

July 8, 2015

Melanie A. Bachman
Acting Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: **Notice of Exempt Modification – Facility Modification
161 Pinney Street, Colebrook, Connecticut**

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless (“Cellco”) currently maintains twelve (12) wireless telecommunications antennas at the 130-foot level on the existing 148-foot tower at 161 Pinney Street in Colebrook, Connecticut (the “Property”). The tower and underlying property are owned by Crown Castle. The Council approved Cellco’s shared use of this tower in 2006. Cellco now intends to modify its facility by replacing six (6) of its existing antennas with three (3) model SBNHH-1D65B, 700/2100 MHz antennas and three (3) model SBNHH-1D65B, 1900 MHz antennas, all at the same 130-foot level on the tower. Cellco also intends to install nine (9) remote radio heads (“RRHs”) and two (2) HYBRIFLEX™ antenna cables. Included in Attachment 1 are specifications for Cellco’s replacement antennas, RRHs and HYBRIFLEX™ cables.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Thomas D. McKeon, First Selectman for the Town of Colebrook.

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

Melanie A. Bachman
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1. The proposed modifications will not result in an increase in the height of the existing tower. The replacement antennas and RRHs will be located at the 130-foot level on the 148-foot tower.
2. The proposed modifications will not involve any change to ground-mounted equipment and, therefore, will not require the extension of the site boundary.
3. The proposed modifications 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 (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. A cumulative General Power Density table is included in Attachment 2.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The tower and its foundation can support Cellco's proposed modifications. (*See Structural Analysis Report included in Attachment 3*).

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

Sincerely,



Kenneth C. Baldwin

Enclosures

Copy to:

Thomas D. McKeon, Colebrook First Selectman
Tim Parks

ATTACHMENT 1



SBNHH-1D65B

Andrew® Tri-band Antenna, 698–896 and 2x 1695–2360 MHz, 65° horizontal beamwidth, internal RET. Both high bands share the same electrical tilt.

- Interleaved dipole technology providing for attractive, low wind load mechanical package

Electrical Specifications

| Frequency Band, MHz | 698–806 | 806–896 | 1695–1880 | 1850–1990 | 1920–2180 | 2300–2360 |
|--------------------------------------|------------|------------|------------|------------|------------|------------|
| Gain, dBi | 14.9 | 14.7 | 17.7 | 18.2 | 18.6 | 18.6 |
| Beamwidth, Horizontal, degrees | 68 | 66 | 69 | 66 | 63 | 58 |
| Beamwidth, Vertical, degrees | 12.1 | 10.7 | 5.6 | 5.2 | 5.0 | 4.5 |
| Beam Tilt, degrees | 0–14 | 0–14 | 0–7 | 0–7 | 0–7 | 0–7 |
| USLS, dB | 14 | 13 | 15 | 15 | 15 | 13 |
| Front-to-Back Ratio at 180°, dB | 27 | 29 | 28 | 28 | 28 | 27 |
| CPR at Boresight, dB | 20 | 23 | 20 | 20 | 17 | 21 |
| CPR at Sector, dB | 14 | 10 | 12 | 10 | 9 | 1 |
| Isolation, dB | 25 | 25 | 25 | 25 | 25 | 25 |
| Isolation, Intersystem, dB | 30 | 30 | 30 | 30 | 30 | 30 |
| VSWR Return Loss, dB | 1.5 14.0 | 1.5 14.0 | 1.5 14.0 | 1.5 14.0 | 1.5 14.0 | 1.5 14.0 |
| PIM, 3rd Order, 2 x 20 W, dBc | -153 | -153 | -153 | -153 | -153 | -153 |
| Input Power per Port, maximum, watts | 350 | 350 | 350 | 350 | 350 | 300 |
| Polarization | ±45° | ±45° | ±45° | ±45° | ±45° | ±45° |
| Impedance | 50 ohm | 50 ohm | 50 ohm | 50 ohm | 50 ohm | 50 ohm |

Electrical Specifications, BASTA*

| Frequency Band, MHz | 698–806 | 806–896 | 1695–1880 | 1850–1990 | 1920–2180 | 2300–2360 |
|---|------------|------------|-----------|-----------|-----------|-----------|
| Gain by all Beam Tilts, average, dBi | 14.5 | 14.3 | 17.4 | 17.9 | 18.2 | 18.3 |
| Gain by all Beam Tilts Tolerance, dB | ±0.5 | ±0.8 | ±0.4 | ±0.3 | ±0.5 | ±0.3 |
| | 0° 14.6 | 0° 14.5 | 0° 17.4 | 0° 17.8 | 0° 18.1 | 0° 18.2 |
| Gain by Beam Tilt, average, dBi | 7° 14.6 | 7° 14.4 | 3° 17.5 | 3° 17.9 | 3° 18.3 | 3° 18.4 |
| | 14° 14.2 | 14° 13.6 | 7° 17.4 | 7° 17.9 | 7° 18.2 | 7° 18.4 |
| Beamwidth, Horizontal Tolerance, degrees | ±2.2 | ±3.4 | ±2 | ±4.6 | ±5.7 | ±4.3 |
| Beamwidth, Vertical Tolerance, degrees | ±0.8 | ±1 | ±0.3 | ±0.2 | ±0.3 | ±0.2 |
| USLS, dB | 16 | 14 | 16 | 16 | 16 | 15 |
| Front-to-Back Total Power at 180° ± 30°, dB | 25 | 26 | 27 | 26 | 26 | 26 |
| CPR at Boresight, dB | 22 | 23 | 21 | 20 | 20 | 22 |
| CPR at Sector, dB | 13 | 11 | 16 | 12 | 11 | 4 |

* CommScope® supports NGMN recommendations on Base Station Antenna Standards (BASTA). To learn more about the benefits of BASTA, [download the whitepaper Time to Raise the Bar on BSAs.](#)

General Specifications

| | |
|--------------------------|--------------------------------------|
| Antenna Brand | Andrew® |
| Antenna Type | DualPol® multiband with internal RET |
| Band | Multiband |
| Brand | DualPol® Teletilt® |
| Operating Frequency Band | 1695 – 2360 MHz 698 – 896 MHz |
| Performance Note | Outdoor usage |

SBNHH-1D65B

POWERED BY



Mechanical Specifications

| | |
|------------------------------|--|
| Color | Light gray |
| Lightning Protection | dc Ground |
| Radiator Material | Aluminum Low loss circuit board |
| Radome Material | Fiberglass, UV resistant |
| Reflector Material | Aluminum |
| RF Connector Interface | 7-16 DIN Female |
| RF Connector Location | Bottom |
| RF Connector Quantity, total | 6 |
| Wind Loading, maximum | 617.7 N @ 150 km/h 138.9 lbf @ 150 km/h |
| Wind Speed, maximum | 241.4 km/h 150.0 mph |

Dimensions

| | |
|------------|---------------------|
| Depth | 181.0 mm 7.1 in |
| Length | 1851.0 mm 72.9 in |
| Width | 301.0 mm 11.9 in |
| Net Weight | 18.4 kg 40.6 lb |

Remote Electrical Tilt (RET) Information

| | |
|---|-----------------------------------|
| Input Voltage | 10–30 Vdc |
| Power Consumption, idle state, maximum | 2.0 W |
| Power Consumption, normal conditions, maximum | 13.0 W |
| Protocol | 3GPP/AISG 2.0 (Multi-RET) |
| RET Interface | 8-pin DIN Female 8-pin DIN Male |
| RET Interface, quantity | 1 female 1 male |
| RET System | Teletilt® |

Regulatory Compliance/Certifications

Agency

RoHS 2011/65/EU
China RoHS SJ/T 11364-2006
ISO 9001:2008

Classification

Compliant by Exemption
Above Maximum Concentration Value (MCV)
Designed, manufactured and/or distributed under this quality management system



Included Products

BSAMNT-1 — Wide Profile Antenna Downtilt Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members. Kit contains one scissor top bracket set and one bottom bracket set.

* Footnotes

Performance Note Severe environmental conditions may degrade optimum performance

ALCATEL-LUCENT B13 RRH4X30-4R

Alcatel-Lucent B13 Remote Radio Head 4x30-4R is the newest addition of Remote Radio Head to the extended product line of Alcatel-Lucent's distributed Base Station solutions, aimed at facilitating smooth RF site acquisition and related civil engineering.

Supporting 2Tx/4Tx MIMO and 4-way Rx diversity, Alcatel-Lucent B13 RRH4x30-4R allows operators to have a compact radio solution to deploy LTE in the 700U band (700 MHz, 3GPP band 13), providing them with the means to achieve high capacity, high quality and high coverage with minimum site requirements.

The Alcatel-Lucent B13 RRH4x30-4R product has four transmit RF paths, offering the possibility to **select, via software only, 2Tx or 4Tx MIMO configurations** with either 2x60 W or 4x30 W RF output power. It supports also 4-way Rx diversity and up to 10MHz instantaneous bandwidth.

The Alcatel-Lucent B13 RRH4x30-4R is a near zero-footprint solution and operates noise free, simplifying negotiations with site property owners and minimizing environmental impacts.

Its compactness and slim design makes the Alcatel-Lucent B13 RRH4x30-4R easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the RF feeder needs and installation costs.

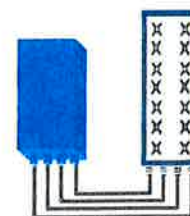


FEATURES

- Supporting LTE in 700 MHz band (700U, 3GPP band 13)
- LTE 2Tx or 4Tx MIMO (SW switchable)
- Output power: Up to 2x60W or 4x30W
- 10MHz LTE carrier with 4Rx Diversity
- Convection-cooled (fan-less)
- Supports AISG 2.0 ALD devices (RET, TMA) through RS485 or RF ports

BENEFITS

- Compact to reduce additional footprint when adding LTE in 700U band
- MIMO scheme operation selection (2Tx or 4Tx) by software only
- Improves downlink spectral efficiency through MIMO4
- Increases LTE coverage thanks to 4Rx diversity capability and best in class Rx sensitivity
- Flexible mounting options: Pole or Wall



4x30W with 4T4R
or
2x60W with 2T4R

Can be switched between modes via SW w/o site visit

TECHNICAL SPECIFICATIONS

| Features & performance | |
|-------------------------------------|---|
| Number of TX/RX paths | 4 duplexed (either 4T4R or 2T4R by SW) |
| Frequency band | U700 (C) (3GPP bands 13): DL: 746 - 756 MHz / UL: 777 - 787 MHz |
| Instantaneous bandwidth - #carriers | 10MHz – 1 LTE carrier (in 10MHz occupied bandwidth) |
| LTE carrier bandwidth | 10 MHz |
| RF output power | 2x60W or 4x30W (by SW) |
| Noise figure – RX Diversity scheme | 2 dB typ. (<2.5 dB max) – 2 or 4 way Rx diversity |
| Sizes (HxWxD) in mm (in.) | 550 x 305 x 230 (21.6" x 12.0" x 9") (with solar shield) |
| Volume in L | 38 (with solar shield) |
| Weight in kg (lb) (w/o mounting HW) | 26 (57.2) (with solar shield) |
| DC voltage range | -40.5 to -57V at full performance, -38 to -57V with relaxation on power consumption |
| DC power consumption | 550W typical @100% RF load (in 2Tx or 4Tx mode) |
| Environmental conditions | -40°C (-40°F) / +55°C (+131°F) |
| Wind load (@150km/h or 93mph) | IP65 Frontal: <200N / Lateral : <150N |
| Antenna ports | 4 ports 7/16 DIN female (50 ohms) VSWR < 1.5 |
| CPRI ports | 2 CPRI ports (HW ready for Rate7, 9.8 Gbps) SFP single mode dual fiber |
| AISG interfaces | 1 AISG2.0 output (RS485) Integrated Smart Bias Tees (x2) |
| Misc. Interfaces | 4 external alarms (1 connector) – 4 RF Tx & 4 RF Rx monitor ports - 1 DC connector (2 pins) |
| Installation conditions | Pole and wall mounting |
| Regulatory compliance | 3GPP 36.141 / 3GPP 36.113 / GR-1089-CORE / GR-3108-CORE / UL 60950-1 / FCC Part 27 |

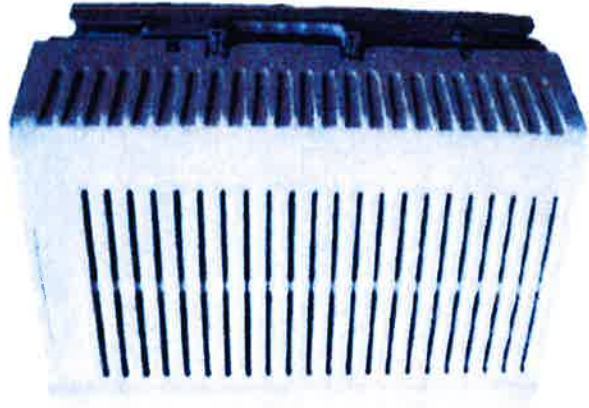
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PCS RF MODULES

RRH1900 2X60 - HW CHARACTERISTICS

LA6.0.1/13.3

| | |
|-------------------------|---|
| RRH2x60 | |
| RF Output Power | 2x60W |
| Instantaneous Bandwidth | 20MHz |
| Transmitter | 2 TX |
| Receiver | 1900 HW version 1900A HW version |
| Features | 2 Branch RX – LA6.0.1 4 Branch RX – LR13.3 AISG 2.0 for RET/TMA |
| Power | Internal Smart Bias-T -48VDC |
| CPRI Ports | 2 CPRI Rate 3 Ports |
| External Alarms | 4 External User Alarms |
| Monitor Ports | TX |
| Environmental | GR487 Compliance |
| RF Connectors | 7/16 DIN (top mounted) |



** Not a Verizon Wireless deployed product

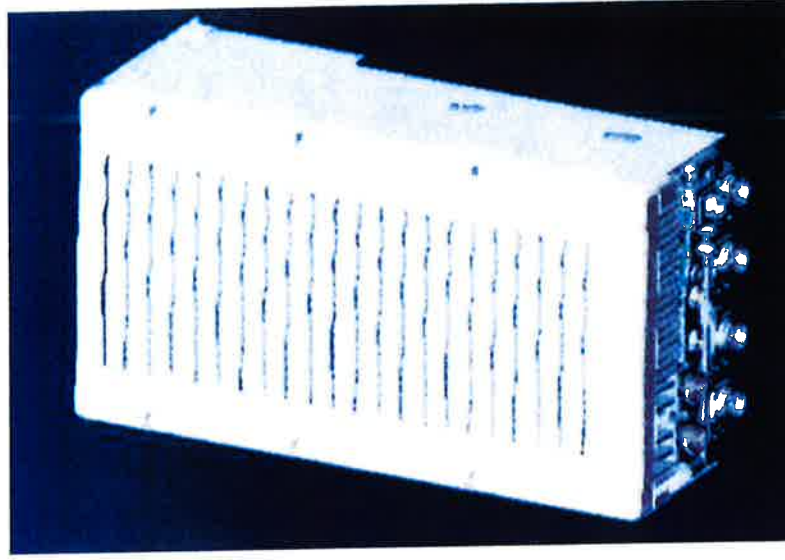
ALCATEL-LUCENT – CONFIDENTIAL – SOLELY FOR AUTHORIZED PERSONS HAVING A NEED TO KNOW – PROPRIETARY – USE PURSUANT TO COMPANY INSTRUCTION

NEW PCS RF MODULES FOR VZW

RRH2X60 - HW CHARACTERISTICS

LR14.3

| | |
|--|---------------------------------|
| | RRH2x60 |
| RF Output Power | 2x60W (4x30W HW Ready) |
| Instantaneous Bandwidth | 60MHz |
| Target Reliability (Annual Return Rate) | <2% |
| Receiver | 4 Branch Rx |
| Features | AISG 2.0 for RET/TMA |
| Power | -48VDC Internal Smart Bias-T |
| CPRJ Ports | 2 CPRJ Rate 5 Ports |
| External Alarms | 4 External User Alarms |
| Monitor Ports | TX, RX |
| Environmental | GR487 Compliance |
| RF Connectors | 7/16 DIN (downward facing) |
| Dimensions | 22"(h) x 12"(w) x 9.4" (d)** |
| Weight | 55lb** |

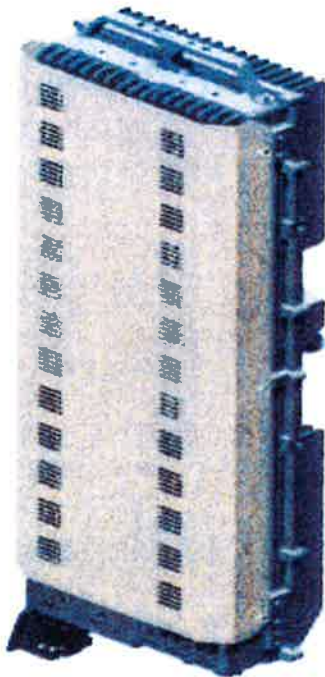


** - Includes solar shield but not mounting brackets (8 lbs.)

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ALCATEL-LUCENT WIRELESS PRODUCT DATASHEET RRH2x60-AWS FOR BAND 4 APPLICATIONS

The Alcatel-Lucent RRH2x60-AWS is a high power, small form factor Remote Radio Head operating in the AWS frequency band (3GPP Band 4) for LTE technology. It is designed with an eco-efficient approach, providing operators with the means to achieve high quality and high capacity coverage with minimum site requirements and efficient operation.



A distributed Node B expands the deployment options by using two components, a Base Band Unit (BBU) containing the digital assets and a separate RRH containing the radio-frequency (RF) elements. This modular design optimizes available space and allows the main components of a Node B to be installed separately, within the same site or several kilometers apart. The Alcatel-Lucent RRH2x60-AWS is linked to the BBU by an optical-fiber connection carrying downlink and uplink digital radio signals

along with operations, administration and maintenance (OA&M) information.

The Alcatel-Lucent RRH2x60-AWS integrates all the latest technologies. This allows to offer best-in-class characteristics.

It delivers an outstanding 120 watts of total RF power thanks to its two transmit RF paths of 60 W each.

It is ideally suited to support multiple-input multiple-output (MIMO) 2x2 operation.

It includes four RF receivers to natively support 4-way uplink reception diversity. This improves the radio uplink coverage and this can be used to extend the cell radius commensurate with 2x2MIMO 2x60 W for the downlink.

It supports multiple discontinuous LTE carriers within an instantaneous bandwidth of 45 MHz corresponding to the entire AWS B4 spectrum.

The latest generation power amplifiers (PA) used in this product achieve high efficiency (>40%), resulting in improved power consumption figures.

The Alcatel-Lucent RRH2x60-AWS is designed to make available all the benefits of a distributed Node B, with excellent RF characteristics, with low capital expenditures (CAPEX) and low operating expenditures (OPEX).

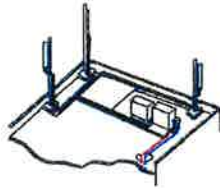
The Alcatel-Lucent RRH2x60-AWS is a very cost-effective solution to deploy LTE MIMO.

The RRH2x60-AWS includes a reversible mounting bracket which allows for ease of installation behind an antenna, or on a rooftop knee wall while providing easy access to the mid body RF connectors.

