Robinson+Cole

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Also admitted in Massachusetts

October 27, 2015

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

Re: **Notice of Exempt Modification – Facility Modification**
130 Birdseye Road, Farmington, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) wireless telecommunications antennas at the 109-foot level of the existing 140-foot tower at 130 Birdseye Road in Farmington, Connecticut (the "Property"). The tower is owned by Crown Castle ("Crown"). The Council approved Cellco's use of the existing tower in 2005. Cellco now intends to modify its facility by replacing nine (9) of its existing antennas with three (3) model SBNHH-1D65B, 700 MHz antennas; three (3) model SBNHH-1D65B, 1900 MHz antennas; and three (3) model SBNHH-1D65B, 2100 MHz antennas, all at the same level on the tower. Cellco also intends to replace three (3) remote radio heads ("RRHs") and install six (6) new RRHs and two (2) HYBRIFLEX™ fiber optic 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 Kathleen A. Eagen, Town Manager for the Town of Farmington. A copy of this letter is also being sent to Global Signal Acquisitions II LLC, the owner of the Property and Crown, the tower owner.

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

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 109-foot level on the 140-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 modified facility will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. Far Field Approximation tables for each of Cellco's operating frequencies are included behind Attachment 2. The Far Field calculations demonstrate that Cellco's modified facility will operate well within the RF emissions standards established by the FCC.

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:
Kathleen A. Eagen, Farmington Town Manager
Global Signal Acquisitions II LLC
Crown Castle
Tim Parks

ATTACHMENT 1

Product Specifications

COMMSCOPE®

POWERED BY ANDREW.

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	1920–2200	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 (First Lobe), 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	1920–2200	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
Gain by Beam Tilt, average, dBi	0 ° | 14.6	0 ° | 14.5	0 ° | 17.4	0 ° | 17.8	0 ° | 18.1	0 ° | 18.2
	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, beampeak to 20° above beampeak, 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

Product Specifications

SBNHH-1D65B

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 km/h | 150 mph

Dimensions

Depth	180.0 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®

Packed Dimensions

Depth	299.0 mm | 11.8 in
Length	1970.0 mm | 77.6 in
Width	409.0 mm | 16.1 in
Shipping Weight	31.0 kg | 68.3 lb

Regulatory Compliance/Certifications

Agency	Classification
RoHS 2011/65/EU	Compliant by Exemption
China RoHS SJ/T 11364-2006	Above Maximum Concentration Value (MCV)
ISO 9001:2008	Designed, manufactured and/or distributed under this quality management system

Included Products

Product Specifications

SBNHH-1D65B

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.

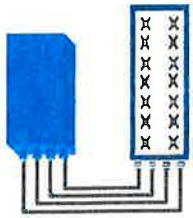
Its compactness and slim design makes the Alcatel-Lucent B13 RRH4x30-4R easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the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

Alcatel·Lucent

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.) Volume in L Weight in kg (lb) (w/o mounting HW)	550 x 305 x 230 (21.6" x 12.0" x 9") (with solar shield) 38 (with solar shield) 26 (57.2) (with solar shield)
DC voltage range DC power consumption	-40.5 to -57V at full performance, -38 to -57V with relaxation on power consumption 550W typical @100% RF load (in 2Tx or 4TX mode)
Environmental conditions Wind load (@150km/h or 93mph)	-40°C (-40°F) /+55°C (+131°F) 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

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	2 Branch RX – LA6.0.1
	1900A HW version	4 Branch RX – LR13.3
Features		AISG 2.0 for RET/TMA
		Internal Smart Bias-T
Power		-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)

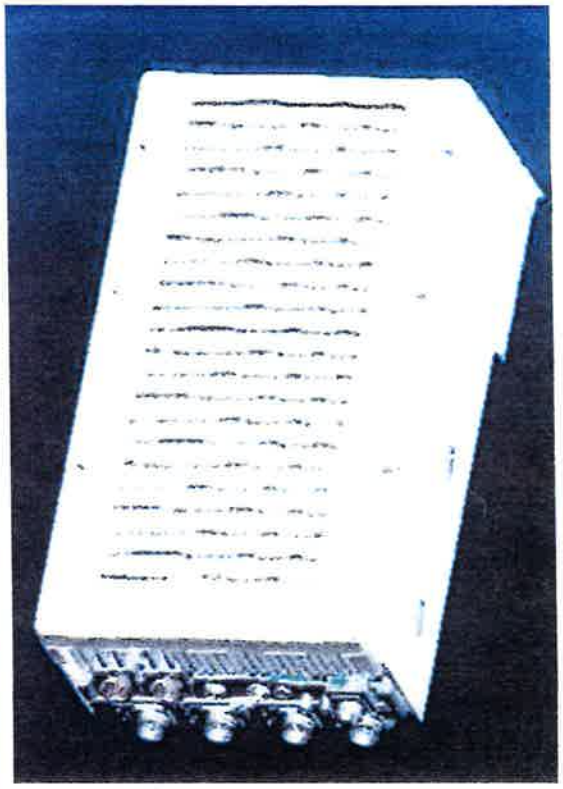
** Not a Verizon Wireless deployed product

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
CPRI Ports	2 CPRI 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.)

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.

SUPERIOR RF PERFORMANCE

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.

OPTIMIZED TCO

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.

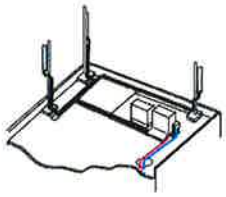
EASY INSTALLATION

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.

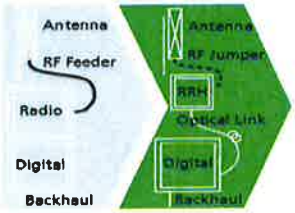
The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment. However, many of these sites can host an Alcatel-Lucent RRH2x60-AWS installation, providing more flexible site selection and improved network quality along with greatly reduced installation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

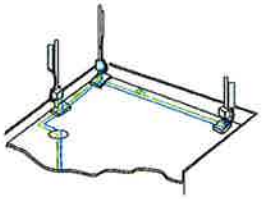
Installation can easily be done by a single person as the Alcatel–Lucent RRH2x60-AWS is compact and weighs about 20 kg, eliminating the need for a crane to hoist the BTS cabinet to the rooftop. A site can be in operation in less than one day.



Macro



RRH for space-constrained cell sites



Distributed

FEATURES

- 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

BENEFITS

- 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.

