multirow[t]{4}{*}{0.0000} \& \multirow[t]{4}{*}{136.00} \& No Ice \& 2.83 \& 1.18 \& 0.05 <br>
\hline \& \& \& 0.00 \& \& \& 1/2" \& 3.04 \& 1.33 \& 0.07 <br>
\hline \& \& \& \multirow[t]{2}{*}{4.00} \& \& \& Ice \& 3.26 \& 1.48 \& 0.10 <br>

\hline \& \& \& \& \& \& $$
\begin{aligned}
& \text { 1" Ice } \\
& \text { 2" Ice }
\end{aligned}
$$ \& 3.71 \& 1.83 \& 0.15 <br>

\hline \multirow[t]{5}{*}{RRUS12/RRUS A2} \& \multirow[t]{5}{*}{A} \& \multirow[t]{5}{*}{From Leg} \& 4.00 \& \multirow[t]{5}{*}{0.0000} \& \multirow[t]{5}{*}{136.00} \& No Ice \& 3.14 \& 1.84 \& 0.07 <br>
\hline \& \& \& 0.00 \& \& \& 1/2" \& 3.36 \& 2.01 \& 0.10 <br>
\hline \& \& \& \multirow[t]{3}{*}{4.00} \& \& \& Ice \& 3.59 \& 2.20 \& 0.13 <br>
\hline \& \& \& \& \& \& 1" Ice \& 4.07 \& 2.59 \& 0.20 <br>
\hline \& \& \& \& \& \& 2" Ice \& \& \& <br>
\hline \multirow[t]{5}{*}{RRUS12/RRUS A2} \& \multirow[t]{5}{*}{B} \& \multirow[t]{5}{*}{From Leg} \& 4.00 \& \multirow[t]{5}{*}{0.0000} \& \multirow[t]{5}{*}{136.00} \& No Ice \& 3.14 \& 1.84 \& 0.07 <br>
\hline \& \& \& 0.00 \& \& \& 1/2" \& 3.36 \& 2.01 \& 0.10 <br>
\hline \& \& \& \multirow[t]{3}{*}{4.00} \& \& \& Ice \& 3.59 \& 2.20 \& 0.13 <br>
\hline \& \& \& \& \& \& 1" Ice \& 4.07 \& 2.59 \& 0.20 <br>
\hline \& \& \& \& \& \& 2" Ice \& \& \& <br>
\hline \multirow[t]{5}{*}{RRUS12/RRUS A2} \& \multirow[t]{5}{*}{C} \& \multirow[t]{5}{*}{From Leg} \& 4.00 \& \multirow[t]{5}{*}{0.0000} \& \multirow[t]{5}{*}{136.00} \& No Ice \& 3.14 \& 1.84 \& 0.07 <br>
\hline \& \& \& 0.00 \& \& \& 1/2" \& 3.36 \& 2.01 \& 0.10 <br>
\hline \& \& \& \multirow[t]{3}{*}{4.00} \& \& \& Ice \& 3.59 \& 2.20 \& 0.13 <br>
\hline \& \& \& \& \& \& 1" Ice \& 4.07 \& 2.59 \& 0.20 <br>
\hline \& \& \& \& \& \& 2" Ice \& \& \& <br>
\hline \multirow[t]{5}{*}{DC6-48-60-18-8F} \& \multirow[t]{5}{*}{A} \& \multirow[t]{5}{*}{From Leg} \& 4.00 \& \multirow[t]{5}{*}{0.0000} \& \multirow[t]{5}{*}{136.00} \& No Ice \& 0.79 \& 0.79 \& 0.02 <br>
\hline \& \& \& 0.00 \& \& \& 1/2" \& 1.27 \& 1.27 \& 0.03 <br>
\hline \& \& \& \multirow[t]{8}{*}{4.00} \& \& \& Ice \& 1.45 \& 1.45 \& 0.05 <br>
\hline \& \& \& \& \& \& 1" Ice \& 1.83 \& 1.83 \& 0.09 <br>
\hline \& \& \& \& \& \& 2" Ice \& \& \& <br>
\hline \multirow[t]{5}{*}{T-Arm Mount [TA 702-3]} \& \multirow[t]{6}{*}{C} \& \multirow[t]{6}{*}{None} \& \& \multirow[t]{5}{*}{0.0000} \& \multirow[t]{5}{*}{136.00} \& No Ice \& 5.64 \& 5.64 \& 0.34 <br>
\hline \& \& \& \& \& \& 1/2" \& 6.55 \& 6.55 \& 0.43 <br>
\hline \& \& \& \& \& \& Ice \& 7.46 \& 7.46 \& 0.52 <br>
\hline \& \& \& \& \& \& \& 9.28 \& 9.28 \& 0.70 <br>
\hline \& \& \& \& \& \& 2" Ice \& \& \& <br>
\hline ***132' *** \& \& \& \& \& \& \& \& \& <br>
\hline \multirow[t]{5}{*}{1900MHZ RRH (65MHZ)} \& \multirow[t]{5}{*}{A} \& \multirow[t]{5}{*}{From Leg} \& 2.00 \& \multirow[t]{5}{*}{0.0000} \& \multirow[t]{5}{*}{132.00} \& No Ice \& 2.32 \& 2.24 \& 0.06 <br>
\hline \& \& \& 0.00 \& \& \& 1/2" \& 2.53 \& 2.44 \& 0.08 <br>
\hline \& \& \& \multirow[t]{3}{*}{0.00} \& \& \& Ice \& 2.74 \& 2.65 \& 0.11 <br>
\hline \& \& \& \& \& \& 1" Ice \& 3.19 \& 3.09 \& 0.17 <br>
\hline \& \& \& \& \& \& 2" Ice \& \& \& <br>
\hline \multirow[t]{5}{*}{1900MHZ RRH (65MHZ)} \& \multirow[t]{5}{*}{B} \& \multirow[t]{5}{*}{From Leg} \& 2.00 \& \multirow[t]{5}{*}{0.0000} \& \multirow[t]{5}{*}{132.00} \& No Ice \& 2.32 \& 2.24 \& 0.06 <br>
\hline \& \& \& 0.00 \& \& \& 1/2" \& 2.53 \& 2.44 \& 0.08 <br>
\hline \& \& \& \multirow[t]{3}{*}{0.00} \& \& \& Ice \& 2.74 \& 2.65 \& 0.11 <br>
\hline \& \& \& \& \& \& 1" Ice \& 3.19 \& 3.09 \& 0.17 <br>
\hline \& \& \& \& \& \& 2" Ice \& \& \& <br>
\hline \multirow[t]{5}{*}{1900MHZ RRH (65MHZ)} \& \multirow[t]{5}{*}{C} \& \multirow[t]{5}{*}{From Leg} \& 2.00 \& \multirow[t]{5}{*}{0.0000} \& \multirow[t]{5}{*}{132.00} \& No Ice \& 2.32 \& 2.24 \& 0.06 <br>
\hline \& \& \& 0.00 \& \& \& 1/2" \& 2.53 \& 2.44 \& 0.08 <br>
\hline \& \& \& 0.00 \& \& \& Ice \& 2.74 \& 2.65 \& 0.11 <br>
\hline \& \& \& \& \& \& 1" Ice \& 3.19 \& 3.09 \& 0.17 <br>
\hline \& \& \& \& \& \& 2" Ice \& \& \& <br>
\hline \multirow[t]{5}{*}{800MHZ RRH} \& \multirow[t]{5}{*}{A} \& \multirow[t]{5}{*}{From Leg} \& 2.00 \& \multirow[t]{5}{*}{0.0000} \& \multirow[t]{5}{*}{132.00} \& No Ice \& 2.13 \& 1.77 \& 0.05 <br>
\hline \& \& \& 0.00 \& \& \& 1/2" \& 2.32 \& 1.95 \& 0.07 <br>
\hline \& \& \& 0.00 \& \& \& Ice \& 2.51 \& 2.13 \& 0.10 <br>
\hline \& \& \& \& \& \& 1" Ice \& 2.92 \& 2.51 \& 0.16 <br>
\hline \& \& \& \& \& \& 2" Ice \& \& \& <br>
\hline \multirow[t]{5}{*}{800MHZ RRH} \& \multirow[t]{5}{*}{B} \& \multirow[t]{5}{*}{From Leg} \& 2.00 \& \multirow[t]{5}{*}{0.0000} \& \multirow[t]{5}{*}{132.00} \& No Ice \& 2.13 \& 1.77 \& 0.05 <br>
\hline \& \& \& 0.00 \& \& \& 1/2" \& 2.32 \& 1.95 \& 0.07 <br>
\hline \& \& \& \multirow[t]{3}{*}{0.00} \& \& \& Ice \& 2.51 \& 2.13 \& 0.10 <br>
\hline \& \& \& \& \& \& 1" Ice \& 2.92 \& 2.51 \& 0.16 <br>
\hline \& \& \& \& \& \& 2" Ice \& \& \& <br>
\hline \multirow[t]{4}{*}{800MHZ RRH} \& \multirow[t]{4}{*}{C} \& \multirow[t]{4}{*}{From Leg} \& 2.00 \& \multirow[t]{4}{*}{0.0000} \& \multirow[t]{4}{*}{132.00} \& No Ice \& 2.13 \& 1.77 \& 0.05 <br>
\hline \& \& \& 0.00 \& \& \& 1/2" \& 2.32 \& 1.95 \& 0.07 <br>
\hline \& \& \& 0.00 \& \& \& Ice \& 2.51 \& 2.13 \& 0.10 <br>
\hline \& \& \& \& \& \& 1" Ice \& 2.92 \& 2.51 \& 0.16 <br>
\hline
\end{tabular}




| Description | $\begin{gathered} \text { Face } \\ \text { or } \\ \text { Leg } \end{gathered}$ | Offset <br> Type | Offsets: Horz Lateral Vert ft ft ft | Azimuth Adjustmen $t$ | Placement |  | $C_{A} A_{A}$ Front <br> $f t^{2}$ | $C_{A} A_{A}$ Side $f t^{2}$ | Weight |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| (2) DB846F65ZAXY w/ Mount Pipe | B | From Leg | 0.00 | 0.0000 | 119.00 | 1/2" | 8.35 | 9.91 | 0.19 |
|  |  |  |  |  |  | Ice | 9.40 | 11.73 | 0.37 |
|  |  |  |  |  |  | $\begin{aligned} & \text { 1" Ice } \\ & \text { 2" Ice } \end{aligned}$ |  |  |  |
|  |  |  | 4.00 |  |  | No Ice | 7.27 | 7.82 | 0.05 |
|  |  |  | 0.00 |  |  | 1/2" | 7.83 | 9.01 | 0.11 |
|  |  |  | 0.00 |  |  | Ice | 8.35 | 9.91 | 0.19 |
| (2) DB846F65ZAXY w/ Mount Pipe | C | From Leg |  | 0.0000 | 119.00 | 1" Ice | 9.40 | 11.73 | 0.37 |
|  |  |  |  |  |  | 2" Ice |  |  |  |
|  |  |  | 4.00 |  |  | No Ice | 7.27 | 7.82 | 0.05 |
|  |  |  | 0.00 |  |  | 1/2" | 7.83 | 9.01 | 0.11 |
|  |  |  | 0.00 |  |  | Ice | 8.35 | 9.91 | 0.19 |
|  | A | From Leg |  | 0.0000 | 119.00 | 1" Ice | 9.40 | 11.73 | 0.37 |
| BXA-171063-8BF-EDIN-0 w/ Mount Pipe |  |  |  |  |  | 2" Ice |  |  |  |
|  |  |  | 4.00 |  |  | No Ice | 3.18 | 3.35 | 0.03 |
|  |  |  | 0.00 |  |  | 1/2" | 3.56 | 3.97 | 0.06 |
|  |  |  | 0.00 |  |  | Ice | 3.93 | 4.60 | 0.10 |
|  | B | From Leg |  | 0.0000 | 119.00 | 1" Ice | 4.69 | 5.89 | 0.19 |
| BXA-171063-8BF-EDIN-0 w/ Mount Pipe |  |  |  |  |  | 2" Ice |  |  |  |
|  |  |  | 4.00 |  |  | No Ice | 3.18 | 3.35 | 0.03 |
|  |  |  | 0.00 |  |  | 1/2" | 3.56 | 3.97 | 0.06 |
|  |  |  | 0.00 |  |  | Ice | 3.93 | 4.60 | 0.10 |
|  | C | From Leg |  | 0.0000 | 119.00 | 1" Ice | 4.69 | 5.89 | 0.19 |
| BXA-171063-8BF-EDIN-0 w/ Mount Pipe |  |  |  |  |  | 2" Ice |  |  |  |
|  |  |  | 4.00 |  |  | No Ice | 3.18 | 3.35 | 0.03 |
|  |  |  | 0.00 |  |  | 1/2" | 3.56 | 3.97 | 0.06 |
|  |  |  | 0.00 |  |  | Ice | 3.93 | 4.60 | 0.10 |
|  | A | From Leg |  | 0.0000 | 119.00 | 1" Ice | 4.69 | 5.89 | 0.19 |
| BXA-70063-6CF-EDIN-0 w/ Mount Pipe |  |  |  |  |  | 2" Ice |  |  |  |
|  |  |  | 4.00 |  |  | No lce | 7.81 | 5.80 | 0.04 |
|  |  |  | 0.00 |  |  | 1/2" | 8.36 | 6.95 | 0.10 |
|  |  |  | 0.00 |  |  | Ice | 8.87 | 7.82 | 0.17 |
|  | B | From Leg |  | 0.0000 | 119.00 | 1" Ice | 9.93 | 9.60 | 0.34 |
| BXA-70063-6CF-EDIN-0 w/ Mount Pipe |  |  |  |  |  | 2" Ice |  |  |  |
|  |  |  | 4.00 |  |  | No Ice | 7.81 | 5.80 | 0.04 |
|  |  |  | 0.00 |  |  | 1/2" | 8.36 | 6.95 | 0.10 |
|  |  |  | 0.00 |  |  | Ice | 8.87 | 7.82 | 0.17 |
|  | C | From Leg |  | 0.0000 | 119.00 | 1" Ice | 9.93 | 9.60 | 0.34 |
| BXA-70063-6CF-EDIN-0 w/ Mount Pipe |  |  |  |  |  | 2" Ice |  |  |  |
|  |  |  | 4.00 |  |  | No Ice | 7.81 | 5.80 | 0.04 |
|  |  |  | 0.00 |  |  | 1/2" | 8.36 | 6.95 | 0.10 |
|  |  |  | 0.00 |  |  | Ice | 8.87 | 7.82 | 0.17 |
|  | A | From Leg |  | 0.0000 | 119.00 | 1" Ice | 9.93 | 9.60 | 0.34 |
| MG D3-800TX w/ Mount Pipe |  |  |  |  |  | 2" Ice |  |  |  |
|  |  |  | 4.00 |  |  | No Ice | 3.57 | 3.42 | 0.03 |
|  |  |  | 0.00 |  |  | 1/2" | 3.98 | 4.12 | 0.07 |
|  |  |  | 0.00 |  |  | Ice | 4.39 | 4.78 | 0.11 |
| MG D3-800TX w/ Mount Pipe | B | From Leg |  | 0.0000 |  | 1" Ice | 5.20 | 6.16 | 0.21 |
|  |  |  |  |  | 119.00 | 2" Ice |  |  |  |
|  |  |  | 4.00 |  |  | No Ice | 3.57 | 3.42 | 0.03 |
|  |  |  | 0.00 |  |  | 1/2" | 3.98 | 4.12 | 0.07 |
|  |  |  | 0.00 |  |  | Ice | 4.39 | 4.78 | 0.11 |
| MG D3-800TX w/ Mount Pipe | C | From Leg |  | 0.0000 | 119.00 | 1" Ice | 5.20 | 6.16 | 0.21 |
|  |  |  |  |  |  | 2" Ice |  |  |  |
|  |  |  | 4.00 |  |  | No Ice | 3.57 | 3.42 | 0.03 |
|  |  |  | 0.00 |  |  | 1/2" | 3.98 | 4.12 | 0.07 |
|  |  |  | 0.00 |  |  | Ice | 4.39 | 4.78 | 0.11 |
| RRH2X40-AWS | A | From Leg |  | 0.0000 | 119.00 | 1" Ice | 5.20 | 6.16 | 0.21 |
|  |  |  |  |  |  | 2" Ice |  |  |  |
|  |  |  | 4.00 |  |  | No Ice | 2.16 | 1.42 | 0.04 |
|  |  |  | 0.00 |  |  | 1/2" | 2.36 | 1.59 | 0.06 |
|  |  |  | 0.00 |  |  | Ice | 2.57 | 1.77 | 0.08 |
|  |  |  |  |  |  | 1" Ice | 3.00 | 2.14 | 0.13 |
|  |  |  |  |  |  | 2" Ice |  |  |  |
| RRH2X40-AWS | B | From Leg | 4.00 | 0.0000 | 119.00 | No Ice | 2.16 | 1.42 | 0.04 |

\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|}
\hline Description \& Face or Leg \& \begin{tabular}{l}
Offset \\
Type
\end{tabular} \& Offsets: Horz Lateral Vert ft ft ft \& Azimuth Adjustmen \(t\) \& Placement

ft \& \& $C_{A} A_{A}$ Front

$$
f t^{2}
$$ \& $C_{A} A_{A}$ Side $f t^{2}$ \& Weight

K <br>
\hline \multirow{7}{*}{RRH2X40-AWS} \& \multirow{6}{*}{C} \& \multirow{6}{*}{From Leg} \& 0.00 \& \multirow{6}{*}{0.0000} \& \multirow{6}{*}{119.00} \& 1/2" \& 2.36 \& 1.59 \& 0.06 <br>
\hline \& \& \& \multirow[t]{2}{*}{0.00} \& \& \& Ice \& 2.57 \& 1.77 \& 0.08 <br>

\hline \& \& \& \& \& \& $$
\begin{aligned}
& \text { 1" Ice } \\
& \text { 2" Ice }
\end{aligned}
$$ \& 3.00 \& 2.14 \& 0.13 <br>

\hline \& \& \& 4.00 \& \& \& No Ice \& 2.16 \& 1.42 \& 0.04 <br>
\hline \& \& \& 0.00 \& \& \& 1/2" \& 2.36 \& 1.59 \& 0.06 <br>
\hline \& \& \& 0.00 \& \& \& Ice \& 2.57 \& 1.77 \& 0.08 <br>
\hline \& \multirow{7}{*}{C} \& \multirow{7}{*}{None} \& \& \multirow{7}{*}{0.0000} \& \multirow{7}{*}{119.00} \& 1 " Ice \& 3.00 \& 2.14 \& 0.13 <br>
\hline \multirow{6}{*}{T-Arm Mount [TA 602-3]} \& \& \& \& \& \& 2 " Ice \& \& \& <br>
\hline \& \& \& \& \& \& No Ice \& 13.04 \& 13.04 \& 0.87 <br>
\hline \& \& \& \& \& \& 1/2" \& 17.37 \& 17.37 \& 1.11 <br>
\hline \& \& \& \& \& \& Ice \& 21.70 \& 21.70 \& 1.36 <br>
\hline \& \& \& \& \& \& 1 " Ice \& 30.36 \& 30.36 \& 1.84 <br>
\hline \& \& \& \& \& \& 2 " Ice \& \& \& <br>
\hline \multicolumn{10}{|l|}{***110' ***} <br>
\hline \multirow[t]{5}{*}{ERICSSON AIR 21 B2A
B4P w/ Mount Pipe} \& \multirow[t]{5}{*}{A} \& \multirow[t]{5}{*}{From Leg} \& 4.00 \& \multirow[t]{5}{*}{0.0000} \& \multirow[t]{5}{*}{110.00} \& No Ice \& 6.33 \& 5.64 \& 0.11 <br>
\hline \& \& \& 0.00 \& \& \& 1/2" \& 6.78 \& 6.43 \& 0.17 <br>
\hline \& \& \& 0.00 \& \& \& Ice \& 7.21 \& 7.13 \& 0.23 <br>
\hline \& \& \& \& \& \& 1 " Ice \& 8.12 \& 8.59 \& 0.38 <br>
\hline \& \& \& \& \& \& 2" Ice \& \& \& <br>
\hline \multirow[t]{5}{*}{ERICSSON AIR 21 B2A B4P w/ Mount Pipe} \& \multirow[t]{5}{*}{B} \& \multirow[t]{5}{*}{From Leg} \& 4.00 \& \multirow[t]{5}{*}{0.0000} \& \multirow[t]{5}{*}{110.00} \& No Ice \& 6.33 \& 5.64 \& 0.11 <br>
\hline \& \& \& 0.00 \& \& \& 1/2" \& 6.78 \& 6.43 \& 0.17 <br>
\hline \& \& \& 0.00 \& \& \& Ice \& 7.21 \& 7.13 \& 0.23 <br>
\hline \& \& \& \& \& \& 1 " Ice \& 8.12 \& 8.59 \& 0.38 <br>
\hline \& \& \& \& \& \& 2" Ice \& \& \& <br>
\hline \multirow[t]{5}{*}{ERICSSON AIR 21 B2A B4P w/ Mount Pipe} \& \multirow[t]{5}{*}{C} \& \multirow[t]{5}{*}{From Leg} \& 4.00 \& \multirow[t]{5}{*}{0.0000} \& \multirow[t]{5}{*}{110.00} \& No Ice \& 6.33 \& 5.64 \& 0.11 <br>
\hline \& \& \& 0.00 \& \& \& 1/2" \& 6.78 \& 6.43 \& 0.17 <br>
\hline \& \& \& 0.00 \& \& \& Ice \& 7.21 \& 7.13 \& 0.23 <br>
\hline \& \& \& \& \& \& 1 " Ice \& 8.12 \& 8.59 \& 0.38 <br>
\hline \& \& \& \& \& \& 2" Ice \& \& \& <br>
\hline \multirow[t]{5}{*}{ERICSSON AIR 21 B4A B2P w/ Mount Pipe} \& \multirow[t]{5}{*}{A} \& \multirow[t]{5}{*}{From Leg} \& 4.00 \& \multirow[t]{5}{*}{0.0000} \& \multirow[t]{5}{*}{110.00} \& No Ice \& 6.32 \& 5.63 \& 0.11 <br>
\hline \& \& \& 0.00 \& \& \& 1/2" \& 6.76 \& 6.41 \& 0.17 <br>
\hline \& \& \& 0.00 \& \& \& Ice \& 7.20 \& 7.12 \& 0.23 <br>
\hline \& \& \& \& \& \& 1 " Ice \& 8.10 \& 8.57 \& 0.38 <br>
\hline \& \& \& \& \& \& 2" Ice \& \& \& <br>

\hline \multirow[t]{5}{*}{ERICSSON AIR 21 B4A B2P w/ Mount Pipe} \& \multirow[t]{5}{*}{B} \& \multirow[t]{5}{*}{From Leg} \& $$
4.00
$$ \& \multirow[t]{5}{*}{0.0000} \& \multirow[t]{5}{*}{110.00} \& No Ice \& 6.32 \& 5.63 \& 0.11 <br>

\hline \& \& \& 0.00 \& \& \& 1/2" \& 6.76 \& 6.41 \& 0.17 <br>
\hline \& \& \& 0.00 \& \& \& Ice \& 7.20 \& 7.12 \& 0.23 <br>
\hline \& \& \& \& \& \& 1 " Ice \& 8.10 \& 8.57 \& 0.38 <br>
\hline \& \& \& \& \& \& 2" Ice \& \& \& <br>

\hline \multirow[t]{5}{*}{ERICSSON AIR 21 B4A B2P w/ Mount Pipe} \& \multirow[t]{5}{*}{C} \& \multirow[t]{5}{*}{From Leg} \& $$
4.00
$$ \& \multirow[t]{5}{*}{0.0000} \& \multirow[t]{5}{*}{110.00} \& No Ice \& 6.32 \& 5.63 \& 0.11 <br>

\hline \& \& \& 0.00 \& \& \& 1/2" \& 6.76 \& 6.41 \& 0.17 <br>
\hline \& \& \& 0.00 \& \& \& Ice \& 7.20 \& 7.12 \& 0.23 <br>
\hline \& \& \& \& \& \& 1 " Ice \& 8.10 \& 8.57 \& 0.38 <br>
\hline \& \& \& \& \& \& 2" Ice \& \& \& <br>
\hline \multirow[t]{5}{*}{APXVAARR24_43-U-NA20 w/ Mount Pipe} \& \multirow[t]{5}{*}{A} \& \multirow[t]{5}{*}{From Leg} \& \& \multirow[t]{5}{*}{0.0000} \& \multirow[t]{5}{*}{110.00} \& No Ice \& 20.48 \& 11.02 \& 0.16 <br>
\hline \& \& \& 0.00 \& \& \& 1/2" \& 21.23 \& 12.55 \& 0.30 <br>
\hline \& \& \& 0.00 \& \& \& Ice \& 21.99 \& 14.10 \& 0.44 <br>
\hline \& \& \& \& \& \& 1 " Ice \& 23.44 \& 16.45 \& 0.78 <br>
\hline \& \& \& \& \& \& 2" Ice \& \& \& <br>

\hline \multirow[t]{5}{*}{APXVAARR24_43-U-NA20 w/ Mount Pipe} \& \multirow[t]{5}{*}{B} \& \multirow[t]{5}{*}{From Leg} \& $$
4.00
$$ \& \multirow[t]{5}{*}{0.0000} \& \multirow[t]{5}{*}{110.00} \& No Ice \& 20.48 \& 11.02 \& 0.16 <br>

\hline \& \& \& 0.00 \& \& \& 1/2" \& 21.23 \& 12.55 \& 0.30 <br>
\hline \& \& \& 0.00 \& \& \& Ice \& 21.99 \& 14.10 \& 0.44 <br>
\hline \& \& \& \& \& \& 1 " Ice \& 23.44 \& 16.45 \& 0.78 <br>
\hline \& \& \& \& \& \& 2" Ice \& \& \& <br>

\hline \multirow[t]{5}{*}{APXVAARR24_43-U-NA20 w/ Mount Pipe} \& \multirow[t]{5}{*}{C} \& \multirow[t]{5}{*}{From Leg} \& $$
4.00
$$ \& \multirow[t]{5}{*}{0.0000} \& \multirow[t]{5}{*}{110.00} \& No Ice \& 20.48 \& 11.02 \& 0.16 <br>

\hline \& \& \& 0.00 \& \& \& 1/2" \& 21.23 \& 12.55 \& 0.30 <br>
\hline \& \& \& 0.00 \& \& \& Ice \& 21.99 \& 14.10 \& 0.44 <br>
\hline \& \& \& \& \& \& 1 " Ice \& 23.44 \& 16.45 \& 0.78 <br>
\hline \& \& \& \& \& \& 2" Ice \& \& \& <br>
\hline \multirow[t]{5}{*}{KRY 112 144/1} \& \multirow[t]{5}{*}{A} \& \multirow[t]{5}{*}{From Leg} \& 4.00 \& \multirow[t]{5}{*}{0.0000} \& \multirow[t]{5}{*}{110.00} \& No Ice \& 0.35 \& 0.17 \& 0.01 <br>
\hline \& \& \& 0.00 \& \& \& 1/2" \& 0.43 \& 0.23 \& 0.01 <br>
\hline \& \& \& 0.00 \& \& \& Ice \& 0.51 \& 0.30 \& 0.02 <br>
\hline \& \& \& \& \& \& 1" Ice \& 0.70 \& 0.46 \& 0.03 <br>
\hline \& \& \& \& \& \& 2" Ice \& \& \& <br>
\hline
\end{tabular}

\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|}
\hline Description \& \[
\begin{gathered}
\hline \text { Face } \\
\text { or } \\
\text { Leg }
\end{gathered}
\] \& \begin{tabular}{l}
Offset \\
Type
\end{tabular} \& Offsets: Horz Lateral Vert ft ft ft \& Azimuth Adjustmen \(t\) \& Placement

ft \& \& $C_{A} A_{A}$ Front

\[
f t^{2}

\] \& | $C_{A} A_{A}$ Side |
| :--- |
| $f t^{2}$ | \& Weight

K <br>
\hline \multirow[t]{4}{*}{KRY 112 144/1} \& \multirow[t]{4}{*}{B} \& \multirow[t]{4}{*}{From Leg} \& 4.00 \& \multirow[t]{4}{*}{0.0000} \& \multirow[t]{4}{*}{110.00} \& No Ice \& 0.35 \& 0.17 \& 0.01 <br>
\hline \& \& \& 0.00 \& \& \& 1/2" \& 0.43 \& 0.23 \& 0.01 <br>
\hline \& \& \& \multirow[t]{2}{*}{0.00} \& \& \& Ice \& 0.51 \& 0.30 \& 0.02 <br>