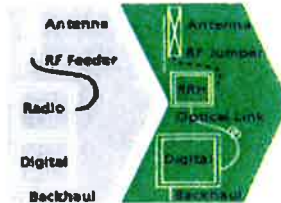
The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment. However, many of these sites can host an Alcatel-Lucent RRH2x60-AWS installation, providing more flexible site selection and improved network quality along with greatly reduced installation time and costs.

The Alcatel-Lucent RRH2x60-AWS is a zero-footprint solution and is convection cooled without fans for silent operation, simplifying negotiations with site property owners and minimizing environmental impacts.

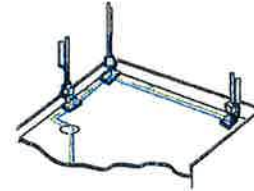
Installation can easily be done by a single person as the Alcatel-Lucent RRH2x60-AWS is compact and weighs about 20 kg, eliminating the need for a crane to hoist the BTS cabinet to the rooftop. A site can be in operation in less than one day.



Macro



RRH for space-constrained cell sites



Distributed

RRH2x60-AWS

- RRH2x60-AWS integrates two power amplifiers of 60W rating (at each antenna connector)
- Support multiple carriers over the entire 3GPP band 4
- RRH2x60-AWS is optimized for LTE operation
- RRH2x60-AWS is a very compact and lightweight product
- Advanced power management techniques are embedded to provide power savings, such as PA bias control

RRH2x60-AWS

- MIMO LTE operation with only one single unit per sector
- Improved uplink coverage with built-in 4-way receive diversity capability
- RRH can be mounted close to the antenna, eliminating nearly all losses in RF cables and thus reducing power consumption by 50% compared to conventional solutions
- Distributed configurations provide easily deployable and cost-effective solutions, near zero footprint and

silent solutions, with minimum impact on the neighborhood, which ease the deployment

- RETA and TMA support without additional hardware thanks to the AISG v2.0 port and the integrated Bias-Tees. Bias-Tees support AISG DC supply and signaling.

Specifications listed are hardware capabilities. Some capabilities depend on support in a specific software release or future release.

Dimensions and weights

- HxWxD : 510x285x186mm (27 l with solar shield)
- Weight : 20 kg (44 lbs)

Electrical Data

- Power Supply : -48V DC (-40.5 to -57V)
- Power Consumption (ETSI average traffic load reference) : 250W @2x60W

RF Characteristics

- Frequency band: 1710-1755, UL / 2110-2155 MHz, DL (3GPP band 4)
- Output power: 2x60W at antenna connectors
- Technology supported: LTE
- Instantaneous bandwidth: 45 MHz
- Rx diversity: 2-way and 4-way uplink reception
- Typical sensitivity without Rx diversity: -105 dBm for LTE

Connectivity

- Two CPRI optical ports for daisy chaining and up to six RRHs per fiber
- Type of optical fiber: Single-Mode (SM) and Multi-Mode (MM) SFPs
- Optical fiber length: up to 500m using MM fiber, up to 20km using SM fiber
- TMA/RETA : AISG 2.0 (RS485 connector and internal Bias-Tee)
- Six external alarms
- Surge protection for all external ports (DC and RF)

Safety and Regulatory Data

- EMC : 3GPP 25113, EN 301 489-1, EN 301 489-23, GR 1089, GR 3108, OET-65
- Safety : IEC60950-1, EN 60825-1, UL, ANSI/NFPA 70, CAN/CSA-C22.2
- Regulatory : FCC Part 15 Class B, CE Mark – European Directive : 2002/95/EC (ROHS); 2002/96/EC (WEEE); 1999/5/EC (R&TTE)
- Health : EN 50385

Environmental specifications

- Operating temperature: -40°C to 55°C including solar load
- Operating relative humidity: 8% to 100%
- Environmental Conditions : ETS 300 019-1-4 class 4.1E
- Ingress Protection : IEC 60529 IP65
- Acoustic Noise : Noiseless (natural convection cooling)

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AT THE SPEED OF IDEAS™

Alcatel-Lucent 



HYBRIFLEX™ RRH Hybrid Feeder Cabling Solution, 1-5/8", Single-Mode Fiber

Product Description

RFS' HYBRIFLEX Remote Radio Head (RRH) hybrid feeder cabling solution combines optical fiber and DC power for RRHs in a single lightweight aluminum corrugated cable, making it the world's most innovative solution for RRH deployments.

It was developed to reduce installation complexity and costs at Cellular sites, HYBRIFLEX allows mobile operators deploying an RRH architecture to standardize the RRH installation process and eliminate the need for and cost of cable grounding. HYBRIFLEX combines optical fiber (multi-mode or single-mode) and power in a single corrugated cable. It eliminates the need for junction boxes and can connect multiple RRHs with a single feeder. Standard RFS CELLFLEX[®] accessories can be used with HYBRIFLEX cable. Both pre-connectorized and on-site options are available.

Features/Benefits

- Aluminum corrugated armor with outstanding bending characteristics – minimizes installation time and enables mechanical protection and shielding
- Same accessories as 1 5/8" coaxial cable
- Outer conductor grounding – Eliminates typical grounding requirements and saves on installation costs
- Lightweight solution and compact design – Decreases tower loading
- Robust cabling – Eliminates need for expensive cable trays and ducts
- Installation of tight bundled fiber optic cable pairs directly to the RRH – Reduces CAPEX and wind load by eliminating need for interconnection
- Optical fiber and power cables housed in single corrugated cable – Saves CAPEX by standardizing RRH cable installation and reducing installation requirements
- Outdoor polyethylene jacket – Ensures long-lasting cable protection



Figure 1: HYBRIFLEX Series

Technical Specifications

| | | | |
|--|--------------------------------|-------------------|---|
| Outer Conductor Armor | Corrugated Aluminum | [mm (in)] | 46.5 (1.83) |
| Jacket | Polyethylene, PE | [mm (in)] | 50.3 (1.98) |
| UV-Protection | Individual and External Jacket | | Yes |
| Weight and Bending | | | |
| Weight, Approximate | | [kg/m (lb/ft)] | 1.9 (1.30) |
| Minimum Bending Radius, Single Bending | | [mm (in)] | 200 (8) |
| Minimum Bending Radius, Repeated Bending | | [mm (in)] | 500 (20) |
| Recommended/Maximum Clamp Spacing | | [m (ft)] | 1.0 / 1.2 (3.25 / 4.0) |
| Electrical Properties | | | |
| DC-Resistance Outer Conductor Armor | | [Ω/km (Ω/1000ft)] | 0.68 (0.205) |
| DC-Resistance Power Cable, 8.4mm ² (8AWG) | | [Ω/km (Ω/1000ft)] | 2.1 (0.307) |
| Optical Properties | | | |
| Version | | | Single-mode OM3 |
| Quantity, Fiber Count | | | 16 (8 pairs) |
| Core/Clad | | [μm] | 50/125 |
| Primary Coating (Acrylate) | | [μm] | 245 |
| Buffer Diameter, Nominal | | [μm] | 900 |
| Secondary Protection, Jacket, Nominal | | [mm (in)] | 2.0 (0.08) |
| Minimum Bending Radius | | [mm (in)] | 104 (4.1) |
| Insertion Loss @ wavelength 850nm | | dB/km | 3.0 |
| Insertion Loss @ wavelength 1310nm | | dB/km | 1.0 |
| Standards (Meets or exceeds) | | | UL94-V0, UL1666 RoHS Compliant |
| Dimensions | | | |
| Size (Power) | | [mm (AWG)] | 8.4 (8) |
| Quantity, Wire Count (Power) | | | 16 (8 pairs) |
| Size (Alarm) | | [mm (AWG)] | 0.8 (18) |
| Quantity, Wire Count (Alarm) | | | 4 (2 pairs) |
| Type | | | UV protected |
| Strands | | | 19 |
| Primary Jacket Diameter, Nominal | | [mm (in)] | 6.8 (0.27) |
| Standards (Meets or exceeds) | | | NFPA 130, ICEA S-95-658 UL Type XHHW-2, UL 44 UL-LS Limited Smoke, UL VW-1 IEEE-383 (1974), IEEE1202/FT4 RoHS Compliant |
| Environmental | | | |
| Installation Temperature | | [°C (°F)] | -40 to +65 (-40 to 149) |
| Operation Temperature | | [°C (°F)] | -40 to +65 (-40 to 149) |

* This data is provisional and subject to change

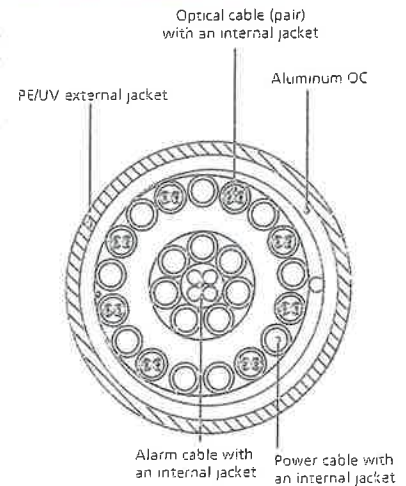


Figure 3: Construction Detail

All information contained in the present datasheet is subject to confirmation at time of ordering.

ATTACHMENT 2

| Site Name: Colebrook SW Tower Height: 148Ft. | | General | Power | Density | | | | |
|---|------------|-------------|------------|------------------|-------------|--------------------|---------------|---------------|
| CARRIER | # OF CHAN. | WATTS ERP | HEIGHT | CALC. POWER DENS | FREQ. | MAX. PERMISS. EXP. | FRACTION MPE | Total |
| *AT&T UMTS | 2 | 565 | 140 | 0.0207 | 880 | 0.5867 | 3.53% | |
| *AT&T UMTS | 2 | 875 | 140 | 0.0321 | 1900 | 1.0000 | 3.21% | |
| *AT&T GSM | 1 | 283 | 140 | 0.0052 | 880 | 0.5867 | 0.88% | |
| *AT&T GSM | 4 | 525 | 140 | 0.0385 | 1900 | 1.0000 | 3.85% | |
| *AT&T LTE | 1 | 1313 | 140 | 0.0241 | 734 | 0.4893 | 4.92% | |
| *Sprint CDMA/LTE | 2 | 778 | 147 | 0.0259 | 1900 | 1.0000 | 2.59% | |
| *Sprint CDMA/LTE | 1 | 438 | 147 | 0.0073 | 850 | 0.5667 | 1.29% | |
| Verizon PCS | 7 | 431 | 130 | 0.0642 | 1970 | 1.0000 | 6.42% | |
| Verizon Cellular | 9 | 399 | 130 | 0.0764 | 869 | 0.5793 | 13.19% | |
| Verizon AWS | 1 | 3500 | 130 | 0.0745 | 2145 | 1.0000 | 7.45% | |
| Verizon 700 | 1 | 2100 | 130 | 0.0447 | 746 | 0.4973 | 8.98% | |
| | | | | | | | | 56.32% |
| * Source: Siting Council | | | | | | | | |

ATTACHMENT 3



Date: June 22, 2015

Marianne Dunst
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277

Paul J Ford and Company
250 E. Broad Street, Suite 600
Columbus, OH 43215
614.221.6679
jwoolley@pjfweb.com

Subject: Structural Analysis Report

| | | |
|--------------------------------------|--|------------------------------|
| Carrier Designation: | Verizon Wireless Co-Locate | |
| | Carrier Site Number: | N/A |
| | Carrier Site Name: | Colebrook SW |
| Crown Castle Designation: | Crown Castle BU Number: | 876377 |
| | Crown Castle Site Name: | HORTON 2 / FREDSELL PROPERTY |
| | Crown Castle JDE Job Number: | 337989 |
| | Crown Castle Work Order Number: | 1079575 |
| | Crown Castle Application Number: | 300765 Rev. 1 |
| Engineering Firm Designation: | Paul J Ford and Company Project Number: | 37515-2143.001.7805 |
| Site Data: | 161 Pinney Street, COLEBROOK, Litchfield County, CT | |
| | Latitude 41° 57' 58.57", Longitude -73° 7' 19.65" | |
| | 148 Foot - Monopole Tower | |

Dear Marianne Dunst,

Paul J Ford and Company is pleased to submit this "Structural Analysis Report" to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 799031, in accordance with application 300765, revision 1.

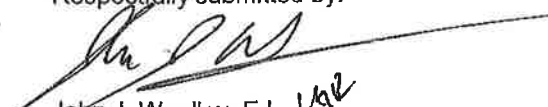
The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

| | |
|---|----------------------------|
| LC5: Existing + Proposed Equipment | Sufficient Capacity |
| Note: See Table I and Table II for the proposed and existing loading, respectively. | |

The structural analysis was performed for this tower in accordance with the requirements the 2005 Connecticut State Building Code of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 80 mph with no ice, 28.1 mph with 1.25 inch ice thickness and 80 mph under service loads.

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

Respectfully submitted by:


 John J. Woolley, E.I. *WJW*
 Structural Designer



6-23-15

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Additional Calculations

1) INTRODUCTION

This tower is a 148 ft Monopole tower designed by SUMMIT in September of 2000. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements the 2005 Connecticut State Building Code of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 80 mph with no ice, 28.1 mph with 1.25 inch ice thickness and 50 mph under service loads.

Table 1 - Proposed Antenna and Cable Information

| Mounting Level (ft) | Center Line Elevation (ft) | Number of Antennas | Antenna Manufacturer | Antenna Model | Number of Feed Lines | Feed Line Size (in) | Note |
|---------------------|----------------------------|--------------------|----------------------|---------------------------|----------------------|---------------------|------|
| 130.0 | 130.0 | 3 | alcatel lucent | RRH2X60-AWS | 2 | 1-5/8 | - |
| | | 3 | alcatel lucent | RRH2X60-PCS | | | |
| | | 3 | alcatel lucent | RRH2x60-700 | | | |
| | | 6 | commscope | SBNHH-1D65B w/ Mount Pipe | | | |
| | | 1 | rfs celwave | DB-T1-6Z-8AB-0Z | | | |

Table 2 - Existing Antenna and Cable Information

| Mounting Level (ft) | Center Line Elevation (ft) | Number of Antennas | Antenna Manufacturer | Antenna Model | Number of Feed Lines | Feed Line Size (in) | Note |
|---------------------|----------------------------|--------------------|------------------------|--------------------------------------|----------------------|----------------------|------|
| 150.0 | 150.0 | 1 | tower mounts | Platform Mount [LP 713-1] | 3 | 1-1/4 | 1 |
| | 148.0 | 3 | alcatel lucent | 800 EXTERNAL NOTCH FILTER | | | |
| | | 3 | alcatel lucent | 800MHZ RRH | | | |
| | | 3 | alcatel lucent | PCS 1900MHz 4x45W-65MHz | | | |
| | | 9 | rfs celwave | ACU-A20-N | | | |
| | | 3 | rfs celwave | APXVSP18-C-A20 w/ Mount Pipe | | | |
| 140.0 | 140.0 | 3 | ericsson | RRUS 11 B12 | 1 2 12 | 3/8 7/16 1-5/8 | 1 |
| | | 1 | kmw communications | AM-X-CD-14-65-00T-RET w/ Mount Pipe | | | |
| | | 2 | kmw communications | AM-X-CD-16-65-00T-RET w/ Mount Pipe | | | |
| | | 6 | powerwave technologies | 7770.00 w/ Mount Pipe | | | |
| | | 6 | powerwave technologies | LGP 17201 | | | |
| | | 6 | powerwave technologies | LGP21901 | | | |
| | | 1 | raycap | DC6-48-60-18-8F | | | |
| | | 1 | tower mounts | T-Arm Mount [TA 602-3] | | | |
| 130.0 | 130.0 | 3 | antel | BXA-171085-12BF-EDIN-2 w/ Mount Pipe | - | - | 2 |
| | | 1 | antel | BXA-70080/6CF w/ Mount Pipe | | | |
| | | 1 | antel | BXA-70080-6CF-EDIN-6 w/ Mount Pipe | | | |
| | | 6 | rfs celwave | FD9R6004/2C-3L | | | |
| | | 1 | antel | BXA-70063/6CFx2 w/ Mount Pipe | 12 | 1-5/8 | 1 |
| | | 2 | antel | LPA-80080-6CF-EDIN-6 w/ Mount Pipe | | | |
| | | 4 | antel | LPA-80080/6CF w/ Mount Pipe | | | |
| | | 1 | tower mounts | Platform Mount [LP 303-1] | | | |

- Notes:
 1) Existing Equipment
 2) Equipment To Be Removed

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

| Document | Remarks | Reference | Source |
|--|-----------------------------------|-----------|----------|
| 4-GEOTECHNICAL REPORTS | SEA, 99674.03-A, 9/5/2000 | 1532992 | CCISITES |
| 4-POST-MODIFICATION INSPECTION | PJF, 41708-0177_Record, 2/11/2009 | 2385953 | CCISITES |
| 4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS | PJF/SUMMIT, 29200-1364, 9/11/2000 | 1629428 | CCISITES |
| 4-TOWER MANUFACTURER DRAWINGS | PJF/SUMMIT, 29200-1364, 9/11/2000 | 1883532 | CCISITES |

3.1) Analysis Method

tnxTower (version 6.1.4.1), 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.
- 4) Monopole has been reinforced in conformance with the referenced modification documents.

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

| Section No. | Elevation (ft) | Component Type | Size | Critical Element | P (K) | SF*P_allow (K) | % Capacity | Pass / Fail |
|-------------|----------------|----------------|--------------------------|------------------|--------|-----------------|-------------|-------------|
| L1 | 148 - 117.25 | Pole | TP27.227x22x0.1875 | 1 | -7.02 | 755.23 | 58.2 | Pass |
| L2 | 117.25 - 97.25 | Pole | TP30.2515x26.2571x0.25 | 2 | -9.74 | 1142.41 | 84.0 | Pass |
| L3 | 97.25 - 80.75 | Pole | TP33.056x30.2515x0.443 | 3 | -11.93 | 2049.74 | 59.1 | Pass |
| L4 | 80.75 - 40 | Pole | TP39.483x31.4476x0.4385 | 4 | -20.54 | 2447.21 | 79.6 | Pass |
| L5 | 40 - 13.25 | Pole | TP43.4677x37.7133x0.4502 | 5 | -28.89 | 2845.69 | 86.9 | Pass |
| L6 | 13.25 - 12.75 | Pole | TP43.5527x43.4677x0.4516 | 6 | -29.02 | 2827.21 | 87.8 | Pass |
| L7 | 12.75 - 5.3333 | Pole | TP44.8134x43.5527x0.4254 | 7 | -30.82 | 2838.90 | 91.1 | Pass |
| L8 | 5.3333 - 4.75 | Pole | TP44.9126x44.8134x0.4467 | 8 | -30.98 | 2888.05 | 89.9 | Pass |
| L9 | 4.75 - 0 | Pole | TP45.72x44.9126x0.4425 | 9 | -32.19 | 2947.77 | 90.4 | Pass |
| | | | | | | | Summary | |
| | | | | | | Pole (L7) | 91.1 | Pass |
| | | | | | | RATING = | 91.1 | Pass |

Table 5 - Tower Component Stresses vs. Capacity

| Notes | Component | Elevation (ft) | % Capacity | Pass / Fail |
|-------|----------------------------------|----------------|------------|-------------|
| 1 | Anchor Rods | 0 | 74.8 | Pass |
| 1 | Base Plate | 0 | 61.0 | Pass |
| 1 | Base Foundation Structural Steel | 0 | 87.7 | Pass |
| 1, 2 | Base Foundation Soil Interaction | 0 | 90.3 | Pass |

| | |
|---|--------------|
| Structure Rating (max from all components) = | 91.1% |
|---|--------------|

Notes:

- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
- 2) Foundation Analysis Notes: According to the procedures prescribed and agreed to by the Crown Castle Engineering Foundation Committee, held in January 2010, the existing caisson foundation was analyzed using the methodology in the software 'PLS-Caisson' (Version 8.10, or newer, by Power Line Systems, Inc.). Per the methods in PLS-Caisson, the soil reactions of cohesive soils are calculated using 8CD independent of the depth of the soil layer. The depth of soil to be ignored at the top of the caisson is the greater of the geotechnical report's recommendation, the frost depth of the site or half of the caisson diameter.