TECHNICAL SPECIFICATIONS

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 daisychaining 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)

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)

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

Alcatel·Lucent

AT THE SPEED OF IDEAS™

Product Data Sheet HB158-1-08U8-S8J18

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.

Figure 1: HYBRIFLEX Series

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

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, 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)
DC-Resistance Outer Conductor Armor		[Ω/km (Ω/1000ft)]	068 (0.205)
DC-Resistance Power Cable, 8.4mm² (8AWG)		[Ω/km (Ω/1000ft)]	2.1 (0.307)
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
Size (Power)		[mm² (AWG)]	8.4 (8)
Quantity, Wire Count (Power)			16 (8 pairs)
Size (Alarm)		[mm² (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-93-658 UL Type XHHW-2, UL 44 UL-LS Limited Smoke, UL VW-1 IEEE-383 (1974), IEEE1202/FT4 RoHS Compliant
Installation Temperature		[°C (°F)]	-40 to +65 (-40 to149)
Operation Temperature		[°C (°F)]	-40 to +65 (-40 to149)

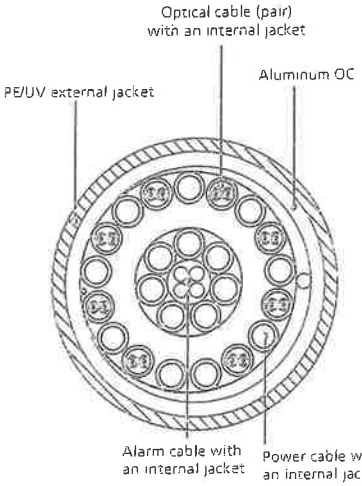


Figure 2: Construction Detail

* This data is provisional and subject to change

ATTACHMENT 2

Far Field Approximation
with downtilt variation

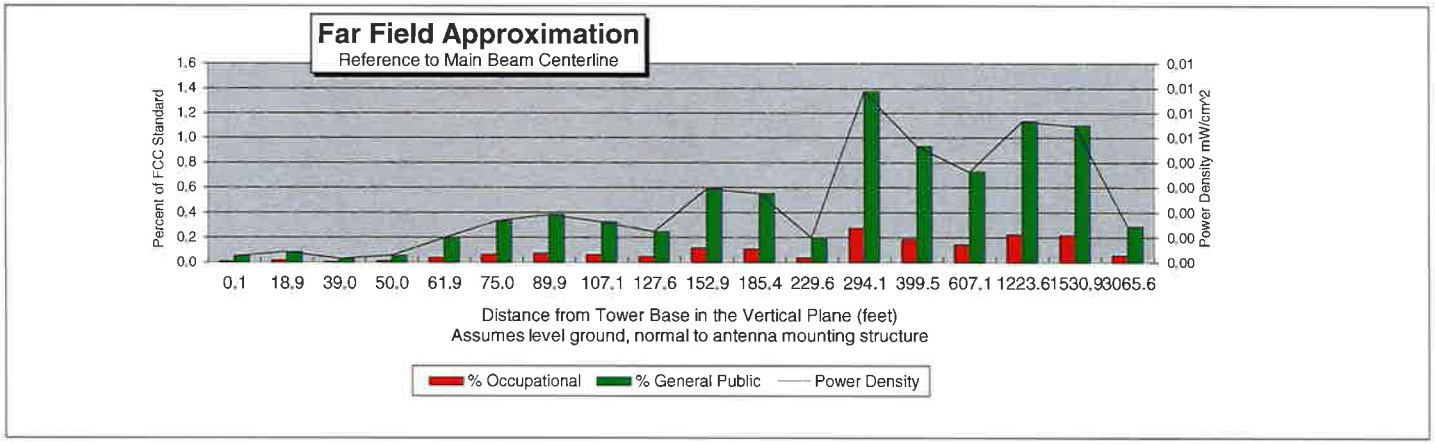
Estimated Radiated Emission

Single Emitter Far Field Model

Dipole / Wire/ Yagi Antenna Types

Location:	New Britain 5, CT
Site #:	8-0150
Date:	10/20/15
Name:	Mark Brauer
File Name:	New Britain 5, CT - FF Power

Operating Freq. (MHz)	**746.0**
Antenna Height (ft):	**110.0**
Antenna Gain (dBi):	**14.7**
Antenna Size (in.):	**72.0**
Downtilt (degrees):	**0.0**
Feedline Loss (dB):	**0.0**
Power @ J4 (w):	**2100.0**
Number of Channels	**1**



Distance in feet below:

Calc Angle	90.0	80.0	70.0	65.0	60.0	55.0	50.0	45.0	40.0	35.0	30.0	25.0	20.0	15.0	10.0	5.0	4.0	2.0	
Solve for r, dx to antenna	107.0	108.7	113.9	118.1	123.6	130.7	139.7	151.4	166.5	186.6	214.1	253.3	313.0	413.6	616.5	1228.3	1534.7	3067.5	
Distance from Antenna Structure Base in Horizontal plane	0.1	18.9	39.0	50.0	61.9	75.0	89.9	107.1	127.6	152.9	185.4	229.6	294.1	399.5	607.1	1223.6	1530.9	3065.6	
Angle from Main Beam (reference to horizontal plane)	90	80	70	65	60	55	50	45	40	35	30	25	20	15	10	5	4	2	
dB down from centerline (referenced to centerline)	36.76	34.35	38.52	35.34	29.54	26.8	25.59	25.63	25.99	21.21	20.29	23.24	13.03	12.3	9.92	2	0.2	0	
Reflection Coefficient (1 to 4, 2.56 typical)	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	
Power Density (mW/cm^2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.01	0.00	
Percent of Occupational Standard	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.3	0.2	0.1	0.2	0.2	0.1	
Percent of General Population Standard	0.1	0.1	0.0	0.1	0.2	0.3	0.4	0.3	0.2	0.6	0.6	0.2	1.4	0.9	0.7	1.1	1.1	0.3	

Antenna Type SBNHH-1D65B
Max% 1.38%

Instructions:

1) Fill in Site Location, Site number, Date, Name of Person Responsible for Date, and enter File Name to ba saved as.
2) References to J4 refer to a point where the transmission line exits the equipment shelter and proceeds to the antenna(s). There is typically a connector located here where power measurements are made.
3) Enter Antenna Height (in feet to bottom of antenna), Antenna Gain (expressed as dBi, add 2.17 to dBd to obtain dBi), Antenna Size (vertical size in inches), Downtilt (in Degrees, enter zero if none), Feedline loss from J4 to Antenna, and J4 Pov
4) From manufacturer's plots, or data sheet, input Angle from mainbeam and dB below mainbeam centerline.
5) Enter Reflection coefficient (2.56 would be typical, 1 for free space)
6) Spreadsheet calculates actual power density, then relates as Occupational or General Population percentage of FCC Standard.
7) An odd distance may be entered in the rightmost column of the lower table.