\hline \& \& \& \& \& \& $$
\begin{aligned}
& \text { 1" Ice } \\
& \text { 2" Ice }
\end{aligned}
$$ \& 0.70 \& 0.46 \& 0.03 <br>

\hline \multirow[t]{4}{*}{KRY 112 144/1} \& \multirow[t]{4}{*}{C} \& \multirow[t]{4}{*}{From Leg} \& 4.00 \& \multirow[t]{4}{*}{0.0000} \& \multirow[t]{4}{*}{110.00} \& No Ice \& 0.35 \& 0.17 \& 0.01 <br>
\hline \& \& \& 0.00 \& \& \& 1/2" \& 0.43 \& 0.23 \& 0.01 <br>
\hline \& \& \& \multirow[t]{2}{*}{0.00} \& \& \& Ice \& 0.51 \& 0.30 \& 0.02 <br>

\hline \& \& \& \& \& \& $$
\begin{aligned}
& \text { 1" Ice } \\
& \text { 2" Ice }
\end{aligned}
$$ \& 0.70 \& 0.46 \& 0.03 <br>

\hline \multirow[t]{5}{*}{RADIO 4449 B12/B71} \& \multirow[t]{5}{*}{A} \& \multirow[t]{5}{*}{From Leg} \& 4.00 \& \multirow[t]{5}{*}{0.0000} \& \multirow[t]{5}{*}{110.00} \& No Ice \& 1.65 \& 1.30 \& 0.08 <br>
\hline \& \& \& 0.00 \& \& \& 1/2" \& 1.81 \& 1.44 \& 0.09 <br>
\hline \& \& \& \multirow[t]{3}{*}{0.00} \& \& \& Ice \& 1.98 \& 1.60 \& 0.11 <br>
\hline \& \& \& \& \& \& 1" Ice \& 2.34 \& 1.92 \& 0.16 <br>
\hline \& \& \& \& \& \& 2" Ice \& \& \& <br>
\hline \multirow[t]{5}{*}{RADIO 4449 B12/B71} \& \multirow[t]{5}{*}{B} \& \multirow[t]{5}{*}{From Leg} \& 4.00 \& \multirow[t]{5}{*}{0.0000} \& \multirow[t]{5}{*}{110.00} \& No Ice \& 1.65 \& 1.30 \& 0.08 <br>
\hline \& \& \& 0.00 \& \& \& 1/2" \& 1.81 \& 1.44 \& 0.09 <br>
\hline \& \& \& \multirow[t]{3}{*}{0.00} \& \& \& Ice \& 1.98 \& 1.60 \& 0.11 <br>
\hline \& \& \& \& \& \& 1" Ice \& 2.34 \& 1.92 \& 0.16 <br>
\hline \& \& \& \& \& \& 2" Ice \& \& \& <br>
\hline \multirow[t]{5}{*}{RADIO 4449 B12/B71} \& \multirow[t]{5}{*}{C} \& \multirow[t]{5}{*}{From Leg} \& 4.00 \& \multirow[t]{5}{*}{0.0000} \& \multirow[t]{5}{*}{110.00} \& No Ice \& 1.65 \& 1.30 \& 0.08 <br>
\hline \& \& \& 0.00 \& \& \& 1/2" \& 1.81 \& 1.44 \& 0.09 <br>
\hline \& \& \& \multirow[t]{3}{*}{0.00} \& \& \& Ice \& 1.98 \& 1.60 \& 0.11 <br>
\hline \& \& \& \& \& \& 1" Ice \& 2.34 \& 1.92 \& 0.16 <br>
\hline \& \& \& \& \& \& 2" Ice \& \& \& <br>
\hline \multirow[t]{5}{*}{6'-P2x0. 154} \& \multirow[t]{5}{*}{A} \& \multirow[t]{5}{*}{From Leg} \& 4.00 \& \multirow[t]{5}{*}{0.0000} \& \multirow[t]{5}{*}{110.00} \& No Ice \& 1.43 \& 1.43 \& 0.02 <br>
\hline \& \& \& 0.00 \& \& \& 1/2" \& 1.92 \& 1.92 \& 0.03 <br>
\hline \& \& \& \multirow[t]{3}{*}{0.00} \& \& \& Ice \& 2.29 \& 2.29 \& 0.05 <br>
\hline \& \& \& \& \& \& 1" Ice \& 3.06 \& 3.06 \& 0.09 <br>
\hline \& \& \& \& \& \& 2" Ice \& \& \& <br>

\hline \multirow[t]{5}{*}{6'-P2x0.154} \& \multirow[t]{5}{*}{B} \& \multirow[t]{5}{*}{From Leg} \& $$
4.00
$$ \& \multirow[t]{5}{*}{0.0000} \& \multirow[t]{5}{*}{110.00} \& No Ice \& 1.43 \& 1.43 \& 0.02 <br>

\hline \& \& \& 0.00 \& \& \& 1/2" \& 1.92 \& 1.92 \& 0.03 <br>
\hline \& \& \& \multirow[t]{3}{*}{0.00} \& \& \& Ice \& 2.29 \& 2.29 \& 0.05 <br>
\hline \& \& \& \& \& \& 1" Ice \& 3.06 \& 3.06 \& 0.09 <br>
\hline \& \& \& \& \& \& 2" Ice \& \& \& <br>
\hline \multirow[t]{5}{*}{6'-P2x0.154} \& \multirow[t]{5}{*}{C} \& \multirow[t]{5}{*}{From Leg} \& 4.00 \& \multirow[t]{5}{*}{0.0000} \& \multirow[t]{5}{*}{110.00} \& No Ice \& 1.43 \& 1.43 \& 0.02 <br>
\hline \& \& \& 0.00 \& \& \& 1/2" \& 1.92 \& 1.92 \& 0.03 <br>
\hline \& \& \& \multirow[t]{3}{*}{0.00} \& \& \& Ice \& 2.29 \& 2.29 \& 0.05 <br>
\hline \& \& \& \& \& \& 1" Ice \& 3.06 \& 3.06 \& 0.09 <br>
\hline \& \& \& \& \& \& 2" Ice \& \& \& <br>
\hline \multirow[t]{5}{*}{13.25'-P2x0.154 H} \& \multirow[t]{5}{*}{A} \& \multirow[t]{5}{*}{From Leg} \& 4.00 \& \multirow[t]{5}{*}{0.0000} \& \multirow[t]{5}{*}{110.00} \& No Ice \& 3.15 \& 0.01 \& 0.05 <br>
\hline \& \& \& 0.00 \& \& \& 1/2" \& 4.50 \& 0.11 \& 0.07 <br>
\hline \& \& \& \multirow[t]{3}{*}{0.00} \& \& \& Ice \& 5.87 \& 0.21 \& 0.10 <br>
\hline \& \& \& \& \& \& 1" Ice \& 8.66 \& 0.40 \& 0.19 <br>
\hline \& \& \& \& \& \& 2" Ice \& \& \& <br>
\hline \multirow[t]{5}{*}{13.25'-P2x0.154 H} \& \multirow[t]{5}{*}{B} \& \multirow[t]{5}{*}{From Leg} \& \& \multirow[t]{5}{*}{0.0000} \& \multirow[t]{5}{*}{110.00} \& No Ice \& 3.15 \& 0.01 \& 0.05 <br>
\hline \& \& \& 0.00 \& \& \& 1/2" \& 4.50 \& 0.11 \& 0.07 <br>
\hline \& \& \& 0.00 \& \& \& Ice \& 5.87 \& 0.21 \& 0.10 <br>
\hline \& \& \& \& \& \& 1" Ice \& 8.66 \& 0.40 \& 0.19 <br>
\hline \& \& \& \& \& \& 2" Ice \& \& \& <br>
\hline \multirow[t]{5}{*}{13.25'-P2x0.154 H} \& \multirow[t]{5}{*}{C} \& \multirow[t]{5}{*}{From Leg} \& 4.00 \& \multirow[t]{5}{*}{0.0000} \& \multirow[t]{5}{*}{110.00} \& No Ice \& 3.15 \& 0.01 \& 0.05 <br>
\hline \& \& \& 0.00 \& \& \& 1/2" \& 4.50 \& 0.11 \& 0.07 <br>
\hline \& \& \& 0.00 \& \& \& Ice \& 5.87 \& 0.21 \& 0.10 <br>
\hline \& \& \& \& \& \& 1" Ice \& 8.66 \& 0.40 \& 0.19 <br>
\hline \& \& \& \& \& \& 2" Ice \& \& \& <br>
\hline \multirow[t]{5}{*}{PRK-SFS} \& \multirow[t]{5}{*}{C} \& \multirow[t]{5}{*}{None} \& \& \multirow[t]{5}{*}{0.0000} \& \multirow[t]{5}{*}{110.00} \& No Ice \& 13.13 \& 13.13 \& 0.25 <br>
\hline \& \& \& \& \& \& 1/2" \& 17.83 \& 17.83 \& 0.27 <br>
\hline \& \& \& \& \& \& Ice \& 22.54 \& 22.54 \& 0.28 <br>
\hline \& \& \& \& \& \& 1" Ice \& 31.96 \& 31.96 \& 0.32 <br>
\hline \& \& \& \& \& \& 2" Ice \& \& \& <br>
\hline \multirow[t]{5}{*}{Miscellaneous [NA 509-3]} \& \multirow[t]{5}{*}{C} \& \multirow[t]{5}{*}{None} \& \& \multirow[t]{5}{*}{0.0000} \& \multirow[t]{5}{*}{110.00} \& No Ice \& 11.84 \& 11.84 \& 0.28 <br>
\hline \& \& \& \& \& \& 1/2" \& 16.96 \& 16.96 \& 0.30 <br>
\hline \& \& \& \& \& \& Ice \& 22.08 \& 22.08 \& 0.32 <br>
\hline \& \& \& \& \& \& 1" Ice \& 32.32 \& 32.32 \& 0.36 <br>
\hline \& \& \& \& \& \& 2" Ice \& \& \& <br>
\hline
\end{tabular}

\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|}
\hline Description \& \[
\begin{gathered}
\text { Face } \\
\text { or } \\
\text { Leg }
\end{gathered}
\] \& \begin{tabular}{l}
Offset \\
Type
\end{tabular} \& Offsets: Horz Lateral Vert ft ft ft \& Azimuth Adjustmen \(t\) \& \begin{tabular}{l}
Placement \\
ft
\end{tabular} \& \& \begin{tabular}{l}
\(C_{A} A_{A}\) Front \\
\(f t^{2}\)
\end{tabular} \& \begin{tabular}{l}
\(C_{A} A_{A}\) Side \\
\(f t^{2}\)
\end{tabular} \& Weight

K <br>

\hline T-Arm Mount [TA 602-3] \& C \& None \& \& 0.0000 \& 110.00 \& $$
\begin{gathered}
\text { No Ice } \\
\text { 1/2" } \\
\text { Ice } \\
\text { 1" Ice } \\
\text { 2" Ice }
\end{gathered}
$$ \& \[

$$
\begin{aligned}
& 12.88 \\
& 17.16 \\
& 21.43 \\
& 29.99
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 12.88 \\
& 17.16 \\
& 21.43 \\
& 29.99
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 0.86 \\
& 1.10 \\
& 1.34 \\
& 1.82
\end{aligned}
$$
\] <br>

\hline $$
\begin{gathered}
* * * 1000^{* * *} \\
\text { APXV18-206517S-C w/ } \\
\text { Mount Pipe }
\end{gathered}
$$ \& A \& From Leg \& \[

$$
\begin{aligned}
& 2.00 \\
& 0.00 \\
& 0.00
\end{aligned}
$$

\] \& 0.0000 \& 100.00 \& \[

$$
\begin{gathered}
\text { No Ice } \\
\text { 1/2" } \\
\text { Ice } \\
\text { 1" Ice } \\
\text { 2" Ice }
\end{gathered}
$$

\] \& \[

$$
\begin{aligned}
& 3.79 \\
& 4.38 \\
& 4.99 \\
& 6.25
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 3.16 \\
& 3.75 \\
& 4.35 \\
& 5.59
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 0.05 \\
& 0.09 \\
& 0.15 \\
& 0.28
\end{aligned}
$$
\] <br>

\hline APXV18-206517S-C w/ Mount Pipe \& B \& From Leg \& $$
\begin{aligned}
& 2.00 \\
& 0.00 \\
& 0.00
\end{aligned}
$$ \& 0.0000 \& 100.00 \& No Ice 1/2" Ice 1" Ice 2" Ice \& \[

$$
\begin{aligned}
& 3.79 \\
& 4.38 \\
& 4.99 \\
& 6.25
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 3.16 \\
& 3.75 \\
& 4.35 \\
& 5.59
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 0.05 \\
& 0.09 \\
& 0.15 \\
& 0.28
\end{aligned}
$$
\] <br>

\hline APXV18-206517S-C w/ Mount Pipe \& C \& From Leg \& $$
\begin{aligned}
& 2.00 \\
& 0.00 \\
& 0.00
\end{aligned}
$$ \& 0.0000 \& 100.00 \& No Ice 1/2" Ice 1" Ice 2" Ice \& \[

$$
\begin{aligned}
& 3.79 \\
& 4.38 \\
& 4.99 \\
& 6.25
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 3.16 \\
& 3.75 \\
& 4.35 \\
& 5.59
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 0.05 \\
& 0.09 \\
& 0.15 \\
& 0.28
\end{aligned}
$$
\] <br>

\hline $$
\begin{gathered}
* * * 75^{\prime * * *} \\
\text { KS24019-L112A }
\end{gathered}
$$ \& C \& From Leg \& \[

$$
\begin{aligned}
& 4.00 \\
& 0.00 \\
& 2.00
\end{aligned}
$$

\] \& 0.0000 \& 75.00 \& | No Ice |
| :--- |
| 1/2" |
| Ice |
| 1" Ice |
| 2" Ice | \& \[

$$
\begin{aligned}
& 0.14 \\
& 0.20 \\
& 0.26 \\
& 0.41
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 0.14 \\
& 0.20 \\
& 0.26 \\
& 0.41
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 0.01 \\
& 0.01 \\
& 0.01 \\
& 0.02
\end{aligned}
$$
\] <br>

\hline Side Arm Mount [SO 7011] \& C \& None \& \& 0.0000 \& 75.00 \& $$
\begin{gathered}
\text { No Ice } \\
\text { 1/2" } \\
\text { Ice } \\
\text { 1" Ice } \\
\text { 2" Ice }
\end{gathered}
$$ \& \[

$$
\begin{aligned}
& 0.85 \\
& 1.14 \\
& 1.43 \\
& 2.01
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 1.67 \\
& 2.34 \\
& 3.01 \\
& 4.35
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 0.07 \\
& 0.08 \\
& 0.09 \\
& 0.12
\end{aligned}
$$
\] <br>

\hline
\end{tabular}

## Dishes

\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline Description \& \[
\begin{gathered}
\text { Face } \\
\text { or } \\
\text { Leg }
\end{gathered}
\] \& \begin{tabular}{l}
Dish \\
Type
\end{tabular} \& \begin{tabular}{l}
Offset \\
Type
\end{tabular} \& \begin{tabular}{l}
Offsets: \\
Horz \\
Lateral Vert ft
\end{tabular} \& Azimuth Adjustment \& \(3 d B\) Beam Width \& Elevation

ft \& | Outside Diameter |
| :--- |
| ft | \& \& Aperture Area

$$
f t^{2}
$$ \& Weight <br>

\hline \multirow[t]{4}{*}{A-ANT-23G-2-C} \& \multirow[t]{4}{*}{B} \& \multirow[t]{4}{*}{Paraboloid w/Shroud (HP)} \& \multirow[t]{4}{*}{From Leg} \& 4.00 \& \multirow[t]{4}{*}{10.0000} \& \& \multirow[t]{4}{*}{130.00} \& \multirow[t]{4}{*}{2.17} \& No Ice \& 3.72 \& 0.03 <br>
\hline \& \& \& \& 0.00 \& \& \& \& \& 1/2" Ice \& 4.01 \& 0.05 <br>
\hline \& \& \& \& \multirow[t]{2}{*}{2.00} \& \& \& \& \& $1{ }^{1 /}$ Ice \& 4.30 \& 0.07 <br>
\hline \& \& \& \& \& \& \& \& \& 2" Ice \& 4.88 \& 0.11 <br>
\hline \multirow[t]{4}{*}{VHLP2-11} \& \multirow[t]{4}{*}{C} \& \multirow[t]{4}{*}{Paraboloid w/Shroud (HP)} \& \multirow[t]{4}{*}{From Leg} \& 4.00 \& \multirow[t]{4}{*}{-20.0000} \& \& \multirow[t]{4}{*}{130.00} \& \multirow[t]{4}{*}{2.17} \& No Ice \& 3.72 \& 0.03 <br>
\hline \& \& \& \& 0.00 \& \& \& \& \& 1/2" Ice \& 4.01 \& 0.05 <br>
\hline \& \& \& \& 4.00 \& \& \& \& \& $1{ }^{\prime \prime}$ Ice \& 4.30 \& 0.07 <br>
\hline \& \& \& \& \& \& \& \& \& 2" Ice \& 4.88 \& 0.11 <br>
\hline
\end{tabular}

## Load Combinations

| Comb. | Description |  |
| :---: | :--- | :--- |
| No. | Dead Only |  |
| 2 | 1.2 Dead+1.0 Wind 0 deg - No Ice |  |
| 3 | 0.9 Dead +1.0 Wind 0 deg - No Ice |  |

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| Comb. No. | Description |
| :---: | :---: |
| 4 | 1.2 Dead+1.0 Wind 30 deg - No Ice |
| 5 | 0.9 Dead+1.0 Wind 30 deg - No Ice |
| 6 | 1.2 Dead+1.0 Wind 60 deg - No Ice |
| 7 | 0.9 Dead+1.0 Wind 60 deg - No Ice |
| 8 | 1.2 Dead+1.0 Wind 90 deg - No Ice |
| 9 | 0.9 Dead+1.0 Wind 90 deg - No Ice |
| 10 | 1.2 Dead+1.0 Wind 120 deg - No Ice |
| 11 | 0.9 Dead+1.0 Wind 120 deg - No Ice |
| 12 | 1.2 Dead+1.0 Wind 150 deg - No Ice |
| 13 | 0.9 Dead+1.0 Wind 150 deg - No Ice |
| 14 | 1.2 Dead+1.0 Wind 180 deg - No Ice |
| 15 | 0.9 Dead+1.0 Wind 180 deg - No Ice |
| 16 | 1.2 Dead+1.0 Wind 210 deg - No Ice |
| 17 | 0.9 Dead+1.0 Wind 210 deg - No Ice |
| 18 | 1.2 Dead+1.0 Wind 240 deg - No Ice |
| 19 | 0.9 Dead+1.0 Wind 240 deg - No Ice |
| 20 | 1.2 Dead+1.0 Wind 270 deg - No Ice |
| 21 | 0.9 Dead+1.0 Wind 270 deg - No Ice |
| 22 | 1.2 Dead+1.0 Wind 300 deg - No Ice |
| 23 | 0.9 Dead+1.0 Wind 300 deg - No Ice |
| 24 | 1.2 Dead+1.0 Wind 330 deg - No Ice |
| 25 | 0.9 Dead+1.0 Wind 330 deg - No Ice |
| 26 | 1.2 Dead+1.0 Ice+1.0 Temp |
| 27 | 1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp |
| 28 | 1.2 Dead+1.0 Wind $30 \mathrm{deg}+1.0 \mathrm{Ice}+1.0$ Temp |
| 29 | 1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp |
| 30 | 1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp |
| 31 | 1.2 Dead+1.0 Wind $120 \mathrm{deg}+1.0$ Ice+1.0 Temp |
| 32 | 1.2 Dead+1.0 Wind $150 \mathrm{deg}+1.0$ Ice+1.0 Temp |
| 33 | 1.2 Dead+1.0 Wind $180 \mathrm{deg}+1.0$ Ice+1.0 Temp |
| 34 | 1.2 Dead+1.0 Wind $210 \mathrm{deg}+1.0$ Ice+1.0 Temp |
| 35 | 1.2 Dead+1.0 Wind $240 \mathrm{deg}+1.0$ Ice+1.0 Temp |
| 36 | 1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp |
| 37 | 1.2 Dead+1.0 Wind $300 \mathrm{deg}+1.0$ Ice+1.0 Temp |
| 38 | 1.2 Dead+1.0 Wind $330 \mathrm{deg}+1.0$ Ice+1.0 Temp |
| 39 | Dead+Wind 0 deg - Service |
| 40 | Dead+Wind 30 deg - Service |
| 41 | Dead+Wind 60 deg - Service |
| 42 | Dead+Wind 90 deg - Service |
| 43 | Dead+Wind 120 deg - Service |
| 44 | Dead+Wind 150 deg - Service |
| 45 | Dead+Wind 180 deg - Service |
| 46 | Dead+Wind 210 deg - Service |
| 47 | Dead+Wind 240 deg - Service |
| 48 | Dead+Wind 270 deg - Service |
| 49 | Dead+Wind 300 deg - Service |
| 50 | Dead+Wind 330 deg - Service |

## Maximum Member Forces

| Sectio $n$ No. | Elevation ft | Component Type | Condition | Gov. <br> Load <br> Comb. | Axial K | Major Axis Moment kip-ft | Minor Axis Moment kip-ft |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| L1 | $\begin{gathered} 139.5- \\ 93.04 \end{gathered}$ | Pole | Max Tension | 14 | 0.00 | -0.00 | 0.00 |
|  |  |  | Max. Compression | 26 | -30.88 | 0.64 | 0.32 |
|  |  |  | Max. Mx | 20 | -12.44 | 553.56 | 0.41 |
|  |  |  | Max. My | 2 | -12.43 | 0.64 | 554.68 |
|  |  |  | Max. Vy | 20 | -22.67 | 553.56 | 0.41 |
|  |  |  | Max. Vx | 2 | -22.70 | 0.64 | 554.68 |
|  |  |  | Max. Torque | 3 |  |  | 0.59 |
| L2 | $\begin{gathered} 93.04- \\ 46.38 \end{gathered}$ | Pole | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
|  |  |  | Max. Compression | 26 | -45.25 | 1.20 | 1.93 |
|  |  |  | Max. Mx | 20 | -23.49 | 1672.86 | 1.67 |
|  |  |  | Max. My | 2 | -23.49 | 1.56 | 1676.03 |
|  |  |  | Max. Vy | 20 | -26.74 | 1672.86 | 1.67 |


| Sectio $n$ No. | Elevation ft | Component Type | Condition | Gov. Load Comb. | Axial K | Major Axis Moment kip-ft | Minor Axis Moment kip-ft |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| L3 | 46.38-0 | Pole | Max. Vx | 2 | -26.77 | 1.56 | 1676.03 |
|  |  |  | Max. Torque | 11 |  |  | -0.63 |
|  |  |  | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
|  |  |  | Max. Compression | 26 | -65.53 | 1.74 | 4.20 |
|  |  |  | Max. Mx | 20 | -39.74 | 3158.24 | 3.34 |
|  |  |  | Max. My | 2 | -39.74 | 2.46 | 3164.07 |
|  |  |  | Max. Vy | 20 | -30.58 | 3158.24 | 3.34 |
|  |  |  | Max. Vx | 2 | -30.60 | 2.46 | 3164.07 |
|  |  |  | Max. Torque | 13 |  |  | -0.74 |

## Maximum Reactions

| Location | Condition | Gov. Load Comb. | Vertical K | $\begin{gathered} \text { Horizontal, X } \\ K \end{gathered}$ | $\begin{gathered} \text { Horizontal, Z } \\ K \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Pole | Max. Vert | 27 | 65.53 | 0.00 | 8.05 |
|  | Max. $\mathrm{H}_{\mathrm{x}}$ | 20 | 39.78 | 30.53 | 0.01 |
|  | Max. $\mathrm{Hz}_{\mathrm{z}}$ | 2 | 39.78 | 0.02 | 30.56 |
|  | Max. $\mathrm{M}_{\mathrm{x}}$ | 2 | 3164.07 | 0.02 | 30.56 |
|  | Max. $\mathrm{M}_{\mathrm{z}}$ | 8 | 3157.06 | -30.52 | 0.04 |
|  | Max. Torsion | 23 | 0.69 | 26.46 | 15.25 |
|  | Min. Vert | 7 | 29.83 | -26.46 | 15.26 |
|  | Min. $\mathrm{H}_{\mathrm{x}}$ | 8 | 39.78 | -30.52 | 0.04 |
|  | Min. $\mathrm{H}_{\mathrm{z}}$ | 14 | 39.78 | -0.01 | -30.49 |
|  | Min. $\mathrm{M}_{\mathrm{x}}$ | 14 | -3151.33 | -0.01 | -30.49 |
|  | Min. $\mathrm{M}_{\mathrm{z}}$ | 20 | -3158.24 | 30.53 | 0.01 |
|  | Min. Torsion | 13 | -0.74 | -15.22 | -26.42 |