APPENDIX A
TNXTOWER OUTPUT

Tower Input Data

There is a pole section.
 This tower is designed using the TIA/EIA-222-F standard.
 The following design criteria apply:

- 1) Tower is located in Litchfield County, Connecticut.
- 2) Basic wind speed of 80 mph.
- 3) Nominal ice thickness of 1.2500 in.
- 4) Ice density of 56 pcf.
- 5) A wind speed of 28 mph is used in combination with ice.
- 6) Temperature drop of 50 °F.
- 7) Deflections calculated using a wind speed of 50 mph.
- 8) A non-linear (P-delta) analysis was used.
- 9) Pressures are calculated at each section.
- 10) Stress ratio used in pole design is 1.333.
- 11) 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) Add IBC .6D+W Combination | Distribute Leg Loads As Uniform Assume Legs Pinned ✓ Assume Rigid Index Plate ✓ Use Clear Spans For Wind Area ✓ Use Clear Spans For KL/r Retension Guys To Initial Tension ✓ Bypass Mast Stability Checks ✓ Use Azimuth Dish Coefficients ✓ Project Wind Area of Appurt. Autocalc Torque Arm Areas SR Members Have Cut Ends Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Use TIA-222-G Tension Splice Capacity Exemption | Treat Feedline Bundles As Cylinder 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 ✓ Consider Feedline Torque Include Angle Block Shear Check <div style="text-align: center; background-color: #e0e0e0; padding: 2px;">Poles</div> ✓ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets |
|--|--|---|

Tapered Pole Section Geometry

| Section | Elevation ft | Section Length ft | Splice Length ft | Number of Sides | Top Diameter in | Bottom Diameter in | Wall Thickness in | Bend Radius in | Pole Grade |
|---------|-----------------|-------------------------|------------------------|-----------------------|-----------------------|--------------------------|-------------------------|----------------------|-----------------------------|
| L1 | 148.00-117.25 | 30.75 | 3.50 | 18 | 22.0000 | 27.2270 | 0.1875 | 0.7500 | A607-60 (60 ksi) |
| L2 | 117.25-97.25 | 23.50 | 0.00 | 18 | 26.2571 | 30.2514 | 0.2500 | 1.0000 | A607-60 (60 ksi) |
| L3 | 97.25-80.75 | 16.50 | 4.25 | 18 | 30.2514 | 33.0560 | 0.4430 | 1.7721 | Reinf 57.15 ksi (57 ksi) |
| L4 | 80.75-40.00 | 45.00 | 5.00 | 18 | 31.4476 | 39.4830 | 0.4385 | 1.7538 | Reinf 57.63 ksi (58 ksi) |
| L5 | 40.00-13.25 | 31.75 | 0.00 | 18 | 37.7133 | 43.4677 | 0.4502 | 1.8009 | Reinf 57.88 ksi (58 ksi) |
| L6 | 13.25-12.75 | 0.50 | 0.00 | 18 | 43.4677 | 43.5527 | 0.4516 | 1.8063 | Reinf 57.22 ksi (57 ksi) |
| L7 | 12.75-5.33 | 7.42 | 0.00 | 18 | 43.5527 | 44.8134 | 0.4254 | 1.7017 | Reinf 59.22 ksi (59 ksi) |
| L8 | 5.33-4.75 | 0.58 | 0.00 | 18 | 44.8134 | 44.9126 | 0.4467 | 1.7867 | Reinf 57.28 ksi (57 ksi) |
| L9 | 4.75-0.00 | 4.75 | | 18 | 44.9126 | 45.7200 | 0.4425 | 1.7699 | Reinf 57.96 ksi |

| Section | Elevation | Section Length | Splice Length | Number of Sides | Top Diameter | Bottom Diameter | Wall Thickness | Bend Radius | Pole Grade |
|---------|-----------|----------------|---------------|-----------------|--------------|-----------------|----------------|-------------|------------|
| | ft | ft | ft | | in | in | in | in | (58 ksi) |

Tapered Pole Properties

| Section | Tip Dia. | Area | I | r | C | I/C | J | It/Q | w | w/t |
|---------|----------|-----------------|-----------------|---------|---------|-----------------|-----------------|-----------------|--------|--------|
| | in | in ² | in ⁴ | in | in | in ³ | in ⁴ | in ² | in | |
| L1 | 22.3394 | 12.9812 | 780.3007 | 7.7434 | 11.1760 | 69.8193 | 1561.6281 | 6.4918 | 3.5420 | 18.891 |
| | 27.6470 | 16.0919 | 1486.4203 | 9.5990 | 13.8313 | 107.4677 | 2974.7964 | 8.0475 | 4.4620 | 23.797 |
| L2 | 27.2662 | 20.6366 | 1763.4291 | 9.2325 | 13.3386 | 132.2051 | 3529.1786 | 10.3203 | 4.1812 | 16.725 |
| | 30.7181 | 23.8062 | 2707.1425 | 10.6505 | 15.3677 | 176.1575 | 5417.8471 | 11.9053 | 4.8843 | 19.537 |
| L3 | 30.7181 | 41.9159 | 4705.3765 | 10.5820 | 15.3677 | 306.1854 | 9416.9444 | 20.9619 | 4.5445 | 10.258 |
| | 33.5659 | 45.8596 | 6162.3812 | 11.5776 | 16.7924 | 366.9734 | 12332.871 | 22.9342 | 5.0381 | 11.372 |
| L4 | 32.7033 | 43.1535 | 5242.4245 | 11.0082 | 15.9754 | 328.1569 | 10491.747 | 21.5809 | 4.7631 | 10.863 |
| | 40.0921 | 54.3360 | 10465.156 | 13.8608 | 20.0574 | 521.7613 | 20944.082 | 27.1731 | 6.1773 | 14.089 |
| L5 | 39.2152 | 53.2488 | 9341.2385 | 13.2284 | 19.1583 | 487.5807 | 18694.768 | 26.6295 | 5.8451 | 12.983 |
| | 44.1382 | 61.4719 | 14371.544 | 15.2712 | 22.0816 | 650.8386 | 28761.999 | 30.7418 | 6.8579 | 15.232 |
| L6 | 44.1382 | 61.6556 | 14413.590 | 15.2707 | 22.0816 | 652.7427 | 28846.146 | 30.8337 | 6.8555 | 15.181 |
| | 44.2245 | 61.7774 | 14499.193 | 15.3009 | 22.1248 | 655.3380 | 29017.464 | 30.8946 | 6.8705 | 15.214 |
| L7 | 44.2245 | 58.2354 | 13684.454 | 15.3102 | 22.1248 | 618.5132 | 27386.914 | 29.1232 | 6.9165 | 16.258 |
| | 45.5047 | 59.9377 | 14919.993 | 15.7577 | 22.7652 | 655.3856 | 29859.618 | 29.9746 | 7.1384 | 16.779 |
| L8 | 45.5047 | 62.9001 | 15642.411 | 15.7502 | 22.7652 | 687.1191 | 31305.406 | 31.4560 | 7.1010 | 15.898 |
| | 45.6054 | 63.0407 | 15747.518 | 15.7854 | 22.8156 | 690.2090 | 31515.757 | 31.5263 | 7.1185 | 15.937 |
| L9 | 45.6054 | 62.4552 | 15604.208 | 15.7869 | 22.8156 | 683.9278 | 31228.949 | 31.2335 | 7.1258 | 16.104 |
| | 46.4253 | 63.5892 | 16469.708 | 16.0735 | 23.2258 | 709.1139 | 32961.088 | 31.8006 | 7.2680 | 16.425 |

| Tower Elevation | Gusset Area (per face) | Gusset Thickness | Gusset Grade | Adjust. Factor A _r | Adjust. Factor A _r | Weight Mult. | Double Angle Stitch Bolt Spacing Diagonals | Double Angle Stitch Bolt Spacing Horizontals |
|------------------|------------------------|------------------|--------------|-------------------------------|-------------------------------|--------------|--|--|
| ft | ft ² | in | | | | | in | in |
| L1 148.00-117.25 | | | | 1 | 1 | 1 | | |
| L2 117.25-97.25 | | | | 1 | 1 | 1 | | |
| L3 97.25-80.75 | | | | 1 | 1 | 1 | | |
| L4 80.75-40.00 | | | | 1 | 1 | 1 | | |
| L5 40.00-13.25 | | | | 1 | 1 | 1 | | |
| L6 13.25-12.75 | | | | 1 | 1 | 1 | | |
| L7 12.75-5.33 | | | | 1 | 1 | 1 | | |
| L8 5.33-4.75 | | | | 1 | 1 | 1 | | |
| L9 4.75-0.00 | | | | 1 | 1 | 1 | | |

Feed Line/Linear Appurtenances - Entered As Area

| Description | Face or Leg | Allow Shield | Component Type | Placement ft | Total Number | | $C_A A_A$ | Weight |
|----------------------------|-------------|--------------|--------------------|-----------------|--------------|----------|-----------|--------|
| | | | | | | | ft^2/ft | plf |
| HB114-1-0813U4-M5J(1 1/4") | C | No | Inside Pole | 148.00 - 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 |
| LCF158-50A(1-5/8") | C | No | Inside Pole | 140.00 - 0.00 | 12 | No Ice | 0.00 | 0.80 |
| | | | | | | 1/2" Ice | 0.00 | 0.80 |
| | | | | | | 1" Ice | 0.00 | 0.80 |
| | | | | | | 2" Ice | 0.00 | 0.80 |
| FB-L98B-002-75000(3/8") | C | No | Inside Pole | 140.00 - 0.00 | 1 | 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 |
| WR-VG122ST-BRDA(7/16) | C | No | Inside Pole | 140.00 - 0.00 | 2 | No Ice | 0.00 | 0.14 |
| | | | | | | 1/2" Ice | 0.00 | 0.14 |
| | | | | | | 1" Ice | 0.00 | 0.14 |
| | | | | | | 2" Ice | 0.00 | 0.14 |
| LDF7-50A(1-5/8") | C | No | Inside Pole | 130.00 - 0.00 | 12 | No Ice | 0.00 | 0.82 |
| | | | | | | 1/2" Ice | 0.00 | 0.82 |
| | | | | | | 1" Ice | 0.00 | 0.82 |
| | | | | | | 2" Ice | 0.00 | 0.82 |
| HB158-1-08U8-S8J18(1-5/8) | C | No | Inside Pole | 130.00 - 0.00 | 2 | No Ice | 0.00 | 1.30 |
| | | | | | | 1/2" Ice | 0.00 | 1.30 |
| | | | | | | 1" Ice | 0.00 | 1.30 |
| | | | | | | 2" Ice | 0.00 | 1.30 |
| ** Aero MP3-05 | C | No | CaAa (Out Of Face) | 99.50 - 0.00 | 1 | No Ice | 0.35 | 0.00 |
| 1/2" Ice | | | | | | 0.40 | 0.00 | |
| 1" Ice | | | | | | 0.66 | 0.00 | |
| 2" Ice | | | | | | 0.88 | 0.00 | |

Feed Line/Linear Appurtenances Section Areas

| Tower Section | Tower Elevation ft | Face | A_R ft^2 | A_F ft^2 | $C_A A_A$ In Face ft^2 | $C_A A_A$ Out Face ft^2 | Weight K |
|---------------|--------------------|------|-----------------|-----------------|--------------------------------|---------------------------------|-------------|
| L1 | 148.00-117.25 | A | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | B | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | 0.000 | 0.000 | 0.000 | 0.000 | 0.50 |
| L2 | 117.25-97.25 | A | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | B | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | 0.000 | 0.000 | 0.000 | 0.783 | 0.52 |
| L3 | 97.25-80.75 | A | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | B | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | 0.000 | 0.000 | 0.000 | 5.739 | 0.43 |
| L4 | 80.75-40.00 | A | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | B | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | 0.000 | 0.000 | 0.000 | 14.173 | 1.06 |
| L5 | 40.00-13.25 | A | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | B | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | 0.000 | 0.000 | 0.000 | 9.304 | 0.69 |
| L6 | 13.25-12.75 | A | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | B | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | 0.000 | 0.000 | 0.000 | 0.174 | 0.01 |
| L7 | 12.75-5.33 | A | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | B | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | 0.000 | 0.000 | 0.000 | 2.579 | 0.19 |
| L8 | 5.33-4.75 | A | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | B | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | 0.000 | 0.000 | 0.000 | 0.203 | 0.02 |
| L9 | 4.75-0.00 | A | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | B | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | 0.000 | 0.000 | 0.000 | 1.652 | 0.12 |

Feed Line/Linear Appurtenances Section Areas - With Ice

| Tower Section | Tower Elevation ft | Face or Leg | Ice Thickness in | A_R | A_F | C_{AA} In Face | C_{AA} Out Face | Weight |
|---------------|-----------------------|-------------|---------------------|-----------------|-----------------|---------------------|----------------------|--------|
| | | | | ft ² | ft ² | ft ² | ft ² | K |
| L1 | 148.00-117.25 | A | 1.250 | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | B | | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | | 0.000 | 0.000 | 0.000 | 0.000 | 0.50 |
| L2 | 117.25-97.25 | A | 1.250 | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | B | | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | | 0.000 | 0.000 | 0.000 | 1.602 | 0.52 |
| L3 | 97.25-80.75 | A | 1.250 | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | B | | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | | 0.000 | 0.000 | 0.000 | 11.750 | 0.43 |
| L4 | 80.75-40.00 | A | 1.250 | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | B | | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | | 0.000 | 0.000 | 0.000 | 29.018 | 1.06 |
| L5 | 40.00-13.25 | A | 1.250 | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | B | | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | | 0.000 | 0.000 | 0.000 | 19.049 | 0.69 |
| L6 | 13.25-12.75 | A | 1.250 | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | B | | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | | 0.000 | 0.000 | 0.000 | 0.356 | 0.01 |
| L7 | 12.75-5.33 | A | 1.250 | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | B | | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | | 0.000 | 0.000 | 0.000 | 5.282 | 0.19 |
| L8 | 5.33-4.75 | A | 1.250 | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | B | | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | | 0.000 | 0.000 | 0.000 | 0.415 | 0.02 |
| L9 | 4.75-0.00 | A | 1.250 | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | B | | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | | 0.000 | 0.000 | 0.000 | 3.383 | 0.12 |

Feed Line Center of Pressure

| Section | Elevation ft | CP_x | CP_z | CP_x Ice | CP_z Ice |
|---------|-----------------|---------|--------|---------------|---------------|
| | | in | in | in | in |
| L1 | 148.00-117.25 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| L2 | 117.25-97.25 | -0.0526 | 0.0304 | -0.0977 | 0.0564 |
| L3 | 97.25-80.75 | -0.3992 | 0.2305 | -0.6858 | 0.3959 |
| L4 | 80.75-40.00 | -0.4047 | 0.2336 | -0.7072 | 0.4083 |
| L5 | 40.00-13.25 | -0.4101 | 0.2368 | -0.7289 | 0.4208 |
| L6 | 13.25-12.75 | -0.4123 | 0.2380 | -0.7378 | 0.4260 |
| L7 | 12.75-5.33 | -0.4128 | 0.2383 | -0.7401 | 0.4273 |
| L8 | 5.33-4.75 | -0.4133 | 0.2386 | -0.7423 | 0.4286 |
| L9 | 4.75-0.00 | -0.4137 | 0.2388 | -0.7438 | 0.4294 |