Far Field Approximation
with downtilt variation

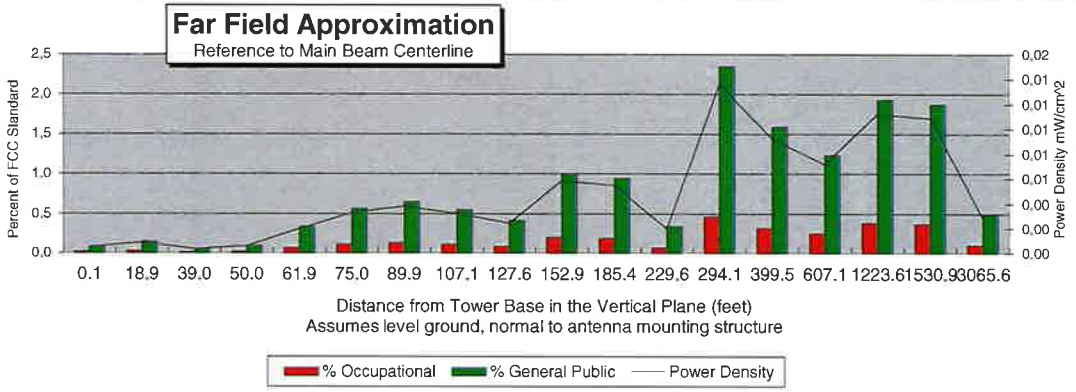
Estimated Radiated Emission

Single Emitter Far Field Model

Dipole / Wire/ Yagi Antenna Types

Location:	New Britain 5, CT
Site #:	8-0150
Date:	10/20/15
Name:	Mark Brauer
File Name:	New Britain 5, CT - FF Power

Operating Freq. (MHz)	**869.0**
Antenna Height (ft):	**110.0**
Antenna Gain (dBi):	**15.2**
Antenna Size (in.):	**48.0**
Downtilt (degrees):	**0.0**
Feedline Loss (dB):	**0.0**
Power @ J4 (w):	**3685.0**
Number of Channels	**9**



Distance in feet below:

Calc Angle	90.0	80.0	70.0	65.0	60.0	55.0	50.0	45.0	40.0	35.0	30.0	25.0	20.0	15.0	10.0	5.0	4.0	2.0	
Solve for r, dx to antenna	107.0	108.7	113.9	118.1	123.6	130.7	139.7	151.4	166.5	186.6	214.1	253.3	313.0	413.6	616.5	1228.3	1534.7	3067.5	
Distance from Antenna Structure Base in Horizontal plane	0.1	18.9	39.0	50.0	61.9	75.0	89.9	107.1	127.6	152.9	185.4	229.6	294.1	399.5	607.1	1223.6	1530.9	3065.6	
Angle from Main Beam (reference to horizontal plane)	90	80	70	65	60	55	50	45	40	35	30	25	20	15	10	5	4	2	
dB down from centerline (referenced to centerline)	36.76	34.35	38.52	35.34	29.54	26.8	25.59	25.63	25.99	21.21	20.29	23.24	13.03	12.3	9.92	2	0.2	0	
Reflection Coefficient (1 to 4, 2.56 typical)	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	
Power Density (mW/cm^2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.00	
Percent of Occupational Standard	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.5	0.3	0.2	0.4	0.4	0.1	
Percent of General Population Standard	0.1	0.1	0.1	0.1	0.3	0.6	0.7	0.6	0.4	1.0	0.9	0.3	2.3	1.6	1.2	1.9	1.9	0.5	

Antenna Type BXA-70063-4
Max% 2.35%

Instructions:

1) Fill in Site Location, Site number, Date, Name of Person Responsible for Date, and enter File Name to ba saved as.
2) References to J4 refer to a point where the transmission line exits the equipment shelter and proceeds to the antenna(s). There is typically a connector located here where power measurements are made.
3) Enter Antenna Height (in feet to bottom of antenna), Antenna Gain (expressed as dBi, add 2.17 to dBd to obtain dBi), Antenna Size (vertical size in inches), Downtilt (in Degrees, enter zero if none), Feedline loss from J4 to Antenna, and J4 Pov
4) From manufacturer's plots, or data sheet, input Angle from mainbeam and dB below mainbeam centerline.
5) Enter Reflection coefficient (2.56 would be typical, 1 for free space)
6) Spreadsheet calculates actual power density, then relates as Occupational or General Population percentage of FCC Standard.
7) An odd distance may be entered in the rightmost column of the lower table.

Far Field Approximation
with downtilt variation

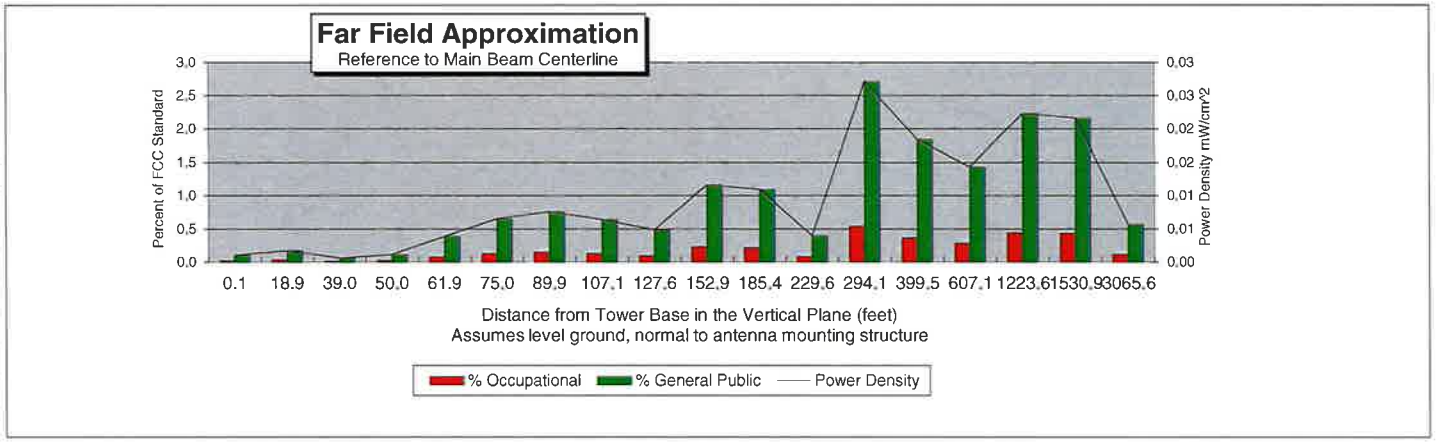
Estimated Radiated Emission

Single Emitter Far Field Model

Dipole / Wire/ Yagi Antenna Types

Location:	New Britain 5, CT
Site #:	
Date:	10/20/15
Name:	Mark Brauer
File Name:	New Britain 5, CT - FF Power