## Tower Mast Reaction Summary

| Load Combination | Vertical <br> K | Shear ${ }_{x}$ <br> K | Shearz <br> K | Overturning Moment, $M_{x}$ kip-ft | Overturning Moment, $M_{z}$ kip-ft | Torque <br> kip-ft |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Dead Only | 33.15 | 0.00 | 0.00 | -1.31 | -0.20 | 0.00 |
| 1.2 Dead+1.0 Wind 0 deg No Ice | 39.78 | -0.02 | -30.56 | -3164.07 | 2.46 | -0.43 |
| 0.9 Dead+1.0 Wind 0 deg No Ice | 29.83 | -0.02 | -30.56 | -3123.83 | 2.48 | -0.43 |
| 1.2 Dead+1.0 Wind 30 deg No Ice | 39.78 | 15.26 | -26.45 | -2738.30 | -1578.88 | 0.01 |
| 0.9 Dead+1.0 Wind 30 deg No Ice | 29.83 | 15.26 | -26.45 | -2703.41 | -1558.94 | 0.01 |
| 1.2 Dead+1.0 Wind 60 deg No Ice | 39.78 | 26.46 | -15.26 | -1580.46 | -2737.99 | 0.25 |
| 0.9 Dead+1.0 Wind 60 deg No Ice | 29.83 | 26.46 | -15.26 | -1560.15 | -2703.45 | 0.25 |
| 1.2 Dead+1.0 Wind 90 deg No Ice | 39.78 | 30.52 | -0.04 | -7.82 | -3157.06 | 0.24 |
| 0.9 Dead+1.0 Wind 90 deg No Ice | 29.83 | 30.52 | -0.04 | -7.30 | -3117.26 | 0.24 |
| 1.2 Dead+1.0 Wind 120 deg <br> - No Ice | 39.78 | 26.41 | 15.23 | 1572.03 | -2731.15 | 0.74 |
| 0.9 Dead+1.0 Wind 120 deg <br> - No Ice | 29.83 | 26.41 | 15.23 | 1552.65 | -2696.70 | 0.74 |
| 1.2 Dead+1.0 Wind 150 deg <br> - No Ice | 39.78 | 15.22 | 26.42 | 2730.59 | -1573.32 | 0.74 |
| 0.9 Dead+1.0 Wind 150 deg <br> - No Ice | 29.83 | 15.22 | 26.42 | 2696.60 | -1553.46 | 0.74 |
| 1.2 Dead+1.0 Wind 180 deg <br> - No Ice | 39.78 | 0.01 | 30.49 | 3151.33 | -0.96 | 0.35 |


| Load Combination | Vertical K | Shear K | Shearz $_{2}$ <br> K | Overturning Moment, $M_{x}$ kip-ft | Overturning Moment, $M_{z}$ kip-ft | Torque kip-ft |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 0.9 Dead+1.0 Wind 180 deg | 29.83 | 0.01 | 30.49 | 3112.07 | -0.89 | 0.35 |
| - No Ice |  |  |  |  |  |  |
| 1.2 Dead+1.0 Wind 210 deg | 39.78 | -15.22 | 26.42 | 2731.02 | 1572.51 | -0.11 |
| - No Ice |  |  |  |  |  |  |
| 0.9 Dead+1.0 Wind 210 deg | 29.83 | -15.22 | 26.42 | 2697.03 | 1552.78 | -0.11 |
| - No Ice |  |  |  |  |  |  |
| 1.2 Dead+1.0 Wind 240 deg | 39.78 | -26.43 | 15.20 | 1568.24 | 2733.81 | -0.24 |
| - No Ice |  |  |  |  |  |  |
| 0.9 Dead+1.0 Wind 240 deg | 29.83 | -26.43 | 15.20 | 1548.91 | 2699.44 | -0.24 |
| - No Ice |  |  |  |  |  |  |
| 1.2 Dead+1.0 Wind 270 deg | 39.78 | -30.53 | -0.01 | -3.34 | 3158.24 | -0.34 |
| - No Ice |  |  |  |  |  |  |
| 0.9 Dead+1.0 Wind 270 deg | 29.83 | -30.53 | -0.01 | -2.89 | 3118.54 | -0.34 |
| - No Ice |  |  |  |  |  |  |
| 1.2 Dead+1.0 Wind 300 deg | 39.78 | -26.46 | -15.25 | -1578.84 | 2737.88 | -0.69 |
| - No Ice |  |  |  |  |  |  |
| 0.9 Dead+1.0 Wind 300 deg | 29.83 | -26.46 | -15.25 | -1558.55 | 2703.46 | -0.69 |
| - No lce |  |  |  |  |  |  |
| 1.2 Dead+1.0 Wind 330 deg | 39.78 | -15.23 | -26.47 | -2741.17 | 1574.59 | -0.66 |
| - No Ice |  |  |  |  |  |  |
| 0.9 Dead+1.0 Wind 330 deg | 29.83 | -15.23 | -26.47 | -2706.24 | 1554.83 | -0.66 |
| - No Ice |  |  |  |  |  |  |
| 1.2 Dead+1.0 Ice+1.0 Temp | 65.53 | -0.00 | -0.00 | -4.20 | 1.74 | 0.00 |
| 1.2 Dead+1.0 Wind 0 | 65.53 | -0.00 | -8.05 | -850.04 | 2.37 | -0.40 |
| deg+1.0 Ice+1.0 Temp |  |  |  |  |  |  |
| 1.2 Dead+1.0 Wind 30 | 65.53 | 4.02 | -6.97 | -736.29 | -420.49 | -0.18 |
| deg+1.0 Ice+1.0 Temp |  |  |  |  |  |  |
| 1.2 Dead+1.0 Wind 60 | 65.53 | 6.97 | -4.02 | -426.69 | -730.35 | 0.05 |
| deg+1.0 Ice+1.0 Temp |  |  |  |  |  |  |
| 1.2 Dead+1.0 Wind 90 | 65.53 | 8.04 | -0.01 | -5.65 | -842.69 | 0.23 |
| deg+1.0 Ice+1.0 Temp |  |  |  |  |  |  |
| 1.2 Dead+1.0 Wind 120 | 65.53 | 6.96 | 4.01 | 416.89 | -728.91 | 0.46 |
| deg+1.0 Ice+1.0 Temp |  |  |  |  |  |  |
| 1.2 Dead+1.0 Wind 150 | 65.53 | 4.01 | 6.96 | 726.64 | -419.32 | 0.51 |
| deg+1.0 Ice+1.0 Temp |  |  |  |  |  |  |
| 1.2 Dead+1.0 Wind 180 | 65.53 | 0.00 | 8.04 | 839.33 | 1.66 | 0.38 |
| deg+1.0 Ice+1.0 Temp |  |  |  |  |  |  |
| 1.2 Dead+1.0 Wind 210 | 65.53 | -4.01 | 6.96 | 726.73 | 422.87 | 0.15 |
| deg+1.0 Ice+1.0 Temp |  |  |  |  |  |  |
| 1.2 Dead+1.0 Wind 240 | 65.53 | -6.96 | 4.01 | 416.10 | 733.19 | -0.05 |
| deg+1.0 Ice+1.0 Temp |  |  |  |  |  |  |
| 1.2 Dead+1.0 Wind 270 | 65.53 | -8.04 | -0.00 | -4.71 | 846.66 | -0.25 |
| deg+1.0 Ice+1.0 Temp |  |  |  |  |  |  |
| 1.2 Dead+1.0 Wind 300 | 65.53 | -6.97 | -4.02 | -426.35 | 734.05 | -0.45 |
| deg+1.0 Ice+1.0 Temp |  |  |  |  |  |  |
| 1.2 Dead+1.0 Wind 330 | 65.53 | -4.02 | -6.97 | -736.89 | 423.31 | -0.49 |
| deg+1.0 Ice+1.0 Temp |  |  |  |  |  |  |
| Dead+Wind 0 deg - Service | 33.15 | -0.00 | -6.63 | -683.61 | 0.38 | -0.10 |
| Dead+Wind 30 deg - Service | 33.15 | 3.31 | -5.74 | -591.75 | -340.77 | 0.00 |
| Dead+Wind 60 deg - Service | 33.15 | 5.74 | -3.31 | -341.96 | -590.83 | 0.06 |
| Dead+Wind 90 deg - Service | 33.15 | 6.62 | -0.01 | -2.69 | -681.23 | 0.05 |
| Dead+Wind 120 deg - | 33.15 | 5.73 | 3.30 | 338.13 | -589.34 | 0.16 |
| Service |  |  |  |  |  |  |
| Dead+Wind 150 deg - | 33.15 | 3.30 | 5.73 | 588.07 | -339.56 | 0.16 |
| Service |  |  |  |  |  |  |
| Dead+Wind 180 deg - | 33.15 | 0.00 | 6.62 | 678.84 | -0.35 | 0.08 |
| Service |  |  |  |  |  |  |
| Dead+Wind 210 deg - | 33.15 | -3.30 | 5.73 | 588.16 | 339.09 | -0.03 |
| Service |  |  |  |  |  |  |
| Dead+Wind 240 deg - | 33.15 | -5.74 | 3.30 | 337.31 | 589.62 | -0.05 |
| Service |  |  |  |  |  |  |
| Dead+Wind 270 deg - | 33.15 | -6.62 | -0.00 | -1.72 | 681.19 | -0.07 |
| Service |  |  |  |  |  |  |
| Dead+Wind 300 deg - | 33.15 | -5.74 | -3.31 | -341.61 | 590.51 | -0.15 |
| Service |  |  |  |  |  |  |
| Dead+Wind 330 deg - | 33.15 | -3.31 | -5.74 | -592.37 | 339.55 | -0.15 |
| Service |  |  |  |  |  |  |

Solution Summary

|  | Sum of Applied Forces |  |  | Sum of Reactions |  |  | \% Error |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Load | $P X$ | PY | PZ | PX | PY | $P Z$ |  |
| Comb. | K | K | K | K | K | K |  |
| 1 | 0.00 | -33.15 | 0.00 | 0.00 | 33.15 | 0.00 | 0.000\% |
| 2 | -0.02 | -39.78 | -30.56 | 0.02 | 39.78 | 30.56 | 0.000\% |
| 3 | -0.02 | -29.83 | -30.56 | 0.02 | 29.83 | 30.56 | 0.000\% |
| 4 | 15.26 | -39.78 | -26.45 | -15.26 | 39.78 | 26.45 | 0.000\% |
| 5 | 15.26 | -29.83 | -26.45 | -15.26 | 29.83 | 26.45 | 0.000\% |
| 6 | 26.46 | -39.78 | -15.26 | -26.46 | 39.78 | 15.26 | 0.000\% |
| 7 | 26.46 | -29.83 | -15.26 | -26.46 | 29.83 | 15.26 | 0.000\% |
| 8 | 30.52 | -39.78 | -0.04 | -30.52 | 39.78 | 0.04 | 0.000\% |
| 9 | 30.52 | -29.83 | -0.04 | -30.52 | 29.83 | 0.04 | 0.000\% |
| 10 | 26.41 | -39.78 | 15.23 | -26.41 | 39.78 | -15.23 | 0.000\% |
| 11 | 26.41 | -29.83 | 15.23 | -26.41 | 29.83 | -15.23 | 0.000\% |
| 12 | 15.22 | -39.78 | 26.42 | -15.22 | 39.78 | -26.42 | 0.000\% |
| 13 | 15.22 | -29.83 | 26.42 | -15.22 | 29.83 | -26.42 | 0.000\% |
| 14 | 0.01 | -39.78 | 30.49 | -0.01 | 39.78 | -30.49 | 0.000\% |
| 15 | 0.01 | -29.83 | 30.49 | -0.01 | 29.83 | -30.49 | 0.000\% |
| 16 | -15.22 | -39.78 | 26.42 | 15.22 | 39.78 | -26.42 | 0.000\% |
| 17 | -15.22 | -29.83 | 26.42 | 15.22 | 29.83 | -26.42 | 0.000\% |
| 18 | -26.43 | -39.78 | 15.20 | 26.43 | 39.78 | -15.20 | 0.000\% |
| 19 | -26.43 | -29.83 | 15.20 | 26.43 | 29.83 | -15.20 | 0.000\% |
| 20 | -30.53 | -39.78 | -0.01 | 30.53 | 39.78 | 0.01 | 0.000\% |
| 21 | -30.53 | -29.83 | -0.01 | 30.53 | 29.83 | 0.01 | 0.000\% |
| 22 | -26.46 | -39.78 | -15.25 | 26.46 | 39.78 | 15.25 | 0.000\% |
| 23 | -26.46 | -29.83 | -15.25 | 26.46 | 29.83 | 15.25 | 0.000\% |
| 24 | -15.23 | -39.78 | -26.47 | 15.23 | 39.78 | 26.47 | 0.000\% |
| 25 | -15.23 | -29.83 | -26.47 | 15.23 | 29.83 | 26.47 | 0.000\% |
| 26 | 0.00 | -65.53 | 0.00 | 0.00 | 65.53 | 0.00 | 0.000\% |
| 27 | -0.00 | -65.53 | -8.05 | 0.00 | 65.53 | 8.05 | 0.000\% |
| 28 | 4.02 | -65.53 | -6.97 | -4.02 | 65.53 | 6.97 | 0.000\% |
| 29 | 6.97 | -65.53 | -4.02 | -6.97 | 65.53 | 4.02 | 0.000\% |
| 30 | 8.04 | -65.53 | -0.01 | -8.04 | 65.53 | 0.01 | 0.000\% |
| 31 | 6.96 | -65.53 | 4.01 | -6.96 | 65.53 | -4.01 | 0.000\% |
| 32 | 4.01 | -65.53 | 6.96 | -4.01 | 65.53 | -6.96 | 0.000\% |
| 33 | 0.00 | -65.53 | 8.04 | -0.00 | 65.53 | -8.04 | 0.000\% |
| 34 | -4.01 | -65.53 | 6.96 | 4.01 | 65.53 | -6.96 | 0.000\% |
| 35 | -6.96 | -65.53 | 4.01 | 6.96 | 65.53 | -4.01 | 0.000\% |
| 36 | -8.04 | -65.53 | -0.00 | 8.04 | 65.53 | 0.00 | 0.000\% |
| 37 | -6.97 | -65.53 | -4.02 | 6.97 | 65.53 | 4.02 | 0.000\% |
| 38 | -4.02 | -65.53 | -6.97 | 4.02 | 65.53 | 6.97 | 0.000\% |
| 39 | -0.00 | -33.15 | -6.63 | 0.00 | 33.15 | 6.63 | 0.000\% |
| 40 | 3.31 | -33.15 | -5.74 | -3.31 | 33.15 | 5.74 | 0.000\% |
| 41 | 5.74 | -33.15 | -3.31 | -5.74 | 33.15 | 3.31 | 0.000\% |
| 42 | 6.62 | -33.15 | -0.01 | -6.62 | 33.15 | 0.01 | 0.000\% |
| 43 | 5.73 | -33.15 | 3.30 | -5.73 | 33.15 | -3.30 | 0.000\% |
| 44 | 3.30 | -33.15 | 5.73 | -3.30 | 33.15 | -5.73 | 0.000\% |
| 45 | 0.00 | -33.15 | 6.62 | -0.00 | 33.15 | -6.62 | 0.000\% |
| 46 | -3.30 | -33.15 | 5.73 | 3.30 | 33.15 | -5.73 | 0.000\% |
| 47 | -5.74 | -33.15 | 3.30 | 5.74 | 33.15 | -3.30 | 0.000\% |
| 48 | -6.62 | -33.15 | -0.00 | 6.62 | 33.15 | 0.00 | 0.000\% |
| 49 | -5.74 | -33.15 | -3.31 | 5.74 | 33.15 | 3.31 | 0.000\% |
| 50 | -3.31 | -33.15 | -5.74 | 3.31 | 33.15 | 5.74 | 0.000\% |

Non-Linear Convergence Results

| Load Combination | Converged? | Number of Cycles | Displacement Tolerance | Force Tolerance |
| :---: | :---: | :---: | :---: | :---: |
| 1 | Yes | 4 | 0.00000001 | 0.00000001 |
| 2 | Yes | 4 | 0.00000001 | 0.00095638 |
| 3 | Yes | 4 | 0.00000001 | 0.00030590 |
| 4 | Yes | 6 | 0.00000001 | 0.00007887 |
| 5 | Yes | 5 | 0.00000001 | 0.00060854 |
| 6 | Yes | 6 | 0.00000001 | 0.00007840 |
| 7 | Yes | 5 | 0.00000001 | 0.00060480 |
| 8 | Yes | 4 | 0.00000001 | 0.00091710 |
| 9 | Yes | 4 | 0.00000001 | 0.00025798 |
| 10 | Yes | 6 | 0.00000001 | 0.00007925 |
| 11 | Yes | 5 | 0.00000001 | 0.00061191 |
| 12 | Yes | 6 | 0.00000001 | 0.00007761 |
| 13 | Yes | 5 | 0.00000001 | 0.00059877 |
| 14 | Yes | 4 | 0.00000001 | 0.00092148 |
| 15 | Yes | 4 | 0.00000001 | 0.00026751 |
| 16 | Yes | 6 | 0.00000001 | 0.00007810 |
| 17 | Yes | 5 | 0.00000001 | 0.00060278 |
| 18 | Yes | 6 | 0.00000001 | 0.00007870 |
| 19 | Yes | 5 | 0.00000001 | 0.00060752 |
| 20 | Yes | 4 | 0.00000001 | 0.00092022 |
| 21 | Yes | 4 | 0.00000001 | 0.00026529 |
| 22 | Yes | 6 | 0.00000001 | 0.00007795 |
| 23 | Yes | 5 | 0.00000001 | 0.00060122 |
| 24 | Yes | 6 | 0.00000001 | 0.00007939 |
| 25 | Yes | 5 | 0.00000001 | 0.00061268 |
| 26 | Yes | 4 | 0.00000001 | 0.00001548 |
| 27 | Yes | 5 | 0.00000001 | 0.00037070 |
| 28 | Yes | 5 | 0.00000001 | 0.00057174 |
| 29 | Yes | 5 | 0.00000001 | 0.00057337 |
| 30 | Yes | 5 | 0.00000001 | 0.00036711 |
| 31 | Yes | 5 | 0.00000001 | 0.00056948 |
| 32 | Yes | 5 | 0.00000001 | 0.00056025 |
| 33 | Yes | 5 | 0.00000001 | 0.00036650 |
| 34 | Yes | 5 | 0.00000001 | 0.00057035 |
| 35 | Yes | 5 | 0.00000001 | 0.00056900 |
| 36 | Yes | 5 | 0.00000001 | 0.00036941 |
| 37 | Yes | 5 | 0.00000001 | 0.00057362 |
| 38 | Yes | 5 | 0.00000001 | 0.00058246 |
| 39 | Yes | 4 | 0.00000001 | 0.00005412 |
| 40 | Yes | 4 | 0.00000001 | 0.00044582 |
| 41 | Yes | 4 | 0.00000001 | 0.00043854 |
| 42 | Yes | 4 | 0.00000001 | 0.00005192 |
| 43 | Yes | 4 | 0.00000001 | 0.00045111 |
| 44 | Yes | 4 | 0.00000001 | 0.00042464 |
| 45 | Yes | 4 | 0.00000001 | 0.00005235 |
| 46 | Yes | 4 | 0.00000001 | 0.00043253 |
| 47 | Yes | 4 | 0.00000001 | 0.00044217 |
| 48 | Yes | 4 | 0.00000001 | 0.00005273 |
| 49 | Yes | 4 | 0.00000001 | 0.00043169 |
| 50 | Yes | 4 | 0.00000001 | 0.00045483 |

## Maximum Tower Deflections - Service Wind

| Section <br> No. | Elevation | Horz. <br> Deflection <br> in | Gov. <br> Load <br> Comb. | Tilt | Twist |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | ft | $139.5-93.04$ | 27.266 | 39 | 1.7532 |
| L1 | $96.96-46.38$ | 12.952 | 39 | 1.3103 | 0 |
| L2 | $51.63-0$ | 3.548 | 39 | 0.6512 | 0.0022 |
| L3 |  |  |  |  | 0.00003 |

## Critical Deflections and Radius of Curvature - Service Wind

| Elevation ft | Appurtenance | Gov. Load Comb. | Deflection in | Tilt | Twist 。 | Radius of Curvature ft |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 136.00 | 80010121 w/ Mount Pipe | 39 | 26.002 | 1.7208 | 0.0020 | 29128 |
| 134.00 | VHLP2-11 | 39 | 25.281 | 1.7023 | 0.0020 | 26480 |
| 132.00 | A-ANT-23G-2-C | 39 | 24.562 | 1.6837 | 0.0019 | 19419 |
| 130.00 | APXVSPP18-C-A20 w/ Mount Pipe | 39 | 23.845 | 1.6649 | 0.0018 | 15330 |
| 119.00 | (2) DB846F65ZAXY w/ Mount Pipe | 39 | 19.976 | 1.5583 | 0.0014 | 7104 |
| 110.00 | ERICSSON AIR 21 B2A B4P w/ Mount Pipe | 39 | 16.959 | 1.4641 | 0.0011 | 4936 |
| 100.00 | APXV18-206517S-C w/ Mount Pipe | 39 | 13.839 | 1.3483 | 0.0008 | 3690 |
| 75.00 | KS24019-L112A | 39 | 7.500 | 1.0000 | 0.0004 | 3438 |

## Maximum Tower Deflections - Design Wind

| Section <br> No. | Elevation | Horz. <br> Deflection <br> in | Gov. <br> Load <br> Comb. | Tilt | o |
| :---: | :---: | :---: | :---: | :---: | :---: |

## Critical Deflections and Radius of Curvature - Design Wind

$\left.\begin{array}{ccccccc}\hline \text { Elevation } & \text { Appurtenance } & \begin{array}{c}\text { Gov. } \\ \text { Load } \\ \text { Comb. }\end{array} & \text { Deflection } & \text { in } & \text { Tilt } & \text { Twist }\end{array} \begin{array}{c}\text { Radius of } \\ \text { Curvature } \\ \mathrm{ft}\end{array}\right)$

## Compression Checks

## Pole Design Data

| Section No. | Elevation <br> ft | Size | $L$ ft | $\begin{gathered} L_{u} \\ f t \end{gathered}$ | K//r | $A$ $i n^{2}$ | $\begin{gathered} P_{u} \\ K \end{gathered}$ | $\begin{gathered} \phi P_{n} \\ K \end{gathered}$ | $\begin{gathered} \text { Ratio } \\ P_{u} \\ \hline \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| L1 | 139.5-93.04 <br> (1) | TP26.99x15.5×0.25 | 46.46 | 0.00 | 0.0 | $\begin{gathered} 20.448 \\ 9 \end{gathered}$ | -12.43 | 1196.26 | 0.010 |
| L2 | $93.04-46.38$ <br> (2) | TP37.91x25.5205x0.375 | 50.58 | 0.00 | 0.0 | $\begin{gathered} 43.145 \\ 4 \end{gathered}$ | -23.49 | 2524.01 | 0.009 |
| L3 | 46.38-0 (3) | TP48.5x35.874×0.375 | 51.63 | 0.00 | 0.0 | $\begin{gathered} 57.280 \\ 8 \end{gathered}$ | -39.74 | 3350.93 | 0.012 |

tnxTower Report - version 8.0.5.0

| Pole Bending Design Data |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Section No. | Elevation | Size | $M_{u x}$ <br> kip-ft | $\phi M_{n x}$ | $\begin{aligned} & \text { Ratio } \\ & M_{u x} \\ & \hline \end{aligned}$ | $M_{u y}$ kip-ft | $\phi M_{n y}$ | $\begin{aligned} & \text { Ratio } \\ & M_{u y} \\ & \hline \end{aligned}$ |
|  | ft |  |  |  | $\phi M_{n x}$ | kip-ft |  | $\phi M_{n y}$ |
| L1 | 139.5-93.04 <br> (1) | TP26.99x15.5×0.25 | 554.68 | 787.46 | 0.704 | 0.00 | 787.46 | 0.000 |
| L2 | $93.04-46.38$ <br> (2) | TP37.91×25.5205x0.375 | 1676.03 | 2373.92 | 0.706 | 0.00 | 2373.92 | 0.000 |
| L3 | 46.38-0 (3) | TP48.5×35.874×0.375 | 3164.07 | 3860.34 | 0.820 | 0.00 | 3860.34 | 0.000 |

## Pole Shear Design Data

| Section No. | Elevation | Size | Actual $V_{u}$ | $\phi V_{n}$ | $\begin{gathered} \text { Ratio } \\ V_{u} \\ \hline \end{gathered}$ | Actual $T_{u}$ | $\phi T_{n}$ | $\begin{gathered} \text { Ratio } \\ T_{u} \\ \hline \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $f t$ |  |  | K | K | $\phi V_{n}$ | kip-ft | kip-ft | $\phi T_{n}$ |
| L1 | 139.5-93.04 <br> (1) | TP26.99x15.5×0.25 | 22.70 | 358.88 | 0.063 | 0.21 | 809.94 | 0.000 |
| L2 | $93.04-46.38$ <br> (2) | TP37.91x25.5205x0.375 | 26.77 | 757.20 | 0.035 | 0.32 | 2403.74 | 0.000 |
| L3 | 46.38-0 (3) | TP48.5x35.874×0.375 | 30.60 | 1005.28 | 0.030 | 0.43 | 4236.79 | 0.000 |

## Pole Interaction Design Data

| Section No. | Elevation | $\begin{gathered} \text { Ratio } \\ P_{u} \end{gathered}$ | $\begin{gathered} \text { Ratio } \\ M_{u x} \end{gathered}$ | $\begin{gathered} \text { Ratio } \\ M u y \end{gathered}$ | $\begin{gathered} \text { Ratio } \\ V_{u} \end{gathered}$ | $\begin{gathered} \text { Ratio } \\ T_{u} \end{gathered}$ | Comb. Stress | Allow. Stress | Criteria |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $f t$ |  | $\phi P_{n}$ | $\phi M_{n x}$ | $\phi M_{\text {ny }}$ | $\phi V_{n}$ | $\phi T_{n}$ | Ratio | Ratio |  |
| L1 | 139.5-93.04 <br> (1) | 0.010 | 0.704 | 0.000 | 0.063 | 0.000 | 0.719 | 1.050 | 4.8.2 |
| L2 | $93.04-46.38$ <br> (2) | 0.009 | 0.706 | 0.000 | 0.035 | 0.000 | 0.717 | 1.050 | 4.8.2 |
| L3 | 46.38-0 (3) | 0.012 | 0.820 | 0.000 | 0.030 | 0.000 | 0.832 | 1.050 | 4.8.2 |

## Section Capacity Table

| Section No. | $\begin{aligned} & \text { Elevation } \\ & \text { ft } \end{aligned}$ | Component Type | Size | Critical Element | $\begin{aligned} & P \\ & K \end{aligned}$ | $\begin{gathered} \varnothing P_{\text {allow }} \\ K \end{gathered}$ | $\begin{gathered} \text { \% } \\ \text { Capacity } \end{gathered}$ | Pass Fail |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| L1 | 139.5-93.04 | Pole | TP26.99x15.5×0.25 | 1 | -12.43 | 1256.07 | 68.5 | Pass |
| L2 | 93.04-46.38 | Pole | TP37.91×25.5205x0.375 | 2 | -23.49 | 2650.21 | 68.2 | Pass |
| L3 | 46.38-0 | Pole | TP48.5×35.874×0.375 | 3 | -39.74 | 3518.48 | 79.3 | Pass |
|  |  |  |  |  |  | Pole (L3) RATING $=$ | $\begin{gathered} \text { Summary } \\ 79.3 \\ 79.3 \end{gathered}$ | Pass Pass |

## APPENDIX B

## BASE LEVEL DRAWING

## APPENDIX C

## ADDITIONAL CALCULATIONS

Monopole Base Plate Connection

| Site Info |  |
| ---: | :---: |
| BU \# |  |
| Site Name | ROGERS PROPERTY |
| Order \# | 479806 Rev.0 |


| Analysis Considerations |  |
| ---: | :---: |
| TIA-222 Revision | H |
| Grout Considered: | No |
| $\mathrm{I}_{\mathrm{ar}}$ (in) | 1 |


$|$| Applied Loads |  |
| ---: | :---: |
| Moment (kip-ft) | 3164.07 |
| Axial Force (kips) | 39.74 |
| Shear Force (kips) |  |
| *TIA-222-H Section 15.5 Applied |  |



## Connection Properties

Analysis Results

## Anchor Rod Data

(16) 2-1/4" $\varnothing$ bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 57" BC

Base Plate Data
63 " OD x 2" Plate (A572-60; Fy=60 ksi, Fu=75 ksi)

Stiffener Data
(16) 15 "H x 6"W x 0.75"T, Notch: 0.75 "
plate: $F y=50 \mathrm{ksi}$; weld: $\mathrm{Fy}=70 \mathrm{ksi}$
horiz. weld: $0.375^{\prime \prime}$ groove, $45^{\circ} \mathrm{dbl}$ bevel, $0.3125^{\prime \prime}$ fillet vert. weld: $0.3125^{\prime \prime}$ fillet

Pole Data
$48.5^{\prime \prime} \times 0.375$ " 18 -sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

| Anchor Rod Summary |  | (units of kips, kip-in) |
| :---: | :--- | :---: |
| Pu_c $=168.91$ | $\phi P n \_c=243.75$ | Stress Rating |
| $\mathrm{Vu}=1.91$ | $\phi \mathrm{Vn}=73.13$ | $\mathbf{6 6 . 1 \%}$ |
| $\mathrm{Mu}=\mathrm{n} / \mathrm{a}$ | $\phi \mathrm{Mn}=\mathrm{n} / \mathrm{a}$ | Pass |


| Base Plate Summary |  |  |
| :--- | :--- | :--- |
| Max Stress (ksi): | 29.13 | (Roark's Flexural) |
| Allowable Stress (ksi): | 54 |  |
| Stress Rating: | $\mathbf{5 1 . 4 \%}$ | Pass |
|  |  |  |
| Stiffener Summary | $\mathbf{6 2 . 4 \%}$ | Pass |
| Horizontal Weld: | $\mathbf{5 8 . 4 \%}$ | Pass |
| Vertical Weld: | $\mathbf{2 2 . 7 \%}$ | Pass |
| Plate Flexure+Shear: | $\mathbf{6 3 . 1 \%}$ | Pass |
| Plate Tension+Shear: | $\mathbf{6 9 . 0 \%}$ | Pass |
| Plate Compression: |  |  |
| Pole Summary | $\mathbf{1 5 . 0 \%}$ | Pass |

## Pier and Pad Foundation

BU \#: 881541<br>Site Name: ROGERS PROPE<br>App. Number: 479806 Rev. 0

|  | TIA-222 Revision: |
| ---: | :---: |
| Tower Type: | Monopole |
|  |  |

Superstructure Analysis Reactions

| Compression, $\mathbf{P}_{\text {comp }}:$ | 39 | kips |
| ---: | :---: | :--- |
| Base Shear, Vu_comp: | 30 | kips |
|  |  |  |
| Moment, $\mathbf{M}_{\mathbf{u}}:$ | 2090 | ft :kips |
| Tower Height, $\mathbf{H}:$ | 139.5 | ft |
|  |  |  |
| BP Dist. Above Fdn, bp $_{\text {dist }}:$ | 3.25 | in |


| Pier Properties |  |  |  |
| ---: | :---: | :--- | :---: |
| Pier Shape: | Square |  |  |
| Pier Diameter, dpier: | 6.5 | ft |  |
| Ext. Above Grade, E: | 1 | ft |  |
| Pier Rebar Size, Sc: | 11 |  |  |
| Pier Rebar Quantity, mc: | 22 |  |  |
| Pier Tie/Spiral Size, St: | 5 |  |  |
| Pier Tie/Spiral Quantity, mt: | 11 |  |  |
| Pier Reinforcement Type: | Tie |  |  |
| Pier Clear Cover, cc pier: $^{2}$ | 4 | in |  |