Discrete Tower Loads

| Description | Face or Leg | Offset Type | Offsets: | | Azimuth Adjustmen t | Placement ft | C_{AA} Front | C_{AA} Side | Weight |
|---------------------------------|-------------|-------------|-----------------------|------------|------------------------|-----------------|---|-------------------------------|------------------------------|
| | | | Horz Lateral ft | Vert ft | | | ft ² | ft ² | K |
| *** | | | | | | | | | |
| APXVSP18-C-A20 w/ Mount Pipe | A | From Leg | 4.00 0.00 -2.00 | | 0.0000 | 150.00 | No Ice 1/2" Ice 1" Ice 2" Ice | 8.50 9.15 9.02 10.84 | 0.08 0.15 0.23 0.41 |

| Description | Face or Leg | Offset Type | Offsets: Horz Lateral Vert ft ft ft | Azimuth Adjustment t ° | Placement ft | | C _A A _A Front ft ² | C _A A _A Side ft ² | Weight K |
|----------------------------------|-------------|-------------|---|------------------------------|-----------------|--------|---|--|-------------|
| APXVSPP18-C-A20 w/ Mount Pipe | B | From Leg | 4.00 | 0.0000 | 150.00 | No Ice | 8.50 | 6.95 | 0.08 |
| | | | 0.00 | | | 1/2" | 9.15 | 8.13 | 0.15 |
| | | | -2.00 | | | Ice | 9.77 | 9.02 | 0.23 |
| | | | | | | 1" Ice | 11.03 | 10.84 | 0.41 |
| | | | | | | 2" Ice | | | |
| APXVSPP18-C-A20 w/ Mount Pipe | C | From Leg | 4.00 | 0.0000 | 150.00 | No Ice | 8.50 | 6.95 | 0.08 |
| | | | 0.00 | | | 1/2" | 9.15 | 8.13 | 0.15 |
| | | | -2.00 | | | Ice | 9.77 | 9.02 | 0.23 |
| | | | | | | 1" Ice | 11.03 | 10.84 | 0.41 |
| | | | | | | 2" Ice | | | |
| (3) ACU-A20-N | A | From Leg | 4.00 | 0.0000 | 150.00 | No Ice | 0.08 | 0.14 | 0.00 |
| | | | 0.00 | | | 1/2" | 0.12 | 0.19 | 0.00 |
| | | | -2.00 | | | Ice | 0.17 | 0.25 | 0.00 |
| | | | | | | 1" Ice | 0.30 | 0.40 | 0.01 |
| | | | | | | 2" Ice | | | |
| (3) ACU-A20-N | B | From Leg | 4.00 | 0.0000 | 150.00 | No Ice | 0.08 | 0.14 | 0.00 |
| | | | 0.00 | | | 1/2" | 0.12 | 0.19 | 0.00 |
| | | | -2.00 | | | Ice | 0.17 | 0.25 | 0.00 |
| | | | | | | 1" Ice | 0.30 | 0.40 | 0.01 |
| | | | | | | 2" Ice | | | |
| (3) ACU-A20-N | C | From Leg | 4.00 | 0.0000 | 150.00 | No Ice | 0.08 | 0.14 | 0.00 |
| | | | 0.00 | | | 1/2" | 0.12 | 0.19 | 0.00 |
| | | | -2.00 | | | Ice | 0.17 | 0.25 | 0.00 |
| | | | | | | 1" Ice | 0.30 | 0.40 | 0.01 |
| | | | | | | 2" Ice | | | |
| 800 EXTERNAL NOTCH FILTER | A | From Leg | 4.00 | 0.0000 | 150.00 | No Ice | 0.77 | 0.37 | 0.01 |
| | | | 0.00 | | | 1/2" | 0.89 | 0.46 | 0.02 |
| | | | -2.00 | | | Ice | 1.02 | 0.56 | 0.02 |
| | | | | | | 1" Ice | 1.30 | 0.79 | 0.04 |
| | | | | | | 2" Ice | | | |
| 800 EXTERNAL NOTCH FILTER | B | From Leg | 4.00 | 0.0000 | 150.00 | No Ice | 0.77 | 0.37 | 0.01 |
| | | | 0.00 | | | 1/2" | 0.89 | 0.46 | 0.02 |
| | | | -2.00 | | | Ice | 1.02 | 0.56 | 0.02 |
| | | | | | | 1" Ice | 1.30 | 0.79 | 0.04 |
| | | | | | | 2" Ice | | | |
| 800 EXTERNAL NOTCH FILTER | C | From Leg | 4.00 | 0.0000 | 150.00 | No Ice | 0.77 | 0.37 | 0.01 |
| | | | 0.00 | | | 1/2" | 0.89 | 0.46 | 0.02 |
| | | | -2.00 | | | Ice | 1.02 | 0.56 | 0.02 |
| | | | | | | 1" Ice | 1.30 | 0.79 | 0.04 |
| | | | | | | 2" Ice | | | |
| 800MHZ RRH | A | From Leg | 4.00 | 0.0000 | 150.00 | No Ice | 2.49 | 2.07 | 0.05 |
| | | | 0.00 | | | 1/2" | 2.71 | 2.27 | 0.07 |
| | | | -2.00 | | | Ice | 2.93 | 2.48 | 0.10 |
| | | | | | | 1" Ice | 3.41 | 2.93 | 0.16 |
| | | | | | | 2" Ice | | | |
| 800MHZ RRH | B | From Leg | 4.00 | 0.0000 | 150.00 | No Ice | 2.49 | 2.07 | 0.05 |
| | | | 0.00 | | | 1/2" | 2.71 | 2.27 | 0.07 |
| | | | -2.00 | | | Ice | 2.93 | 2.48 | 0.10 |
| | | | | | | 1" Ice | 3.41 | 2.93 | 0.16 |
| | | | | | | 2" Ice | | | |
| 800MHZ RRH | C | From Leg | 4.00 | 0.0000 | 150.00 | No Ice | 2.49 | 2.07 | 0.05 |
| | | | 0.00 | | | 1/2" | 2.71 | 2.27 | 0.07 |
| | | | -2.00 | | | Ice | 2.93 | 2.48 | 0.10 |
| | | | | | | 1" Ice | 3.41 | 2.93 | 0.16 |
| | | | | | | 2" Ice | | | |
| PCS 1900MHz 4x45W- 65MHz | A | From Leg | 4.00 | 0.0000 | 150.00 | No Ice | 2.71 | 2.61 | 0.06 |
| | | | 0.00 | | | 1/2" | 2.95 | 2.85 | 0.08 |
| | | | -2.00 | | | Ice | 3.20 | 3.09 | 0.11 |
| | | | | | | 1" Ice | 3.72 | 3.61 | 0.17 |
| | | | | | | 2" Ice | | | |
| PCS 1900MHz 4x45W- 65MHz | B | From Leg | 4.00 | 0.0000 | 150.00 | No Ice | 2.71 | 2.61 | 0.06 |
| | | | 0.00 | | | 1/2" | 2.95 | 2.85 | 0.08 |
| | | | -2.00 | | | Ice | 3.20 | 3.09 | 0.11 |
| | | | | | | 1" Ice | 3.72 | 3.61 | 0.17 |
| | | | | | | 2" Ice | | | |

| Description | Face or Leg | Offset Type | Offsets: Horz Lateral Vert ft ft ft | Azimuth Adjustmen t ° | Placement ft | | C _A A _A Front ft ² | C _A A _A Side ft ² | Weight K |
|-------------------------------------|-------------|-------------|---|--------------------------------|-----------------|----------|---|--|-------------|
| PCS 1900MHz 4x45W-65MHz | C | From Leg | 4.00 0.00 -2.00 | 0.0000 | 150.00 | No Ice | 2.71 | 2.61 | 0.06 |
| | | | | | | 1/2" Ice | 2.95 | 2.85 | 0.08 |
| | | | | | | Ice | 3.20 | 3.09 | 0.11 |
| | | | | | | 1" Ice | 3.72 | 3.61 | 0.17 |
| | | | | | | 2" Ice | | | |
| Platform Mount [LP 713-1] | C | None | | 0.0000 | 150.00 | No Ice | 31.27 | 31.27 | 1.51 |
| | | | | | | 1/2" Ice | 39.68 | 39.68 | 1.93 |
| | | | | | | Ice | 48.09 | 48.09 | 2.35 |
| | | | | | | 1" Ice | 64.91 | 64.91 | 3.19 |
| | | | | | | 2" Ice | | | |
| *** | | | | | | | | | |
| AM-X-CD-16-65-00T-RET w/ Mount Pipe | A | From Leg | 4.00 0.00 0.00 | 0.0000 | 140.00 | No Ice | 8.50 | 6.30 | 0.07 |
| | | | | | | 1/2" Ice | 9.15 | 7.48 | 0.14 |
| | | | | | | Ice | 9.77 | 8.37 | 0.21 |
| | | | | | | 1" Ice | 11.03 | 10.18 | 0.38 |
| | | | | | | 2" Ice | | | |
| AM-X-CD-14-65-00T-RET w/ Mount Pipe | B | From Leg | 4.00 0.00 0.00 | 0.0000 | 140.00 | No Ice | 5.74 | 4.02 | 0.05 |
| | | | | | | 1/2" Ice | 6.20 | 4.63 | 0.10 |
| | | | | | | Ice | 6.66 | 5.28 | 0.15 |
| | | | | | | 1" Ice | 7.62 | 6.68 | 0.27 |
| | | | | | | 2" Ice | | | |
| AM-X-CD-16-65-00T-RET w/ Mount Pipe | C | From Leg | 4.00 0.00 0.00 | 0.0000 | 140.00 | No Ice | 8.50 | 6.30 | 0.07 |
| | | | | | | 1/2" Ice | 9.15 | 7.48 | 0.14 |
| | | | | | | Ice | 9.77 | 8.37 | 0.21 |
| | | | | | | 1" Ice | 11.03 | 10.18 | 0.38 |
| | | | | | | 2" Ice | | | |
| (2) 7770.00 w/ Mount Pipe | A | From Leg | 4.00 0.00 0.00 | 0.0000 | 140.00 | No Ice | 6.22 | 4.82 | 0.09 |
| | | | | | | 1/2" Ice | 6.71 | 5.51 | 0.14 |
| | | | | | | Ice | 7.22 | 6.21 | 0.21 |
| | | | | | | 1" Ice | 8.26 | 7.67 | 0.36 |
| | | | | | | 2" Ice | | | |
| (2) 7770.00 w/ Mount Pipe | B | From Leg | 4.00 0.00 0.00 | 0.0000 | 140.00 | No Ice | 6.22 | 4.82 | 0.09 |
| | | | | | | 1/2" Ice | 6.71 | 5.51 | 0.14 |
| | | | | | | Ice | 7.22 | 6.21 | 0.21 |
| | | | | | | 1" Ice | 8.26 | 7.67 | 0.36 |
| | | | | | | 2" Ice | | | |
| (2) 7770.00 w/ Mount Pipe | C | From Leg | 4.00 0.00 0.00 | 0.0000 | 140.00 | No Ice | 6.22 | 4.82 | 0.09 |
| | | | | | | 1/2" Ice | 6.71 | 5.51 | 0.14 |
| | | | | | | Ice | 7.22 | 6.21 | 0.21 |
| | | | | | | 1" Ice | 8.26 | 7.67 | 0.36 |
| | | | | | | 2" Ice | | | |
| RRUS 11 B12 | A | From Leg | 4.00 0.00 0.00 | 0.0000 | 140.00 | No Ice | 3.31 | 1.36 | 0.05 |
| | | | | | | 1/2" Ice | 3.55 | 1.54 | 0.07 |
| | | | | | | Ice | 3.80 | 1.73 | 0.10 |
| | | | | | | 1" Ice | 4.33 | 2.13 | 0.15 |
| | | | | | | 2" Ice | | | |
| RRUS 11 B12 | B | From Leg | 4.00 0.00 0.00 | 0.0000 | 140.00 | No Ice | 3.31 | 1.36 | 0.05 |
| | | | | | | 1/2" Ice | 3.55 | 1.54 | 0.07 |
| | | | | | | Ice | 3.80 | 1.73 | 0.10 |
| | | | | | | 1" Ice | 4.33 | 2.13 | 0.15 |
| | | | | | | 2" Ice | | | |
| RRUS 11 B12 | C | From Leg | 4.00 0.00 0.00 | 0.0000 | 140.00 | No Ice | 3.31 | 1.36 | 0.05 |
| | | | | | | 1/2" Ice | 3.55 | 1.54 | 0.07 |
| | | | | | | Ice | 3.80 | 1.73 | 0.10 |
| | | | | | | 1" Ice | 4.33 | 2.13 | 0.15 |
| | | | | | | 2" Ice | | | |
| (2) LGP 17201 | A | From Leg | 4.00 0.00 0.00 | 0.0000 | 140.00 | No Ice | 1.95 | 0.52 | 0.03 |
| | | | | | | 1/2" Ice | 2.13 | 0.64 | 0.04 |
| | | | | | | Ice | 2.33 | 0.77 | 0.06 |
| | | | | | | 1" Ice | 2.75 | 1.06 | 0.09 |
| | | | | | | 2" Ice | | | |
| (2) LGP 17201 | B | From Leg | 4.00 0.00 0.00 | 0.0000 | 140.00 | No Ice | 1.95 | 0.52 | 0.03 |
| | | | | | | 1/2" Ice | 2.13 | 0.64 | 0.04 |
| | | | | | | Ice | 2.33 | 0.77 | 0.06 |
| | | | | | | 1" Ice | 2.75 | 1.06 | 0.09 |
| | | | | | | 2" Ice | | | |

| Description | Face or Leg | Offset Type | Offsets: Horz Lateral Vert ft ft ft | Azimuth Adjustment t | Placement ft | C _A A _{Front} ft ² | C _A A _{Side} ft ² | Weight K | |
|--|-------------|-------------|--|-------------------------|-----------------|--|---|-------------|------|
| (2) LGP 17201 | C | From Leg | 4.00 0.00 0.00 | 0.0000 | 140.00 | 2" Ice | | | |
| | | | | | | No Ice | 1.95 | 0.52 | 0.03 |
| | | | | | | 1/2" | 2.13 | 0.64 | 0.04 |
| | | | | | | Ice | 2.33 | 0.77 | 0.06 |
| (2) LGP21901 | A | From Leg | 4.00 0.00 0.00 | 0.0000 | 140.00 | 2" Ice | | | |
| | | | | | | No Ice | 0.27 | 0.18 | 0.01 |
| | | | | | | 1/2" | 0.34 | 0.25 | 0.01 |
| | | | | | | Ice | 0.43 | 0.32 | 0.01 |
| (2) LGP21901 | B | From Leg | 4.00 0.00 0.00 | 0.0000 | 140.00 | 2" Ice | | | |
| | | | | | | No Ice | 0.27 | 0.18 | 0.01 |
| | | | | | | 1/2" | 0.34 | 0.25 | 0.01 |
| | | | | | | Ice | 0.43 | 0.32 | 0.01 |
| (2) LGP21901 | C | From Leg | 4.00 0.00 0.00 | 0.0000 | 140.00 | 2" Ice | | | |
| | | | | | | No Ice | 0.27 | 0.18 | 0.01 |
| | | | | | | 1/2" | 0.34 | 0.25 | 0.01 |
| | | | | | | Ice | 0.43 | 0.32 | 0.01 |
| DC6-48-60-18-8F | B | From Leg | 4.00 0.00 0.00 | 0.0000 | 140.00 | 2" Ice | | | |
| | | | | | | No Ice | 1.47 | 1.47 | 0.02 |
| | | | | | | 1/2" | 1.67 | 1.67 | 0.04 |
| | | | | | | Ice | 1.88 | 1.88 | 0.06 |
| T-Arm Mount [TA 602-3] | C | None | | 0.0000 | 140.00 | 2" Ice | | | |
| | | | | | | No Ice | 11.59 | 11.59 | 0.77 |
| | | | | | | 1/2" | 15.44 | 15.44 | 0.99 |
| | | | | | | Ice | 19.29 | 19.29 | 1.21 |
| *** (2) LPA-80080/6CF w/ Mount Pipe | A | From Leg | 4.00 0.00 0.00 | 0.0000 | 130.00 | 2" Ice | | | |
| | | | | | | No Ice | 4.56 | 10.73 | 0.05 |
| | | | | | | 1/2" | 5.11 | 11.99 | 0.11 |
| | | | | | | Ice | 5.61 | 12.97 | 0.19 |
| (2) LPA-80080/6CF w/ Mount Pipe | B | From Leg | 4.00 0.00 0.00 | 0.0000 | 130.00 | 2" Ice | | | |
| | | | | | | No Ice | 4.56 | 10.73 | 0.05 |
| | | | | | | 1/2" | 5.11 | 11.99 | 0.11 |
| | | | | | | Ice | 5.61 | 12.97 | 0.19 |
| (2) LPA-80080-6CF-EDIN- 6 w/ Mount Pipe | C | From Leg | 4.00 0.00 0.00 | 0.0000 | 130.00 | 2" Ice | | | |
| | | | | | | No Ice | 4.56 | 10.74 | 0.05 |
| | | | | | | 1/2" | 5.10 | 12.00 | 0.11 |
| | | | | | | Ice | 5.61 | 12.98 | 0.19 |
| Platform Mount [LP 303-1] | C | None | | 0.0000 | 130.00 | 2" Ice | | | |
| | | | | | | No Ice | 14.66 | 14.66 | 1.25 |
| | | | | | | 1/2" | 18.87 | 18.87 | 1.48 |
| | | | | | | Ice | 23.08 | 23.08 | 1.71 |
| (2) SBNHH-1D65B w/ Mount Pipe | A | From Leg | 4.00 0.00 0.00 | 0.0000 | 130.00 | 2" Ice | | | |
| | | | | | | No Ice | 8.64 | 7.07 | 0.07 |
| | | | | | | 1/2" | 9.30 | 8.26 | 0.14 |
| | | | | | | Ice | 9.92 | 9.18 | 0.21 |
| (2) SBNHH-1D65B w/ Mount Pipe | B | From Leg | 4.00 0.00 0.00 | 0.0000 | 130.00 | 2" Ice | | | |
| | | | | | | No Ice | 8.64 | 7.07 | 0.07 |
| | | | | | | 1/2" | 9.30 | 8.26 | 0.14 |
| | | | | | | Ice | 9.92 | 9.18 | 0.21 |
| (2) SBNHH-1D65B w/ Mount Pipe | C | From Leg | 4.00 0.00 0.00 | 0.0000 | 130.00 | 2" Ice | | | |
| | | | | | | No Ice | 8.64 | 7.07 | 0.07 |
| | | | | | | 1/2" | 9.30 | 8.26 | 0.14 |
| | | | | | | Ice | 9.92 | 9.18 | 0.21 |

| Description | Face or Leg | Offset Type | Offsets: Horz Lateral Vert ft ft ft | Azimuth Adjustment t ° | Placement ft | C _A A _A Front ft ² | C _A A _A Side ft ² | Weight K |
|-----------------|-------------|-------------|---|------------------------------|-----------------|---|--|-------------|
| | | | | | | 1" Ice 11.20 | 11.01 | 0.39 |
| | | | | | | 2" Ice | | |
| RRH2x60-700 | A | From Leg | 4.00 | 0.0000 | 130.00 | No Ice 3.96 | 1.82 | 0.06 |
| | | | 0.00 | | | 1/2" 4.27 | 2.08 | 0.08 |
| | | | 0.00 | | | Ice 4.60 | 2.36 | 0.11 |
| | | | | | | 1" Ice 5.27 | 2.96 | 0.17 |
| | | | | | | 2" Ice | | |
| RRH2x60-700 | B | From Leg | 4.00 | 0.0000 | 130.00 | No Ice 3.96 | 1.82 | 0.06 |
| | | | 0.00 | | | 1/2" 4.27 | 2.08 | 0.08 |
| | | | 0.00 | | | Ice 4.60 | 2.36 | 0.11 |
| | | | | | | 1" Ice 5.27 | 2.96 | 0.17 |
| | | | | | | 2" Ice | | |
| RRH2x60-700 | C | From Leg | 4.00 | 0.0000 | 130.00 | No Ice 3.96 | 1.82 | 0.06 |
| | | | 0.00 | | | 1/2" 4.27 | 2.08 | 0.08 |
| | | | 0.00 | | | Ice 4.60 | 2.36 | 0.11 |
| | | | | | | 1" Ice 5.27 | 2.96 | 0.17 |
| | | | | | | 2" Ice | | |
| RRH2X60-AWS | A | From Leg | 4.00 | 0.0000 | 130.00 | No Ice 2.19 | 1.43 | 0.04 |
| | | | 0.00 | | | 1/2" 2.40 | 1.61 | 0.06 |
| | | | 0.00 | | | Ice 2.61 | 1.80 | 0.08 |
| | | | | | | 1" Ice 3.07 | 2.21 | 0.13 |
| | | | | | | 2" Ice | | |
| RRH2X60-AWS | B | From Leg | 4.00 | 0.0000 | 130.00 | No Ice 2.19 | 1.43 | 0.04 |
| | | | 0.00 | | | 1/2" 2.40 | 1.61 | 0.06 |
| | | | 0.00 | | | Ice 2.61 | 1.80 | 0.08 |
| | | | | | | 1" Ice 3.07 | 2.21 | 0.13 |
| | | | | | | 2" Ice | | |
| RRH2X60-AWS | C | From Leg | 4.00 | 0.0000 | 130.00 | No Ice 2.19 | 1.43 | 0.04 |
| | | | 0.00 | | | 1/2" 2.40 | 1.61 | 0.06 |
| | | | 0.00 | | | Ice 2.61 | 1.80 | 0.08 |
| | | | | | | 1" Ice 3.07 | 2.21 | 0.13 |
| | | | | | | 2" Ice | | |
| RRH2X60-PCS | A | From Leg | 4.00 | 0.0000 | 130.00 | No Ice 2.57 | 2.01 | 0.06 |
| | | | 0.00 | | | 1/2" 2.79 | 2.22 | 0.08 |
| | | | 0.00 | | | Ice 3.02 | 2.43 | 0.10 |
| | | | | | | 1" Ice 3.52 | 2.89 | 0.16 |
| | | | | | | 2" Ice | | |
| RRH2X60-PCS | B | From Leg | 4.00 | 0.0000 | 130.00 | No Ice 2.57 | 2.01 | 0.06 |
| | | | 0.00 | | | 1/2" 2.79 | 2.22 | 0.08 |
| | | | 0.00 | | | Ice 3.02 | 2.43 | 0.10 |
| | | | | | | 1" Ice 3.52 | 2.89 | 0.16 |
| | | | | | | 2" Ice | | |
| RRH2X60-PCS | C | From Leg | 4.00 | 0.0000 | 130.00 | No Ice 2.57 | 2.01 | 0.06 |
| | | | 0.00 | | | 1/2" 2.79 | 2.22 | 0.08 |
| | | | 0.00 | | | Ice 3.02 | 2.43 | 0.10 |
| | | | | | | 1" Ice 3.52 | 2.89 | 0.16 |
| | | | | | | 2" Ice | | |
| DB-T1-6Z-8AB-0Z | C | From Leg | 4.00 | 0.0000 | 130.00 | No Ice 5.60 | 2.33 | 0.04 |
| | | | 0.00 | | | 1/2" 5.92 | 2.56 | 0.08 |
| | | | 0.00 | | | Ice 6.24 | 2.79 | 0.12 |
| | | | | | | 1" Ice 6.91 | 3.28 | 0.21 |
| | | | | | | 2" Ice | | |