Operating Freq. (MHz)	**1970.0**
Antenna Height (ft):	**110.0**
Antenna Gain (dBi):	**18.4**
Antenna Size (in.):	**72.0**
Downtilt (degrees):	**0.0**
Feedline Loss (dB):	**0.0**
Power @ J4 (w):	**3500.0**
Number of Channels	**1**



Distance in feet below:

Calc Angle	90.0	80.0	70.0	65.0	60.0	55.0	50.0	45.0	40.0	35.0	30.0	25.0	20.0	15.0	10.0	5.0	4.0	2.0	
Solve for r, dx to antenna	107.0	108.7	113.9	118.1	123.6	130.7	139.7	151.4	166.5	186.6	214.1	253.3	313.0	413.6	616.5	1228.3	1534.7	3067.5	
Distance from Antenna Structure Base in Horizontal plane	0.1	18.9	39.0	50.0	61.9	75.0	89.9	107.1	127.6	152.9	185.4	229.6	294.1	399.5	607.1	1223.6	1530.9	3065.6	
Angle from Main Beam (reference to horizontal plane)	90	80	70	65	60	55	50	45	40	35	30	25	20	15	10	5	4	2	
dB down from centerline (referenced to centerline)	36.76	34.35	38.52	35.34	29.54	26.8	25.59	25.63	25.99	21.21	20.29	23.24	13.03	12.3	9.92	2	0.2	0	
Reflection Coefficient (1 to 4, 2.56 typical)	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	
Power Density (mW/cm^2)	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.01	0.01	0.00	0.03	0.02	0.01	0.02	0.02	0.01	
Percent of Occupational Standard	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.1	0.5	0.4	0.3	0.4	0.4	0.1	
Percent of General Population Standard	0.1	0.2	0.1	0.1	0.4	0.7	0.8	0.6	0.5	1.2	1.1	0.4	2.7	1.8	1.4	2.2	2.2	0.6	

Antenna Type SBNHH-1D65B
Max% 2.71%

Instructions:

1) Fill in Site Location, Site number, Date, Name of Person Responsible for Date, and enter File Name to ba saved as.
2) References to J4 refer to a point where the transmission line exits the equipment shelter and proceeds to the antenna(s). There is typically a connector located here where power measurements are made.
3) Enter Antenna Height (in feet to bottom of antenna), Antenna Gain (expressed as dBi, add 2.17 to dBd to obtain dBi), Antenna Size (vertical size in inches), Downtilt (in Degrees, enter zero if none), Feedline loss from J4 to Antenna, and J4 Pov
4) From manufacturer's plots, or data sheet, input Angle from mainbeam and dB below mainbeam centerline.
5) Enter Reflection coefficient (2.56 would be typical, 1 for free space)
6) Spreadsheet calculates actual power density, then relates as Occupational or General Population percentage of FCC Standard.
7) An odd distance may be entered in the rightmost column of the lower table.

Far Field Approximation
with downtilt variation

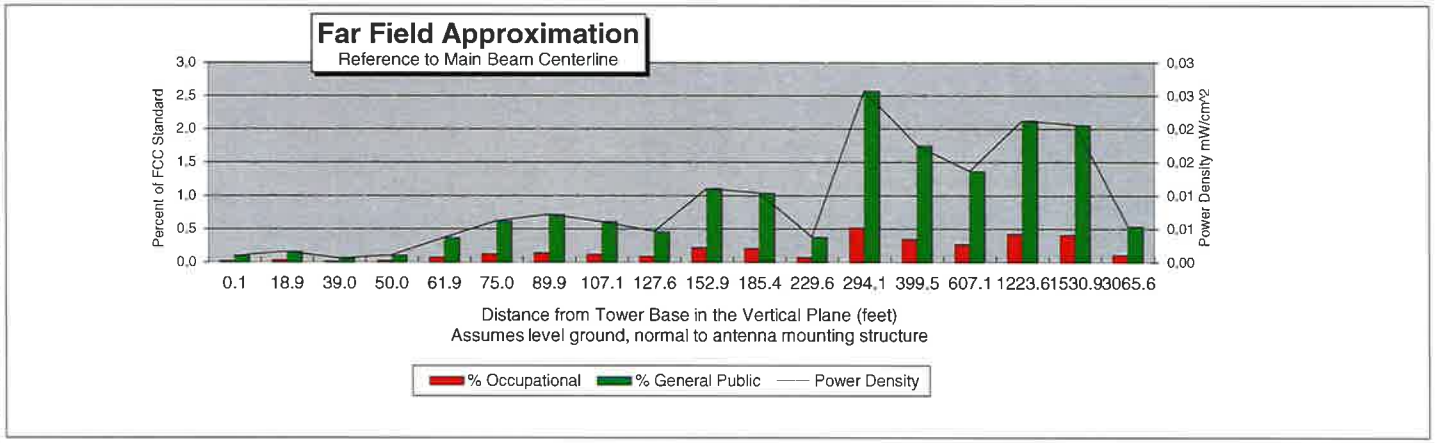
Estimated Radiated Emission

Single Emitter Far Field Model

Dipole / Wire/ Yagi Antenna Types

Location:	New Britain 5, CT
Site #:	8-0150
Date:	10/20/15
Name:	Mark Brauer
File Name:	New Britain 5, CT - FF Power

Operating Freq. (MHz)	**2110.0**
Antenna Height (ft):	**110.0**
Antenna Gain (dBi):	**18.2**
Antenna Size (in.):	**72.0**
Downtilt (degrees):	**0.0**
Feedline Loss (dB):	**0.0**
Power @ J4 (w):	**3500.0**
Number of Channels	**1**