Pad Properties

| Pad Properties |  |  |
| ---: | :---: | :---: |
| Depth, D: | 7 | ft |
| Pad Width, $\mathbf{W}:$ | 23 | ft |
| Pad Thickness, T: | 3 | ft |
| Pad Rebar Size (Bottom), Sp: | 8 |  |
| Pad Rebar Quantity (Bottom), mp: | 45 |  |
| Pad Clear Cover, $\mathbf{c c}_{\text {pad }}:$ | 3 | in |

Material Properties
Rebar Grade, Fy:

| Rebar Grade, Fy: | 60 | ksi |
| ---: | :---: | :--- |
| Concrete Compressive Strength, F'c: | 4 | ksi |
| Dry Concrete Density, $\delta \mathbf{c}:$ | 150 | pcf |


| Soil Properties |  |  |
| ---: | :---: | :--- |
| Total Soil Unit Weight, $\gamma:$ | 125 | pcf |
| Ultimate Net Bearing, Qnet: | 8.000 | ksf |
| Cohesion, $\mathbf{C u}:$ | 0.000 | ksf |
| Friction Angle, $\varphi:$ | 34 | degrees |
| SPT Blow Count, $\mathbf{N}_{\text {blows: }}:$ |  |  |
| Base Friction, $\mu:$ | 0.6 |  |
| Neglected Depth, N: | 3.50 | ft |
| Foundation Bearing on Rock? | No |  |
| Groundwater Depth, gw: | 7 | ft |

ry Concrete Density, $\delta \mathbf{c}$
Soil Properties

Goundwater Depth, gw: ft

| Top \& Bot. Pad Rein. Different?: | $\Gamma$ |
| ---: | :---: |
| Block Foundation?: | $\Gamma$ |


| Foundation Analysis Checks |  |  |  |  |
| ---: | :---: | :---: | :---: | :---: |
|  | Capacity | Demand | Rating* | Check |
|  |  |  |  |  |
| Lateral (Sliding) (kips) | 350.86 | 30.00 | $\mathbf{8 . 1} \%$ | Pass |
| Bearing Pressure (ksf) | 6.66 | 2.04 | $\mathbf{2 9 . 2 \%}$ | Pass |
| Overturning (kip*ft) | 5370.99 | 2338.13 | $\mathbf{4 3 . 5 \%}$ | Pass |
| Pier Flexure (Comp.) (kip*ft) | 5006.11 | 2240.00 | $\mathbf{4 2 . 6 \%}$ | Pass |
|  |  |  |  |  |
| Pier Compression (kip) | 26891.28 | 77.03 | $\mathbf{0 . 3} \%$ | Pass |
| Pad Flexure (kip*ft) | 4857.40 | 763.13 | $\mathbf{1 5 . 0 \%}$ | Pass |
| Pad Shear - 1-way (kips) | 824.79 | 125.33 | $\mathbf{1 4 . 5 \%}$ | Pass |
| Pad Shear - 2-way (Comp) (ksi) | 0.190 | 0.026 | $\mathbf{1 3 . 0} \%$ | Pass |
| Flexural 2-way (Comp) (kip*ft) | 6567.23 | 1344.00 | $\mathbf{1 9 . 5 \%}$ | Pass |

*Rating per TIA-222-H Section 15.5

Soil Rating*: 43.5\%
Structural Rating* 42.6\%
<--Toggle between Gross and Net
Drilled Pier Foundation

| BU \# : | 881541 |
| ---: | :--- |
| Site Name: | ROGERS PROPERTY |
| Order Number: | 479806 Rev.0 |
|  |  |
| TIA-222 Revison: | $\begin{aligned} & H \\ \text { Tower Type: } & \text { Monopole } \\ & \end{aligned}$ |




|  | $\left\|\begin{array}{l} \operatorname{lon} \\ m \end{array}\right\|$ | $\stackrel{10}{\sim}$ | $\stackrel{\square}{\square}$ |
| :---: | :---: | :---: | :---: |
|  | $\mid$ | N | 앗 |
| 은 | $\bigcirc$ | $\stackrel{1}{n}$ |  |
| $\stackrel{\text { ® }}{\text { ® }}$ |  | $N$ |  |

## ASCE 7 Hazards Report

| Standard: | ASCE/SEI 7-10 | Elevation: 91.22 ft (NAVD 88) |
| :--- | :--- | :--- |
| Risk Category: | II | Latitude: 41.285486 |
| Soil Class: | D - Stiff Soil | Longitude: -73.042575 |



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## Seismic

Site Soil Class: D-Stiff Soil

Results:

| $\mathrm{S}_{\mathrm{S}}:$ | 0.193 |
| :--- | :--- |
| $\mathrm{~S}_{1}:$ | 0.063 |
| $\mathrm{~F}_{\mathrm{a}}:$ | 1.6 |
| $\mathrm{~F}_{\mathrm{V}}:$ | 2.4 |
| $\mathrm{~S}_{\mathrm{Ms}}:$ | 0.309 |
| $\mathrm{~S}_{\mathrm{M} 1}:$ | 0.152 |


| $\mathrm{S}_{\mathrm{DS}}:$ | 0.206 |
| :--- | :--- |
| $\mathrm{~S}_{\mathrm{D} 1}:$ | 0.101 |
| $\mathrm{~T}_{\mathrm{L}}:$ | 6 |
| $\mathrm{PGA}:$ | 0.102 |
| $\mathrm{PGA}_{\mathrm{M}}:$ | 0.163 |
| $\mathrm{~F}_{\mathrm{PGA}}:$ | 1.596 |
| $\mathrm{I}_{\mathrm{e}}:$ | 1 |

## Seismic Design Category <br> B




Data Accessed:
Date Source:

Fri Jun 142019
USGS Seismic Design Maps based on ASCE/SEI 7-10, incorporating Supplement 1 and errata of March 31, 2013, and ASCE/SEI 7-10 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-10 Ch. 21 are available from USGS.

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## Ice

## Results

Ice Thickness:
Concurrent Temperature:
Gust Speed:
Data Source:
Date Accessed:
0.75 in .

15 F
50 mph
Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Fri Jun 142019

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.
Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 50 -year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

The ASCE 7 Hazard Tool is provided for your convenience, for informational purposes only, and is provided "as is" and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE 7 standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

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## Exhibit E

## Mount Analysis

Charles McGuirt
Crown Castle
3530 Torringdon Way Suite 300
Charlotte, NC 28277

Subject:
Carrier Designation:

## Crown Castle Designation:

Engineering Firm Designation:
Site Data:

## Structure Information

## Mount Modification Analysis

T-Mobile Equipment Change-Out Carrier Site Number: Carrier Site Name:

Crown Castle BU Number: Crown Castle Site Name: Crown Castle JDE Number: Crown Castle Order Number:

Mastec Network Solutions
507 Airport Blvd, Suite 111
Morrisville, NC 27560
(919) 674-5895

Mastec Network Solutions Project Number: 18545-MOD1
700 Grassy Hill Road, Orange, New Haven County, CT, 06477
Latitude: 41¹7' 7.74" Longitude: $-73^{\circ} \mathbf{2}^{\prime} 33.27^{\prime \prime}$
Tower Height \& Type: Mount Elevation:
Mount Width \& Type:
139.5 ft Monopole

110 ft
13'-4" ft T-Arm Mount W/ Modifications

CT11083Q CT083/Sprint/Grassy Hill

881541
Rogers Property
559347
479806 Revision 0

Dear Charles McGuirt,
Mastec Network Solutions is pleased to submit this "Mount Modification Analysis Report" to determine the structural integrity of T-Mobile's antenna mounting system with the proposed appurtenance and equipment addition on the above mentioned supporting tower structure. Analysis of the existing supporting tower structure is to be completed by others and therefore is not part of this analysis. Analysis of the antenna mounting system as a tie-off point for fall protection or rigging is not part of this document.

The purpose of the analysis is to determine acceptability of the mount stress level. Based on our analysis we have determined the mount stress level to be:

T-Arm Mount W/ Modifications Sufficient
This analysis utilizes an ultimate 3-second gust wind speed of 125 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Mount analysis prepared by: Noah Noxon
Respectfully Submitted by:

Raphael Mohamed, PE, Peng
Senior Director of Engineering CT PE License No. 25112

## TABLE OF CONTENTS

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Table 1 - Proposed Equipment Configuration Information

## 3) ANALYSIS PROCEDURE

Table 2 - Documents Provided
3.1) Analysis Method
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## 5) APPENDIX A

Wire Frame and Rendered Models

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Software Input Calculations

## 7) APPENDIX C

Software Analysis Output

## 8) APPENDIX D

Additional Calculations

## 9) APPENDIX E

Modification Drawings

## 1) INTRODUCTION

This is a $13^{\prime}-4$ " ft T-Arm Mount mapped by P-Sec in April of 2019. It is installed at the 110 ft elevation of a 139.5 ft Monopole.

## 2) ANALYSIS CRITERIA

TIA-222 Revision:
Risk Category
an ultimate:
Exposure Category:
Topographic Category:
Ice Thickness:
Wind Speed with Ice:
Seismic Ss:
Seismic S1:
Live Loading Wind Speed:
Live Loading at Mid/End-Points:
Man Live Loading at Mount Pipes

TIA-222-H
II
125 mph
C
1
1.5 in

50 mph
0.193
0.063

30 mph
500 lb
250 lb

Table 1 - Proposed Loading Configuration

| Mount Centerline (ft) | Antenna Centerline (ft) | $\begin{array}{\|l\|} \hline \text { Number } \\ \text { of } \\ \text { Antennas } \\ \hline \end{array}$ | Antenna Manufacturer | Antenna Model | Mount / Modification Details |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 110.0 | 110.0 | 3 | ericsson | Air 21 B2A B4P | (3) 13'-4" T-Arm W/ Modifications |
|  |  | 3 | ericsson | Air 21 B4A B2P |  |
|  |  | 3 | rfs celwave | APXVAARR24-43-U-NA20 |  |
|  |  | 3 | ericsson | KRY 112 144/1 |  |
|  |  | 3 | ericsson | RADIO 4449 B12/B71 |  |

## 3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

| Document | Remarks | Reference | Source |
| :---: | :---: | :---: | :---: |
| 4-MOUNT MAPPING | P-Sec | 8347381 | CCIsites |
| 4-MOUNT ANALYSIS REPORT | Mastec | 8366040 | CCIsites |
| 4-MOUNT REINFORCEMENT DESIGN DRAWINGS | Mastec | - | On File |
| 4-ORDER INFORMATION | CROWN CASTLE | $\begin{gathered} \text { ORDER NO. } \\ \text { 479806, REV } \\ 0 \end{gathered}$ | CCIsites |

## 3.1) Analysis Method

RISA-3D (Version No. 17.0.2), a commercially available analysis software package, was used to create a three-dimensional model of the antenna mounting system and calculate member stresses for various loading cases.

This analysis was performed in accordance with Crown Castle's ENG-SOW-10208 Tower Mount Analysis (Revision C).

## 3.2) Assumptions

1) The antenna mounting system was properly fabricated, installed and maintained in good condition in accordance with its original design and manufacturer's specifications.
2) The configuration of antennas, mounts, and other appurtenances are as specified in Tables 1 and the referenced drawings.
3) All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
4) Steel grades have been assumed as follows, unless noted otherwise:
```
Channel, Solid Round, Angle, Plate
    ASTM A36 (GR 36)
    HSS (Rectangular) ASTM 500 (GR B-46)
    Pipe
    Connection Bolts
    ASTM A53 (GR B-35)
    ASTM A325
```

This analysis may be affected if any assumptions are not valid or have been made in error. Mastec should be notified to determine the effect on the structural integrity of the antenna mounting system.

## 4) ANALYSIS RESULTS

Table 4 - Mount Component Stresses vs. Capacity (T-Arm Mount, All Sectors)

| Notes | Component | Beam No. | Centerline (ft) | \% Capacity | Pass / Fail |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 1,2 | Standoff | -- | 110 | 23.6 | Pass |
| 1,2 | Support Pipe | -- | 110 | 0.1 | Pass |
| 1,2 | Face Horizontal | -- | 110 | 44.2 | Pass |
| 1,2 | Mount Pipes | -- | 110 | 43.7 | Pass |
| 1,2 | PRK-SFS | -- | 110 | 49.7 | Pass |
| 1,2 | P2174 | -- | 110 | 38.8 | Pass |
| 1,2 | PV-PKBK-M | -- | 110 | 26.1 | Pass |
| 1,2 | Mount to Tower Connection Plate |  | 110 | 30.9 | Pass |
| 1,2 | Mount to Tower Connection Bolts |  | - | 16.8 | Pass |


|  | Structure Rating (max from all components) $=$ | $49.7 \%$ |
| :--- | :--- | :---: |
| Notes: <br> 1) | See additional documentation in "Appendix C - Software Analysis Output" for calculations supporting the \% capacity <br> consumed. <br> All sectors are typical |  |

## 4.1) Recommendations

The mount has sufficient capacity to carry the proposed loading configuration. In order for the results of the analysis to be considered valid, the structural modifications listed below must be completed.

1. Site Pro PRK-SFS
2. PV- PKPB-M

Engineering Detail Drawings have been provided in Appendix E- Mount Modification Drawings. Connection from the mount to the tower and local stresses on the tower are sufficient.

## APPENDIX A

WIRE FRAME AND RENDERED MODELS


| Mastec |  | Render |
| :--- | :---: | :--- |
| NDN |  | 881541 Rogers Property |



| Mastec |  | Member Labels |
| :--- | :---: | :--- |
| NDN | 881541 Rogers Property | June 3, 2019 at 3:59 PM |
| 18545-MOD1 |  | T-Arm.r3d |



| Mastec |  | Joint Labels |
| :--- | :---: | :--- |
| NDN | 881541 Rogers Property | June 3, 2019 at 3:59 PM |
| 18545-MOD1 |  | T-Arm.3d |



| Mastec |  | Shapes |
| :--- | :---: | :--- |
| NDN | 881541 Rogers Property | June 3, 2019 at 3:59 PM |
| 18545-MOD1 |  | T-Arm.r3d |



| Mastec | 881541 Rogers Property | Unity Bending Check |
| :---: | :---: | :---: |
| NDN |  | June 3, 2019 at 5:03 PM |
| 18545-MOD1 |  | T-Arm.r3d |



| Mastec |  | Shear Check |
| :--- | :---: | :--- |
| NDN |  | 881541 Rogers Property |
| 18545-MOD1 |  | June 3, 2019 at 5:03 PM |

## APPENDIX B

SOFTWARE INPUT CALCULATIONS







## APPENDIX C

SOFTWARE ANALYSIS OUTPUT

## Hot Rolled Steel Properties

|  | Label | E [ksi] | G [ksi] | Nu | Therm (11E. | Density[k/ft. | Yield[ksi] | Ry | Fu[ksi] | Rt |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | A992 | 29000 | 11154 | 3 | . 65 | 49 | 50 | 1.1 | 65 | 1.1 |
| 2 | A36 Gr. 36 | 29000 | 11154 | 3 | 65 | 49 | 36 | 1.5 | 58 | 1.2 |
| 3 | A572 Gr. 50 | 29000 | 11154 | 3 | 65 | 49 | 50 | 1.1 | 65 | 1.1 |
| 4 | A500 Gr.B RND | 29000 | 11154 | 3 | . 65 | . 527 | 42 | 1.4 | 58 | 1.3 |
| 5 | A500 Gr.B Rect | 29000 | 11154 | 3 | 65 | 527 | 46 | 1.4 | 58 | 1.3 |
| 6 | A53 Gr.B | 29000 | 11154 | 3 | 65 | 49 | 35 | 1.6 | 60 | 1.2 |
| 7 | A1085 | 29000 | 11154 | 3 | . 65 | 49 | 50 | 1.4 | 65 | 1.3 |

## Hot Rolled Steel Section Sets

| Label |  | Shape | Type | Design List | Material | Design R | A [in2] | Iyy [in4] Izz [in4] |  | $\frac{J \text { [in4] }}{12.8}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | Standoff | HSS4X4X4 | Beam | Tube | A500 Gr.. | Typical | 3.37 | 7.8 | 7.8 |  |
| 2 | Support Pipe | PIPE 4.0 | Beam | Pipe | A53 Gr.B | Typical | 2.96 | 6.82 | 6.82 | 13.6 |
| 3 | Face Horizontal | PIPE 3.0 | Beam | Pipe | A53 Gr.B | Typical | 2.07 | 2.85 | 2.85 | 5.69 |
| 4 | Mount Pipes | PIPE_2.0X | Beam | Pipe | A53 Gr.B | Typical | 1.4 | 827 | 827 | 1.65 |
| 5 | Position 3 Mount Pipe | PIPE 2.5 | Beam | Pipe | A53 Gr.B | Typical | 1.61 | 1.45 | 1.45 | 2.89 |
| 6 | SFS-H | L2.5×2.5×3 | Beam | Single Angle | A36 Gr. 36 | Typical | 901 | 535 | 535 | 011 |
| 7 | P2174 | PIPE 2.0 | Beam | Pipe | A53 Gr.B | Typical | 1.02 | 627 | 627 | 1.25 |
| 8 | PKBK | LL3x3x3x3 | Beam | Double Angle (3.. | A53 Gr.B | Typical | 2.18 | 4.09 | 1.9 | 027 |

Joint Coordinates and Temperatures

|  | Label | $\mathrm{X}[\mathrm{ft}]$ | $\mathrm{Y}[\mathrm{ft}]$ | $\mathrm{Z}[\mathrm{ft}]$ | Temp [F] | Detach From Diap.. |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | N1 | 0 | 0 | 0 | 0 |  |
| 2 | N2 | 0 | 0 | 2.916667 | 0 |  |
| 3 | N3 | 0 | 75 | 2.916667 | 0 |  |
| 4 | N4 | 0 | -. 75 | 2.916667 | 0 |  |
| 5 | N5 | 0 | 0 | 3.104167 | 0 |  |
| 6 | N6 | 6.666667 | 0 | 3.104167 | 0 |  |
| 7 | N7 | -6.666667 | 0 | 3.104167 | 0 |  |
| 8 | N8 | -6 | 0 | 3.104167 | 0 |  |
| 9 | N9 | 6 | 0 | 3.104167 | 0 |  |
| 10 | N10 | -1.083333 | 0 | 3.104167 | 0 |  |
| 11 | N11 | 2 | 0 | 3.104167 | 0 |  |
| 12 | N12 | -1.083333 | 4.416667 | 3.354167 | 0 |  |
| 13 | N13 | -1.083333 | -3.583333 | 3.354167 | 0 |  |
| 14 | N14 | -1.083333 | 0 | 3.354167 | 0 |  |
| 15 | N15 | -6 | 0 | 3.354167 | 0 |  |
| 16 | N16 | 6 | 0 | 3.354167 | 0 |  |
| 17 | N17 | 2 | 0 | 3.354167 | 0 |  |
| 18 | N18 | -6 | 2.916667 | 3.354167 | 0 |  |
| 19 | N19 | 6 | 2.916667 | 3.354167 | 0 |  |
| 20 | N20 | 2 | 2.916667 | 3.354167 | 0 |  |
| 21 | N21 | -6 | -3.083333 | 3.354167 | 0 |  |
| 22 | N22 | 6 | -3.083333 | 3.354167 | 0 |  |
| 23 | N23 | 2 | -3.083333 | 3.354167 | 0 |  |
| 24 | N24 | 0 | 2 | 0 | 0 |  |
| 25 | N25 | 6.666667 | 2 | 3.104167 | 0 |  |
| 26 | N26 | -6.666667 | 2 | 3.104167 | 0 |  |
| 27 | N27 | -6 | 2 | 3.104167 | 0 |  |
| 28 | N28 | 6 | 2 | 3.104167 | 0 |  |
| 29 | N29 | -1.083333 | 2 | 3.104167 | 0 |  |
| 30 | N30 | 2 | 2 | 3.104167 | 0 |  |
| 31 | N31 | -1.083333 | 2 | 3.354167 | 0 |  |
| 32 | N32 | -6 | 2 | 3.354167 | 0 |  |

Joint Coordinates and Temperatures (Continued)

| Label |  |  |  |  |  |  |  | X[ft] | $\mathrm{Y}[\mathrm{ft}]$ | $\mathrm{Z}[\mathrm{ft}]$ | Temp [F] | Detach From Diap... |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 33 | N33 | 6 | 2 | 3.354167 | 0 |  |  |  |  |  |  |  |
| 34 | N34 | 2 | 2 | 3.354167 | 0 |  |  |  |  |  |  |  |
| 35 | N35 | -0.333333 | 2 | 0 | 0 |  |  |  |  |  |  |  |
| 36 | N36 | 0.333333 | 2 | 0 | 0 |  |  |  |  |  |  |  |
| 37 | N37 | -3.416667 | 2 | 3.104167 | 0 |  |  |  |  |  |  |  |
| 38 | N38 | 3.416667 | 2 | 3.104167 | 0 |  |  |  |  |  |  |  |
| 39 | N39 | 0 | 0 | 2.416667 | 0 |  |  |  |  |  |  |  |
| 40 | N40 | 0 | -3.1875 | 0 | 0 |  |  |  |  |  |  |  |

## Joint Boundary Conditions

|  | int Lab | X [k/in] | Y [k/in] | Z [k/in] | X Rot.[k-ft/rad] | Y Rot.[k-ft/rad] | Z Rot.[k-ft/rad] |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | N1 | Reaction | Reaction | Reaction | Reaction | Reaction | Reaction |
| 2 | N24 | Reaction | Reaction | Reaction | Reaction | Reaction | Reaction |
| 3 | N35 |  |  |  |  |  |  |
| 4 | N36 |  |  |  |  |  |  |
| 5 | N40 | Reaction | Reaction | Reaction | Reaction | Reaction | Reaction |

## Member Primary Data

|  | Label | 1 Joint | $J$ Joint | K Joint | Rotate(deg) | Section/Shape | Type | Design List | Material | Design Rules |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | M1 | N2 | N1 |  |  | Standoff | Beam | Tube | A500 Gr.B.. | Typical |
| 2 | M2 | N3 | N4 |  |  | Support Pipe | Beam | Pipe | A53 Gr.B | Typical |
| 3 | M3 | N7 | N6 |  |  | Face Horizontal | Beam | Pipe | A53 Gr.B | Typical |
| 4 | M4 | N5 | N2 |  |  | RIGID | None | None | RIGID | Typical |
| 5 | MP3 | N12 | N13 |  |  | Position 3 Mou. | Beam | Pipe | A53 Gr.B | Typical |
| 6 | M6 | N15 | N8 |  |  | RIGID | None | None | RIGID | Typical |
| 7 | M7 | N14 | N10 |  |  | RIGID | None | None | RIGID | Typical |
| 8 | M8 | N17 | N11 |  |  | RIGID | None | None | RIGID | Typical |
| 9 | M9 | N16 | N9 |  |  | RIGID | None | None | RIGID | Typical |
| 10 | MP4 | N18 | N21 |  |  | Mount Pipes | Beam | Pipe | A53 Gr.B | Typical |
| 11 | MP2 | N20 | N23 |  |  | Mount Pipes | Beam | Pipe | A53 Gr.B | Typical |
| 12 | MP1 | N19 | N22 |  |  | Mount Pipes | Beam | Pipe | A53 Gr.B | Typical |
| 13 | M13 | N26 | N25 |  |  | P2174 | Beam | Pipe | A53 Gr.B | Typical |
| 14 | M14 | N32 | N27 |  |  | RIGID | None | None | RIGID | Typical |
| 15 | M15 | N31 | N29 |  |  | RIGID | None | None | RIGID | Typical |
| 16 | M16 | N34 | N30 |  |  | RIGID | None | None | RIGID | Typical |
| 17 | M17 | N33 | N28 |  |  | RIGID | None | None | RIGID | Typical |
| 18 | M18 | N35 | N36 |  |  | RIGID | None | None | RIGID | Typical |
| 19 | M19 | N37 | N35 |  | 90 | SFS-H | Beam | Sinqle Anqle | A36 Gr. 36 | Typical |
| 20 | M20 | N38 | N36 |  | 180 | SFS-H | Beam | Single Angle | A36 Gr. 36 | Typical |
| 21 | M21 | N39 | N40 |  |  | PKBK | Beam | Double Angle (.. | A53 Gr.B | Typical |

Joint Loads and Enforced Displacements (BLC 42 : Man 1 (500 Ibs))

| Joint Label |  |  | L,D,M | Direction | Magnitude[(k,k-ft), (in,rad), (k*s^2/f... |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | N9 | L | Y | -.5 |  |

## Joint Loads and Enforced Displacements (BLC 43 : Man 2 (500 lbs))

|  | Joint Label | L,D,M | Direction | Magnitude[(k,k-ft), (in,rad), (k*s^2/f.. |
| :---: | :---: | :---: | :---: | :---: |
| 1 | N28 | L | Y | -. 5 |

## Joint Loads and Enforced Displacements (BLC 44 : Man 3 (500 lbs))

Joint Loads and Enforced Displacements (BLC 44 : Man 3 (500 Ibs)) (Continued)

|  | Joint Label | L,D,M | Direction | Magnitude[(k,k-ft), (in,rad), (k*s^2/f. |
| :---: | :---: | :---: | :---: | :---: |
| 1 | N10 | L | Y | -. 5 |

Joint Loads and Enforced Displacements (BLC 45: Man 4 (250 lbs))

| Joint Label | L.D.M | Direction | Magnitude[(k,k-ft). (in, rad). (k**^2/f... |  |
| :---: | :---: | :---: | :---: | :---: |
| 1 | N29 | L | Y | -.25 |

Joint Loads and Enforced Displacements (BLC 46 : Man 5 (250 Ibs))

|  | Joint Label | L.D.M | Direction | Magnitude[(k,k-ft), (in,rad), ( $\mathrm{k}^{*} \mathrm{~s}^{\wedge} 2 / \mathrm{f}$. |
| :---: | :---: | :---: | :---: | :---: |
| 1 | N8 | L | Y | -. 25 |

Joint Loads and Enforced Displacements (BLC 47 : Man 6 (250 Ibs))

| Joint Label | L,D,M | Direction | Magnitude[(k,k-ft), (in, rad), (k*s^2/f... |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | N 27 | L | Y | -.25 |

## Member Point Loads (BLC 1 : Dead)

| Member Label |  |  |  |  |  |  | Direction | Magnitude $[\mathrm{k}, \mathrm{k}-\mathrm{ft}]$ | Location[ft,\%] |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | MP1 | Y | -.092 | $\% 50$ |  |  |  |  |  |
| 2 | MP1 | Y | -.011 | $\% 50$ |  |  |  |  |  |
| 3 | MP3 | Y | -.128 | $\% 50$ |  |  |  |  |  |
| 4 | MP4 | Y | -.092 | $\% 50$ |  |  |  |  |  |
| 5 | MP4 | Y | -.075 | $\% 50$ |  |  |  |  |  |

Member Point Loads (BLC 2 : Ice Dead)

| Member Label |  |  |  |  |  | Direction | Magnitude $[\mathrm{k}, \mathrm{k}-\mathrm{ft}]$ | Location[ft,\%] |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | MP1 | Y | -.156 | $\% 50$ |  |  |  |  |
| 2 | MP1 | Y | -.01 | $\% 50$ |  |  |  |  |
| 3 | MP3 | Y | -.45 | $\% 50$ |  |  |  |  |
| 4 | MP4 | Y | -.155 | $\% 50$ |  |  |  |  |
| 5 | MP4 | Y | -.046 | $\% 50$ |  |  |  |  |