Tower Pressures - No Ice

$G_H = 1.690$

| Section Elevation ft | z ft | K _z | q _z psf | A _G ft ² | F a c e | A _F ft ² | A _R ft ² | A _{leg} ft ² | Leg % | C _A A _A In Face ft ² | C _A A _A Out Face ft ² |
|-------------------------|---------|----------------|-----------------------|-----------------------------------|---------|-----------------------------------|-----------------------------------|-------------------------------------|--------|--|---|
| L1 148.00-117.25 | 132.21 | 1.487 | 24 | 63.072 | A | 0.000 | 63.072 | 63.072 | 100.00 | 0.000 | 0.000 |
| | | | | | B | 0.000 | 63.072 | | 100.00 | 0.000 | 0.000 |
| | | | | | C | 0.000 | 63.072 | | 100.00 | 0.000 | 0.000 |
| L2 117.25-97.25 | 107.05 | 1.4 | 23 | 47.586 | A | 0.000 | 47.586 | 47.586 | 100.00 | 0.000 | 0.000 |
| | | | | | B | 0.000 | 47.586 | | 100.00 | 0.000 | 0.000 |
| | | | | | C | 0.000 | 47.586 | | 100.00 | 0.000 | 0.783 |
| L3 97.25-80.75 | 88.88 | 1.327 | 22 | 43.524 | A | 0.000 | 43.524 | 43.524 | 100.00 | 0.000 | 0.000 |
| | | | | | B | 0.000 | 43.524 | | 100.00 | 0.000 | 0.000 |
| | | | | | C | 0.000 | 43.524 | | 100.00 | 0.000 | 5.739 |
| L4 80.75-40.00 | 60.18 | 1.187 | 19 | 121.723 | A | 0.000 | 121.723 | 121.723 | 100.00 | 0.000 | 0.000 |
| | | | | | B | 0.000 | 121.723 | | 100.00 | 0.000 | 0.000 |
| | | | | | C | 0.000 | 121.723 | | 100.00 | 0.000 | 14.173 |
| L5 40.00-13.25 | 26.36 | 1 | 16 | 91.493 | A | 0.000 | 91.493 | 91.493 | 100.00 | 0.000 | 0.000 |
| | | | | | B | 0.000 | 91.493 | | 100.00 | 0.000 | 0.000 |
| | | | | | C | 0.000 | 91.493 | | 100.00 | 0.000 | 9.304 |
| L6 13.25-12.75 | 13.00 | 1 | 16 | 1.813 | A | 0.000 | 1.813 | 1.813 | 100.00 | 0.000 | 0.000 |
| | | | | | B | 0.000 | 1.813 | | 100.00 | 0.000 | 0.000 |
| | | | | | C | 0.000 | 1.813 | | 100.00 | 0.000 | 0.174 |
| L7 12.75-5.33 | 9.02 | 1 | 16 | 27.308 | A | 0.000 | 27.308 | 27.308 | 100.00 | 0.000 | 0.000 |
| | | | | | B | 0.000 | 27.308 | | 100.00 | 0.000 | 0.000 |
| | | | | | C | 0.000 | 27.308 | | 100.00 | 0.000 | 2.579 |
| L8 5.33-4.75 | 5.04 | 1 | 16 | 2.181 | A | 0.000 | 2.181 | 2.181 | 100.00 | 0.000 | 0.000 |
| | | | | | B | 0.000 | 2.181 | | 100.00 | 0.000 | 0.000 |
| | | | | | C | 0.000 | 2.181 | | 100.00 | 0.000 | 0.203 |
| L9 4.75-0.00 | 2.37 | 1 | 16 | 17.938 | A | 0.000 | 17.938 | 17.938 | 100.00 | 0.000 | 0.000 |
| | | | | | B | 0.000 | 17.938 | | 100.00 | 0.000 | 0.000 |
| | | | | | C | 0.000 | 17.938 | | 100.00 | 0.000 | 1.652 |

Tower Pressure - With Ice

$G_H = 1.690$

| Section Elevation ft | z ft | K _z | q _z psf | t _z in | A _G ft ² | F a c e | A _F ft ² | A _R ft ² | A _{leg} ft ² | Leg % | C _A A _A In Face ft ² | C _A A _A Out Face ft ² |
|-------------------------|---------|----------------|-----------------------|----------------------|-----------------------------------|---------|-----------------------------------|-----------------------------------|-------------------------------------|--------|--|---|
| L1 148.00-117.25 | 132.21 | 1.487 | 3 | 1.2500 | 69.478 | A | 0.000 | 69.478 | 69.478 | 100.00 | 0.000 | 0.000 |
| | | | | | | B | 0.000 | 69.478 | | 100.00 | 0.000 | 0.000 |
| | | | | | | C | 0.000 | 69.478 | | 100.00 | 0.000 | 0.000 |
| L2 117.25-97.25 | 107.05 | 1.4 | 3 | 1.2500 | 51.753 | A | 0.000 | 51.753 | 51.753 | 100.00 | 0.000 | 0.000 |
| | | | | | | B | 0.000 | 51.753 | | 100.00 | 0.000 | 0.000 |
| | | | | | | C | 0.000 | 51.753 | | 100.00 | 0.000 | 1.602 |
| L3 97.25-80.75 | 88.88 | 1.327 | 3 | 1.2500 | 46.961 | A | 0.000 | 46.961 | 46.961 | 100.00 | 0.000 | 0.000 |
| | | | | | | B | 0.000 | 46.961 | | 100.00 | 0.000 | 0.000 |
| | | | | | | C | 0.000 | 46.961 | | 100.00 | 0.000 | 11.750 |
| L4 80.75-40.00 | 60.18 | 1.187 | 2 | 1.2500 | 130.212 | A | 0.000 | 130.212 | 130.212 | 100.00 | 0.000 | 0.000 |
| | | | | | | B | 0.000 | 130.212 | | 100.00 | 0.000 | 0.000 |
| | | | | | | C | 0.000 | 130.212 | | 100.00 | 0.000 | 29.018 |
| L5 40.00-13.25 | 26.36 | 1 | 2 | 1.2500 | 97.066 | A | 0.000 | 97.066 | 97.066 | 100.00 | 0.000 | 0.000 |
| | | | | | | B | 0.000 | 97.066 | | 100.00 | 0.000 | 0.000 |
| | | | | | | C | 0.000 | 97.066 | | 100.00 | 0.000 | 19.049 |
| L6 13.25-12.75 | 13.00 | 1 | 2 | 1.2500 | 1.917 | A | 0.000 | 1.917 | 1.917 | 100.00 | 0.000 | 0.000 |
| | | | | | | B | 0.000 | 1.917 | | 100.00 | 0.000 | 0.000 |
| | | | | | | C | 0.000 | 1.917 | | 100.00 | 0.000 | 0.356 |
| L7 12.75-5.33 | 9.02 | 1 | 2 | 1.2500 | 28.853 | A | 0.000 | 28.853 | 28.853 | 100.00 | 0.000 | 0.000 |
| | | | | | | B | 0.000 | 28.853 | | 100.00 | 0.000 | 0.000 |
| | | | | | | C | 0.000 | 28.853 | | 100.00 | 0.000 | 5.282 |
| L8 5.33-4.75 | 5.04 | 1 | 2 | 1.2500 | 2.302 | A | 0.000 | 2.302 | 2.302 | 100.00 | 0.000 | 0.000 |
| | | | | | | B | 0.000 | 2.302 | | 100.00 | 0.000 | 0.000 |
| | | | | | | C | 0.000 | 2.302 | | 100.00 | 0.000 | 0.415 |
| L9 4.75-0.00 | 2.37 | 1 | 2 | 1.2500 | 18.927 | A | 0.000 | 18.927 | 18.927 | 100.00 | 0.000 | 0.000 |
| | | | | | | B | 0.000 | 18.927 | | 100.00 | 0.000 | 0.000 |
| | | | | | | C | 0.000 | 18.927 | | 100.00 | 0.000 | 3.383 |

Tower Pressure - Service

$G_H = 1.690$

| Section Elevation | z | K_z | q_z | A_G | F a c e | A_F | A_R | A_{leg} | Leg % | C_{AA} In Face | C_{AA} Out Face |
|----------------------|--------|-------|-------|-----------------|------------------|-----------------|-----------------|-----------------|----------|------------------------|-------------------------|
| ft | ft | | psf | ft ² | | ft ² | ft ² | ft ² | | ft ² | ft ² |
| L1 148.00- 117.25 | 132.21 | 1.487 | 10 | 63.072 | A | 0.000 | 63.072 | 63.072 | 100.00 | 0.000 | 0.000 |
| | | | | | B | 0.000 | 63.072 | 100.00 | 0.000 | 0.000 | |
| | | | | | C | 0.000 | 63.072 | 100.00 | 0.000 | 0.000 | |
| L2 117.25- 97.25 | 107.05 | 1.4 | 9 | 47.586 | A | 0.000 | 47.586 | 47.586 | 100.00 | 0.000 | 0.000 |
| | | | | | B | 0.000 | 47.586 | 100.00 | 0.000 | 0.000 | |
| | | | | | C | 0.000 | 47.586 | 100.00 | 0.000 | 0.783 | |
| L3 97.25- 80.75 | 88.88 | 1.327 | 8 | 43.524 | A | 0.000 | 43.524 | 43.524 | 100.00 | 0.000 | 0.000 |
| | | | | | B | 0.000 | 43.524 | 100.00 | 0.000 | 0.000 | |
| | | | | | C | 0.000 | 43.524 | 100.00 | 0.000 | 5.739 | |
| L4 80.75- 40.00 | 60.18 | 1.187 | 8 | 121.72 3 | A | 0.000 | 121.723 | 121.723 | 100.00 | 0.000 | 0.000 |
| | | | | | B | 0.000 | 121.723 | 100.00 | 0.000 | 0.000 | |
| | | | | | C | 0.000 | 121.723 | 100.00 | 0.000 | 14.173 | |
| L5 40.00- 13.25 | 26.36 | 1 | 6 | 91.493 | A | 0.000 | 91.493 | 91.493 | 100.00 | 0.000 | 0.000 |
| | | | | | B | 0.000 | 91.493 | 100.00 | 0.000 | 0.000 | |
| | | | | | C | 0.000 | 91.493 | 100.00 | 0.000 | 9.304 | |
| L6 13.25- 12.75 | 13.00 | 1 | 6 | 1.813 | A | 0.000 | 1.813 | 1.813 | 100.00 | 0.000 | 0.000 |
| | | | | | B | 0.000 | 1.813 | 100.00 | 0.000 | 0.000 | |
| | | | | | C | 0.000 | 1.813 | 100.00 | 0.000 | 0.174 | |
| L7 12.75-5.33 | 9.02 | 1 | 6 | 27.308 | A | 0.000 | 27.308 | 27.308 | 100.00 | 0.000 | 0.000 |
| | | | | | B | 0.000 | 27.308 | 100.00 | 0.000 | 0.000 | |
| | | | | | C | 0.000 | 27.308 | 100.00 | 0.000 | 2.579 | |
| L8 5.33-4.75 | 5.04 | 1 | 6 | 2.181 | A | 0.000 | 2.181 | 2.181 | 100.00 | 0.000 | 0.000 |
| | | | | | B | 0.000 | 2.181 | 100.00 | 0.000 | 0.000 | |
| | | | | | C | 0.000 | 2.181 | 100.00 | 0.000 | 0.203 | |
| L9 4.75-0.00 | 2.37 | 1 | 6 | 17.938 | A | 0.000 | 17.938 | 17.938 | 100.00 | 0.000 | 0.000 |
| | | | | | B | 0.000 | 17.938 | 100.00 | 0.000 | 0.000 | |
| | | | | | C | 0.000 | 17.938 | 100.00 | 0.000 | 1.652 | |

Load Combinations

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

| Comb. No. | Description |
|-----------|-----------------------------|
| 26 | Dead+Wind 330 deg+Ice+Temp |
| 27 | Dead+Wind 0 deg - Service |
| 28 | Dead+Wind 30 deg - Service |
| 29 | Dead+Wind 60 deg - Service |
| 30 | Dead+Wind 90 deg - Service |
| 31 | Dead+Wind 120 deg - Service |
| 32 | Dead+Wind 150 deg - Service |
| 33 | Dead+Wind 180 deg - Service |
| 34 | Dead+Wind 210 deg - Service |
| 35 | Dead+Wind 240 deg - Service |
| 36 | Dead+Wind 270 deg - Service |
| 37 | Dead+Wind 300 deg - Service |
| 38 | Dead+Wind 330 deg - Service |

Maximum Member Forces

| Section No. | Elevation ft | Component Type | Condition | Gov. Load Comb. | Force K | Major Axis Moment kip-ft | Minor Axis Moment kip-ft |
|-------------|----------------|----------------|------------------|-----------------|---------|--------------------------|--------------------------|
| L1 | 148 - 117.25 | Pole | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 14 | -17.31 | 0.66 | -0.36 |
| | | | Max. Mx | 11 | -7.03 | 234.55 | -0.84 |
| | | | Max. My | 8 | -7.04 | 0.89 | -234.02 |
| | | | Max. Vy | 11 | -14.11 | 234.55 | -0.84 |
| | | | Max. Vx | 8 | 14.05 | 0.89 | -234.02 |
| | | | Max. Torque | 13 | | | 0.56 |
| L2 | 117.25 - 97.25 | Pole | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 14 | -20.92 | 0.66 | -0.36 |
| | | | Max. Mx | 11 | -9.75 | 583.35 | -2.46 |
| | | | Max. My | 8 | -9.75 | 2.52 | -581.44 |
| | | | Max. Vy | 11 | -15.57 | 583.35 | -2.46 |
| | | | Max. Vx | 8 | 15.51 | 2.52 | -581.44 |
| | | | Max. Torque | 13 | | | 0.57 |
| L3 | 97.25 - 80.75 | Pole | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 14 | -23.66 | 0.65 | -0.36 |
| | | | Max. Mx | 11 | -11.94 | 779.94 | -3.30 |
| | | | Max. My | 8 | -11.94 | 3.37 | -777.31 |
| | | | Max. Vy | 11 | -16.54 | 779.94 | -3.30 |
| | | | Max. Vx | 8 | 16.48 | 3.37 | -777.31 |
| | | | Max. Torque | 13 | | | 0.60 |
| L4 | 80.75 - 40 | Pole | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 14 | -34.15 | 0.65 | -0.35 |
| | | | Max. Mx | 11 | -20.54 | 1501.99 | -6.06 |
| | | | Max. My | 8 | -20.55 | 6.13 | -1497.00 |
| | | | Max. Vy | 11 | -19.47 | 1501.99 | -6.06 |
| | | | Max. Vx | 8 | 19.41 | 6.13 | -1497.00 |
| | | | Max. Torque | 13 | | | 0.71 |
| L5 | 40 - 13.25 | Pole | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 14 | -44.15 | 0.64 | -0.35 |
| | | | Max. Mx | 11 | -28.89 | 2151.29 | -8.21 |
| | | | Max. My | 8 | -28.89 | 8.29 | -2144.44 |
| | | | Max. Vy | 11 | -21.37 | 2151.29 | -8.21 |
| | | | Max. Vx | 8 | 21.31 | 8.29 | -2144.44 |
| | | | Max. Torque | 13 | | | 0.80 |
| L6 | 13.25 - 12.75 | Pole | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 14 | -44.30 | 0.64 | -0.35 |
| | | | Max. Mx | 11 | -29.03 | 2161.97 | -8.25 |
| | | | Max. My | 8 | -29.03 | 8.32 | -2155.10 |
| | | | Max. Vy | 11 | -21.39 | 2161.97 | -8.25 |
| | | | Max. Vx | 8 | 21.33 | 8.32 | -2155.10 |
| | | | Max. Torque | 13 | | | 0.81 |
| L7 | 12.75 - 5.3333 | Pole | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 14 | -46.50 | 0.64 | -0.35 |

| Section No. | Elevation ft | Component Type | Condition | Gov. Load Comb. | Force K | Major Axis Moment kip-ft | Minor Axis Moment kip-ft |
|-------------|---------------|----------------|------------------|-----------------|---------|--------------------------|--------------------------|
| L8 | 5.3333 - 4.75 | Pole | Max. Mx | 11 | -30.82 | 2322.01 | -8.74 |
| | | | Max. My | 8 | -30.83 | 8.82 | -2314.71 |
| | | | Max. Vy | 11 | -21.79 | 2322.01 | -8.74 |
| | | | Max. Vx | 8 | 21.73 | 8.82 | -2314.71 |
| | | | Max. Torque | 13 | | | 0.83 |
| | | | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 14 | -46.68 | 0.64 | -0.35 |
| | | | Max. Mx | 11 | -30.98 | 2334.72 | -8.78 |
| | | | Max. My | 8 | -30.98 | 8.85 | -2327.39 |
| | | | Max. Vy | 11 | -21.82 | 2334.72 | -8.78 |
| L9 | 4.75 - 0 | Pole | Max. Vx | 8 | 21.76 | 8.85 | -2327.39 |
| | | | Max. Torque | 13 | | | 0.83 |
| | | | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 14 | -48.17 | 0.64 | -0.35 |
| | | | Max. Mx | 11 | -32.19 | 2438.94 | -9.09 |
| | | | Max. My | 8 | -32.19 | 9.17 | -2431.34 |
| | | | Max. Vy | 11 | -22.08 | 2438.94 | -9.09 |
| | | | Max. Vx | 8 | 22.03 | 9.17 | -2431.34 |
| | | | Max. Torque | 13 | | | 0.84 |