Distance in feet below:

Calc Angle	90.0	80.0	70.0	65.0	60.0	55.0	50.0	45.0	40.0	35.0	30.0	25.0	20.0	15.0	10.0	5.0	4.0	2.0	
Solve for r, dx to antenna	107.0	108.7	113.9	118.1	123.6	130.7	139.7	151.4	166.5	186.6	214.1	253.3	313.0	413.6	616.5	1228.3	1534.7	3067.5	
Distance from Antenna Structure Base in Horizontal plane	0.1	18.9	39.0	50.0	61.9	75.0	89.9	107.1	127.6	152.9	185.4	229.6	294.1	399.5	607.1	1223.6	1530.9	3065.6	
Angle from Main Beam (reference to horizontal plane)	90	80	70	65	60	55	50	45	40	35	30	25	20	15	10	5	4	2	
dB down from centerline (referenced to centerline)	36.76	34.35	38.52	35.34	29.54	26.8	25.59	25.63	25.99	21.21	20.29	23.24	13.03	12.3	9.92	2	0.2	0	
Reflection Coefficient (1 to 4, 2.56 typical)	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	
Power Density (mW/cm^2)	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.01	0.01	0.00	0.03	0.02	0.01	0.02	0.02	0.01	
Percent of Occupational Standard	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.5	0.3	0.3	0.4	0.4	0.1	
Percent of General Population Standard	0.1	0.2	0.1	0.1	0.4	0.6	0.7	0.6	0.5	1.1	1.0	0.4	2.6	1.7	1.4	2.1	2.1	0.5	

Antenna Type SBNHH-1D65B
Max% 2.58%

Instructions:

1) Fill in Site Location, Site number, Date, Name of Person Responsible for Date, and enter File Name to ba saved as.
2) References to J4 refer to a point where the transmission line exits the equipment shelter and proceeds to the antenna(s). There is typically a connector located here where power measurements are made.
3) Enter Antenna Height (in feet to bottom of antenna), Antenna Gain (expressed as dBi, add 2.17 to dBd to obtain dBi), Antenna Size (vertical size in inches), Downtilt (in Degrees, enter zero if none), Feedline loss from J4 to Antenna, and J4 Pov
4) From manufacturer's plots, or data sheet, input Angle from mainbeam and dB below mainbeam centerline.
5) Enter Reflection coefficient (2.56 would be typical, 1 for free space)
6) Spreadsheet calculates actual power density, then relates as Occupational or General Population percentage of FCC Standard.
7) An odd distance may be entered in the rightmost column of the lower table.

ATTACHMENT 3

Date: **September 14, 2015**

Darcy Tarr
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277

Velocitel, Inc., d.b.a. FDH Velocitel
6521 Meridien Drive, Suite 107
Raleigh, North Carolina 27616
(919) 755-1012

Subject: Structural Analysis Report

Carrier Designation:	***Verizon Wireless* Co-Locate**	
	Carrier Site Name:	New Britain 5 CT
Crown Castle Designation:	**Crown Castle BU Number:**	876335
	Crown Castle Site Name:	EAST FARMINGTON
	Crown Castle JDE Job Number:	344848
	Crown Castle Work Order Number:	1118722
	Crown Castle Application Number:	308873 Rev. 6
Engineering Firm Designation:	**FDH Velocitel Project Number:**	15BZUJ1400
Site Data:	**3 A Birdseye Road, Farmington, Hartford County, CT**	
	Latitude *41° 42' 56.94"*, Longitude *-72° 48' 37.42"*	
	140 Foot - Monopole Tower	

Dear Darcy Tarr,

FDH Velocitel 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 824954, in accordance with application 308873, revision 6.

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

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

The analysis has been performed in accordance with the TIA/EIA-222-F and the 2005 Connecticut State Building Code based upon a wind speed of 80 mph fastest mile.

We at *FDH Velocitel* 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:

Brian Apple, EI
Project Engineer I

Reviewed by:

Dennis D. Abel, PE
Director of Structural Engineering
CT PE License No. 23247

09-14-2015

tnxTower Report - version 6.1.4.1

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 140 ft Monopole tower designed by SUMMIT in November of 1997. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F. The tower has been modified multiple times in the past to accommodate additional loading.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements 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, 38 mph with 1 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
108.0	109.0	9	andrew	SBNHH-1D65B w/ Mount Pipe	1	1-5/8	--
		3	alcatel lucent	RRH2X60-PCS			
		3	alcatel lucent	RRH2X60-700			
		3	alcatel lucent	RRH4X45-AWS4 B66			
		2	rfs celwave	DB-T1-6Z-8AB-0Z			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
139.0	139.0	3	rfs celwave	APXV9ERR18-C-A20 w/ Mount Pipe	4	1-1/4	1
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe			
		3	alcatel lucent	TD-RRH8x20-25			
		1	crown mounts	Platform Mount [LP 1201-1]			
137.0	140.0	3	alcatel lucent	800MHz 2X50W RRH W/FILTER	--	--	1
	137.0	3	alcatel lucent	PCS 1900MHz 4x45W-65MHz			
		1	crown mounts	Side Arm Mount [SO 102-3]			
129.0	130.0	3	ericsson	RRUS-11	--	--	1
	129.0	1	crown mounts	Side Arm Mount [SO 102-3]			
128.0	130.0	1	andrew	SBNH-1D6565C w/ Mount Pipe	1 2 9	3/8 3/4 7/8	1
		3	ericsson	RRUS-11			
		2	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe			
		3	powerwave technologies	7770.00 w/ Mount Pipe			
		1	raycap	DC6-48-60-18-8F			
	128.0	6	powerwave technologies	LGP21401			
		1	crown mounts	T-Arm Mount [TA 602-3]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
120.0	120.0	12	swedcom	ALP 9212-N w/ Mount Pipe	2 12	1/2 7/8	3
		1	crown mounts	Platform Mount [LP 1201-1]			
110.0	110.0	1	raycap	TME-DB-T16Z-8AB-0Z	--	--	3
		1	crown mounts	Side Arm Mount [SO 102-1]			
108.0	109.0	3	antel	BXA-185060/8CFx2 w/ Mount Pipe	--	--	3
		1	kathrein	800 10735V01 w/ Mount Pipe			
		3	antel	BXA-171063-12CF-EDIN-2 w/ Mount Pipe			
		3	antel	BXA-70063-4CF-EDIN-X w/Mount Pipe			
		2	antel	BXA-70063-6CF-EDIN-4 w/Mount Pipe			
		6	rfs celwave	FD9R6004/2C-3L			
		3	alcatel lucent	RRH2x40-AWS			
		3	antel	BXA-70063-4CF-EDIN-X w/ Mount Pipe	13	1-5/8	1
	108.0	1	crown mounts	Platform Mount [LP 304-1]			
100.0	100.0	3	commscope	LNX-6515DS-VTM w/ Mount Pipe	--	--	2
		3	ericsson	RRUS 11 B12			
		3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	12 1	7/8 1-5/8	1
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe			
		3	ericsson	KRY 112 144/1			
		1	crown mounts	T-Arm Mount [TA 602-3]			
90.0	90.0	1	crown mounts	Pipe Mount [PM 601-3]	-	-	1
70.0	72.0	2	lucent	KS24019-L112A	2	5/16	1
	70.0	2	crown mounts	Side Arm Mount [SO 701-1]			
49.0	51.0	1	lucent	KS24019-L112A	1	1/2	1
	49.0	1	crown mounts	Side Arm Mount [SO 701-1]			