Member Point Loads (BLC 3 : Full Wind Antenna (0 Deg))

| Member Label |  |  |  |  |  | Direction | Magnitude[k,k-ft] | Location[ft, \%] |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | MP1 | $Z$ | -.134 | $\% 11.1$ |  |  |  |  |
| 2 | MP3 | $Z$ | -.447 | $\% .1$ |  |  |  |  |
| 3 | MP4 | $Z$ | -.134 | $\% 11.2$ |  |  |  |  |
| 4 | MP4 | $Z$ | -.007 | $\% 50$ |  |  |  |  |
| 5 | MP1 | $Z$ | -.134 | $\% 88.9$ |  |  |  |  |
| 6 | MP3 | $Z$ | -.447 | $\% 99.9$ |  |  |  |  |
| 7 | MP4 | $Z$ | -.134 | $\% 88.8$ |  |  |  |  |

Member Point Loads (BLC 4 : Full Wind Antenna (30 Deg))

| Member Label |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| 1 | MP1 | Direction | Magnitude[k,k-ft] | Location[ft,\%] |
| 2 | MP3 | $Z$ | -.108 | $\% 11.1$ |
| 3 | MP4 | $Z$ | -.333 | $\% .1$ |
| 4 | MP4 | $Z$ | -.108 | $\% 11.2$ |
| 5 | MP1 | $Z$ | -.006 | $\% 80$ |
| 6 | MP3 | $Z$ | -.108 | $\% 99.9$ |
| 7 | MP4 | $Z$ | -.333 | $\% 88.8$ |
| 8 | MP1 | X | -.108 | $\% 11.1$ |
| 9 | MP1 | X | .062 | $\% 45.1$ |
| 10 | MP3 | $X$ | 0 | $\% .1$ |

Location[ft,\%]
\%11.2
\%50
\%88.9
\%54.9
\%99.9
\%88.8

## Member Point Loads (BLC 5 : Full Wind Antenna (60 Deg))

|  | Member Label | Direction | Magnitude[k,k-ft] | Location[ft, \%] |
| :---: | :---: | :---: | :---: | :---: |
| 1 | MP1 | Z | -. 052 | \%11.1 |
| 2 | MP3 | Z | -. 129 | \%. 1 |
| 3 | MP4 | Z | -. 052 | \%11.2 |
| 4 | MP4 | Z | -. 003 | \%50 |
| 5 | MP1 | Z | -. 052 | \%88.9 |
| 6 | MP3 | Z | -. 129 | \%99.9 |
| 7 | MP4 | Z | -. 052 | \%88.8 |
| 8 | MP1 | X | 091 | \%11.1 |
| 9 | MP1 | X | 003 | \%45.1 |
| 10 | MP3 | X | 224 | \%. 1 |
| 11 | MP4 | X | 091 | \%11.2 |
| 12 | MP4 | X | 035 | \%50 |
| 13 | MP1 | X | 091 | \%88.9 |
| 14 | MP1 | X | 003 | \%54.9 |
| 15 | MP3 | X | 224 | \%99.9 |
| 16 | MP4 | X | 091 | \%88.8 |

## Member Point Loads (BLC 6 : Full Wind Antenna (90 Deg))

|  | Member Label | Direction | Magnitude[k.k-ft] | Location[ft, \%] |
| :---: | :---: | :---: | :---: | :---: |
| 1 | MP1 | Z | 0 | \%11.1 |
| 2 | MP3 | Z | 0 | \%. 1 |
| 3 | MP4 | Z | 0 | \%11.2 |
| 4 | MP4 | Z | 0 | \%50 |
| 5 | MP1 | Z | 0 | \%88.9 |
| 6 | MP3 | Z | 0 | \%99.9 |
| 7 | MP4 | Z | 0 | \%88.8 |
| 8 | MP1 | X | 095 | \%11.1 |
| 9 | MP1 | X | 004 | \%45.1 |
| 10 | MP3 | X | 196 | \%. 1 |
| 11 | MP4 | X | . 095 | \%11.2 |
| 12 | MP4 | X | . 051 | \%50 |
| 13 | MP1 | X | 095 | \%88.9 |
| 14 | MP1 | X | 004 | \%54.9 |
| 15 | MP3 | X | 196 | \%99.9 |
| 16 | MP4 | X | 095 | \%88.8 |


| Member Point Loads (BLC 7 : Full Wind Antenna (120 Deg)) |  |  |  |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Member Label |  |  |  |  | Direction | Magnitude[k,k-ft] | Location[ft.\%] |
| 1 |  |  |  |  |  |  |  |


| Location[ft,\%] |
| :---: |
| $\% 45.1$ |
| $\% .1$ |
| $\% 11.2$ |
| $\% 50$ |
| $\% 88.9$ |
| $\% 54.9$ |
| $\% 99.9$ |
| 888.8 |

## Member Point Loads (BLC 8 : Full Wind Antenna (150 Deg))

|  | Member Label | Direction | Magnitude[k,k-ft] | Location[ft, \%] |
| :---: | :---: | :---: | :---: | :---: |
| 1 | MP1 | Z | 108 | \%11.1 |
| 2 | MP3 | Z | 333 | \%. 1 |
| 3 | MP4 | Z | 108 | \%11.2 |
| 4 | MP4 | Z | 006 | \%50 |
| 5 | MP1 | Z | 108 | \%88.9 |
| 6 | MP3 | Z | 333 | \%99.9 |
| 7 | MP4 | Z | 108 | \%88.8 |
| 8 | MP1 | X | 062 | \%11.1 |
| 9 | MP1 | X | 0 | \%45.1 |
| 10 | MP3 | X | 192 | \%. 1 |
| 11 | MP4 | X | 062 | \%11.2 |
| 12 | MP4 | X | 009 | \%50 |
| 13 | MP1 | X | 062 | \%88.9 |
| 14 | MP1 | X | 0 | \%54.9 |
| 15 | MP3 | X | 192 | \%99.9 |
| 16 | MP4 | X | 062 | \%88.8 |

## Member Point Loads (BLC 15 : Ice Wind Antenna (0 Deg))

| Member Label |  |  |  |  |  | Direction | Lagnitude[k,k-ft] | Location[ft,\%] |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | MP1 | $Z$ | -.028 | $\% 11.1$ |  |  |  |  |
| 2 | MP3 | $Z$ | -.083 | $\% .1$ |  |  |  |  |
| 3 | MP4 | $Z$ | -.028 | $\% 11.2$ |  |  |  |  |
| 4 | MP4 | $Z$ | -.002 | $\% 50$ |  |  |  |  |
| 5 | MP1 | $Z$ | -.028 | $\% 88.9$ |  |  |  |  |
| 6 | MP3 | $Z$ | -.083 | $\% 99.9$ |  |  |  |  |
| 7 | MP4 | $Z$ | -.028 | $\% 88.8$ |  |  |  |  |

## Member Point Loads (BLC 16 : Ice Wind Antenna (30 Deg))

|  | Member Label | Direction | Magnitude[k,k-ft] | Location[ft, \%] |
| :---: | :---: | :---: | :---: | :---: |
| 1 | MP1 | Z | -. 023 | \%11.1 |
| 2 | MP3 | Z | -. 063 | \%. 1 |
| 3 | MP4 | Z | -. 023 | \%11.2 |
| 4 | MP4 | Z | -. 001 | \%50 |
| 5 | MP1 | Z | -. 023 | \%88.9 |
| 6 | MP3 | Z | -. 063 | \%99.9 |
| 7 | MP4 | Z | -. 023 | \%88.8 |
| 8 | MP1 | X | . 013 | \%11.1 |
| 9 | MP1 | X | 0 | \%45.1 |
| 10 | MP3 | X | 037 | \%. 1 |
| 11 | MP4 | X | . 013 | \%11.2 |
| 12 | MP4 | X | . 002 | \%50 |
| 13 | MP1 | X | 013 | \%88.9 |
| 14 | MP1 | X | 0 | \%54.9 |
| 15 | MP3 | X | . 037 | \%99.9 |

Location[ft,\%] \%88.8

|  | Member Label | Direction | Magnitude[k,k-ft] | Location[ft, \%] |
| :---: | :---: | :---: | :---: | :---: |
| 1 | MP1 | Z | -. 012 | \%11.1 |
| 2 | MP3 | Z | -. 026 | \%. 1 |
| 3 | MP4 | Z | -. 012 | \%11.2 |
| 4 | MP4 | Z | -. 001 | \%50 |
| 5 | MP1 | Z | -. 012 | \%88.9 |
| 6 | MP3 | Z | -. 026 | \%99.9 |
| 7 | MP4 | Z | -. 012 | \%88.8 |
| 8 | MP1 | X | . 02 | \%11.1 |
| 9 | MP1 | X | . 001 | \%45.1 |
| 10 | MP3 | X | . 046 | \%. 1 |
| 11 | MP4 | X | . 02 | \%11.2 |
| 12 | MP4 | X | . 009 | \%50 |
| 13 | MP1 | X | . 02 | \%88.9 |
| 14 | MP1 | X | . 001 | \%54.9 |
| 15 | MP3 | X | . 046 | \%99.9 |
| 16 | MP4 | X | . 02 | \%88.8 |

## Member Point Loads (BLC 18 : Ice Wind Antenna (90 Deg))

|  | Member Label | Direction | Magnitude[k,k-ft] | Location[ft, \%] |
| :---: | :---: | :---: | :---: | :---: |
| 1 | MP1 | Z | 0 | \%11.1 |
| 2 | MP3 | Z | 0 | \%. 1 |
| 3 | MP4 | Z | 0 | \%11.2 |
| 4 | MP4 | Z | 0 | \%50 |
| 5 | MP1 | Z | 0 | \%88.9 |
| 6 | MP3 | Z | 0 | \%99.9 |
| 7 | MP4 | Z | 0 | \%88.8 |
| 8 | MP1 | X | . 022 | \%11.1 |
| 9 | MP1 | X | . 002 | \%45.1 |
| 10 | MP3 | X | . 042 | \%. 1 |
| 11 | MP4 | X | . 022 | \%11.2 |
| 12 | MP4 | X | . 014 | \%50 |
| 13 | MP1 | X | 022 | \%88.9 |
| 14 | MP1 | X | . 002 | \%54.9 |
| 15 | MP3 | X | . 042 | \%99.9 |
| 16 | MP4 | X | . 022 | \%88.8 |

Member Point Loads (BLC 19 : Ice Wind Antenna (120 Deg))

|  | Member Label | Direction | Magnitude[k,k-ft] | Location[ft, \%] |
| :---: | :---: | :---: | :---: | :---: |
| 1 | MP1 | Z | . 012 | \%11.1 |
| 2 | MP3 | Z | 026 | \%. 1 |
| 3 | MP4 | Z | . 012 | \%11.2 |
| 4 | MP4 | Z | 001 | \%50 |
| 5 | MP1 | Z | 012 | \%88.9 |
| 6 | MP3 | Z | . 026 | \%99.9 |
| 7 | MP4 | Z | . 012 | \%88.8 |
| 8 | MP1 | X | 02 | \%11.1 |
| 9 | MP1 | X | . 001 | \%45.1 |
| 10 | MP3 | X | . 046 | \%. 1 |
| 11 | MP4 | X | . 02 | \%11.2 |
| 12 | MP4 | X | . 009 | \%50 |
| 13 | MP1 | X | 02 | \%88.9 |

## Member Point Loads (BLC 19 : Ice Wind Antenna (120 Deg)) (Continued)

| Member Label | Direction | Magnitude[k,k-ft] | Location[ft,\%] |  |
| :---: | :---: | :---: | :---: | :---: |
| 14 | MP1 | $X$ | .001 | $\% 54.9$ |
| 15 | MP3 | $X$ | .046 | $\% 99.9$ |
| 16 | MP4 | $X$ | .02 | $\% 88.8$ |

## Member Point Loads (BLC 20 : Ice Wind Antenna (150 Deg))

|  | Member Label | Direction | Magnitude[k,k-ft] | Location[ft, \%] |
| :---: | :---: | :---: | :---: | :---: |
| 1 | MP1 | Z | . 023 | \%11.1 |
| 2 | MP3 | Z | 026 | \%. 1 |
| 3 | MP4 | Z | . 012 | \%11.2 |
| 4 | MP4 | Z | 001 | \%50 |
| 5 | MP1 | Z | 023 | \%88.9 |
| 6 | MP3 | Z | . 026 | \%99.9 |
| 7 | MP4 | Z | 012 | \%88.8 |
| 8 | MP1 | X | . 013 | \%11.1 |
| 9 | MP1 | X | . 001 | \%45.1 |
| 10 | MP3 | X | . 046 | \%. 1 |
| 11 | MP4 | X | . 02 | \%11.2 |
| 12 | MP4 | X | . 009 | \%50 |
| 13 | MP1 | X | . 013 | \%88.9 |
| 14 | MP1 | X | . 001 | \%54.9 |
| 15 | MP3 | X | . 046 | \%99.9 |
| 16 | MP4 | X | . 02 | \%88.8 |

## Member Point Loads (BLC 27 : Seismic Antenna (0 Deg))

| Member Label |  |  |  |  |  | Direction | Magnitude[k,k-ft] | Location[ft,\%] |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | MP1 | Z | -.009 | $\% 50$ |  |  |  |  |
| 2 | MP1 | Z | -.001 | $\% 50$ |  |  |  |  |
| 3 | MP3 | Z | -.013 | $\% 50$ |  |  |  |  |
| 4 | MP4 | Z | -.009 | $\% 50$ |  |  |  |  |

## Member Point Loads (BLC 28 : Seismic Antenna (90 Deg))

| Member Label | Direction | Magnitude[k,k-ft] | Location[ft.\%] |  |
| :---: | :---: | :---: | :---: | :---: |
| 1 | MP1 | $X$ | .009 | $\% 50$ |
| 2 | MP1 | $X$ | .001 | $\% 50$ |
| 3 | MP3 | $X$ | .013 | $\% 50$ |
| 4 | MP4 | $X$ | .009 | $\% 50$ |
| 5 | MP4 | $X$ | .008 | $\% 50$ |

## Member Point Loads (BLC 41 : Seismic Vertical Antennas)

| Member Label |  |  |  |  |  |  | Direction | Magnitude[k,k-ft] | Location[ft,\%] |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | MP1 | Y | -.018 | $\% 50$ |  |  |  |  |  |
| 2 | MP1 | Y | -.002 | $\% 50$ |  |  |  |  |  |
| 3 | MP3 | Y | -.026 | $\% 50$ |  |  |  |  |  |
| 4 | MP4 | Y | -.018 | $\% 50$ |  |  |  |  |  |
| 5 | MP4 | Y | -.015 | $\% 50$ |  |  |  |  |  |

Member Distributed Loads (BLC 2 : Ice Dead)

| Member Label |  |  | Direction |  | Start Magnitude[k/ft,F,ksf] |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | M 1 | Y | -.015 | -.015 | 0 | $\%$ |
| 2 | M | Y | -.013 | -.013 | 0 | $\% 100$ |
| 3 | M 3 | Y | -.011 | -.011 | 0 | $\% 100$ |
| 4 | M 4 | Y | -.003 | -.003 | 0 | $\% 100$ |

## Member Distributed Loads (BLC 2 : Ice Dead) (Continued)

|  | Member Label | Direction | Start Magnitude[k/ft,F,ksf] | End Magnitude[k/ft,F,ksf] | Start Location[ft,... | End Location[ft, \%] |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 5 | MP3 | Y | -. 009 | -. 009 | 0 | \%100 |
| 6 | M6 | Y | -. 003 | -. 003 | 0 | \%100 |
| 7 | M7 | Y | -. 003 | -. 003 | 0 | \%100 |
| 8 | M8 | Y | -. 003 | -. 003 | 0 | \%100 |
| 9 | M9 | Y | -. 003 | -. 003 | 0 | \%100 |
| 10 | MP4 | Y | -. 008 | -. 008 | 0 | \%100 |
| 11 | MP2 | Y | -. 008 | -. 008 | 0 | \%100 |
| 12 | MP1 | Y | -. 008 | -. 008 | 0 | \%100 |
| 13 | M13 | Y | -. 008 | -. 008 | 0 | \%100 |
| 14 | M14 | Y | -. 003 | -. 003 | 0 | \%100 |
| 15 | M15 | Y | -. 003 | -. 003 | 0 | \%100 |
| 16 | M16 | Y | -. 003 | -. 003 | 0 | \%100 |
| 17 | M17 | Y | -. 003 | -. 003 | 0 | \%100 |
| 18 | M18 | Y | -. 003 | -. 003 | 0 | \%100 |
| 19 | M19 | Y | -. 011 | -. 011 | 0 | \%100 |
| 20 | M20 | Y | -. 011 | -. 011 | 0 | \%100 |
| 21 | M21 | Y | -. 012 | -. 012 | 0 | \%100 |

## Member Distributed Loads (BLC 9 : Full Wind Members (0 Deg))

|  | Member La | Direction | Start Magnitude[kft. F. .ksf] | End Magnitude[kft.F.ksf] | Start Locationfft, | End Location[ft.\%] |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | M1 | Z | 0 | 0 | 0 | \%100 |
| 2 | M2 | Z | -. 02 | -. 02 | 0 | \%100 |
| 3 | M3 | Z | -. 015 | -. 015 | 0 | \%100 |
| 4 | MP3 | Z | -. 013 | -. 013 | 0 | \%. 1 |
| 5 | MP4 | Z | -. 011 | -. 011 | 0 | \%11.2 |
| 6 | MP2 | Z | -. 011 | -. 011 | 0 | \%100 |
| 7 | MP1 | Z | -. 011 | -. 011 | 0 | \%11.1 |
| 8 | M13 | Z | -. 011 | -. 011 | 0 | \%100 |
| 9 | M19 | Z | -. 009 | -. 009 | 0 | \%100 |
| 10 | M20 | Z | -. 009 | -. 009 | 0 | \%100 |
| 11 | M21 | Z | -. 018 | -. 018 | 0 | \%100 |
| 12 | MP3 | Z | -. 013 | -. 013 | \%99.9 | \%100 |
| 13 | MP4 | Z | -. 011 | -. 011 | \%88.8 | \%100 |
| 14 | MP1 | Z | -. 011 | -. 011 | \%88.9 | \%100 |
| 15 | M1 | X | 0 | 0 | 0 | \%100 |
| 16 | M2 | X | 0 | 0 | 0 | \%100 |
| 17 | M3 | X | 0 | 0 | 0 | \%100 |
| 18 | MP3 | X | 0 | 0 | 0 | \%100 |
| 19 | MP4 | X | 0 | 0 | 0 | \%100 |
| 20 | MP2 | X | 0 | 0 | 0 | \%100 |
| 21 | MP1 | X | 0 | 0 | 0 | \%100 |
| 22 | M13 | X | 0 | 0 | 0 | \%100 |
| 23 | M19 | X | 0 | 0 | 0 | \%100 |
| 24 | M20 | X | 0 | 0 | 0 | \%100 |
| 25 | M21 | X | 0 | 0 | 0 | \%100 |

## Member Distributed Loads (BLC 10 : Full Wind Members (30 Deg))

|  | Member Label | Direction | Start Magnitude[k/ft,F,ksf] | End Magnitude[k/ft,F.ksf] | Start Location[ft, | End Location[ft,\%] |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | M1 | Z | -. 006 | -. 006 | 0 | \%100 |
| 2 | M2 | Z | -. 017 | -. 017 | 0 | \%100 |
| 3 | M3 | Z | -. 01 | -. 01 | 0 | \%100 |
| 4 | MP3 | Z | -. 011 | -. 011 | 0 | \%. 1 |
| 5 | MP4 | Z | -. 009 | -. 009 | 0 | \%11.2 |
| 6 | MP2 | Z | -. 009 | -. 009 | 0 | \%100 |
| 7 | MP1 | Z | -. 009 | -. 009 | 0 | \%11.1 |
| 8 | M13 | Z | -. 007 | -. 007 | 0 | \%100 |

Member Distributed Loads (BLC 10 : Full Wind Members (30 Deg)) (Continued)

|  | Member Label | Direction | Start Magnitude[k/ft,F,ksf] | End Magnitude[k/ft,F,ksf] | Start Location[ft,.. | End Location[ft, \%] |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 9 | M19 | Z | -. 001 | -. 001 | 0 | \%100 |
| 10 | M20 | Z | -. 015 | -. 015 | 0 | \%100 |
| 11 | M21 | Z | -. 016 | -. 016 | 0 | \%100 |
| 12 | MP3 | Z | -. 011 | -. 011 | \%99.9 | \%100 |
| 13 | MP4 | Z | -. 009 | -. 009 | \%88.8 | \%100 |
| 14 | MP1 | Z | -. 009 | -. 009 | \%88.9 | \%100 |
| 15 | M1 | X | 004 | 004 | 0 | \%100 |
| 16 | M2 | X | 01 | 01 | 0 | \%100 |
| 17 | M3 | X | 006 | 006 | 0 | \%100 |
| 18 | MP3 | X | . 006 | 006 | 0 | \%100 |
| 19 | MP4 | X | 005 | 005 | 0 | \%100 |
| 20 | MP2 | X | 005 | 005 | 0 | \%100 |
| 21 | MP1 | X | 005 | . 005 | 0 | \%100 |
| 22 | M13 | X | 004 | 004 | 0 | \%100 |
| 23 | M19 | X | 001 | . 001 | 0 | \%100 |
| 24 | M20 | X | . 009 | . 009 | 0 | \%100 |
| 25 | M21 | X | . 009 | . 009 | 0 | \%100 |

## Member Distributed Loads (BLC 11 : Full Wind Members (60 Deg))

|  | Member Label | Direction | Start Magnitude[k/ft,F,ksf] | End Magnitude[k/ft,F.ksf] | Start Location[ft, | End Location[ft, \%] |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | M1 | Z | -. 011 | -. 011 | 0 | \%100 |
| 2 | M2 | Z | -. 01 | -. 01 | 0 | \%100 |
| 3 | M3 | Z | -. 002 | -. 002 | 0 | \%100 |
| 4 | MP3 | Z | -. 006 | -. 006 | 0 | \%. 1 |
| 5 | MP4 | Z | -. 005 | -. 005 | 0 | \%11.2 |
| 6 | MP2 | Z | -. 005 | -. 005 | 0 | \%100 |
| 7 | MP1 | Z | -. 005 | -. 005 | 0 | \%11.1 |
| 8 | M13 | Z | -. 001 | -. 0001 | 0 | \%100 |
| 9 | M19 | Z | -. 001 | -. 001 | 0 | \%100 |
| 10 | M20 | Z | -. 009 | -. 009 | 0 | \%100 |
| 11 | M21 | Z | -. 01 | -. 01 | 0 | \%100 |
| 12 | MP3 | Z | -. 006 | -. 006 | \%99.9 | \%100 |
| 13 | MP4 | Z | -. 005 | -. 005 | \%88.8 | \%100 |
| 14 | MP1 | Z | -. 005 | -. 005 | \%88.9 | \%100 |
| 15 | M1 | X | . 019 | . 019 | 0 | \%100 |
| 16 | M2 | X | . 017 | . 017 | 0 | \%100 |
| 17 | M3 | X | . 003 | . 003 | 0 | \%100 |
| 18 | MP3 | X | . 011 | . 011 | 0 | \%100 |
| 19 | MP4 | X | . 009 | . 009 | 0 | \%100 |
| 20 | MP2 | X | . 009 | . 009 | 0 | \%100 |
| 21 | MP1 | X | . 009 | . 009 | 0 | \%100 |
| 22 | M13 | X | . 002 | . 002 | 0 | \%100 |
| 23 | M19 | X | . 001 | . 001 | 0 | \%100 |
| 24 | M20 | X | . 015 | . 015 | 0 | \%100 |
| 25 | M21 | X | . 018 | . 018 | 0 | \%100 |

## Member Distributed Loads (BLC 12 : Full Wind Members (90 Deg))

|  | Member Label | Direction | Start Magnitude[[/ft,F,ksf] | End Magnitude[[k/ft,F.ksf] | Start Location[ft, | End Location[ft,\%] |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | M1 | Z | 0 | 0 | 0 | \%100 |
| 2 | M2 | Z | 0 | 0 | 0 | \%100 |
| 3 | M3 | Z | 0 | 0 | 0 | \%100 |
| 4 | MP3 | Z | 0 | 0 | 0 | \%. 1 |
| 5 | MP4 | Z | 0 | 0 | 0 | \%11.2 |
| 6 | MP2 | Z | 0 | 0 | 0 | \%100 |
| 7 | MP1 | Z | 0 | 0 | 0 | \%11.1 |
| 8 | M13 | Z | 0 | 0 | 0 | \%100 |

Member Distributed Loads (BLC 12 : Full Wind Members (90 Deg)) (Continued)

|  | Member Label | Direction | Start Magnitude[k/ft,F,ksf] | End Magnitude[k/ft,F,ksf] | Start Location[ft | .End Location[ft, \%] |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 9 | M19 | Z | 0 | 0 | 0 | \%100 |
| 10 | M20 | Z | 0 | 0 | 0 | \%100 |
| 11 | M21 | Z | 0 | 0 | 0 | \%100 |
| 12 | MP3 | Z | 0 | 0 | \%99.9 | \%100 |
| 13 | MP4 | Z | 0 | 0 | \%88.8 | \%100 |
| 14 | MP1 | Z | 0 | 0 | \%88.9 | \%100 |
| 15 | M1 | X | 029 | 029 | 0 | \%100 |
| 16 | M2 | X | 02 | . 02 | 0 | \%100 |
| 17 | M3 | X | 0 | 0 | 0 | \%100 |
| 18 | MP3 | X | 013 | . 013 | 0 | \%100 |
| 19 | MP4 | X | 011 | . 011 | 0 | \%100 |
| 20 | MP2 | X | 011 | 011 | 0 | \%100 |
| 21 | MP1 | X | 011 | 011 | 0 | \%100 |
| 22 | M13 | X | 0 | 0 | 0 | \%100 |
| 23 | M19 | X | . 009 | . 009 | 0 | \%100 |
| 24 | M20 | X | 009 | 009 | 0 | \%100 |
| 25 | M21 | X | . 022 | . 022 | 0 | \%100 |

## Member Distributed Loads (BLC 13 : Full Wind Members (120 Deg))

|  | Member Label | Direction | Start Magnitude[k/ft,F.ksf] | End Magnitude[k/ft,F.ksf] | Start Location [ft | End Location[ft, \%] |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | M1 | Z | . 011 | . 011 | 0 | \%100 |
| 2 | M2 | Z | 01 | 01 | 0 | \%100 |
| 3 | M3 | Z | 002 | 002 | 0 | \%100 |
| 4 | MP3 | Z | 006 | 006 | 0 | \%. 1 |
| 5 | MP4 | Z | 005 | 005 | 0 | \%11.2 |
| 6 | MP2 | Z | 005 | 005 | 0 | \%100 |
| 7 | MP1 | Z | 005 | 005 | 0 | \%11.1 |
| 8 | M13 | Z | 001 | . 001 | 0 | \%100 |
| 9 | M19 | Z | 009 | 009 | 0 | \%100 |
| 10 | M20 | Z | 001 | . 001 | 0 | \%100 |
| 11 | M21 | Z | 01 | 01 | 0 | \%100 |
| 12 | MP3 | Z | 006 | 006 | \%99.9 | \%100 |
| 13 | MP4 | Z | 005 | 005 | \%88.8 | \%100 |
| 14 | MP1 | Z | 005 | 005 | \%88.9 | \%100 |
| 15 | M1 | X | 019 | 019 | 0 | \%100 |
| 16 | M2 | X | 017 | 017 | 0 | \%100 |
| 17 | M3 | X | 003 | 003 | 0 | \%100 |
| 18 | MP3 | X | 011 | . 011 | 0 | \%100 |
| 19 | MP4 | X | 009 | 009 | 0 | \%100 |
| 20 | MP2 | X | 009 | 009 | 0 | \%100 |
| 21 | MP1 | X | 009 | 009 | 0 | \%100 |
| 22 | M13 | X | 002 | 002 | 0 | \%100 |
| 23 | M19 | X | 015 | 015 | 0 | \%100 |
| 24 | M20 | X | 001 | . 001 | 0 | \%100 |
| 25 | M21 | X | . 018 | 018 | 0 | \%100 |