Maximum Reactions

| Location | Condition | Gov. Load Comb. | Vertical K | Horizontal, X K | Horizontal, Z K |
|----------|---------------------|-----------------|------------|-----------------|-----------------|
| Pole | Max. Vert | 14 | 48.17 | -0.00 | 0.00 |
| | Max. H _x | 11 | 32.20 | 22.07 | -0.07 |
| | Max. H _z | 2 | 32.20 | -0.07 | 22.01 |
| | Max. M _x | 2 | 2431.13 | -0.07 | 22.01 |
| | Max. M _z | 5 | 2438.57 | -22.07 | 0.07 |
| | Max. Torsion | 13 | 0.84 | 10.98 | 19.03 |
| | Min. Vert | 11 | 32.20 | 22.07 | -0.07 |
| | Min. H _x | 5 | 32.20 | -22.07 | 0.07 |
| | Min. H _z | 8 | 32.20 | 0.07 | -22.01 |
| | Min. M _x | 8 | -2431.34 | 0.07 | -22.01 |
| | Min. M _z | 11 | -2438.94 | 22.07 | -0.07 |
| | Min. Torsion | 7 | -0.84 | -10.98 | -19.03 |

Tower Mast Reaction Summary

| Load Combination | Vertical K | Shear _x K | Shear _z K | Overturing Moment, M _x kip-ft | Overturing Moment, M _z kip-ft | Torque kip-ft |
|----------------------------|------------|----------------------|----------------------|--|--|---------------|
| Dead Only | 32.20 | -0.00 | 0.00 | 0.10 | 0.17 | 0.00 |
| Dead+Wind 0 deg - No Ice | 32.20 | 0.07 | -22.01 | -2431.13 | -8.80 | -0.80 |
| Dead+Wind 30 deg - No Ice | 32.20 | 11.09 | -19.10 | -2110.15 | -1227.14 | -0.55 |
| Dead+Wind 60 deg - No Ice | 32.20 | 19.15 | -11.07 | -1223.43 | -2116.60 | -0.15 |
| Dead+Wind 90 deg - No Ice | 32.20 | 22.07 | -0.07 | -8.88 | -2438.57 | 0.30 |
| Dead+Wind 120 deg - No Ice | 32.20 | 19.08 | 10.95 | 1208.10 | -2107.65 | 0.66 |
| Dead+Wind 150 deg - No Ice | 32.20 | 10.98 | 19.03 | 2101.42 | -1211.60 | 0.84 |
| Dead+Wind 180 deg - No Ice | 32.20 | -0.07 | 22.01 | 2431.34 | 9.17 | 0.80 |
| Dead+Wind 210 deg - No Ice | 32.20 | -11.09 | 19.10 | 2110.37 | 1227.50 | 0.55 |
| Dead+Wind 240 deg - No Ice | 32.20 | -19.15 | 11.07 | 1223.65 | 2116.97 | 0.15 |
| Dead+Wind 270 deg - No Ice | 32.20 | -22.07 | 0.07 | 9.09 | 2438.94 | -0.29 |
| Dead+Wind 300 deg - No Ice | 32.20 | -19.08 | -10.95 | -1207.90 | 2108.02 | -0.66 |
| Dead+Wind 330 deg - No Ice | 32.20 | -10.98 | -19.03 | -2101.21 | 1211.96 | -0.84 |
| Dead+Ice+Temp | 48.17 | 0.00 | -0.00 | 0.35 | 0.64 | 0.00 |
| Dead+Wind 0 deg+Ice+Temp | 48.17 | 0.01 | -3.48 | -405.40 | -0.32 | -0.15 |
| Dead+Wind 30 deg+Ice+Temp | 48.17 | 1.75 | -3.01 | -351.56 | -203.69 | -0.10 |

| Load Combination | Vertical K | Shear _x K | Shear _z K | Overturning Moment, M _x kip-ft | Overturning Moment, M _z kip-ft | Torque kip-ft |
|-----------------------------|---------------|-------------------------|-------------------------|---|---|------------------|
| deg+Ice+Temp | | | | | | |
| Dead+Wind 60 | 48.17 | 3.02 | -1.74 | -203.41 | -352.28 | -0.03 |
| deg+Ice+Temp | | | | | | |
| Dead+Wind 90 | 48.17 | 3.49 | -0.01 | -0.65 | -406.29 | 0.06 |
| deg+Ice+Temp | | | | | | |
| Dead+Wind 120 | 48.17 | 3.01 | 1.73 | 202.39 | -351.23 | 0.13 |
| deg+Ice+Temp | | | | | | |
| Dead+Wind 150 | 48.17 | 1.74 | 3.01 | 351.31 | -201.86 | 0.16 |
| deg+Ice+Temp | | | | | | |
| Dead+Wind 180 | 48.17 | -0.01 | 3.48 | 406.20 | 1.80 | 0.15 |
| deg+Ice+Temp | | | | | | |
| Dead+Wind 210 | 48.17 | -1.75 | 3.01 | 352.36 | 205.17 | 0.10 |
| deg+Ice+Temp | | | | | | |
| Dead+Wind 240 | 48.17 | -3.02 | 1.74 | 204.22 | 353.77 | 0.03 |
| deg+Ice+Temp | | | | | | |
| Dead+Wind 270 | 48.17 | -3.49 | 0.01 | 1.46 | 407.77 | -0.06 |
| deg+Ice+Temp | | | | | | |
| Dead+Wind 300 | 48.17 | -3.01 | -1.73 | -201.58 | 352.71 | -0.13 |
| deg+Ice+Temp | | | | | | |
| Dead+Wind 330 | 48.17 | -1.74 | -3.01 | -350.50 | 203.34 | -0.16 |
| deg+Ice+Temp | | | | | | |
| Dead+Wind 0 deg - Service | 32.20 | 0.03 | -8.60 | -950.67 | -3.33 | -0.32 |
| Dead+Wind 30 deg - Service | 32.20 | 4.33 | -7.46 | -825.22 | -479.82 | -0.22 |
| Dead+Wind 60 deg - Service | 32.20 | 7.48 | -4.32 | -478.43 | -827.70 | -0.06 |
| Dead+Wind 90 deg - Service | 32.20 | 8.62 | -0.03 | -3.41 | -953.53 | 0.12 |
| Dead+Wind 120 deg - Service | 32.20 | 7.45 | 4.28 | 472.55 | -824.18 | 0.26 |
| Dead+Wind 150 deg - Service | 32.20 | 4.29 | 7.43 | 821.93 | -473.74 | 0.33 |
| Dead+Wind 180 deg - Service | 32.20 | -0.03 | 8.60 | 950.88 | 3.70 | 0.32 |
| Dead+Wind 210 deg - Service | 32.20 | -4.33 | 7.46 | 825.44 | 480.20 | 0.22 |
| Dead+Wind 240 deg - Service | 32.20 | -7.48 | 4.32 | 478.64 | 828.07 | 0.06 |
| Dead+Wind 270 deg - Service | 32.20 | -8.62 | 0.03 | 3.62 | 953.91 | -0.12 |
| Dead+Wind 300 deg - Service | 32.20 | -7.45 | -4.28 | -472.34 | 824.56 | -0.26 |
| Dead+Wind 330 deg - Service | 32.20 | -4.29 | -7.43 | -821.71 | 474.11 | -0.33 |

Solution Summary

| Load Comb. | Sum of Applied Forces | | | Sum of Reactions | | | % Error |
|------------|-----------------------|---------|---------|------------------|---------|---------|---------|
| | PX K | PY K | PZ K | PX K | PY K | PZ K | |
| 1 | 0.00 | -32.20 | 0.00 | 0.00 | 32.20 | -0.00 | 0.000% |
| 2 | 0.07 | -32.20 | -22.02 | -0.07 | 32.20 | 22.01 | 0.007% |
| 3 | 11.09 | -32.20 | -19.10 | -11.09 | 32.20 | 19.10 | 0.000% |
| 4 | 19.15 | -32.20 | -11.07 | -19.15 | 32.20 | 11.07 | 0.000% |
| 5 | 22.07 | -32.20 | -0.07 | -22.07 | 32.20 | 0.07 | 0.007% |
| 6 | 19.08 | -32.20 | 10.95 | -19.08 | 32.20 | -10.95 | 0.000% |
| 7 | 10.98 | -32.20 | 19.03 | -10.98 | 32.20 | -19.03 | 0.000% |
| 8 | -0.07 | -32.20 | 22.02 | 0.07 | 32.20 | -22.01 | 0.007% |
| 9 | -11.09 | -32.20 | 19.10 | 11.09 | 32.20 | -19.10 | 0.000% |
| 10 | -19.15 | -32.20 | 11.07 | 19.15 | 32.20 | -11.07 | 0.000% |
| 11 | -22.07 | -32.20 | 0.07 | 22.07 | 32.20 | -0.07 | 0.007% |
| 12 | -19.08 | -32.20 | -10.95 | 19.08 | 32.20 | 10.95 | 0.000% |
| 13 | -10.98 | -32.20 | -19.03 | 10.98 | 32.20 | 19.03 | 0.000% |
| 14 | 0.00 | -48.17 | 0.00 | -0.00 | 48.17 | 0.00 | 0.000% |
| 15 | 0.01 | -48.17 | -3.48 | -0.01 | 48.17 | 3.48 | 0.001% |
| 16 | 1.75 | -48.17 | -3.01 | -1.75 | 48.17 | 3.01 | 0.001% |
| 17 | 3.02 | -48.17 | -1.74 | -3.02 | 48.17 | 1.74 | 0.001% |
| 18 | 3.49 | -48.17 | -0.01 | -3.49 | 48.17 | 0.01 | 0.001% |
| 19 | 3.01 | -48.17 | 1.73 | -3.01 | 48.17 | -1.73 | 0.001% |

| Load Comb. | Sum of Applied Forces | | | Sum of Reactions | | | % Error |
|------------|-----------------------|---------|---------|------------------|---------|---------|---------|
| | PX K | PY K | PZ K | PX K | PY K | PZ K | |
| 20 | 1.74 | -48.17 | 3.01 | -1.74 | 48.17 | -3.01 | 0.001% |
| 21 | -0.01 | -48.17 | 3.48 | 0.01 | 48.17 | -3.48 | 0.001% |
| 22 | -1.75 | -48.17 | 3.01 | 1.75 | 48.17 | -3.01 | 0.001% |
| 23 | -3.02 | -48.17 | 1.74 | 3.02 | 48.17 | -1.74 | 0.001% |
| 24 | -3.49 | -48.17 | 0.01 | 3.49 | 48.17 | -0.01 | 0.001% |
| 25 | -3.01 | -48.17 | -1.73 | 3.01 | 48.17 | 1.73 | 0.001% |
| 26 | -1.74 | -48.17 | -3.01 | 1.74 | 48.17 | 3.01 | 0.001% |
| 27 | 0.03 | -32.20 | -8.60 | -0.03 | 32.20 | 8.60 | 0.007% |
| 28 | 4.33 | -32.20 | -7.46 | -4.33 | 32.20 | 7.46 | 0.002% |
| 29 | 7.48 | -32.20 | -4.32 | -7.48 | 32.20 | 4.32 | 0.002% |
| 30 | 8.62 | -32.20 | -0.03 | -8.62 | 32.20 | 0.03 | 0.007% |
| 31 | 7.45 | -32.20 | 4.28 | -7.45 | 32.20 | -4.28 | 0.002% |
| 32 | 4.29 | -32.20 | 7.44 | -4.29 | 32.20 | -7.43 | 0.002% |
| 33 | -0.03 | -32.20 | 8.60 | 0.03 | 32.20 | -8.60 | 0.007% |
| 34 | -4.33 | -32.20 | 7.46 | 4.33 | 32.20 | -7.46 | 0.002% |
| 35 | -7.48 | -32.20 | 4.32 | 7.48 | 32.20 | -4.32 | 0.002% |
| 36 | -8.62 | -32.20 | 0.03 | 8.62 | 32.20 | -0.03 | 0.007% |
| 37 | -7.45 | -32.20 | -4.28 | 7.45 | 32.20 | 4.28 | 0.002% |
| 38 | -4.29 | -32.20 | -7.44 | 4.29 | 32.20 | 7.43 | 0.002% |

Non-Linear Convergence Results

| Load Combination | Converged? | Number of Cycles | Displacement Tolerance | Force Tolerance |
|------------------|------------|------------------|------------------------|-----------------|
| 1 | Yes | 6 | 0.00000001 | 0.00000001 |
| 2 | Yes | 16 | 0.00006739 | 0.00009258 |
| 3 | Yes | 21 | 0.00000001 | 0.00011245 |
| 4 | Yes | 21 | 0.00000001 | 0.00011382 |
| 5 | Yes | 16 | 0.00006737 | 0.00007702 |
| 6 | Yes | 21 | 0.00000001 | 0.00011233 |
| 7 | Yes | 21 | 0.00000001 | 0.00010977 |
| 8 | Yes | 16 | 0.00006739 | 0.00013914 |
| 9 | Yes | 21 | 0.00000001 | 0.00011450 |
| 10 | Yes | 21 | 0.00000001 | 0.00011330 |
| 11 | Yes | 16 | 0.00006736 | 0.00009682 |
| 12 | Yes | 21 | 0.00000001 | 0.00011021 |
| 13 | Yes | 21 | 0.00000001 | 0.00011262 |
| 14 | Yes | 6 | 0.00000001 | 0.00000511 |
| 15 | Yes | 17 | 0.00000001 | 0.00010912 |
| 16 | Yes | 17 | 0.00000001 | 0.00012341 |
| 17 | Yes | 17 | 0.00000001 | 0.00012370 |
| 18 | Yes | 17 | 0.00000001 | 0.00010924 |
| 19 | Yes | 17 | 0.00000001 | 0.00012343 |
| 20 | Yes | 17 | 0.00000001 | 0.00012305 |
| 21 | Yes | 17 | 0.00000001 | 0.00010958 |
| 22 | Yes | 17 | 0.00000001 | 0.00012492 |
| 23 | Yes | 17 | 0.00000001 | 0.00012491 |
| 24 | Yes | 17 | 0.00000001 | 0.00011007 |
| 25 | Yes | 17 | 0.00000001 | 0.00012361 |
| 26 | Yes | 17 | 0.00000001 | 0.00012371 |
| 27 | Yes | 15 | 0.00014040 | 0.00008130 |
| 28 | Yes | 17 | 0.00000001 | 0.00014012 |
| 29 | Yes | 17 | 0.00000001 | 0.00014459 |
| 30 | Yes | 15 | 0.00014039 | 0.00007718 |
| 31 | Yes | 17 | 0.00000001 | 0.00014393 |
| 32 | Yes | 17 | 0.00000001 | 0.00013543 |
| 33 | Yes | 15 | 0.00014040 | 0.00008484 |
| 34 | Yes | 17 | 0.00000001 | 0.00014706 |
| 35 | Yes | 17 | 0.00000001 | 0.00014287 |
| 36 | Yes | 15 | 0.00014040 | 0.00007844 |
| 37 | Yes | 17 | 0.00000001 | 0.00013680 |
| 38 | Yes | 17 | 0.00000001 | 0.00014502 |

Maximum Tower Deflections - Service Wind

| Section No. | Elevation ft | Horz. Deflection in | Gov. Load Comb. | Tilt ° | Twist ° |
|-------------|-----------------|---------------------------|-----------------------|-----------|------------|
| L1 | 148 - 117.25 | 37.688 | 35 | 2.2372 | 0.0026 |
| L2 | 120.75 - 97.25 | 25.324 | 35 | 2.0115 | 0.0019 |
| L3 | 97.25 - 80.75 | 16.397 | 35 | 1.5609 | 0.0011 |
| L4 | 85 - 40 | 12.618 | 35 | 1.3826 | 0.0009 |
| L5 | 45 - 13.25 | 3.606 | 35 | 0.7326 | 0.0004 |
| L6 | 13.25 - 12.75 | 0.311 | 35 | 0.2266 | 0.0001 |
| L7 | 12.75 - 5.3333 | 0.287 | 35 | 0.2183 | 0.0001 |
| L8 | 5.3333 - 4.75 | 0.049 | 35 | 0.0885 | 0.0000 |
| L9 | 4.75 - 0 | 0.039 | 35 | 0.0789 | 0.0000 |

Critical Deflections and Radius of Curvature - Service Wind

| Elevation ft | Appurtenance | Gov. Load Comb. | Deflection in | Tilt ° | Twist ° | Radius of Curvature ft |
|-----------------|-------------------------------------|-----------------------|------------------|-----------|------------|------------------------------|
| 150.00 | APXVSP18-C-A20 w/ Mount Pipe | 35 | 37.688 | 2.2372 | 0.0026 | 19595 |
| 140.00 | AM-X-CD-16-65-00T-RET w/ Mount Pipe | 35 | 33.947 | 2.1976 | 0.0024 | 12247 |
| 130.00 | (2) LPA-80080/6CF w/ Mount Pipe | 35 | 29.367 | 2.1251 | 0.0021 | 5442 |

Maximum Tower Deflections - Design Wind

| Section No. | Elevation ft | Horz. Deflection in | Gov. Load Comb. | Tilt ° | Twist ° |
|-------------|-----------------|---------------------------|-----------------------|-----------|------------|
| L1 | 148 - 117.25 | 96.112 | 10 | 5.7103 | 0.0068 |
| L2 | 120.75 - 97.25 | 64.627 | 10 | 5.1353 | 0.0047 |
| L3 | 97.25 - 80.75 | 41.867 | 10 | 3.9867 | 0.0027 |
| L4 | 85 - 40 | 32.226 | 10 | 3.5318 | 0.0022 |
| L5 | 45 - 13.25 | 9.215 | 10 | 1.8721 | 0.0010 |
| L6 | 13.25 - 12.75 | 0.794 | 10 | 0.5793 | 0.0003 |
| L7 | 12.75 - 5.3333 | 0.735 | 10 | 0.5580 | 0.0003 |
| L8 | 5.3333 - 4.75 | 0.126 | 10 | 0.2263 | 0.0001 |
| L9 | 4.75 - 0 | 0.100 | 10 | 0.2017 | 0.0001 |

Critical Deflections and Radius of Curvature - Design Wind

| Elevation ft | Appurtenance | Gov. Load Comb. | Deflection in | Tilt ° | Twist ° | Radius of Curvature ft |
|-----------------|-------------------------------------|-----------------------|------------------|-----------|------------|------------------------------|
| 150.00 | APXVSP18-C-A20 w/ Mount Pipe | 10 | 96.112 | 5.7103 | 0.0068 | 7829 |
| 140.00 | AM-X-CD-16-65-00T-RET w/ Mount Pipe | 10 | 86.587 | 5.6095 | 0.0062 | 4893 |
| 130.00 | (2) LPA-80080/6CF w/ Mount Pipe | 10 | 74.924 | 5.4248 | 0.0055 | 2172 |