Notes:
1) Existing Equipment
2) Reserved Equipment
3) Equipment to be Removed, Not Considered in this Analysis

Table 3 - Design 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)
UNKNOWN						

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH Engineering, Inc.	1531892	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Paul J. Ford & Company	1440555	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Summit Manufacturing, Inc.	1615361	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	B+T Group	2397525	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	B+T Group	3262310	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	B+T Group	3672042	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	B+T Group	4456376	CCISITES
4-POST-MODIFICATION INSPECTION	Tower Engineering Professionals	1397390	CCISITES
4-POST-MODIFICATION INSPECTION	B+T Group	2397526	CCISITES
4-POST-MODIFICATION INSPECTION	Tower Engineering Professionals	3412577	CCISITES
4-POST-MODIFICATION INSPECTION	Tower Engineering Professionals	3413367	CCISITES
4-POST-MODIFICATION INSPECTION	Tower Engineering Professionals	4836319	CCISITES
4-POST-MODIFICATION INSPECTION	Tower Engineering Professionals	4836434	CCISITES
4-POST-MODIFICATION INSPECTION	Tower Engineering Professionals	5400317	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) When applicable, transmission cables are considered as structural components for calculating winds loads as allowed by TIA/EIA-222-F.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
L1	140 - 135	Pole	TP17.025x16x0.25	Pole	10.1%	Pass
L2	135 - 130	Pole	TP18.05x17.025x0.25	Pole	19.8%	Pass
L3	130 - 125	Pole	TP19.075x18.05x0.25	Pole	33.7%	Pass
L4	125 - 120	Pole	TP20.099x19.075x0.25	Pole	45.8%	Pass
L5	120 - 115	Pole	TP21.124x20.099x0.25	Pole	55.9%	Pass
L6	115 - 110	Pole	TP22.149x21.124x0.25	Pole	64.5%	Pass
L7	110 - 105	Pole	TP23.174x22.149x0.25	Pole	77.1%	Pass
L8	105 - 102.33	Pole	TP23.721x23.174x0.25	Pole	83.6%	Pass
L9	102.33 - 102.08	Pole + Reinf.	TP23.772x23.721x0.3875	Reinf. 7 Tension Rupture	61.4%	Pass
L10	102.08 - 97.08	Pole + Reinf.	TP24.797x23.772x0.375	Reinf. 7 Tension Rupture	72.2%	Pass
L11	97.08 - 95	Pole + Reinf.	TP25.89x24.797x0.375	Reinf. 7 Tension Rupture	76.8%	Pass
L12	95 - 90.75	Pole + Reinf.	TP25.595x24.724x0.3563	Pole	84.6%	Pass
L13	90.75 - 85.75	Pole + Reinf.	TP26.62x25.595x0.3563	Pole	92.9%	Pass
L14	85.75 - 85.33	Pole + Reinf.	TP26.706x26.62x0.3563	Pole	93.5%	Pass
L15	85.33 - 85.08	Pole + Reinf.	TP26.758x26.706x0.4875	Pole	69.7%	Pass
L16	85.08 - 82.5	Pole + Reinf.	TP27.287x26.758x0.4875	Pole	72.9%	Pass
L17	82.5 - 82.25	Pole + Reinf.	TP27.338x27.287x0.4938	Reinf. 6 Tension Rupture	83.1%	Pass
L18	82.25 - 77.15	Pole + Reinf.	TP28.383x27.337x0.475	Pole	79.3%	Pass
L19	77.15 - 76.92	Pole + Reinf.	TP28.431x28.383x0.475	Pole	79.5%	Pass
L20	76.92 - 71.92	Pole + Reinf.	TP29.457x28.431x0.475	Pole	84.8%	Pass
L21	71.92 - 66.92	Pole + Reinf.	TP30.482x29.457x0.4625	Pole	89.7%	Pass
L22	66.92 - 66.67	Pole + Reinf.	TP30.534x30.482x0.4625	Pole	90.0%	Pass
L23	66.67 - 66.42	Pole + Reinf.	TP30.585x30.534x0.5125	Reinf. 4 Tension Rupture	85.9%	Pass
L24	66.42 - 61.42	Pole + Reinf.	TP31.61x30.585x0.5125	Reinf. 4 Tension Rupture	90.4%	Pass
L25	61.42 - 60	Pole + Reinf.	TP31.901x31.61x0.5063	Reinf. 4 Tension Rupture	91.6%	Pass
L26	60 - 59.75	Pole + Reinf.	TP31.952x31.901x0.5125	Reinf. 4 Tension Rupture	84.6%	Pass
L27	59.75 - 54.75	Pole + Reinf.	TP32.978x31.952x0.5125	Reinf. 4 Tension Rupture	88.5%	Pass
L28	54.75 - 51	Pole + Reinf.	TP34.67x32.978x0.5063	Reinf. 4 Tension Rupture	91.2%	Pass
L29	51 - 45.5	Pole + Reinf.	TP34.25x33.122x0.95	Reinf. 4 Tension Rupture	57.3%	Pass
L30	45.5 - 44.25	Pole + Reinf.	TP34.506x34.25x0.95	Reinf. 4 Tension Rupture	57.7%	Pass
L31	44.25 - 44	Pole + Reinf.	TP34.557x34.506x1.1	Reinf. 9 Bolt Shear	53.0%	Pass
L32	44 - 39	Pole + Reinf.	TP35.583x34.557x1.075	Reinf. 9 Compression	53.7%	Pass
L33	39 - 34	Pole + Reinf.	TP36.608x35.583x1.075	Reinf. 9 Compression	55.2%	Pass
L34	34 - 29	Pole + Reinf.	TP37.633x36.608x1.05	Reinf. 9 Compression	56.5%	Pass
L35	29 - 27.75	Pole + Reinf.	TP37.89x37.633x1.05	Reinf. 9 Compression	56.8%	Pass
L36	27.75 - 27.5	Pole + Reinf.	TP37.941x37.89x1.075	Reinf. 9 Compression	56.8%	Pass
L37	27.5 - 24.08	Pole + Reinf.	TP38.642x37.941x1.05	Reinf. 9 Bolt Shear	58.6%	Pass
L38	24.08 - 23.83	Pole + Reinf.	TP38.693x38.642x0.9375	Reinf. 2 Tension Rupture	59.7%	Pass
L39	23.83 - 18.83	Pole + Reinf.	TP39.718x38.693x0.925	Reinf. 2 Tension Rupture	60.7%	Pass
L40	18.83 - 18.08	Pole + Reinf.	TP39.872x39.718x0.925	Reinf. 2 Tension Rupture	60.8%	Pass
L41	18.08 - 17.83	Pole + Reinf.	TP39.923x39.872x1.05	Reinf. 1 Tension Rupture	59.6%	Pass
L42	17.83 - 12.83	Pole + Reinf.	TP40.948x39.923x1.0375	Reinf. 1 Tension Rupture	60.5%	Pass
L43	12.83 - 7.83	Pole + Reinf.	TP41.974x40.948x1.025	Reinf. 1 Tension Rupture	61.4%	Pass
L44	7.83 - 2.83	Pole + Reinf.	TP42.999x41.974x1.025	Reinf. 1 Tension Rupture	62.2%	Pass
L45	2.83 - 0	Pole + Reinf.	TP43.58x42.999x1.025	Reinf. 1 Tension Rupture	62.7%	Pass
					Summary	
				Pole	93.5%	Pass
				Reinforcement	91.6%	Pass
				Overall	93.5%	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	98.2	Pass
1	Base Plate	0	95.9	Pass
1	Base Transfer Stiffeners	0	80.4	Pass
1	Base Foundation	0	87.1	Pass