## Member Distributed Loads (BLC 14 : Full Wind Members (150 Deg))

|  | Member Label | Direction | Start Magnitude[k/ft,F,ksf] | End Magnitude[k/ft,F, ksf] | Start Location[ft, | End Location[ft, \%] |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | M1 | Z | . 006 | 006 | 0 | \%100 |
| 2 | M2 | Z | 017 | 017 | 0 | \%100 |
| 3 | M3 | Z | 01 | 01 | 0 | \%100 |
| 4 | MP3 | Z | 011 | 011 | 0 | \%. 1 |
| 5 | MP4 | Z | 009 | 009 | 0 | \%11.2 |
| 6 | MP2 | Z | 009 | 009 | 0 | \%100 |
| 7 | MP1 | Z | 009 | 009 | 0 | \%11.1 |
| 8 | M13 | Z | 007 | 007 | 0 | \%100 |

Member Distributed Loads (BLC 14 : Full Wind Members (150 Deg)) (Continued)

|  | Member Label | Direction | Start Magnitude[k/ft,F,ksf] | End Magnitude[k/ft,F,ksf] | Start Location[ft | End Location[ft, \%] |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 9 | M19 | Z | 015 | 015 | 0 | \%100 |
| 10 | M20 | Z | . 001 | 001 | 0 | \%100 |
| 11 | M21 | Z | 016 | 016 | 0 | \%100 |
| 12 | MP3 | Z | 011 | 011 | \%99.9 | \%100 |
| 13 | MP4 | Z | 009 | 009 | \%88.8 | \%100 |
| 14 | MP1 | Z | 009 | . 009 | \%88.9 | \%100 |
| 15 | M1 | X | 004 | 004 | 0 | \%100 |
| 16 | M2 | X | 01 | 01 | 0 | \%100 |
| 17 | M3 | X | 006 | . 006 | 0 | \%100 |
| 18 | MP3 | X | 006 | 006 | 0 | \%100 |
| 19 | MP4 | X | 005 | 005 | 0 | \%100 |
| 20 | MP2 | X | 005 | 005 | 0 | \%100 |
| 21 | MP1 | X | 005 | 005 | 0 | \%100 |
| 22 | M13 | X | 004 | 004 | 0 | \%100 |
| 23 | M19 | X | 009 | . 009 | 0 | \%100 |
| 24 | M20 | X | 001 | . 001 | 0 | \%100 |
| 25 | M21 | X | . 009 | . 009 | 0 | \%100 |

## Member Distributed Loads (BLC 21 : Ice Wind Members (O Deg))

|  | Member Label | Direction | Start Magnitude[k/ft,F.ksf] | End Magnitude[k/ft,F.ksf] | Start Location[ft | End Location[ft, \%] |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | M1 | Z | 0 | 0 | 0 | \%100 |
| 2 | M2 | Z | -. 008 | -. 008 | 0 | \%100 |
| 3 | M3 | Z | -. 005 | -. 005 | 0 | \%100 |
| 4 | M4 | Z | 0 | 0 | 0 | \%100 |
| 5 | MP3 | Z | -. 005 | -. 005 | 0 | \%. 1 |
| 6 | M6 | Z | 0 | 0 | 0 | \%100 |
| 7 | M7 | Z | 0 | 0 | 0 | \%100 |
| 8 | M8 | Z | 0 | 0 | 0 | \%100 |
| 9 | M9 | Z | 0 | 0 | 0 | \%100 |
| 10 | MP4 | Z | -. 004 | -. 004 | 0 | \%11.2 |
| 11 | MP2 | Z | -. 004 | -. 004 | 0 | \%100 |
| 12 | MP1 | Z | -. 004 | -. 004 | 0 | \%11.1 |
| 13 | M13 | Z | -. 004 | -. 004 | 0 | \%100 |
| 14 | M14 | Z | 0 | 0 | 0 | \%100 |
| 15 | M15 | Z | 0 | 0 | 0 | \%100 |
| 16 | M16 | Z | 0 | 0 | 0 | \%100 |
| 17 | M17 | Z | 0 | 0 | 0 | \%100 |
| 18 | M18 | Z | -. 003 | -. 003 | 0 | \%100 |
| 19 | M19 | Z | -. 003 | -. 003 | 0 | \%100 |
| 20 | M20 | Z | -. 003 | -. 003 | 0 | \%100 |
| 21 | M21 | Z | -. 005 | -. 005 | 0 | \%100 |
| 22 | MP3 | Z | -. 005 | -. 005 | \%99.9 | \%100 |
| 23 | MP4 | Z | -. 004 | -. 004 | \%88.8 | \%100 |
| 24 | MP1 | Z | -. 004 | -. 004 | \%88.9 | \%100 |
| 25 | M1 | X | 0 | 0 | 0 | \%100 |
| 26 | M2 | X | 0 | 0 | 0 | \%100 |
| 27 | M3 | X | 0 | 0 | 0 | \%100 |
| 28 | M4 | X | 0 | 0 | 0 | \%100 |
| 29 | MP3 | X | 0 | 0 | 0 | \%100 |
| 30 | M6 | X | 0 | 0 | 0 | \%100 |
| 31 | M7 | X | 0 | 0 | 0 | \%100 |
| 32 | M8 | X | 0 | 0 | 0 | \%100 |
| 33 | M9 | X | 0 | 0 | 0 | \%100 |
| 34 | MP4 | X | 0 | 0 | 0 | \%100 |
| 35 | MP2 | X | 0 | 0 | 0 | \%100 |
| 36 | MP1 | X | 0 | 0 | 0 | \%100 |

Company

Member Distributed Loads (BLC 21 : Ice Wind Members (0 Deg)) (Continued)

|  | Member Label | Direction | Start Magnitude[k/ft,F,ksf] | End Magnitude[k/ft,F,ksf] | Start Location[ft, | End Location[ft, \%] |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 37 | M13 | X | 0 | 0 | 0 | \%100 |
| 38 | M14 | X | 0 | 0 | 0 | \%100 |
| 39 | M15 | X | 0 | 0 | 0 | \%100 |
| 40 | M16 | X | 0 | 0 | 0 | \%100 |
| 41 | M17 | X | 0 | 0 | 0 | \%100 |
| 42 | M18 | X | 0 | 0 | 0 | \%100 |
| 43 | M19 | X | 0 | 0 | 0 | \%100 |
| 44 | M20 | X | 0 | 0 | 0 | \%100 |
| 45 | M21 | X | 0 | 0 | 0 | \%100 |

## Member Distributed Loads (BLC 22 : Ice Wind Members (30 Deg))

|  | Member Label | Direction | Start Magnitude[k/ft.F. . ksf] | End Magnitude[k/ft.F. . ksf] | Start Locationff | .End Location[ft.\%] |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | M1 | Z | -. 001 | -. 001 | 0 | \%100 |
| 2 | M2 | Z | -. 007 | -. 007 | 0 | \%100 |
| 3 | M3 | Z | -. 004 | -. 004 | 0 | \%100 |
| 4 | M4 | Z | 0 | 0 | 0 | \%100 |
| 5 | MP3 | Z | -. 004 | -. 004 | 0 | \%. 1 |
| 6 | M6 | Z | 0 | 0 | 0 | \%100 |
| 7 | M7 | Z | 0 | 0 | 0 | \%100 |
| 8 | M8 | Z | 0 | 0 | 0 | \%100 |
| 9 | M9 | Z | 0 | 0 | 0 | \%100 |
| 10 | MP4 | Z | -. 004 | -. 004 | 0 | \%11.2 |
| 11 | MP2 | Z | -. 004 | -. 004 | 0 | \%100 |
| 12 | MP1 | Z | -. 004 | -. 004 | 0 | \%11.1 |
| 13 | M13 | Z | -. 003 | -. 003 | 0 | \%100 |
| 14 | M14 | Z | 0 | 0 | 0 | \%100 |
| 15 | M15 | Z | 0 | 0 | 0 | \%100 |
| 16 | M16 | Z | 0 | 0 | 0 | \%100 |
| 17 | M17 | Z | 0 | 0 | 0 | \%100 |
| 18 | M18 | Z | -. 003 | -. 003 | 0 | \%100 |
| 19 | M19 | Z | -. 001 | -. 001 | 0 | \%100 |
| 20 | M20 | Z | -. 004 | -. 004 | 0 | \%100 |
| 21 | M21 | Z | -. 005 | -. 005 | 0 | \%100 |
| 22 | MP3 | Z | -. 004 | -. 004 | \%99.9 | \%100 |
| 23 | MP4 | Z | -. 004 | -. 004 | \%88.8 | \%100 |
| 24 | MP1 | Z | -. 004 | -. 004 | \%88.9 | \%100 |
| 25 | M1 | X | . 001 | . 001 | 0 | \%100 |
| 26 | M2 | X | . 004 | . 004 | 0 | \%100 |
| 27 | M3 | X | . 002 | . 002 | 0 | \%100 |
| 28 | M4 | X | 0 | 0 | 0 | \%100 |
| -29 | MP3 | X | . 002 | . 002 | 0 | \%100 |
| 30 | M6 | X | 0 | 0 | 0 | \%100 |
| 31 | M7 | X | 0 | 0 | 0 | \%100 |
| 32 | M8 | X | 0 | 0 | 0 | \%100 |
| 33 | M9 | X | 0 | 0 | 0 | \%100 |
| 34 | MP4 | X | . 002 | 002 | 0 | \%100 |
| 35 | MP2 | X | . 002 | . 002 | 0 | \%100 |
| 36 | MP1 | X | . 002 | . 002 | 0 | \%100 |
| -37 | M13 | X | . 002 | 002 | 0 | \%100 |
| 38 | M14 | X | 0 | 0 | 0 | \%100 |
| 39 | M15 | X | 0 | 0 | 0 | \%100 |
| 40 | M16 | X | 0 | 0 | 0 | \%100 |
| 41 | M17 | X | 0 | 0 | 0 | \%100 |
| 42 | M18 | X | . 002 | . 002 | 0 | \%100 |
| 43 | M19 | X | . 001 | . 001 | 0 | \%100 |
| 44 | M20 | X | . 002 | . 002 | 0 | \%100 |

## Member Distributed Loads (BLC 22 : Ice Wind Members (30 Deg)) (Continued)

|  | Member Label | Direction | Start Magnitude[kfft,F, ksf] | End Magnitude[k/ft,F.,.ksf | Start Locationft | ) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 45 | M21 | X | 003 | 003 | 0 | \%100 |

## Member Distributed Loads (BLC 23 : Ice Wind Members (60 Deg))

|  | Member Label | Direction | Start Magnitude[k/ft.F. . ksf] | End Magnitude[k/ft.F.ksf] | Start Locationft | End Location[t. \%] |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | M1 | Z | -. 002 | -. 002 | 0 | \%100 |
| 2 | M2 | Z | -. 004 | -. 004 | 0 | \%100 |
| 3 | M3 | Z | -. 002 | -. 002 | 0 | \%100 |
| 4 | M4 | Z | 0 | 0 | 0 | \%100 |
| 5 | MP3 | Z | -. 002 | -. 002 | 0 | \%. 1 |
| 6 | M6 | Z | 0 | 0 | 0 | \%100 |
| 7 | M7 | Z | 0 | 0 | 0 | \%100 |
| 8 | M8 | Z | 0 | 0 | 0 | \%100 |
| 9 | M9 | Z | 0 | 0 | 0 | \%100 |
| 10 | MP4 | Z | -. 002 | -. 002 | 0 | \%11.2 |
| 11 | MP2 | Z | -. 002 | -. 002 | 0 | \%100 |
| 12 | MP1 | Z | -. 002 | -. 002 | 0 | \%11.1 |
| 13 | M13 | Z | -. 001 | -. 001 | 0 | \%100 |
| 14 | M14 | Z | 0 | 0 | 0 | \%100 |
| 15 | M15 | Z | 0 | 0 | 0 | \%100 |
| 16 | M16 | Z | 0 | 0 | 0 | \%100 |
| 17 | M17 | Z | 0 | 0 | 0 | \%100 |
| 18 | M18 | Z | -. 002 | -. 002 | 0 | \%100 |
| 19 | M19 | Z | -. 001 | -. 001 | 0 | \%100 |
| 20 | M20 | Z | -. 002 | -. 002 | 0 | \%100 |
| 21 | M21 | Z | -. 003 | -. 003 | 0 | \%100 |
| 22 | MP3 | Z | -. 002 | -. 002 | \%99.9 | \%100 |
| 23 | MP4 | Z | -. 002 | -. 002 | \%88.8 | \%100 |
| 24 | MP1 | Z | -. 002 | -. 002 | \%88.9 | \%100 |
| 25 | M1 | X | . 003 | . 003 | 0 | \%100 |
| 26 | M2 | X | . 007 | . 007 | 0 | \%100 |
| 27 | M3 | X | 003 | . 003 | 0 | \%100 |
| 28 | M4 | X | 0 | 0 | 0 | \%100 |
| 29 | MP3 | X | . 004 | 004 | 0 | \%100 |
| 30 | M6 | X | 0 | 0 | 0 | \%100 |
| 31 | M7 | X | 0 | 0 | 0 | \%100 |
| 32 | M8 | X | 0 | 0 | 0 | \%100 |
| 33 | M9 | X | 0 | 0 | 0 | \%100 |
| 34 | MP4 | X | . 004 | . 004 | 0 | \%100 |
| 35 | MP2 | X | . 004 | . 004 | 0 | \%100 |
| 36 | MP1 | X | . 004 | 004 | 0 | \%100 |
| 37 | M13 | X | . 003 | . 003 | 0 | \%100 |
| 38 | M14 | X | 0 | 0 | 0 | \%100 |
| 39 | M15 | X | 0 | 0 | 0 | \%100 |
| 40 | M16 | X | 0 | 0 | 0 | \%100 |
| 41 | M17 | X | 0 | 0 | 0 | \%100 |
| 42 | M18 | X | . 003 | . 003 | 0 | \%100 |
| 43 | M19 | X | 001 | 001 | 0 | \%100 |
| 44 | M20 | X | . 004 | . 004 | 0 | \%100 |
| 45 | M21 | X | . 005 | 005 | 0 | \%100 |

## Member Distributed Loads (BLC 24 : Ice Wind Members (90 Deg))

|  | Member Label | Direction | Start Magnitude[k/ft.F.ksf] | End Magnitude[k/ft.F.ksf] | Start Location [ft. | End Location[ft.\%] |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | M1 | Z | 0 | 0 | 0 | \%100 |
| 2 | M2 | Z | 0 | 0 | 0 | \%100 |
| 3 | M3 | Z | 0 | 0 | 0 | \%100 |
| 4 | M4 | Z | 0 | 0 | 0 | \%100 |

Company

Member Distributed Loads (BLC 24 : Ice Wind Members (90 Deg)) (Continued)

|  | Member Label | Direction | Start Magnitude[k/ft,F,ksf] | End Magnitude[k/ft,F,ksf] | Start Location [ft,.. | End Location[ft, \%] |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 5 | MP3 | Z | 0 | 0 | 0 | \%. 1 |
| 6 | M6 | Z | 0 | 0 | 0 | \%100 |
| 7 | M7 | Z | 0 | 0 | 0 | \%100 |
| 8 | M8 | Z | 0 | 0 | 0 | \%100 |
| 9 | M9 | Z | 0 | 0 | 0 | \%100 |
| 10 | MP4 | Z | 0 | 0 | 0 | \%11.2 |
| 11 | MP2 | Z | 0 | 0 | 0 | \%100 |
| 12 | MP1 | Z | 0 | 0 | 0 | \%11.1 |
| 13 | M13 | Z | 0 | 0 | 0 | \%100 |
| 14 | M14 | Z | 0 | 0 | 0 | \%100 |
| 15 | M15 | Z | 0 | 0 | 0 | \%100 |
| 16 | M16 | Z | 0 | 0 | 0 | \%100 |
| 17 | M17 | Z | 0 | 0 | 0 | \%100 |
| 18 | M18 | Z | 0 | 0 | 0 | \%100 |
| 19 | M19 | Z | 0 | 0 | 0 | \%100 |
| 20 | M20 | Z | 0 | 0 | 0 | \%100 |
| 21 | M21 | Z | 0 | 0 | 0 | \%100 |
| 22 | MP3 | Z | 0 | 0 | \%99.9 | \%100 |
| 23 | MP4 | Z | 0 | 0 | \%88.8 | \%100 |
| 24 | MP1 | Z | 0 | 0 | \%88.9 | \%100 |
| 25 | M1 | X | . 005 | 005 | 0 | \%100 |
| 26 | M2 | X | . 008 | . 008 | 0 | \%100 |
| 27 | M3 | X | . 002 | . 002 | 0 | \%100 |
| 28 | M4 | X | 0 | 0 | 0 | \%100 |
| 29 | MP3 | X | . 005 | . 005 | 0 | \%100 |
| 30 | M6 | X | 0 | 0 | 0 | \%100 |
| 31 | M7 | X | 0 | 0 | 0 | \%100 |
| 32 | M8 | X | 0 | 0 | 0 | \%100 |
| 33 | M9 | X | 0 | 0 | 0 | \%100 |
| 34 | MP4 | X | . 004 | . 004 | 0 | \%100 |
| 35 | MP2 | X | . 004 | . 004 | 0 | \%100 |
| 36 | MP1 | X | . 004 | . 004 | 0 | \%100 |
| 37 | M13 | X | . 002 | . 002 | 0 | \%100 |
| 38 | M14 | X | 0 | 0 | 0 | \%100 |
| 39 | M15 | X | 0 | 0 | 0 | \%100 |
| 40 | M16 | X | 0 | 0 | 0 | \%100 |
| 41 | M17 | X | 0 | 0 | 0 | \%100 |
| 42 | M18 | X | . 003 | 003 | 0 | \%100 |
| 43 | M19 | X | 003 | 003 | 0 | \%100 |
| 44 | M20 | X | 003 | 003 | 0 | \%100 |
| 45 | M21 | X | . 007 | 007 | 0 | \%100 |

## Member Distributed Loads (BLC 25 : Ice Wind Members (120 Deg))

|  | Member Label | Direction | Start Magnitude[k/ft,F,ksf] | End Magnitude[k/ft,F.ksf] | Start Location[ft, | End Location[ft, \%] |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | M1 | Z | . 002 | 002 | 0 | \%100 |
| 2 | M2 | Z | 004 | 004 | 0 | \%100 |
| 3 | M3 | Z | 002 | 002 | 0 | \%100 |
| 4 | M4 | Z | 0 | 0 | 0 | \%100 |
| 5 | MP3 | Z | 002 | 002 | 0 | \%. 1 |
| 6 | M6 | Z | 0 | 0 | 0 | \%100 |
| 7 | M7 | Z | 0 | 0 | 0 | \%100 |
| 8 | M8 | Z | 0 | 0 | 0 | \%100 |
| 9 | M9 | Z | 0 | 0 | 0 | \%100 |
| 10 | MP4 | Z | . 002 | . 002 | 0 | \%11.2 |
| 11 | MP2 | Z | . 002 | 002 | 0 | \%100 |
| 12 | MP1 | Z | 002 | . 002 | 0 | \%11.1 |

Company

Member Distributed Loads (BLC 25 : Ice Wind Members (120 Deg)) (Continued)

|  | Member Label | Direction | Start Magnitude[k/ft,F,ksf] | End Magnitude[k/ft,F,ksf] | Start Location [ft, | End Location[ft, \%] |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 13 | M13 | Z | . 001 | . 001 | 0 | \%100 |
| 14 | M14 | Z | 0 | 0 | 0 | \%100 |
| 15 | M15 | Z | 0 | 0 | 0 | \%100 |
| 16 | M16 | Z | 0 | 0 | 0 | \%100 |
| 17 | M17 | Z | 0 | 0 | 0 | \%100 |
| 18 | M18 | Z | 002 | 002 | 0 | \%100 |
| 19 | M19 | Z | 002 | 002 | 0 | \%100 |
| 20 | M20 | Z | . 001 | . 001 | 0 | \%100 |
| 21 | M21 | Z | 003 | 003 | 0 | \%100 |
| 22 | MP3 | Z | 002 | 002 | \%99.9 | \%100 |
| 23 | MP4 | Z | 002 | 002 | \%88.8 | \%100 |
| 24 | MP1 | Z | 002 | 002 | \%88.9 | \%100 |
| 25 | M1 | X | . 003 | . 003 | 0 | \%100 |
| 26 | M2 | X | 007 | 007 | 0 | \%100 |
| 27 | M3 | X | 003 | 003 | 0 | \%100 |
| 28 | M4 | X | 0 | 0 | 0 | \%100 |
| 29 | MP3 | X | . 004 | 004 | 0 | \%100 |
| 30 | M6 | X | 0 | 0 | 0 | \%100 |
| 31 | M7 | X | 0 | 0 | 0 | \%100 |
| 32 | M8 | X | 0 | 0 | 0 | \%100 |
| 33 | M9 | X | 0 | 0 | 0 | \%100 |
| 34 | MP4 | X | 004 | 004 | 0 | \%100 |
| 35 | MP2 | X | . 004 | 004 | 0 | \%100 |
| 36 | MP1 | X | . 004 | . 004 | 0 | \%100 |
| 37 | M13 | X | . 003 | . 003 | 0 | \%100 |
| 38 | M14 | X | 0 | 0 | 0 | \%100 |
| 39 | M15 | X | 0 | 0 | 0 | \%100 |
| 40 | M16 | X | 0 | 0 | 0 | \%100 |
| 41 | M17 | X | 0 | 0 | 0 | \%100 |
| 42 | M18 | X | . 003 | . 003 | 0 | \%100 |
| 43 | M19 | X | . 004 | 004 | 0 | \%100 |
| 44 | M20 | X | . 001 | . 001 | 0 | \%100 |
| 45 | M21 | X | . 005 | 005 | 0 | \%100 |

Member Distributed Loads (BLC 26 : Ice Wind Members (150 Deg))

|  | Member Label | Direction | Start Magnitude[k/ft.F. .ksf] | End Magnitude[k/ft.F. . ksf] | Start Locationfft. | .End Location[ft.\%] |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | M1 | Z | . 001 | . 001 | 0 | \%100 |
| 2 | M2 | Z | . 007 | . 007 | 0 | \%100 |
| 3 | M3 | Z | 004 | 004 | 0 | \%100 |
| 4 | M4 | Z | 0 | 0 | 0 | \%100 |
| 5 | MP3 | Z | . 004 | . 004 | 0 | \%. 1 |
| 6 | M6 | Z | 0 | 0 | 0 | \%100 |
| 7 | M7 | Z | 0 | 0 | 0 | \%100 |
| 8 | M8 | Z | 0 | 0 | 0 | \%100 |
| 9 | M9 | Z | 0 | 0 | 0 | \%100 |
| 10 | MP4 | Z | . 004 | . 004 | 0 | \%11.2 |
| 11 | MP2 | Z | . 004 | . 004 | 0 | \%100 |
| 12 | MP1 | Z | . 004 | . 004 | 0 | \%11.1 |
| 13 | M13 | Z | 003 | 003 | 0 | \%100 |
| 14 | M14 | Z | 0 | 0 | 0 | \%100 |
| 15 | M15 | Z | 0 | 0 | 0 | \%100 |
| 16 | M16 | Z | 0 | 0 | 0 | \%100 |
| 17 | M17 | Z | 0 | 0 | 0 | \%100 |
| 18 | M18 | Z | . 003 | . 003 | 0 | \%100 |
| 19 | M19 | Z | . 004 | . 004 | 0 | \%100 |
| 20 | M20 | Z | . 001 | 001 | 0 | \%100 |

Company

## Member Distributed Loads (BLC 26 : Ice Wind Members (150 Deg)) (Continued)

|  | Member Label | Direction | Start Magnitude[k/ft,F,ksf] | End Magnitude[k/ft,F,ksf] | Start Location [ft, | End Location[ft, \%] |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 21 | M21 | Z | . 005 | . 005 | 0 | \%100 |
| 22 | MP3 | Z | 004 | 004 | \%99.9 | \%100 |
| 23 | MP4 | Z | 004 | 004 | \%88.8 | \%100 |
| 24 | MP1 | Z | 004 | 004 | \%88.9 | \%100 |
| 25 | M1 | X | 001 | 001 | 0 | \%100 |
| 26 | M2 | X | 004 | 004 | 0 | \%100 |
| 27 | M3 | X | 002 | 002 | 0 | \%100 |
| 28 | M4 | X | 0 | 0 | 0 | \%100 |
| 29 | MP3 | X | 002 | 002 | 0 | \%100 |
| 30 | M6 | X | 0 | 0 | 0 | \%100 |
| 31 | M7 | X | 0 | 0 | 0 | \%100 |
| 32 | M8 | X | 0 | 0 | 0 | \%100 |
| 33 | M9 | X | 0 | 0 | 0 | \%100 |
| 34 | MP4 | X | 002 | 002 | 0 | \%100 |
| 35 | MP2 | X | 002 | . 002 | 0 | \%100 |
| 36 | MP1 | X | 002 | . 002 | 0 | \%100 |
| 37 | M13 | X | 002 | . 002 | 0 | \%100 |
| 38 | M14 | X | 0 | 0 | 0 | \%100 |
| 39 | M15 | X | 0 | 0 | 0 | \%100 |
| 40 | M16 | X | 0 | 0 | 0 | \%100 |
| 41 | M17 | X | 0 | 0 | 0 | \%100 |
| 42 | M18 | X | 002 | . 002 | 0 | \%100 |
| 43 | M19 | X | 002 | . 002 | 0 | \%100 |
| 44 | M20 | X | 001 | . 001 | 0 | \%100 |
| 45 | M21 | X | . 003 | . 003 | 0 | \%100 |

Member Area Loads
Joint A Joint B
Joint C
Joint D
Direction
Distribution Magnitude[ksf] No Data to Print ...