Compression Checks

Pole Design Data

| Section No. | Elevation ft | Size | L ft | L_u ft | Kl/r | F_a ksi | A in^2 | Actual P K | Allow. P_a K | Ratio $\frac{P}{P_a}$ |
|-------------|-----------------------|-------------------------|---------|-------------|--------|--------------|-------------|---------------|-------------------|--------------------------|
| L1 | 148 - 117.25 (1) | TP27.227x22x0.1875 | 30.75 | 0.00 | 0.0 | 36.000 | 15.7378 | -7.02 | 566.56 | 0.012 |
| L2 | 117.25 - 97.25 (2) | TP30.2515x26.2571x0.25 | 23.50 | 0.00 | 0.0 | 36.000 | 23.8062 | -9.74 | 857.02 | 0.011 |
| L3 | 97.25 - 80.75 (3) | TP33.056x30.2515x0.443 | 16.50 | 0.00 | 0.0 | 34.290 | 44.8438 | -11.93 | 1537.69 | 0.008 |
| L4 | 80.75 - 40 (4) | TP39.483x31.4476x0.4385 | 45.00 | 0.00 | 0.0 | 34.578 | 53.0935 | -20.54 | 1835.87 | 0.011 |
| L5 | 40 - 13.25 (5) | TP43.4677x37.7133x0.450 | 31.75 | 0.00 | 0.0 | 34.728 | 61.4719 | -28.89 | 2134.80 | 0.014 |
| L6 | 13.25 - 12.75 (6) | TP43.5527x43.4677x0.451 | 0.50 | 0.00 | 0.0 | 34.332 | 61.7774 | -29.02 | 2120.94 | 0.014 |
| L7 | 12.75 - 5.3333 (7) | TP44.8134x43.5527x0.425 | 7.42 | 0.00 | 0.0 | 35.532 | 59.9377 | -30.82 | 2129.71 | 0.014 |
| L8 | 5.3333 - 4.75 (8) | TP44.9126x44.8134x0.446 | 0.58 | 0.00 | 0.0 | 34.368 | 63.0407 | -30.98 | 2166.58 | 0.014 |
| L9 | 4.75 - 0 (9) | TP45.72x44.9126x0.4425 | 4.75 | 0.00 | 0.0 | 34.776 | 63.5892 | -32.19 | 2211.38 | 0.015 |

Pole Bending Design Data

| Section No. | Elevation ft | Size | Actual M_x kip-ft | Actual f_{bx} ksi | Allow. F_{bx} ksi | Ratio $\frac{f_{bx}}{F_{bx}}$ | Actual M_y kip-ft | Actual f_{by} ksi | Allow. F_{by} ksi | Ratio $\frac{f_{by}}{F_{by}}$ |
|-------------|-----------------------|-------------------------|------------------------|------------------------|------------------------|----------------------------------|------------------------|------------------------|------------------------|----------------------------------|
| L1 | 148 - 117.25 (1) | TP27.227x22x0.1875 | 235.12 | 27.453 | 36.000 | 0.763 | 0.00 | 0.000 | 36.000 | 0.000 |
| L2 | 117.25 - 97.25 (2) | TP30.2515x26.2571x0.25 | 585.01 | 39.851 | 36.000 | 1.107 | 0.00 | 0.000 | 36.000 | 0.000 |
| L3 | 97.25 - 80.75 (3) | TP33.056x30.2515x0.443 | 782.17 | 26.757 | 34.290 | 0.780 | 0.00 | 0.000 | 34.290 | 0.000 |
| L4 | 80.75 - 40 (4) | TP39.483x31.4476x0.4385 | 1506.1 | 36.289 | 34.578 | 1.049 | 0.00 | 0.000 | 34.578 | 0.000 |
| L5 | 40 - 13.25 (5) | TP43.4677x37.7133x0.450 | 2156.9 | 39.769 | 34.728 | 1.145 | 0.00 | 0.000 | 34.728 | 0.000 |
| L6 | 13.25 - 12.75 (6) | TP43.5527x43.4677x0.451 | 2167.6 | 39.691 | 34.332 | 1.156 | 0.00 | 0.000 | 34.332 | 0.000 |
| L7 | 12.75 - 5.3333 (7) | TP44.8134x43.5527x0.425 | 2327.9 | 42.625 | 35.532 | 1.200 | 0.00 | 0.000 | 35.532 | 0.000 |
| L8 | 5.3333 - 4.75 (8) | TP44.9126x44.8134x0.446 | 2340.7 | 40.696 | 34.368 | 1.184 | 0.00 | 0.000 | 34.368 | 0.000 |
| L9 | 4.75 - 0 (9) | TP45.72x44.9126x0.4425 | 2445.1 | 41.379 | 34.776 | 1.190 | 0.00 | 0.000 | 34.776 | 0.000 |

Pole Shear Design Data

| Section No. | Elevation ft | Size | Actual V K | Actual f_v ksi | Allow. F_v ksi | Ratio $\frac{f_v}{F_v}$ | Actual T kip-ft | Actual f_{vt} ksi | Allow. F_{vt} ksi | Ratio $\frac{f_{vt}}{F_{vt}}$ |
|-------------|-----------------------|-------------------------|---------------|---------------------|---------------------|----------------------------|--------------------|------------------------|------------------------|----------------------------------|
| L1 | 148 - 117.25 (1) | TP27.227x22x0.1875 | 14.15 | 0.899 | 24.000 | 0.075 | 0.15 | 0.008 | 24.000 | 0.000 |
| L2 | 117.25 - 97.25 (2) | TP30.2515x26.2571x0.25 | 15.62 | 0.656 | 24.000 | 0.055 | 0.15 | 0.005 | 24.000 | 0.000 |
| L3 | 97.25 - 80.75 (3) | TP33.056x30.2515x0.443 | 16.59 | 0.370 | 22.860 | 0.032 | 0.15 | 0.002 | 22.860 | 0.000 |
| L4 | 80.75 - 40 (4) | TP39.483x31.4476x0.4385 | 19.51 | 0.368 | 23.052 | 0.032 | 0.15 | 0.002 | 23.052 | 0.000 |

| Section No. | Elevation ft | Size | Actual V K | Actual f_v ksi | Allow. F_v ksi | Ratio $\frac{f_v}{F_v}$ | Actual T kip-ft | Actual f_{vt} ksi | Allow. F_{vt} ksi | Ratio $\frac{f_{vt}}{F_{vt}}$ |
|-------------|--------------------|--------------------------|------------|------------------|------------------|-------------------------|-----------------|---------------------|---------------------|-------------------------------|
| L5 | 40 - 13.25 (5) | TP43.4677x37.7133x0.4502 | 21.41 | 0.348 | 23.152 | 0.030 | 0.15 | 0.001 | 23.152 | 0.000 |
| L6 | 13.25 - 12.75 (6) | TP43.5527x43.4677x0.4516 | 21.43 | 0.347 | 22.888 | 0.030 | 0.15 | 0.001 | 22.888 | 0.000 |
| L7 | 12.75 - 5.3333 (7) | TP44.8134x43.5527x0.4254 | 21.84 | 0.364 | 23.688 | 0.031 | 0.15 | 0.001 | 23.688 | 0.000 |
| L8 | 5.3333 - 4.75 (8) | TP44.9126x44.8134x0.4467 | 21.86 | 0.347 | 22.912 | 0.030 | 0.15 | 0.001 | 22.912 | 0.000 |
| L9 | 4.75 - 0 (9) | TP45.72x44.9126x0.4425 | 22.13 | 0.348 | 23.184 | 0.030 | 0.15 | 0.001 | 23.184 | 0.000 |

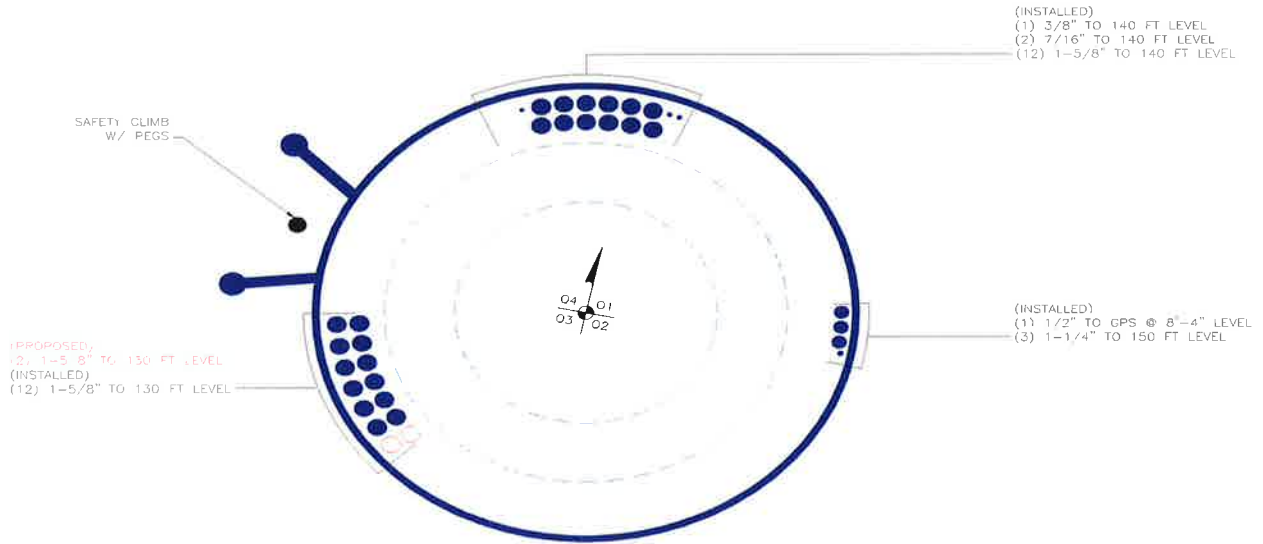
Pole Interaction Design Data

| Section No. | Elevation ft | Ratio P | Ratio f_{bx} | Ratio f_{by} | Ratio f_v | Ratio f_{vt} | Comb. Stress Ratio | Allow. Stress Ratio | Criteria |
|-------------|--------------------|---------|----------------|----------------|-------------|----------------|--------------------|---------------------|-----------|
| | | P_a | F_{bx} | F_{by} | F_v | F_{vt} | | | |
| L1 | 148 - 117.25 (1) | 0.012 | 0.763 | 0.000 | 0.075 | 0.000 | 0.776 | 1.333 | H1-3+VT ✓ |
| L2 | 117.25 - 97.25 (2) | 0.011 | 1.107 | 0.000 | 0.055 | 0.000 | 1.119 | 1.333 | H1-3+VT ✓ |
| L3 | 97.25 - 80.75 (3) | 0.008 | 0.780 | 0.000 | 0.032 | 0.000 | 0.788 | 1.333 | H1-3+VT ✓ |
| L4 | 80.75 - 40 (4) | 0.011 | 1.049 | 0.000 | 0.032 | 0.000 | 1.061 | 1.333 | H1-3+VT ✓ |
| L5 | 40 - 13.25 (5) | 0.014 | 1.145 | 0.000 | 0.030 | 0.000 | 1.159 | 1.333 | H1-3+VT ✓ |
| L6 | 13.25 - 12.75 (6) | 0.014 | 1.156 | 0.000 | 0.030 | 0.000 | 1.170 | 1.333 | H1-3+VT ✓ |
| L7 | 12.75 - 5.3333 (7) | 0.014 | 1.200 | 0.000 | 0.031 | 0.000 | 1.214 | 1.333 | H1-3+VT ✓ |
| L8 | 5.3333 - 4.75 (8) | 0.014 | 1.184 | 0.000 | 0.030 | 0.000 | 1.199 | 1.333 | H1-3+VT ✓ |
| L9 | 4.75 - 0 (9) | 0.015 | 1.190 | 0.000 | 0.030 | 0.000 | 1.205 | 1.333 | H1-3+VT ✓ |

Section Capacity Table

| Section No. | Elevation ft | Component Type | Size | Critical Element | P K | SF* P_{allow} K | % Capacity | Pass Fail | |
|-------------|----------------|----------------|--------------------------|------------------|--------|-------------------|-----------------|-------------|-------------|
| L1 | 148 - 117.25 | Pole | TP27.227x22x0.1875 | 1 | -7.02 | 755.23 | 58.2 | Pass | |
| L2 | 117.25 - 97.25 | Pole | TP30.2515x26.2571x0.25 | 2 | -9.74 | 1142.41 | 84.0 | Pass | |
| L3 | 97.25 - 80.75 | Pole | TP33.056x30.2515x0.443 | 3 | -11.93 | 2049.74 | 59.1 | Pass | |
| L4 | 80.75 - 40 | Pole | TP39.483x31.4476x0.4385 | 4 | -20.54 | 2447.21 | 79.6 | Pass | |
| L5 | 40 - 13.25 | Pole | TP43.4677x37.7133x0.4502 | 5 | -28.89 | 2845.69 | 86.9 | Pass | |
| L6 | 13.25 - 12.75 | Pole | TP43.5527x43.4677x0.4516 | 6 | -29.02 | 2827.21 | 87.8 | Pass | |
| L7 | 12.75 - 5.3333 | Pole | TP44.8134x43.5527x0.4254 | 7 | -30.82 | 2838.90 | 91.1 | Pass | |
| L8 | 5.3333 - 4.75 | Pole | TP44.9126x44.8134x0.4467 | 8 | -30.98 | 2888.05 | 89.9 | Pass | |
| L9 | 4.75 - 0 | Pole | TP45.72x44.9126x0.4425 | 9 | -32.19 | 2947.77 | 90.4 | Pass | |
| | | | | | | | Summary | | |
| | | | | | | | Pole (L7) | 91.1 | Pass |
| | | | | | | | RATING = | 91.1 | Pass |

APPENDIX B
BASE LEVEL DRAWING

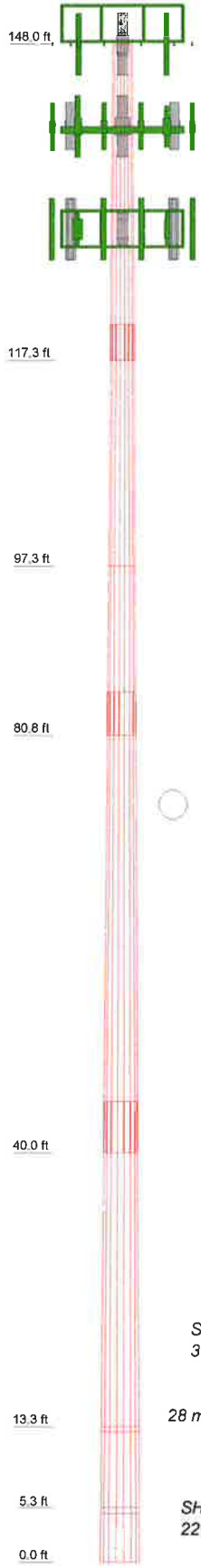


APPENDIX C

ADDITIONAL CALCULATIONS

Program Version 6.1.4.1 - 12/17/2013 File:G:/TOWER/375_Crown_Castle/2015/37515-2143_876377_HORTON 2 - FREDSELL
PRO/37515-2143.001.7805_SA_1079575/37515-2143.001.7805_Reinforced.eri

| Section | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|--------------------|---|---------|-----------------|-----------------|-----------------|-----------------|---------|
| Length (ft) | | 23.50 | 16.50 | 45.00 | 31.75 | 0.50 | 30.75 |
| Number of Sides | | 18 | 18 | 18 | 18 | 18 | 18 |
| Thickness (in) | | 0.2500 | 0.4430 | 0.4385 | 0.4502 | 0.4516 | 0.1875 |
| Socket Length (ft) | | | 4.25 | 5.00 | | | 3.50 |
| Top Dia (in) | | | 30.2514 | 31.4476 | 37.7133 | | 22.0000 |
| Bot Dia (in) | | | 33.0560 | 39.4830 | 43.4677 | | 27.2270 |
| Grade | | A607-60 | Reinf 57.15 ksi | Reinf 57.63 ksi | Reinf 57.88 ksi | Reinf 57.88 ksi | |
| Weight (K) | | 1.8 | 2.5 | 7.5 | 6.2 | 0.1 | 1.5 |



DESIGNED APPURTENANCE LOADING

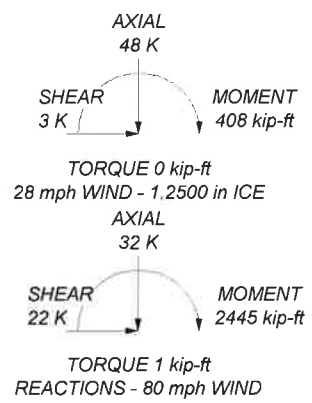
| TYPE | ELEVATION | TYPE | ELEVATION |
|-------------------------------------|-----------|--|-----------|
| APXVSP18-C-A20 w/ Mount Pipe | 150 | RRUS 11 B12 | 140 |
| APXVSP18-C-A20 w/ Mount Pipe | 150 | (2) LGP 17201 | 140 |
| APXVSP18-C-A20 w/ Mount Pipe | 150 | (2) LGP 17201 | 140 |
| (3) ACU-A20-N | 150 | (2) LGP 17201 | 140 |
| (3) ACU-A20-N | 150 | (2) LGP21901 | 140 |
| (3) ACU-A20-N | 150 | (2) LGP21901 | 140 |
| 800 EXTERNAL NOTCH FILTER | 150 | (2) LGP21901 | 140 |
| 800 EXTERNAL NOTCH FILTER | 150 | DC6-48-60-18-8F | 140 |
| 800 EXTERNAL NOTCH FILTER | 150 | T-Arm Mount [TA 602-3] | 140 |
| 800MHZ RRH | 150 | (2) LPA-80080/6CF w/ Mount Pipe | 130 |
| 800MHZ RRH | 150 | (2) LPA-80080/6CF w/ Mount Pipe | 130 |
| 800MHZ RRH | 150 | (2) LPA-80080-6CF-EDIN-6 w/ Mount Pipe | 130 |
| PCS 1900MHz 4x45W-65MHz | 150 | | |
| PCS 1900MHz 4x45W-65MHz | 150 | Platform Mount [LP 303-1] | 130 |
| PCS 1900MHz 4x45W-65MHz | 150 | (2) SBNHH-1D65B w/ Mount Pipe | 130 |
| Platform Mount [LP 713-1] | 150 | (2) SBNHH-1D65B w/ Mount Pipe | 130 |
| AM-X-CD-16-65-00T-RET w/ Mount Pipe | 140 | (2) SBNHH-1D65B w/ Mount Pipe | 130 |
| AM-X-CD-14-65-00T-RET w/ Mount Pipe | 140 | RRH2x60-700 | 130 |
| AM-X-CD-16-65-00T-RET w/ Mount Pipe | 140 | RRH2x60-700 | 130 |
| (2) 7770.00 w/ Mount Pipe | 140 | RRH2x60-AWS | 130 |
| (2) 7770.00 w/ Mount Pipe | 140 | RRH2x60-AWS | 130 |
| (2) 7770.00 w/ Mount Pipe | 140 | RRH2x60-AWS | 130 |
| RRUS 11 B12 | 140 | RRH2x60-PCS | 130 |
| RRUS 11 B12 | 140 | RRH2x60-PCS | 130 |
| | | DB-T1-6Z-8AB-0Z | 130 |