Structure Rating (max from all components) =	98.2%

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

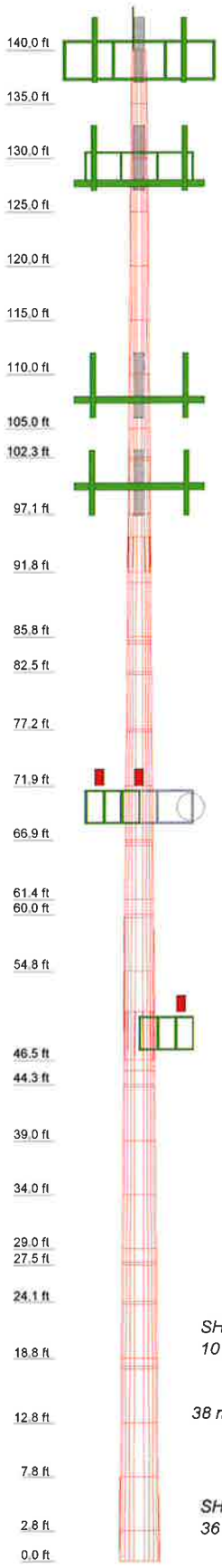
4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT

Section	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
Length (ft)	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	4.25	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.508.25	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	2.83
Number of Sides	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Thickness (in)	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.375	0.375	0.375	0.375	0.375	0.375	0.375	0.375	0.375	0.375	0.375	0.375	0.375	0.375	0.375	0.375	0.506	0.512	0.475	0.475	0.475	0.463	0.463	0.463	0.463	1.075	1.050	1.050	1.038	0.925	1.025	1.025	1.025	1.025	1.025	1.025	1.025	1.025
Socket Length (ft)																										4.50																							
Top Dia (in)	16.000	17.025	18.050	19.075	20.099	21.124	22.149	23.174	24.199	25.223	26.248	27.273	28.298	29.322	30.347	31.372	32.396	33.421	34.446	35.471	36.495	37.520	38.545	39.569	40.594	41.619	42.644	43.668	44.693	45.718	46.743	47.767	48.792	49.817	50.842	51.866	52.891	53.916	54.941	55.965	56.990	58.015	59.040	60.064	61.089	62.114	63.139
Bot Dia (in)	17.025	18.050	19.075	20.099	21.124	22.149	23.174	24.199	25.223	26.248	27.273	28.298	29.322	30.347	31.372	32.396	33.421	34.446	35.471	36.495	37.520	38.545	39.569	40.594	41.619	42.644	43.668	44.693	45.718	46.743	47.767	48.792	49.817	50.842	51.866	52.891	53.916	54.941	55.965	56.990	58.015	59.040	60.064	61.089	62.114	63.139	64.163
Grade	A607-60																									A607-65																						
Weight (K)	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.5	0.5	0.5	0.6	0.0	0.0	0.9	0.9	0.9	0.8	0.2	0.9	1.6	1.9	1.9	2.0	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.3	2.4	2.4	2.5	2.5	2.6	2.6	2.7	2.7	2.8	2.8	2.9	2.9	3.0	1.3