## Basic Load Cases

|  | BLC Description | Category | X Gravity | Y Gravity | Z Gravity | Joint | Point | Distribut. | Area(Me... | Surface(... |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | Dead | None |  | -1 |  |  | 5 |  |  |  |
| 2 | Ice Dead | None |  |  |  |  | 5 | 21 |  |  |
| 3 | Full Wind Antenna (0 Deq) | None |  |  |  |  | 7 |  |  |  |
| 4 | Full Wind Antenna (30 Deg) | None |  |  |  |  | 16 |  |  |  |
| 5 | Full Wind Antenna ( 60 Deg ) | None |  |  |  |  | 16 |  |  |  |
| 6 | Full Wind Antenna (90 Deg) | None |  |  |  |  | 16 |  |  |  |
| 7 | Full Wind Antenna (120 Deg) | None |  |  |  |  | 16 |  |  |  |
| 8 | Full Wind Antenna (150 Deg) | None |  |  |  |  | 16 |  |  |  |
| 9 | Full Wind Members (0 Deg) | None |  |  |  |  |  | 25 |  |  |
| 10 | Full Wind Members (30 Deg) | None |  |  |  |  |  | 25 |  |  |
| 11 | Full Wind Members (60 Deg) | None |  |  |  |  |  | 25 |  |  |
| 12 | Full Wind Members (90 Deg) | None |  |  |  |  |  | 25 |  |  |
| 13 | Full Wind Members (120 Deg) | None |  |  |  |  |  | 25 |  |  |
| 14 | Full Wind Members (150 Deg) | None |  |  |  |  |  | 25 |  |  |
| 15 | Ice Wind Antenna (0 Deq) | None |  |  |  |  | 7 |  |  |  |
| 16 | Ice Wind Antenna (30 Deg) | None |  |  |  |  | 16 |  |  |  |
| 17 | Ice Wind Antenna (60 Deg) | None |  |  |  |  | 16 |  |  |  |
| 18 | Ice Wind Antenna (90 Deg) | None |  |  |  |  | 16 |  |  |  |
| 19 | Ice Wind Antenna (120 Deg) | None |  |  |  |  | 16 |  |  |  |
| 20 | Ice Wind Antenna (150 Deg) | None |  |  |  |  | 16 |  |  |  |
| 21 | Ice Wind Members (0 Deq) | None |  |  |  |  |  | 45 |  |  |
| 22 | Ice Wind Members (30 Deg) | None |  |  |  |  |  | 45 |  |  |

Company

## Basic Load Cases (Continued)

|  | BLC Description | Category | X Gravity | Y Gravity | Z Gravity | Joint | Point | Distribut.. | Area(Me... | Surface(... |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 23 | Ice Wind Members (60 Deg) | None |  |  |  |  |  | 45 |  |  |
| 24 | Ice Wind Members (90 Deg) | None |  |  |  |  |  | 45 |  |  |
| 25 | Ice Wind Members (120 Deg) | None |  |  |  |  |  | 45 |  |  |
| 26 | Ice Wind Members (150 Deg) | None |  |  |  |  |  | 45 |  |  |
| 27 | Seismic Antenna (0 Deq) | None |  |  |  |  | 5 |  |  |  |
| 28 | Seismic Antenna (90 Deg) | None |  |  |  |  | 5 |  |  |  |
| 29 | Seismic Members (0 Deq) | None |  | -. 041 | -. 103 |  |  |  |  |  |
| 30 | Seismic Members (30 Deg) | None | 051 | -. 041 | -. 089 |  |  |  |  |  |
| 31 | Seismic Members (60 Deq) | None | 089 | -. 041 | -. 051 |  |  |  |  |  |
| 32 | Seismic Members (90 Deg) | None | 103 | -. 041 |  |  |  |  |  |  |
| 33 | Seismic Members (120 Deg) | None | 089 | -. 041 | 051 |  |  |  |  |  |
| 34 | Seismic Members (150 Deg) | None | 051 | -. 041 | 089 |  |  |  |  |  |
| 35 | Seismic Members (180 Deg) | None |  | -. 041 | 103 |  |  |  |  |  |
| 36 | Seismic Members (210 Deg) | None | -. 051 | -. 041 | 089 |  |  |  |  |  |
| 37 | Seismic Members (240 Deg) | None | -. 089 | -. 041 | 051 |  |  |  |  |  |
| 38 | Seismic Members (270 Deg) | None | -. 103 | -. 041 |  |  |  |  |  |  |
| 39 | Seismic Members (300 Deg) | None | -. 089 | -. 041 | -. 051 |  |  |  |  |  |
| 40 | Seismic Members (330 Deg) | None | -. 051 | -. 041 | -. 089 |  |  |  |  |  |
| 41 | Seismic Vertical Antennas | None |  |  |  |  | 5 |  |  |  |
| 42 | Man 1 ( 500 lbs ) | None |  |  |  | 1 |  |  |  |  |
| 43 | Man 2 ( 500 lbs ) | None |  |  |  | 1 |  |  |  |  |
| 44 | Man 3 ( 500 lbs ) | None |  |  |  | 1 |  |  |  |  |
| 45 | Man 4 ( 250 lbs ) | None |  |  |  | 1 |  |  |  |  |
| 46 | Man 5 ( 250 lbs ) | None |  |  |  | 1 |  |  |  |  |
| 47 | Man 6 ( 250 lbs ) | None |  |  |  | 1 |  |  |  |  |

## Load Combinations

|  | Description S |  |  | B... | Fa.. |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | B... Fa... |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | 1.4D |  |  | 1 | 1.4 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2 | $1.2 \mathrm{D}+1.0 \mathrm{~W} 0^{\circ}$ | Yes | Y | 1 | 1.2 | 3 | 1 | 9 | 1 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3 | $1.2 \mathrm{D}+1.0 \mathrm{~W} \mathrm{30}$ |  | Y | 1 | 1.2 | 4 | 1 | 10 | 1 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 4 | $1.2 \mathrm{D}+1.0 \mathrm{~W} 60^{\circ}$ | Yes | Y | 1 | 1.2 | 5 | 1 | 11 | 1 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5 | $1.2 \mathrm{D}+1.0 \mathrm{~W} \mathrm{90}$ - |  | Y | 1 | 1.2 | 6 | 1 | 12 | 1 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 6 | $1.2 \mathrm{D}+1.0 \mathrm{~W} 120^{\circ}$ |  | Y | 1 | 1.2 | 7 | 1 | 13 | 1 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 7 | $1.2 \mathrm{D}+1.0 \mathrm{~W} 150^{\circ}$ |  | Y | 1 | 1.2 | 8 | 1 | 14 | 1 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 8 | $1.2 \mathrm{D}+1.0 \mathrm{~W} 180^{\circ}$ |  | Y | 1 | 1.2 | 3 | -1 | 9 | -1 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 9 | $1.2 \mathrm{D}+1.0 \mathrm{~W} 210^{\circ}$ | Yes | Y | 1 | 1.2 | 4 | -1 | 10 | -1 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 10 | $1.2 \mathrm{D}+1.0 \mathrm{~W} 240^{\circ}$ | Yes | - | 1 | 1.2 | 5 | -1 | 11 | -1 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 11 | $1.2 \mathrm{D}+1.0 \mathrm{~W} 270^{\circ}$ | Yes | Y | 1 | 1.2 | 6 | -1 | 12 | -1 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 12 | $1.2 \mathrm{D}+1.0 \mathrm{~W} 300^{\circ}$ | Yes |  | 1 | 1.2 | 7 | -1 | 13 | -1 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 13 | $1.2 \mathrm{D}+1.0 \mathrm{~W} 330^{\circ}$ | Yes | Y | 1 | 1.2 | 8 | -1 | 14 | -1 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 14 | $1.2 \mathrm{D}+1.0 \mathrm{Di}+1.0 \mathrm{Wi} 0^{\circ}$ | Yes | - | 1 | 1.2 | 2 | 1 | 15 | 1 | 21 | 1 |  |  |  |  |  |  |  |  |  |  |  |
| 15 | $1.2 \mathrm{D}+1.0 \mathrm{Di}+1.0 \mathrm{Wi} \mathrm{30}$ - | Yes |  | 1 | 1.2 | 2 | 1 | 16 | 1 | 22 | 1 |  |  |  |  |  |  |  |  |  |  |  |
| 16 | $1.2 \mathrm{D}+1.0 \mathrm{Di}+1.0 \mathrm{Wi} 60^{\circ}$ | Yes | Y | 1 | 1.2 | 2 | 1 | 17 | 1 | 23 | 1 |  |  |  |  |  |  |  |  |  |  |  |
| 17 | $1.2 \mathrm{D}+1.0 \mathrm{Di}+1.0 \mathrm{Wi} 90^{\circ}$ | Yes | Y | 1 | 1.2 | 2 | 1 | 18 | 1 | 24 | 1 |  |  |  |  |  |  |  |  |  |  |  |
| 18 | $1.2 \mathrm{D}+1.0 \mathrm{Di}+1.0 \mathrm{Wi} 120^{\circ}$ | Yes | - | 1 | 1.2 | 2 | 1 | 19 | 1 | 25 | 1 |  |  |  |  |  |  |  |  |  |  |  |
| 19 | $1.2 \mathrm{D}+1.0 \mathrm{Di}+1.0 \mathrm{Wi} 150^{\circ}$ |  |  | 1 | 1.2 | 2 | 1 | 20 | 1 | 26 | 1 |  |  |  |  |  |  |  |  |  |  |  |
| 20 | $1.2 \mathrm{D}+1.0 \mathrm{Di}+1.0 \mathrm{Wi} 180^{\circ} \mathrm{Y}$ | Yes | Y | 1 | 1.2 | 2 | 1 | 15 | -1 | 21 | -1 |  |  |  |  |  |  |  |  |  |  |  |
| 21 | $1.2 \mathrm{D}+1.0 \mathrm{Di}+1.0 \mathrm{Wi} 210^{\circ} \mathrm{Y}$ |  | Y | 1 | 1.2 | 2 | 1 | 16 | -1 | 22 | -1 |  |  |  |  |  |  |  |  |  |  |  |
| 22 | $1.2 \mathrm{D}+1.0 \mathrm{Di}+1.0 \mathrm{Wi} 240^{\circ} \mathrm{Y}$ |  |  | 1 | 1.2 | 2 | 1 | 17 | -1 | 23 | -1 |  |  |  |  |  |  |  |  |  |  |  |
| 23 | $1.2 \mathrm{D}+1.0 \mathrm{Di}+1.0 \mathrm{Wi} 270^{\circ} \mathrm{Y}$ |  | Y | 1 | 1.2 | 2 | 1 | 18 | -1 | 24 | -1 |  |  |  |  |  |  |  |  |  |  |  |
| 24 | $1.2 \mathrm{D}+1.0 \mathrm{Di}+1.0 \mathrm{Wi} 300^{\circ}$ |  | V | 1 | 1.2 | 2 | 1 | 19 | -1 | 25 | -1 |  |  |  |  |  |  |  |  |  |  |  |
| 25 | $1.2 \mathrm{D}+1.0 \mathrm{Di}+1.0 \mathrm{Wi} \mathrm{330}$ | Yes | $Y$ | 1 | 1.2 | 2 | 1 | 20 | -1 | 26 | -1 |  |  |  |  |  |  |  |  |  |  |  |
| 26 | $1.2 \mathrm{D}+1.5 \mathrm{Lm} \_1+1.0 \mathrm{Wm} \mathrm{0}{ }^{\circ}$ | Yes | Y | 1 | 1.2 | 3 | . 059 | 9 | . 059 | 42 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |
| 27 | $1.2 \mathrm{D}+1.5 \mathrm{Lm} \_1+1.0 \mathrm{Wm} 30^{\circ}$ | Yes | Y | 1 | 1.2 | 4 | . 059 | 10 | . 059 | 42 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |

## Load Combinations (Continued)

|  | De |  |  |  | B |  |  |  |  |  |  |  |  |  |  | Fa... | B.. | Fa.. | B... | Fa.. | B.. | Fa.. | B... Fa... |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 28 | $1.2 \mathrm{D}+1.5 \mathrm{Lm}$ _1 + $1.0 \mathrm{Wm} 60^{\circ}$ | Yes | $Y$ |  | 1 | 1.2 | 5 | . 059 | 11. | . 059 | 42 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |
| 29 | $1.2 \mathrm{D}+1.5 \mathrm{Lm} \_1+1.0 \mathrm{Wm} 90^{\circ}$ | Yes | Y |  | 1 | 1.2 | 6 | 059 | 12 | . 059 | 42 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |
| 30 | $1.2 \mathrm{D}+1.5 \mathrm{Lm}$ _ $1+1.0 \mathrm{Wm} 120^{\circ}$ | Yes | Y |  | 1 | 1.2 | 7 | 059 | 13 | . 059 | 42 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |
| 31 | $1.2 \mathrm{D}+1.5 \mathrm{Lm}$ _1 + $1.0 \mathrm{Wm} 150^{\circ}$ | Yes | Y |  | 1 | 1.2 | 8 | 059 | 14 | . 059 | 42 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |
| 32 | $1.2 \mathrm{D}+1.5 \mathrm{Lm}$ _ $1+1.0 \mathrm{Wm} 180^{\circ}$ | Yes | Y |  | 1 | 1.2 | 3 | -.0... | 9 | -.0... | 42 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |
| 33 | $1.2 \mathrm{D}+1.5 \mathrm{Lm} \_1+1.0 \mathrm{Wm} \mathrm{210}{ }^{\circ}$ | Yes | Y |  | 1 | 1.2 | 4 | -.0... | 10 | -.0... | 42 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |
| 34 | $1.2 \mathrm{D}+1.5 \mathrm{Lm}$ _ $1+1.0 \mathrm{Wm} 240^{\circ}$ | Yes | Y |  | 1 | 1.2 | 5 | -.0... | 11 | -.0.. | 42 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |
| 35 | $1.2 \mathrm{D}+1.5 \mathrm{Lm}$ _ $1+1.0 \mathrm{Wm} \mathrm{270}$ | Yes | Y |  | 1 | 1.2 | 6 | -.0... | 12- | -.0.. | 42 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |
| 36 | $1.2 \mathrm{D}+1.5 \mathrm{Lm}$ _ $1+1.0 \mathrm{Wm} 300^{\circ}$ | Yes | $Y$ |  | 1 | 1.2 | 7 | -.0... | 13 | -.0... | 42 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |
| 37 | $1.2 \mathrm{D}+1.5 \mathrm{Lm} \_1+1.0 \mathrm{Wm} 330^{\circ}$ | Yes | Y |  | 1 | 1.2 | 8 | -.0... | 14 | -.0.. | 42 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |
| 38 | $1.2 \mathrm{D}+1.5 \mathrm{Lm} \_2+1.0 \mathrm{Wm} 0^{\circ}$ | Yes | Y |  | 1 | 1.2 | 3 | . 059 | 9 | . 059 | 43 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |
| 39 | $1.2 \mathrm{D}+1.5 \mathrm{Lm} \_2+1.0 \mathrm{Wm} 30^{\circ}$ | Yes | Y |  | 1 | 1.2 | 4 | . 059 | 10 | . 059 | 43 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |
| 40 | $1.2 \mathrm{D}+1.5 \mathrm{Lm} \_2+1.0 \mathrm{Wm} 60^{\circ}$ | Yes | Y |  | 1 | 1.2 | 5 | 059 | 11 | . 059 | 43 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |
| 41 | $1.2 \mathrm{D}+1.5 \mathrm{Lm} \_2+1.0 \mathrm{Wm} 90^{\circ}$ | Yes | Y |  | 1 | 1.2 | 6 | . 059 | 12 | . 059 | 43 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |
| 42 | $1.2 \mathrm{D}+1.5 \mathrm{Lm}$ _ $2+1.0 \mathrm{Wm} 120^{\circ}$ | Yes | Y |  | 1 | 1.2 | 7 | 059 | 13 | . 059 | 43 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |
| 43 | $1.2 \mathrm{D}+1.5 \mathrm{Lm}$ _ $2+1.0 \mathrm{Wm} 150^{\circ}$ | Yes | Y |  | 1 | 1.2 | 8 | . 059 | 14 | . 059 | 43 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |
| 44 | $1.2 \mathrm{D}+1.5 \mathrm{Lm} \_2+1.0 \mathrm{Wm} \mathrm{180}{ }^{\circ}$ | Yes | Y |  | 1 | 1.2 | 3 | -.0... | 9 | -.0... | 43 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |
| 45 | $1.2 \mathrm{D}+1.5 \mathrm{Lm} \_2+1.0 \mathrm{Wm} \mathrm{210}{ }^{\circ}$ | Yes | Y |  | 1 | 1.2 | 4 | -.0... | 10 | -.0.. | 43 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |
| 46 | $1.2 \mathrm{D}+1.5 \mathrm{Lm} \_2+1.0 \mathrm{Wm} 240^{\circ}$ | Yes | Y |  | 1 | 1.2 | 5 | -.0... | 11 | -.0... | 43 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |
| 47 | $1.2 \mathrm{D}+1.5 \mathrm{Lm} \_2+1.0 \mathrm{Wm} 270^{\circ}$ | Yes | Y |  | 1 | 1.2 | 6 | -.0... | 12 | -.0... | 43 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |
| 48 | $1.2 \mathrm{D}+1.5 \mathrm{Lm} 2+1.0 \mathrm{Wm} 300^{\circ}$ | Yes | Y |  | 1 | 1.2 | 7 | -.0... | 13 | -.0.. | 43 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |
| 49 | $1.2 \mathrm{D}+1.5 \mathrm{Lm} \_2+1.0 \mathrm{Wm} \mathrm{330}$ | Yes | Y |  | 1 | 1.2 | 8 | -.0... | 14 | -.0... | 43 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |
| 50 | $1.2 \mathrm{D}+1.5 \mathrm{Lm} \_3+1.0 \mathrm{Wm} 0^{\circ}$ | Yes | Y |  | 1 | 1.2 | 3 | . 059 | 9 | . 059 | 44 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |
| 51 | $1.2 \mathrm{D}+1.5 \mathrm{Lm}$ _ $3+1.0 \mathrm{Wm} 30^{\circ}$ | Yes | Y |  | 1 | 1.2 | 4 | 059 | 10 | . 059 | 44 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |
| 52 | $1.2 \mathrm{D}+1.5 \mathrm{Lm}$ _ $3+1.0 \mathrm{Wm} 60^{\circ}$ | Yes | Y |  | 1 | 1.2 | 5 | . 059 | 11. | . 059 | 44 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |
| 53 | $1.2 \mathrm{D}+1.5 \mathrm{Lm}$ _3 + 1.0Wm $90^{\circ}$ | Yes | Y |  | 1 | 1.2 | 6 | . 059 | 12 | . 059 | 44 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |
| 54 | $1.2 \mathrm{D}+1.5 \mathrm{Lm}$ _3 + $1.0 \mathrm{Wm} 120^{\circ}$ | Yes | Y |  | 1 | 1.2 | 7 | . 059 | 13 | . 059 | 44 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |
| 55 | $1.2 \mathrm{D}+1.5 \mathrm{Lm}$ _3 + $1.0 \mathrm{Wm} 150^{\circ}$ | Yes | $Y$ |  | 1 | 1.2 | 8 | . 059 | 14 | . 059 | 44 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |
| 56 | $1.2 \mathrm{D}+1.5 \mathrm{Lm}$ _ $3+1.0 \mathrm{Wm} 180^{\circ}$ | Yes | Y |  | 1 | 1.2 | 3 | -.0... | 9 | -.0... | 44 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |
| 57 | $1.2 \mathrm{D}+1.5 \mathrm{Lm}$ _3 $+1.0 \mathrm{Wm} 210^{\circ}$ | Yes | Y |  | 1 | 1.2 | 4 | -.0... | 10 | -.0... | 44 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |
| 58 | $1.2 \mathrm{D}+1.5 \mathrm{Lm}$ _ $3+1.0 \mathrm{Wm} 240^{\circ}$ | Yes | Y |  | 1 | 1.2 | 5 | -.0... | 11 | -.0... | 44 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |
| 59 | $1.2 \mathrm{D}+1.5 \mathrm{Lm}$ _3 $+1.0 \mathrm{Wm} 270^{\circ}$ | Yes | Y |  | 1 | 1.2 | 6 | -.0... | 12 | -.0... | 44 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |
| 60 | $1.2 \mathrm{D}+1.5 \mathrm{Lm}$ _3 + $1.0 \mathrm{Wm} 300^{\circ}$ | Yes | Y |  | 1 | 1.2 | 7 | -.0... | 13 | -.0... | 44 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |
| 61 | 1.2D + 1.5Lm_3 + $1.0 \mathrm{Wm} 330^{\circ}$ | Yes | Y |  | 1 | 1.2 | 8 | -.0... | 14 | -.0.. | 44 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |
| 62 | $1.2 \mathrm{D}+1.5 \mathrm{Lv} 10^{\circ}$ | Yes | Y |  | 1 | 1.2 | 45 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 63 | $1.2 \mathrm{D}+1.5 \mathrm{Lv} 10^{\circ}$ | Yes | $Y$ |  | 1 | 1.2 | 45 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 64 | $1.2 \mathrm{D}+1.5 \mathrm{Lv}$-1 $60^{\circ}$ | Yes | Y |  | 1 | 1.2 | 45 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 65 | $1.2 \mathrm{D}+1.5 \mathrm{Lv}-190^{\circ}$ | Yes | Y |  | 1 | 1.2 | 45 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 66 | $1.2 \mathrm{D}+1.5 \mathrm{Lv}-1120^{\circ}$ | Yes | Y |  | 1 | 1.2 | 45 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 67 | $1.2 \mathrm{D}+1.5 \mathrm{LV} 1{ }^{-150}$ | Yes | $Y$ |  | 1 | 1.2 | 45 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 68 | $1.2 \mathrm{D}+1.5 \mathrm{Lv}-1180^{\circ}$ | Yes | Y |  | 1 | 1.2 | 45 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 69 | $1.2 \mathrm{D}+1.5 \mathrm{Lv}-1210^{\circ}$ | Yes | Y |  | 1 | 1.2 | 45 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 70 | $1.2 \mathrm{D}+1.5 \mathrm{Lv}$ - $1240^{\circ}$ | Yes | $Y$ |  | 1 | 1.2 | 45 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 71 | $1.2 \mathrm{D}+1.5 \mathrm{LV}-1270^{\circ}$ | Yes | $Y$ |  | 1 | 1.2 | 45 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 72 | $1.2 \mathrm{D}+1.5 \mathrm{Lv} 1{ }^{\text {d }} 300^{\circ}$ | Yes | $Y$ |  | 1 | 1.2 | 45 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 73 | $1.2 \mathrm{D}+1.5 \mathrm{Lv}{ }^{-1330}$ | Yes | $Y$ |  | 1 | 1.2 | 45 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 74 | $1.2 \mathrm{D}+1.5 \mathrm{Lv} 20^{\circ}$ | Yes | $Y$ |  | 1 | 1.2 | 46 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 75 | $1.2 \mathrm{D}+1.5 \mathrm{Lv} 230^{\circ}$ | Yes | $Y$ |  | 1 | 1.2 | 46 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 76 | $1.2 \mathrm{D}+1.5 \mathrm{Lv} 260^{\circ}$ | Yes | $Y$ |  | 1 | 1.2 | 46 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 77 | $1.2 \mathrm{D}+1.5 \mathrm{Lv} 290^{\circ}$ | Yes | $Y$ |  | 1 | 1.2 | 46 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 78 | $1.2 \mathrm{D}+1.5 \mathrm{Lv} 2120^{\circ}$ | Yes | Y |  | 1 | 1.2 | 46 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 79 | $1.2 \mathrm{D}+1.5 \mathrm{Lv} 2150^{\circ}$ | Yes | Y |  | 1 | 1.2 | 46 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 80 | $1.2 \mathrm{D}+1.5 \mathrm{Lv} 2180^{\circ}$ | Yes | $Y$ |  | 1 | 1.2 | 46 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 81 | $1.2 \mathrm{D}+1.5 \mathrm{Lv} 2210^{\circ}$ | Yes | $Y$ |  | 1 | 1.2 | 46 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 82 | $1.2 \mathrm{D}+1.5 \mathrm{Lv} 2240^{\circ}$ | Yes | $Y$ |  | 1 | 1.2 | 46 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 83 | $1.2 \mathrm{D}+1.5 \mathrm{LV} 2270^{\circ}$ | Yes | $Y$ |  | 1 | 1.2 | 46 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 84 | $1.2 \mathrm{D}+1.5 \mathrm{Lv} 2300^{\circ}$ | Yes | Y |  | 1 | 1.2 | 46 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Company
Designer
Job Number

## Load Combinations (Continued)

|  | Description |  |  | S... B | Fa |  |  |  |  |  |  |  | . Fa... |  |  |  |  |  | Fa.. |  |  | B... Fa... |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 85 | $1.2 \mathrm{D}+1.5 \mathrm{Lv} 2330^{\circ}$ | Yes | Y | 1 | 1.2 | 46 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 86 | $1.2 \mathrm{D}+1.5 \mathrm{Lv} 30^{\circ}$ | Yes | Y | 1 | 1.2 | 47 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 87 | $1.2 \mathrm{D}+1.5 \mathrm{Lv}-30^{\circ}$ | Yes | Y | 1 | 1.2 | 47 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 88 | $1.2 \mathrm{D}+1.5 \mathrm{Lv} 360^{\circ}$ | Yes | Y | 1 | 1.2 | 47 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 89 | $1.2 \mathrm{D}+1.5 \mathrm{Lv} 390^{\circ}$ | Yes | Y | 1 | 1.2 | 47 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 90 | $1.2 \mathrm{D}+1.5 \mathrm{Lv} 3120^{\circ}$ | Yes | Y | 1 | 1.2 | 47 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 91 | $1.2 \mathrm{D}+1.5 \mathrm{LV}-3150^{\circ}$ | Yes | Y | 1 | 1.2 | 47 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 92 | $1.2 \mathrm{D}+1.5 \mathrm{Lv} 3180^{\circ}$ | Yes | Y | 1 | 1.2 | 47 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 93 | $1.2 \mathrm{D}+1.5 \mathrm{Lv} 3210^{\circ}$ | Yes | Y | 1 | 1.2 | 47 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 94 | $1.2 \mathrm{D}+1.5 \mathrm{Lv} 3240^{\circ}$ | Yes | Y | 1 | 1.2 | 47 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 95 | $1.2 \mathrm{D}+1.5 \mathrm{Lv} 3270^{\circ}$ | Yes | Y | 1 | 1.2 | 47 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 96 | $1.2 \mathrm{D}+1.5 \mathrm{Lv} 3300^{\circ}$ | Yes | Y | 1 | 1.2 | 47 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 97 | $1.2 \mathrm{D}+1.5 \mathrm{LV}-3330^{\circ}$ | Yes | Y | 1 | 1.2 | 47 | 1.5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 98 | $1.2 \mathrm{D}+1.0 \mathrm{EV}+1.0 \mathrm{EH} 0^{\circ}$ | Yes | Y | 1 | 1.2 | 27 | 1 | 28 |  | 29 | 1 | 40 | 1 |  |  |  |  |  |  |  |  |  |
| 99 | $1.2 \mathrm{D}+1.0 \mathrm{EV}+1.0 \mathrm{EH} 30^{\circ}$ | Yes | Y | 1 | 1.2 | 27 | . 866 | 28 | . 5 | 30 | 1 | 40 | - 1 |  |  |  |  |  |  |  |  |  |
| 100 | $1.2 \mathrm{D}+1.0 \mathrm{EV}+1.0 \mathrm{EH} 60^{\circ}$ | Yes | Y | 1 | 1.2 | 27 | . 5 | 28 | . 866 | 31 | 1 | 40 | 1 |  |  |  |  |  |  |  |  |  |
| 101 | $1.2 \mathrm{D}+1.0 \mathrm{EV}+1.0 \mathrm{EH} \mathrm{90}$ | Yes | Y | 1 | 1.2 | 27 |  | 28 | 1 | 32 | 1 | 40 | 1 |  |  |  |  |  |  |  |  |  |
| 102 | $1.2 \mathrm{D}+1.0 \mathrm{EV}+1.0 \mathrm{EH} 120^{\circ}$ | Yes | Y | 1 | 1.2 | 27 | -. 5 | 28 | . 866 | 33 | 1 | 40 | 1 |  |  |  |  |  |  |  |  |  |
| 103 | $1.2 \mathrm{D}+1.0 \mathrm{EV}+1.0 \mathrm{EH} 150^{\circ}$ | Yes | Y | 1 | 1.2 | 27 | -.8. | 28 | . 5 | 34 | 1 | 40 | 1 |  |  |  |  |  |  |  |  |  |
| 104 | $1.2 \mathrm{D}+1.0 \mathrm{EV}+1.0 \mathrm{EH} 180^{\circ}$ | Yes | Y | 1 | 1.2 | 27 | -1 | 28 |  | 35 | 1 | 40 | 1 |  |  |  |  |  |  |  |  |  |
| 105 | $1.2 \mathrm{D}+1.0 \mathrm{EV}+1.0 \mathrm{EH} 210^{\circ}$ | Yes | Y | 1 | 1.2 | 27 | -.8.. | 28 | -. 5 | 36 | 1 | 40 | - 1 |  |  |  |  |  |  |  |  |  |
| 106 | $1.2 \mathrm{D}+1.0 \mathrm{EV}+1.0 \mathrm{EH} 240^{\circ}$ | Yes | Y | 1 | 1.2 | 27 | -. 5 | 28 | -.8.. | 37 | 1 | 40 | 1 |  |  |  |  |  |  |  |  |  |
| 107 | $1.2 \mathrm{D}+1.0 \mathrm{EV}+1.0 \mathrm{EH} 270^{\circ}$ | Yes | Y | 1 | 1.2 | 27 |  | 28 | -1 | 38 | 1 | 40 | 1 |  |  |  |  |  |  |  |  |  |
| 108 | $1.2 \mathrm{D}+1.0 \mathrm{EV}+1.0 \mathrm{EH} 300^{\circ}$ | Yes | Y | 1 | 1.2 | 27 | . 5 | 28 | -.8.. | 39 | 1 | 40 | - 1 |  |  |  |  |  |  |  |  |  |
| 109 | $1.2 \mathrm{D}+1.0 \mathrm{EV}+1.0 \mathrm{EH} 330^{\circ}$ | Yes | Y | 1 | 1.2 | 27 | . 866 | 28 | -. 5 | 40 | 1 | 40 | 1 |  |  |  |  |  |  |  |  |  |