MATERIAL STRENGTH

| GRADE | Fy | Fu | GRADE | Fy | Fu |
|-----------------|--------|--------|-----------------|--------|--------|
| A607-60 | 60 ksi | 75 ksi | Reinf 57.22 ksi | 57 ksi | 72 ksi |
| Reinf 57.15 ksi | 57 ksi | 72 ksi | Reinf 59.22 ksi | 59 ksi | 75 ksi |
| Reinf 57.63 ksi | 58 ksi | 73 ksi | Reinf 57.28 ksi | 57 ksi | 72 ksi |
| Reinf 57.88 ksi | 58 ksi | 73 ksi | Reinf 57.96 ksi | 58 ksi | 73 ksi |

TOWER DESIGN NOTES

1. Tower is located in Litchfield County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 28 mph basic wind with 1.25 in ice.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 91.1%



Paul J Ford and Company
 250 E. Broad Street, Suite 600
 Columbus, OH 43215
 Phone: 614.221.6679
 FAX: 614.448.4105

Job: **148' Monopole / Horton 2 Fredsall Prope**
 Project: **PJF 37515-2143.001.7805 / BU 876377**
 Client: CCI
 Code: TIA/EIA-222-F
 Path:
 Drawn by: John J Woolley
 Date: 06/23/15
 App'd:
 Scale: NTS
 Dwg No: E-1

Square, Stiffened / Unstiffened Base Plate, Any Rod Material - Rev. F /G

- Assumptions: 1) Rod groups at corners. Total # rods divisible by 4. Maximum total # of rods = 48 (12 per Corner).
 2) Rod Spacing = Straight Center-to-Center distance between any (2) adjacent rods (same corner)
 3) Clear space between bottom of leveling nut and top of concrete not exceeding (1)*(Rod Diameter)

Site Data

| BU#: | | |
|--------------------|--------|------------------|
| Site Name: | | |
| App #: | | |
| Anchor Rod Data | | |
| Eta Factor, η | 0.5 | TIA G (Fig. 4-4) |
| Qty: | 12 | |
| Diam: | 2.25 | in |
| Rod Material: | A615-J | |
| Yield, F_y : | 75 | ksi |
| Strength, F_u : | 100 | ksi |
| Bolt Circle: | 52 | in |
| Anchor Spacing: | 6 | in |

Base Reactions

| | | |
|--------------------------|------|---------|
| TIA Revision: | G | |
| Factored Moment, M_u : | 2445 | ft-kips |
| Factored Axial, P_u : | 32 | kips |
| Factored Shear, V_u : | 22 | kips |

Anchor Rod Results

| | |
|---|-------------------|
| TIA G --> Max Rod ($C_u + V_u/\eta$): | 194.4 Kips |
| Axial Design Strength, $\Phi * F_u * A_{net}$: | 260.0 Kips |
| Anchor Rod Stress Ratio: | 74.8% Pass |

Plate Data

| | | |
|----------------|------|-----|
| W=Side: | 51 | in |
| Thick: | 2.75 | in |
| Grade: | 55 | ksi |
| Clip Distance: | | in |

Base Plate Results

| | |
|--|-------------------|
| Base Plate Stress: | 30.2 ksi |
| PL Design Bending Strength, $\Phi * F_y$: | 49.5 ksi |
| Base Plate Stress Ratio: | 61.0% Pass |

Flexural Check

PL Ref. Data

| | |
|------------------|-------|
| Yield Line (in): | 26.40 |
| Max PL Length: | 26.40 |

Stiffener Data (Welding at both sides)

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

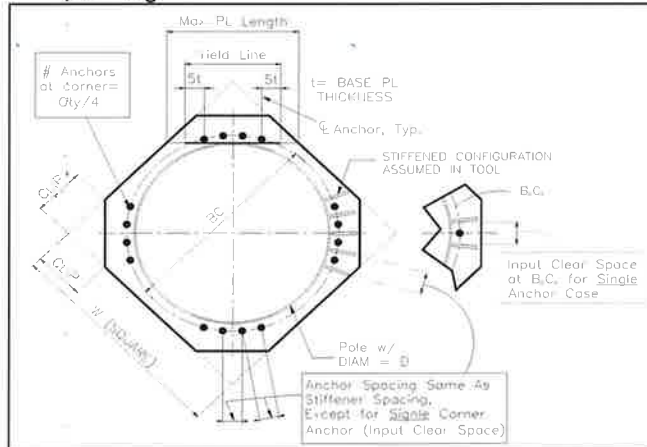
N/A - Unstiffened

Stiffener Results

| | |
|--|-----|
| Horizontal Weld : | N/A |
| Vertical Weld: | N/A |
| Plate Flex+Shear, $f_b/F_b + (f_v/F_v)^2$: | N/A |
| Plate Tension+Shear, $f_t/F_t + (f_v/F_v)^2$: | N/A |
| Plate Comp. (AISC Bracket): | N/A |

Pole Results

| | |
|----------------------------|-----|
| Pole Punching Shear Check: | N/A |
|----------------------------|-----|



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

DRILLED PIER SOIL AND STEEL ANALYSIS - TIA/EIA-222-F

Unfactored Base Reactions from RISA

| | | | |
|-----------------|-----------|-------------|---------------|
| | Comp. (+) | Tension (-) | |
| Moment, M = | 2200.0 | | k-ft |
| Shear, V = | 22.0 | | kips |
| Axial Load, P = | 32.0 | | kips |
| OTM = | 2211.0 | 0.0 | k-ft @ Ground |

Safety Factors / Load Factors / Φ Factors

| | |
|---------------------------|---------------|
| Tower Type = | Monopole DP |
| ACI Code = | ACI 318-02 |
| Seismic Design Category = | D |
| Reference Standard = | TIA/EIA-222-F |
| Use 1.3 Load Factor? | Yes |
| Load Factor = | 1.30 |

Drilled Pier Parameters

| | | |
|-----------------------|-------|-------|
| Diameter = | 6 | ft |
| Height Above Grade = | 0.5 | ft |
| Depth Below Grade = | 18.5 | ft |
| fc' = | 3 | ksi |
| ec = | 0.003 | in/in |
| Mat Fdn. Cap Width = | 10 | ft |
| Mat Fdn. Cap Length = | 10 | ft |
| Depth Below Grade = | 5 | ft |

| | | |
|------------------------------|---------------|---------------|
| | Safety Factor | Φ Factor |
| Soil Lateral Resistance = | 2.00 | 0.75 |
| Skin Friction = | 2.00 | 0.75 |
| End Bearing = | 2.00 | 0.75 |
| Concrete Wt. Resist Uplift = | 1.25 | |

Load Combinations Checked per TIA/EIA-222-F

- Ult. Skin Friction/2.00 + Ult. End Bearing/2.00 + Effective Soil Wt. - Buoyant Conc. Wt. \geq Comp.
- Ult. Skin Friction/2.00 + Buoyant Conc. Wt./1.25 \geq Uplift
- Ult. Skin Friction/1.50 + Buoyant Conc. Wt./1.50 \geq Uplift

Steel Parameters

| | | |
|----------------------------|-------|-----|
| Number of Bars = | 16 | |
| Rebar Size = | #11 | |
| Rebar Fy = | 60 | ksi |
| Rebar MOE = | 29000 | ksi |
| Tie Size = | #5 | |
| Side Clear Cover to Ties = | 3 | in |

Soil Parameters

| | | |
|--------------------------|--------|----|
| Water Table Depth = | 11.00 | ft |
| Depth to Ignore Soil = | 3.33 | ft |
| Depth to Full Cohesion = | 0 | ft |
| Full Cohesion Starts at? | Ground | |

Above Full Cohesion Lateral Resistance = 4(Cohesion)(Dia)(H)
 Below Full Cohesion Lateral Resistance = 8(Cohesion)(Dia)(H)

Direct Embed Pole Shaft Parameters

| | | |
|---------------------------|--|-----|
| Dia @ Grade = | | in |
| Dia @ Depth Below Grade = | | in |
| Number of Sides = | | |
| Thickness = | | in |
| Fy = | | ksi |
| Backfill Condition = | | |

Maximum Capacity Ratios

| | |
|-----------------------|--------|
| Maximum Soil Ratio = | 100.0% |
| Maximum Steel Ratio = | 100.0% |

Define Soil Layers

Note: Cohesion = Undrained Shear Strength = Unconfined Compressive Strength / 2

| Layer | Thickness ft | Unit Weight pcf | Cohesion psf | Friction Angle degrees | Soil Type | Ultimate End Bearing psf | Comp. Ult. Skin Friction psf | Tension Ult. Skin Friction psf | Depth ft |
|-------|--------------|-----------------|--------------|------------------------|-----------|--------------------------|------------------------------|--------------------------------|----------|
| 1 | 3 | 100 | 0 | 0 | Sand | | | | 3 |
| 2 | 8 | 140 | 0 | 38 | Sand | 8000 | | | 11 |
| 3 | 3 | 140 | 0 | 38 | Sand | 8000 | | | 14 |
| 4 | 4 | 160 | 0 | 40 | Sand | 12000 | | | 18 |
| 5 | 6 | 160 | 0 | 40 | Sand | 12000 | | | 24 |
| 6 | | | | | | | | | |
| 7 | | | | | | | | | |
| 8 | | | | | | | | | |
| 9 | | | | | | | | | |
| 10 | | | | | | | | | |
| 11 | | | | | | | | | |
| 12 | | | | | | | | | |

Soil Results: Overturning

| | | |
|------------------------|---------|----------------|
| Depth to COR = | 13.38 | ft, from Grade |
| Bending Moment, M = | 2505.26 | k-ft, from COR |
| Resisting Moment, Ma = | 2773.27 | k-ft, from COR |

MOMENT RATIO = 90.3% OK

| | | |
|-----------------------|-------|------|
| Shear, V = | 22.00 | kips |
| Resisting Shear, Va = | 24.35 | kips |

SHEAR RATIO = 90.3% OK

Soil Results: Uplift

| | | |
|-----------------------------|--------|------|
| Uplift, T = | 0.00 | kips |
| Allowable Uplift Cap., Ta = | 101.22 | kips |

UPLIFT RATIO = 0.0% OK

Soil Results: Compression

| | | |
|----------------------------|--------|------|
| Compression, C = | 32.00 | kips |
| Allowable Comp. Cap., Ca = | 430.78 | kips |

COMPRESSION RATIO = 7.4% OK

Steel Results (ACI 318-02):

| | | |
|----------------------|-------|-------|
| Minimum Steel Area = | 13.57 | sq in |
| Actual Steel Area = | 24.96 | sq in |

| | | |
|---------------------------|----------|-------------------------|
| Allowable Min Axial, Pa = | -1036.80 | kips, Where Ma = 0 k-ft |
| Allowable Max Axial, Pa = | 4726.51 | kips, Where Ma = 0 k-ft |

| | | |
|------------------------|---------|----------------------------|
| Axial Load, P = | 36.59 | kips @ 5.00 ft Below Grade |
| Moment, M = | 2287.42 | k-ft @ 5.00 ft Below Grade |
| Allowable Moment, Ma = | 2609.14 | k-ft |

MOMENT RATIO = 87.7% OK

Moment Capacity of Drilled Concrete Shaft (Caisson) for TIA Rev F or G

Note: Shaft assumed to have ties, not spiral, transverse reinforcing

Site Data

BU#: 876377
 Site Name: Horton 2 / Fredsall Property
 App #:

Enter Load Factors Below:

| | | |
|------------|-----|--------------------|
| For M (WL) | 1.3 | <---- Enter Factor |
| For P (DL) | 1.3 | <---- Enter Factor |

Pier Properties

Concrete:
 Pier Diameter = 6.0 ft
 Concrete Area = 4071.5 in²

Reinforcement:
 Clear Cover to Tie = 3.00 in
 Horiz. Tie Bar Size = 5
 Vert. Cage Diameter = 5.28 ft
 Vert. Cage Diameter = 63.34 in
Vertical Bar Size = 11
 Bar Diameter = 1.41 in
 Bar Area = 1.56 in²
 Number of Bars = 16
 As Total = 24.96 in²
 A s/ Aconc, Rho: 0.0061 0.61%

ACI 10.5 , ACI 21.10.4, and IBC 1810.
Min As for Flexural, Tension Controlled, Shafts:

$$(3) \cdot (\sqrt{f_c}) / F_y = 0.0027$$

$$200 / F_y = 0.0033$$

Minimum Rho Check:

| | | |
|------------------------|-------|-----------|
| Actual Req'd Min. Rho: | 0.33% | Flexural |
| Provided Rho: | 0.61% | OK |

| Ref. Shaft Max Axial Capacities, ϕ Max(Pn or Tn): | | |
|--|---------|---------|
| Max Pu = ($\phi=0.65$) Pn. | | |
| Pn per ACI 318 (10-2) | 6144.47 | kips |
| at Mu=($\phi=0.65$)Mn= | 3192.16 | ft-kips |
| | | |
| Max Tu, ($\phi=0.9$) Tn = | 1347.84 | kips |
| at Mu= $\phi(0.90)$ Mn= | 0.00 | ft-kips |

Maximum Shaft Superimposed Forces

| | | |
|-----------------------|---------|------------------|
| TIA Revision: | F | |
| Max. Service Shaft M: | 2287.42 | ft-kips (* Note) |
| Max. Service Shaft P: | 36.59 | kips |
| Max Axial Force Type: | Comp. | |

(* Note: Max Shaft Superimposed Moment does not necessarily equal to the shaft top reaction moment

| Load Factor | Shaft Factored Loads | |
|-------------|----------------------|---------|
| 1.30 | Mu: 2973.646 | ft-kips |
| 1.30 | Pu: 47.567 | kips |

Material Properties

| | | |
|--|---------|-----|
| Concrete Comp. strength, f'c = | 3000 | psi |
| Reinforcement yield strength, Fy = | 60 | ksi |
| Reinforcing Modulus of Elasticity, E = | 29000 | ksi |
| Reinforcement yield strain = | 0.00207 | |
| Limiting compressive strain = | 0.003 | |

ACI 318 Code

Select Analysis ACI Code = 2002

Seismic Properties

Seismic Design Category = D

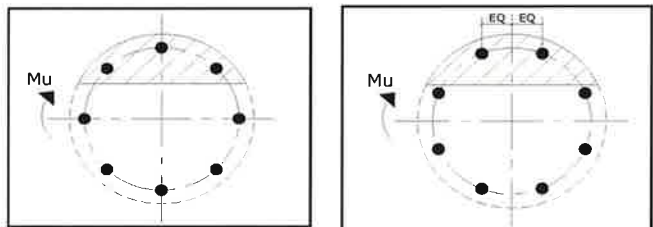
Seismic Risk = High

Solve
(Run)

<-- Press Upon Completing All Input

Results:

Governing Orientation Case: 2



Case 1

Case 2

Dist. From Edge to Neutral Axis: 12.23 in
 Extreme Steel Strain, ϵ_t : 0.0135

$\epsilon_t > 0.0050$, Tension Controlled

Reduction Factor, ϕ : 0.900

Output Note: Negative Pu=Tension

For Axial Compression, ϕ Pn = Pu: 47.57 kips
 Drilled Shaft Moment Capacity, ϕ Mn: 3391.87 ft-kips
 Drilled Shaft Superimposed Mu: 2973.65 ft-kips

| | |
|--|--------------|
| (Mu/ϕMn, Drilled Shaft Flexure CSR: | 87.7% |
|--|--------------|

foundation loads

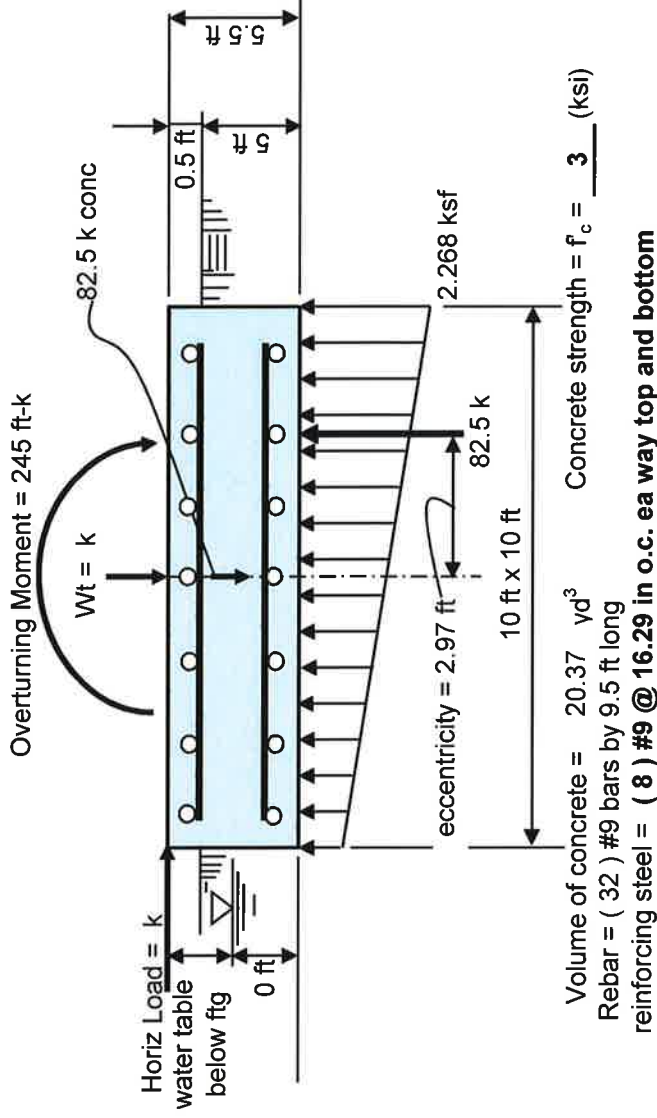
Tower or Pole Weight = 0 kips
 Total Horizontal Force = 0 kips
 Overturning Moment = 245 ft-kips

soil properties

Safety factor against overturning = 1.5
 Soil density = 140 pcf
 Allowable soil bearing = 4 ksf
 Depth to water table = 11 ft

mat dimensions

depth to bottom of footing = 5 ft
 Footing thickness = 5.5 ft
 Footing Width = 10 ft
 Footing Length = 10 ft
 Tower/Pole Center Offset = 0 ft



Summary of analysis results

Overturning Moment: (Stress Ratio = 0.891) < **CONTROLLING CRITERIA**

Calculated Overturning Moment = 245 ft-kips

Resisting Moment = 412.5 ft-kips

Factor of Safety against overturning = 1.684 > 1.5 okay

Soil Bearing

(Stress Ratio = 0.567)

Net Soil Bearing Resistance = 4 ksf

Calculated Soil Bearing Pressure = 2.268 ksf < 4 ksf okay

Bending Moment

(Stress Ratio = 0.067)

Ultimate Bending Moment Resistance = 2179 ft-kips

Calculated Ultimate Bending Moment = 146 ft-kips < 2179 ft-kips okay

Bending Shear

(Stress Ratio = 0.086)

Ultimate Bending Shear Resistance = 604 kips

Calculated Ultimate Bending Shear = 52 kips < 604 kips okay

Rebar strength = Fy = 60 (ksi)
 minimum cover over rebar = 3 inches