Envelope Joint Reactions

| Joint |  |  | X [k] | LC Y [k] |  | LC Z [k] |  | LC | MX [k-ft] | LC | MY [k-ft] | LC | MZ [k-ft] | $\begin{array}{\|c} \text { LC } \\ \hline 39 \end{array}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | N1 | max | 1.167 | 12 | 477 | 8 | -. 454 | 2 | . 665 | 2 | 3.453 | 12 | . 997 |  |
| 2 |  | min | -1.216 | 6 | -1.028 | 2 | -2.22 | 20 | -. 382 | 8 | -3.548 | 6 | -. 716 | 86 |
| 3 | N24 | max | 462 | 85 | 13 | 19 | 1.006 | 2 | -. 051 | 13 | 752 | 13 | . 688 | 43 |
| 4 |  | min | -. 624 | 27 | -. 014 | 13 | -1.13 | 8 | -. 243 | 43 | -. 713 | 43 | -. 516 | 86 |
| 5 | N40 | max | 485 | 47 | 3.243 | 14 | 2.437 | 14 | 0 | 109 | . 421 | 48 | . 658 | 6 |
| 6 |  | min | -. 343 | 86 | 384 | 8 | 242 | 8 | 0 | 1 | -. 501 | 6 | -. 553 | 48 |
| 7 | Totals: | max | 1.414 | 11 | 2.433 | 15 | 2.06 | 2 |  |  |  |  |  |  |
| 8 |  | min | -1.414 | 5 | 93 | 9 | -2.06 | 8 |  |  |  |  |  |  |

## Envelope AISC 14th(360-10): LRFD Steel Code Checks

|  | Mem. | Shape | Code Check | Loc[ft] | LC | Shear | Loc[ft] | Dir | LC | phi* ...phi*...phi*...phi*. | Cb | Eqn |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | M1 | HSS4X4X4 | . 236 | 2.917 | 12 | 184 | . 486 | V | 31 | 119...139...16.1..16.1. | .1.725 | H1. |
| 2 | M2 | PIPE_4.0 | . 001 | 75 | 11 | 001 | . 75 |  | 11 | 92.5..93.24 10.6..10.6. | 1.562 | H1. |
| 3 | M3 | PIPE 3.0 | 442 | 6.667 | 27 | 240 | 6.667 |  | 8 | 22.8...65.2..5.7495.749 | 1.748 | H1. |
| 4 | MP3 | PIPE_2.5 | 460 | 4.417 | 8 | 116 | 2.417 |  | 8 | 31.9..50.7..3.5963.596 | 2.36 | H1. |
| 5 | MP4 | PIPE 2.0X | 331 | 2.875 | 97 | 072 | 938 |  | 97 | 26.1..44.1 2.5312 .531 | 4.304 | H1. |
| 6 | MP2 | PIPE_2.0X | . 346 | 2.875 | 37 | 115 | 2.875 |  | 45 | 26.1..44.12.5312.531 | 1 | H1.. |
| 7 | MP1 | PIPE 2.0X | 437 | 2.875 | 47 | 101 | 2.875 |  | 49 | 26.1..44.12.5312.531 | 1 | H1. |
| 8 | M13 | PIPE 2.0 | 388 | 12.639 | 47 | 140 | 3.333 |  | 8 | 18.3.32.131.8721.872 | 1 | H1. |
| 9 | M19 | L2.5x2.5x3 | 360 | 4.375 | 97 | . 025 | 4.375 | z | 97 | 15.5..29.1...8731.863 | 1.689 | H2. |
| 10 | M20 | L2.5x2.5x3 | 497 | 4.375 | 43 | . 036 | 4.375 | $y$ | 43 | 15.5..29.1... 8731.918 | 2.015 | H2. |
| 11 | M21 | LL3x3x3x3 | . 261 | 0 | 40 | . 026 | 4 | z | 48 | 45.5..68.675.3893.647 | 2.175 | H1.. |

## APPENDIX D

## ADDITIONAL CALCUATIONS

## Bolt Calcuations:

| Bolt Size: | $5 / 8$ | in |
| :---: | :---: | :---: |
| \# Bolts: | 4 |  |
| Plate Width: | 10 | in |
| Plate Height: | 10 | in |
| Bolt H Gap: | 7 | in |
| Bolt V Gap: | 7 | in |
| Plate T: | 0.625 | in |
| Bolt Grade: $_{\text {Fu }}^{\text {bolt }}$ | A 325 N |  |
| $\mathrm{r}:$ | 120 | ksi |
| J: | 4.950 | in $^{\text {Jolt Area, Normal }:}$ |
| Bolt Area, Net Tensile: | 0.307 | $\mathrm{in}^{4} / \mathrm{in}^{2}$ |
|  | 0.226 | $\mathrm{in}^{2}$ |



| Allowable Shear: | 12.4 | kip |
| :---: | :---: | :---: |
| Allowable Tension: | 20.3 | kip |


| Tension Capacity: | $16.8 \%$ |
| :---: | ---: |
| Shear Capacity: | $7.9 \%$ |
| Combined Capacity: | $2.9 \%$ |


| Bolt Capacity: | $16.8 \%$ |
| :--- | :--- |

## Plate Calculations:

| Horizontal Member Height: | 4 | in |
| :---: | :---: | :---: |
| Horizontal Member Width: | 4 | in |
| Plate Grade: | A36 |  |
| Plate Fy: | 36 | ksi |


| $\mathrm{Mx}=$ | 9.783 | $\mathrm{k}^{*}$ in |
| ---: | ---: | :--- |
| $\mathrm{Mz}=$ | 2.834 | $\mathrm{k}^{*}$ in |


| $\mathrm{Zx}=$ | 0.977 | $\mathrm{in}^{3}$ |
| ---: | :--- | :--- |
| $\mathrm{Zz}=$ | 0.977 | $\mathrm{in}^{3}$ |


| $\varnothing \mathrm{Mpy}(\mathrm{X})=$ | 31.641 | $\mathrm{k}-\mathrm{in}$ |
| :--- | :--- | :--- |
| $\varnothing \mathrm{Mpx}(\mathrm{X})=$ | 31.641 | $\mathrm{k}-\mathrm{in}$ |

## APPENDIX E

MODIFICATION DRAWINGS



-
RECOMMENDATIONS:
THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO
ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING A MI REPORT: - IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF 5 BUSINESS DAYS
NOTICE, PREFERABLY 10, TO THE MIINSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.

- THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE
ENTIRE PROJECT. - ENTIRE PROJECT.
- WHEN POSSIBLE IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR
ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS.
- IT MAY BE BENEFICIAL TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO
CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW FOUNDATION - IT MAY BE BENEFICIAL TO INSTALL ALL TOWER MODIFICATIONS PRIOR
CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW FOUNDATION
AND MI INSPECTION(S) TO COMMENCE WITH ONE SITE VISIT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR
ON-SITE DURING THE MIT IO HAE ANY DEFICIENCIES CORRECTED DURING
THE INITAL MI, THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE
MI CAREFULLY TO ENSURE ALL CONSTRUCTION FACULTIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON SITE.
CANCELLATION OR DELAYS IN SCHEDULED MI: IF THE GC AND MI INSPECTOR AGREE TO A DATE ON WHICH THE MI WILL BE


MODIFICATION INSPECTION NOTES:

EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY. IF
CONTACT INFORMATION IS NOT KNOWN, CONTACT YOUR POINT OF CONTACT
(POC).
MI INSPECTOR:

1. THE MI INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A
PO FOR THE MI TO AT AINIMUM
OR THE MI TO, AT A MINIMUM
REVIEW THE REQUIREMENTS OF THE MI CHECKLIST WORK WITH THE GC
TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS,
2. THE MI IS RESPONSIBLE FOR COLLECTING ALL GENERAL CONTRACTORS (GC)
THE MI IS RESPONSIBLE FOR COLLECTING ALL GENERAL CONTRACTORS (GC)
INSPECTION AND TEST REPORTS, REVIEWING THE DOCUMENTS FOR
ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING THE IN-FIELD
INSPECTIONS AND SUBMITTING THE MI REPORT. GENERAL CONTRACTOR:
3. THE GC IS REQUIRED TO CONTA
PO FOR THE MODIFICATION IN
4. THE GC IS REQUIRED TO CONTACT THE MI INSPECTOR AS SOON AS RECEIVING A
PO FOR THE MODIFICATION INSTALLATION OR TURNKEY PROJECT TO, AT A
MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST.
- WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT
WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT
ON-SITE MI INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS.
- ON-SITE MIINSPECTIONS, INCLUDING FOUNDATIONINSPECTIONS.

2. THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN
ACCORDANCE WITH THE REQUIREMENTS OF THE MI CHECKLIST.
MI VERIFICATION INSPECTIONS:
VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT FIRM AFTER
A MODIFICATION PROJECT IS COMPLETED, AS MARKED BY THE OF AN ACCEPTED
"PASSING MI" OR "PASS AS NOTED MI" REPORT FOR THE ORIGINAL PROJECT. REQUIRED PHOTOS:
BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A
MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT:
PRE-CONSTRUCTION GENERAL SITE CONDITION
PHOTOGRACIO
CONSTRUCTION/ERECTIONS AND INSPECTION:
RAW MATERIALS
RAW MATERIALS
PHOTOS OF ALL CR
FOUNDATION MOD
PHOTOS OF ALL CRITICAL DETAILS
FOUNDATION MODIFICATIONS
BELT INSTALLATION AND TORQUE
SURFACE COATING REPAIR

- POST CONSTRUCTION PHOTOGRAPHS
- FINAL INFIELD CONDITIONS
PHOTOS OF ELEVATED MODIFICATION TAKEN FR
PHOTOS OF ELEVATED MODIFICATION TAKEN FROM THE GROUND SHALL BE
CONSIDERED INADEQUATE.

| MI CHECKLIST |  |
| :---: | :---: |
| CONSTRUCTIONINSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY EOR) | REPORT ITEM |
| PRE-CONSTRUCTION |  |
| X | MI CHECKLIST DRAWING |
| N/A | EOR APPROVAL |
| X | FABRICATION INSPECTION |
| N/A | FABRICATOR CERTIFIED WELD INSPECTION |
| X | MATERIAL TEST REPORT (MTR) |
| N/A | FABRICATOR NDE INSPECTION |
| N/A | NDE REPORT OF BASE PLATE |
| X | PACKING SLIPS |
| ADDITIONAL TESTING AND INSPECTIONS: |  |
| CONSTRUCTION |  |
| X | CONSTRUCTION INSPECTIONS |
| N/A | CONTINUOUS FOUNDATION INSPECTIONS |
| N/A | CONCRETE COMP. STRENGTH AND SLUMP TESTS |
| N/A | GROUT COMP. STRENGTH (ASTM C109) |
| N/A | POST INSTALLED ANCHOR ROD VERIFICATION |
| N/A | BASE PLATE GROUT VERIFICATION |
| N/A | CONTRACTOR'S CERTIFIED WELD INSPECTION AND NDE REPORTS |
| N/A | EARTHWORK: LIFT AND DENSITY |
| X | ON SITE COLD GALVANIZING VERIFICATION |
| N/A | GUY WIRE TENSION REPORT |
| X | GC AS-BUILT DOCUMENTS |
| ADDITIONAL TESTING AND INSPECTIONS: |  |
| POST-CONSTRUCTION |  |
| X | MI INSPECTOR REDLINE OR RECORD DRAWING(S) |
| N/A | POST INSTALLED ANCHOR ROD PULL-OUT TESTING |
| X | PHOTOGRAPHS |
| ADDITIONAL TESTING AND I | SPECTIONS: |

NOTE: X DENOTES A DOCUMENT NEEDED FOR THE PMI REPORT
N/A DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE PMI REPORT

$\qquad$



GENERAL NOTES:
ALL WORK PRESENTED IN THESE DRAWINGS MUST BE COMPLETED BY
THE CONTRACTOR UNLESS OTHERWIIE SPECIFIED.
THE CONTRACTOR MUST HAVE A MINIMUM OF 5 YEARS OF
EXPERINCE IN TOWER ERECTION AND RETROFIT SIMILAR TO THAT
DESCRIBED HEREIN.

 STANARDS TO ACCEPT THIS WORK, BY ACCEPTING THIS PROJEC
TTE CONTRACORII ATESTIG THATHE HASUFFICIET
EXPERIENCE, ABIITY, AND KNO WLEDGE OF THE WORK NO BE


## THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYYNG ALL

 E WITHOUTA PREFABRICATION MAPPINGIS DONE AT THE RISK OF THE CONTRACTOR AND/OR FABACACNST
 DRAL MATERILLS AND EQUIPMENT USED IN THE INSTALLATON OF THESE
DRAWINGS SHALL BE IN NEW OR GOOD WORKING QUALTY. FREE
 ACCEPTANCEDATE. 8. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL
 APPLCABLE, THE CONTRACTOR MUST NOTIFY THE APPLION 9. THE CONTRACTOR IS RESPONSIBLL FOR ALL CONSTRUCTION MEANS



$\begin{aligned} & \text { MEMBER USING CHANNEL BRACKETS } \\ & \text { INCLUDED IN THE REINFORCEMENT KIT. }\end{aligned}$
(TYP.)

[^0]$\square$







## Product Info

A valmont $\mathbb{V}$ COMPANY

## Pxxx: Bulk Pipe

Features:

- Factory cut end, hot-dip galvanized pipe


## Construction:

- ASTM A53 Grade B
- Schedule 40


## Design Criteria:

- ASTM A53 Grade B (Yield Fy = 35 ksi [240 MPa] / Tensile Fu $=60$ ksi [415 MPa])
- Hot dip galvanized in accordance with ASTM A123 requirements

| Part \# | Length | OD x Length (in) |
| :--- | :--- | :--- |
| P263 | $5^{\prime}-3^{\prime \prime}$ | $2-3 / 8^{\prime \prime} \times 63^{\prime \prime}$ |
| P272 | $6^{\prime}-0^{\prime \prime}$ | $2-3 / 8^{\prime \prime} \times 72^{\prime \prime}$ |
| P284 | $7^{\prime}-0^{\prime \prime}$ | $2-3 / 8^{\prime \prime} \times 84^{\prime \prime}$ |
| P296 | $8^{\prime}-0^{\prime \prime}$ | $2-3 / 8^{\prime \prime} \times 96^{\prime \prime}$ |
| P2120 | $10^{\prime}-0^{\prime \prime}$ | $2-3 / 8^{\prime \prime} \times 120^{\prime \prime}$ |
| P2126 | $10^{\prime}-6^{\prime \prime}$ | $2-3 / 8^{\prime \prime} \times 126^{\prime \prime}$ |
| P2150 | $12^{\prime}-6^{\prime \prime}$ | $2-3 / 8^{\prime \prime} \times 150^{\prime \prime}$ |
| P2174 | $14^{\prime}-6^{\prime \prime}$ | $2-3 / 8^{\prime \prime} \times 174^{\prime \prime}$ |
| P3084 | $7^{\prime}-0^{\prime \prime}$ | $2-7 / 8^{\prime \prime} \times 84^{\prime \prime}$ |
| P3096 | $8^{\prime}-0^{\prime \prime}$ | $2-7 / 8^{\prime \prime} \times 96^{\prime \prime}$ |
| P30120 | $10^{\prime}-0^{\prime \prime}$ | $2-7 / 8^{\prime \prime} \times 120^{\prime \prime}$ |
| P30126 | $10^{\prime}-6^{\prime \prime}$ | $2-7 / 8^{\prime \prime} \times 126^{\prime \prime}$ |
| P30150 | $12^{\prime}-6^{\prime \prime}$ | $2-7 / 8^{\prime \prime} \times 150^{\prime \prime}$ |
| P30174 | $14^{\prime}-6^{\prime \prime}$ | $2-7 / 8^{\prime \prime} \times 174^{\prime \prime}$ |
| P360 | $5^{\prime}-0^{\prime \prime}$ | $3-1 / 2^{\prime \prime} \times 60^{\prime \prime}$ |
| P372 | $6^{\prime}-0^{\prime \prime}$ | $3-1 / 2^{\prime \prime} \times 72^{\prime \prime}$ |
| P396 | $8^{\prime}-0^{\prime \prime}$ | $3-1 / 2^{\prime \prime} \times 96^{\prime \prime}$ |
| P3150 | $12^{\prime}-6^{\prime \prime}$ | $3-1 / 2^{\prime \prime} \times 150 \prime \prime$ |
| P3160 | $13^{\prime}-4 \prime \prime$ | $3-1 / 2^{\prime \prime} \times 160^{\prime \prime}$ |
| P3174 | $14^{\prime}-6^{\prime \prime}$ | $3-1 / 2^{\prime \prime} \times 174^{\prime \prime}$ |
| P3216 | $18^{\prime}-0^{\prime \prime}$ | $3-1 / 2^{\prime \prime} \times 216^{\prime \prime}$ |
| P4126 | $6^{\prime}-0^{\prime \prime}$ | $4-1 / 2^{\prime \prime} \times 72^{\prime \prime}$ |
| $10^{\prime}-6^{\prime \prime}$ | $4-1 / 2^{\prime \prime} \times 126^{\prime \prime}$ |  |



## Exhibit F

## Power Density/RF Emissions Report

## Transcom Engineering, Inc.

# Radio Frequency Emissions Analysis Report 

T-MOBILE Existing Facility

Site ID: CT11083Q

CT083/Sprint/Grassy Hill<br>700 Grassy Hill Road<br>Orange, CT 06477

July 16, 2019

Transcom Engineering Project Number: 737001-0010

| Site Compliance Summary |  |
| :---: | :---: |
| Compliance Status: | COMPLIANT |
| Site total MPE\% of FCC <br> general population <br> allowable limit: | $\mathbf{1 4 . 4 8} \%$ |

# Transcom Engineering, Inc. 

July 16, 2019
T-MOBILE
Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, CT 6009

## Emissions Analysis for Site: CT11083Q - CT083/Sprint/Grassy Hill

Transcom Engineering, Inc ("Transcom") was directed to analyze the proposed upgrades to the TMOBILE facility located at $\mathbf{7 0 0}$ Grassy Hill Road, Orange, 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 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ( $\mu \mathrm{W} / \mathrm{cm} 2$ ). The number of $\mu \mathrm{W} / \mathrm{cm}^{2}$ 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 population 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 population 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.

Population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter $\left(\mu \mathrm{W} / \mathrm{cm}^{2}\right)$. The general population exposure limits for the $600 \& 700 \mathrm{MHz}$ bands are approximately $400 \mu \mathrm{~W} / \mathrm{cm}^{2}$ and $467 \mu \mathrm{~W} / \mathrm{cm}^{2}$ respectively. The general population exposure limit for the 1900 MHz (PCS) and 2100 MHz (AWS) bands is $1000 \mu \mathrm{~W} / \mathrm{cm}^{2}$. 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.

## Transcom Engineering, Inc.

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.

## Transcom Engineering, Inc.

## CALCULATIONS

Calculations were performed for the proposed upgrades to the T-MOBILE antenna facility located at $\mathbf{7 0 0}$
Grassy Hill Road, Orange, 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, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was focused at the base of the tower. For this report the sample point is the top of a 6 -foot person standing at the base of the tower.

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. All power values expressed and analyzed are maximum power levels expected to be used on all radios.

All emissions values for additional carriers were taken from the Connecticut Siting Council (CSC) active MPE database. Values in this database are provided by the individual carriers themselves

For each sector the following channel counts, frequency bands and power levels were utilized as shown in Table 1:

| Technology | Frequency Band | Channel Count | Transmit Power per <br> Channel (W) |
| :---: | :---: | :---: | :---: |
| UMTS | 1900 MHz (PCS) | 1 | 40 |
| GSM | 1900 MHz (PCS) | 1 | 15 |
| LTE | $2100 \mathrm{MHz}($ AWS $)$ | 2 | 60 |
| LTE $/ 5 \mathrm{G} \mathrm{NR}$ | 600 MHz | 2 | 20 |
| LTE | 700 MHz | 2 | 40 |

Table 1: Channel Data Table

## Transcom Engineering, Inc.

The following antennas listed in Table 2 were used in the modeling for transmission in the $600,700 \mathrm{MHz}$, 1900 MHz (PCS) and 2100 MHz (AWS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

| Sector | Antenna <br> Number | Antenna Make / Model | Antenna <br> Centerline <br> $(\mathrm{ft})$ |
| :---: | :---: | :---: | :---: |
| A | 1 | Ericsson AIR21 B2A/B4P | 110 |
| A | 2 | Ericsson AIR21 B4A/B2P | 110 |
| A | 3 | RFS APXVAARR24_43-U-NA20 | 110 |
| B | 1 | Ericsson AIR21 B2A/B4P | 110 |
| B | 2 | Ericsson AIR21 B4A/B2P | 110 |
| B | 3 | RFS APXVAARR24_43-U-NA20 | 110 |
| C | 1 | Ericsson AIR21 B2A/B4P | 110 |
| C | 2 | Ericsson AIR21 B4A/B2P | 110 |
| C | 3 | RFS APXVAARR24_43-U-NA20 | 110 |

Table 2: Antenna Data

All calculations were done with respect to uncontrolled / general population threshold limits.

Cable losses were factored in the calculations for this site. Since all $\mathbf{2 1 0 0} \mathbf{~ M H z}$ UMTS radios are ground mounted the following cable loss values were used. For each ground mounted $2100 \mathbf{M H z}$ (AWS) UMTS radio there was $\mathbf{1 . 8 0} \mathbf{~ d B}$ of cable loss calculated into the system gains / losses for this site. These values were calculated based upon the manufacturers specifications for 170 feet of $\mathbf{1 - 5 / 8}$ " coax

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## RESULTS

Per the calculations completed for the proposed T-MOBILE configurations Table 3 shows resulting emissions power levels and percentages of the FCC's allowable general population limit.

| $\begin{gathered} \text { Antenna } \\ \text { ID } \\ \hline \end{gathered}$ | Antenna Make / Model | Frequency Bands | Antenna Gain (dBd) | Channel Count | Total TX Power (W) | ERP (W) | MPE \% |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Antenna A1 | Ericsson AIR21 B2A/B4P | $\begin{aligned} & 1900 \mathrm{MHz} \text { (PCS) / } \\ & 2100 \mathrm{MHz} \text { (AWS) } \end{aligned}$ | 15.9 | 3 | 95 | 3,167.91 | 1.05 |
| Antenna A2 | $\begin{gathered} \text { Ericsson } \\ \text { AIR21 B4A/B2P } \end{gathered}$ | 2100 MHz (AWS) | 15.9 | 2 | 120 | 4,668.54 | 1.55 |
| Antenna A3 | $\begin{gathered} \text { RFS } \\ \text { APXVAARR24_43-U-NA20 } \\ \hline \end{gathered}$ | $600 \mathrm{MHz} / 700 \mathrm{MHz}$ | 12.95 / 13.35 | 4 | 120 | 2,443.03 | 1.95 |
| Sector A Composite MPE\% |  |  |  |  |  |  | 4.55 |
| $\begin{gathered} \text { Antenna } \\ \text { B1 } \\ \hline \end{gathered}$ | $\begin{gathered} \text { Ericsson } \\ \text { AIR21 B2A/B4P } \end{gathered}$ | 1900 MHz (PCS) / <br> 2100 MHz (AWS) | 15.9 | 3 | 95 | 3,167.91 | 1.05 |
| $\begin{aligned} & \text { Antenna } \\ & \text { B2 } \end{aligned}$ | $\begin{gathered} \text { Ericsson } \\ \text { AIR21 B4A/B2P } \end{gathered}$ | 2100 MHz (AWS) | 15.9 | 2 | 120 | 4,668.54 | 1.55 |
| Antenna B3 | RFS APXVAARR24_43-U-NA20 | $600 \mathrm{MHz} / 700 \mathrm{MHz}$ | 12.95 / 13.35 | 4 | 120 | 2,443.03 | 1.93 |
| Sector B Composite MPE\% |  |  |  |  |  |  | 4.53 |
| Antenna $\mathrm{C} 1$ | $\begin{gathered} \text { Ericsson } \\ \text { AIR21 B2A/B4P } \\ \hline \end{gathered}$ | $\begin{aligned} & 1900 \mathrm{MHz} \text { (PCS) / } \\ & 2100 \mathrm{MHz} \text { (AWS) } \\ & \hline \end{aligned}$ | 15.9 | 3 | 95 | 3,167.91 | 1.05 |
| Antenna C2 | Ericsson AIR21 B4A/B2P | 2100 MHz (AWS) | 15.9 | 2 | 120 | 4,668.54 | 1.55 |
| Antenna $\mathrm{C} 3$ | RFS APXVAARR24_43-U-NA20 | $600 \mathrm{MHz} / 700 \mathrm{MHz}$ | 12.95 / 13.35 | 4 | 120 | 2,443.03 | 1.93 |
| Sector C Composite MPE\% |  |  |  |  |  |  | 4.53 |

Table 3: T-MOBILE Emissions Levels

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The Following table (table 4) shows all additional carriers on site and their MPE\% as recorded in the CSC active MPE database for this facility along with the newly calculated maximum T-MOBILE MPE contributions per this report. FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. For this site, all three sectors have the same configuration yielding the same results on all three sectors. Table 5 below shows a summary for each T-MOBILE Sector as well as the composite MPE value for the site.

| Site Composite MPE \% |  |
| :---: | :---: |
| Carrier | MPE \% |
| T-MOBILE - Max Per Sector Value | $\mathbf{4 . 5 5} \%$ |
| Sprint | $3.85 \%$ |
| Verizon Wireless | $2.75 \%$ |
| MetroPCS | $0.77 \%$ |
| Clearwire | $0.12 \%$ |
| AT\&T | $2.44 \%$ |
| Site Total MPE \%: | $\mathbf{1 4 . 4 8} \%$ |

Table 4: All Carrier MPE Contributions

| T-MOBILE Sector A Total: | $4.55 \%$ |
| ---: | :---: |
| T-MOBILE Sector B Total: | $4.53 \%$ |
| T-MOBILE Sector C Total: | $4.53 \%$ |
| Site Total: |  |

Table 5: Site MPE Summary

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FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. Table 6 below details a breakdown by frequency band and technology for the MPE power values for the maximum calculated T-MOBILE sector(s). For this site, all three sectors have the same configuration yielding the same results on all three sectors.

| T-MOBILE _ Frequency Band/ Technology <br> Max Power Values (Per Sector) | \# <br> Channels | Watts ERP (Per Channel) | Height (feet) | Total Power Density ( $\mu \mathrm{W} / \mathrm{cm}^{2}$ ) | Frequency (MHz) | Allowable <br> MPE <br> ( $\mu \mathrm{W} / \mathrm{cm}^{2}$ ) | Calculated \% MPE |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| T-Mobile 1900 MHz (PCS) UMTS | 1 | 583.57 | 110 | 1.94 | 1900 MHz (PCS) | 1000 | 0.19\% |
| T-Mobile 1900 MHz (PCS) GSM | 1 | 1,556.18 | 110 | 5.17 | 1900 MHz (PCS) | 1000 | 0.52\% |
| T-Mobile 2100 MHz (AWS) UMTS | 1 | 1,028.16 | 110 | 3.42 | 2100 MHz (AWS) | 1000 | 0.34\% |
| T-Mobile 2100 MHz (AWS) LTE | 2 | 2,334.27 | 110 | 15.52 | 2100 MHz (AWS) | 1000 | 1.55\% |
| T-Mobile 600 MHz LTE / 5G NR | 2 | 788.97 | 110 | 5.33 | 600 MHz | 400 | 1.33\% |
| T-Mobile 700 MHz LTE | 2 | 432.54 | 110 | 2.88 | 700 MHz | 467 | 0.62\% |
|  |  |  |  |  |  | Total: | 4.55\% |

Table 6: T-MOBILE Maximum Sector MPE Power Values

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## Summary

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

The anticipated maximum composite contributions from the T-MOBILE facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

| T-MOBILE Sector | Power Density Value (\%) |
| ---: | :--- |
| Sector A: | $4.55 \%$ |
| Sector B: | $4.53 \%$ |
| Sector C: | $4.53 \%$ |
| T-MOBILE Maximum |  |
| Total (per sector): | $4.55 \%$ |
|  |  |
| Site Total: | $14.48 \%$ |
|  |  |
| Site Compliance Status: | COMPLIANT |

The anticipated composite MPE value for this site assuming all carriers present is $\mathbf{1 4 . 4 8} \%$ of the allowable FCC established general population 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 well within the allowable $100 \%$ threshold standard per the federal government.


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[^0]:    CONTRACTOR TO FIILL V VERIFY THE REQUIRED LENGTH OF THE NEW FACE
    HORRZOTTALSPIPES AND MAY CUTENDS RAS REQUIRED TO AVOID
    UNNECESSARY OVERHANG AND OVERLAP.
    Z
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