AXIAL
69 K

SHEAR
10 K

MOMENT
951 kip-ft

TORQUE 0 kip-ft
38 mph WIND - 1.000 in ICE

AXIAL
46 K

SHEAR
36 K

MOMENT
3219 kip-ft

TORQUE 2 kip-ft
REACTIONS - 80 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod	140	RRH2X60-PCS	108
APXV9ERR18-C-A20	139	RRH2X60-PCS	108
APXV9ERR18-C-A20	139	RRH2x60-700	108
APXV9ERR18-C-A20	139	RRH2x60-700	108
APXVTM14-C-120	139	RRH2x60-700	108
APXVTM14-C-120	139	RRH4X45-AWS4 B66	108
APXVTM14-C-120	139	RRH4X45-AWS4 B66	108
TD-RRH8x20-25	139	RRH4X45-AWS4 B66	108
TD-RRH8x20-25	139	(2) DB-T1-6Z-8AB-0Z	108
TD-RRH8x20-25	139	BXA-70063-4CF-EDIN-X w/ Mount Pipe	108
Platform Mount [LP 1201-1]	139	BXA-70063-4CF-EDIN-X w/ Mount Pipe	108
Miscellaneous [NA 510-3]	139	BXA-70063-4CF-EDIN-X w/ Mount Pipe	108
PCS 1900MHz 4x45W-65MHz	137	Platform Mount [LP 304-1]	108
PCS 1900MHz 4x45W-65MHz	137	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	100
PCS 1900MHz 4x45W-65MHz	137	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	100
800MHz 2X50W RRH W/FILTER	137	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	100
800MHz 2X50W RRH W/FILTER	137	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	100
800MHz 2X50W RRH W/FILTER	137	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	100
Side Arm Mount [SO 102-3]	137	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	100
RRUS-11	129	LNX-6515DS-VTM w/ Mount Pipe	100
RRUS-11	129	LNX-6515DS-VTM w/ Mount Pipe	100
RRUS-11	129	LNX-6515DS-VTM w/ Mount Pipe	100
Side Arm Mount [SO 102-3]	129	RRUS 11 B12	100
7770.00 w/ Mount Pipe	128	RRUS 11 B12	100
7770.00 w/ Mount Pipe	128	RRUS 11 B12	100
7770.00 w/ Mount Pipe	128	KRY 112 144/1	100
SBNH-1D6565C w/ Mount Pipe	128	KRY 112 144/1	100
AM-X-CD-16-65-00T-RET w/ Mount Pipe	128	KRY 112 144/1	100
AM-X-CD-16-65-00T-RET w/ Mount Pipe	128	T-Arm Mount [TA 602-3]	100
RRUS-11	128	Pipe Mount [PM 601-3]	90
RRUS-11	128	KS24019-L112A	70
RRUS-11	128	Side Arm Mount [SO 701-1]	70
(2) LGP21401	128	KS24019-L112A	70
(2) LGP21401	128	Side Arm Mount [SO 701-1]	70
(2) LGP21401	128	KS24019-L112A	49
DC6-48-60-18-8F	128	Side Arm Mount [SO 701-1]	49
Empty Mount Pipe	128		
Empty Mount Pipe	128		
Empty Mount Pipe	128		
T-Arm Mount [TA 602-3]	128		
(3) SBNHH-1D65B w/ Mount Pipe	108		
(3) SBNHH-1D65B w/ Mount Pipe	108		
(3) SBNHH-1D65B w/ Mount Pipe	108		
RRH2X60-PCS	108		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-60	60 ksi	75 ksi	A607-65	65 ksi	80 ksi

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.

FDH VELOCITEL
ENGINEERING INNOVATION
Tower Analysis

Velocitel, Inc., d.b.a. FDH Velocitel
6521 Meridien Drive, Suite 107
Raleigh, North Carolina 27616
Phone: 9197551012
FAX: 9197551031

Job:	*East Farmington, BU# 876335*		
Project:	*15BZUJ1400*		
Client:	Crown Castle	Drawn by: BApple	App'd:
Code:	TIA/EIA-222-F	Date: 09/14/15	Scale: N
Path:			Dwg No.

Tower Input Data

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

Tower is located in Hartford County, Connecticut.
Basic wind speed of 80 mph.
Nominal ice thickness of 1.000 in.
Ice thickness is considered to increase with height.
Ice density of 56.00 pcf.
A wind speed of 38 mph is used in combination with ice.
Temperature drop of 50.000 °F.
Deflections calculated using a wind speed of 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.333.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

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	140.00-135.00	5.00	0.00	12	16.000	17.025	0.250	1.000	A607-60 (60 ksi)
L2	135.00-130.00	5.00	0.00	12	17.025	18.050	0.250	1.000	A607-60 (60 ksi)
L3	130.00-125.00	5.00	0.00	12	18.050	19.075	0.250	1.000	A607-60 (60 ksi)
L4	125.00-120.00	5.00	0.00	12	19.075	20.099	0.250	1.000	A607-60 (60 ksi)
L5	120.00-115.00	5.00	0.00	12	20.099	21.124	0.250	1.000	A607-60

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
									(60 ksi)
L6	115.00-110.00	5.00	0.00	12	21.124	22.149	0.250	1.000	A607-60 (60 ksi)
L7	110.00-105.00	5.00	0.00	12	22.149	23.174	0.250	1.000	A607-60 (60 ksi)
L8	105.00-102.33	2.67	0.00	12	23.174	23.721	0.250	1.000	A607-60 (60 ksi)
L9	102.33-102.08	0.25	0.00	12	23.721	23.772	0.388	1.550	A607-60 (60 ksi)
L10	102.08-97.08	5.00	0.00	12	23.772	24.797	0.375	1.500	A607-60 (60 ksi)
L11	97.08-91.75	5.33	3.25	12	24.797	25.890	0.375	1.500	A607-60 (60 ksi)
L12	91.75-90.75	4.25	0.00	12	24.724	25.595	0.356	1.425	A607-65 (65 ksi)
L13	90.75-85.75	5.00	0.00	12	25.595	26.620	0.356	1.425	A607-65 (65 ksi)
L14	85.75-85.33	0.42	0.00	12	26.620	26.706	0.356	1.425	A607-65 (65 ksi)
L15	85.33-85.08	0.25	0.00	12	26.706	26.758	0.487	1.950	A607-65 (65 ksi)
L16	85.08-82.50	2.58	0.00	12	26.758	27.287	0.487	1.950	A607-65 (65 ksi)
L17	82.50-82.25	0.25	0.00	12	27.287	27.338	0.494	1.975	A607-65 (65 ksi)
L18	82.25-77.15	5.10	0.00	12	27.337	28.383	0.475	1.900	A607-65 (65 ksi)
L19	77.15-76.92	0.23	0.00	12	28.383	28.431	0.475	1.900	A607-65 (65 ksi)
L20	76.92-71.92	5.00	0.00	12	28.431	29.457	0.475	1.900	A607-65 (65 ksi)
L21	71.92-66.92	5.00	0.00	12	29.457	30.482	0.463	1.850	A607-65 (65 ksi)
L22	66.92-66.67	0.25	0.00	12	30.482	30.534	0.463	1.850	A607-65 (65 ksi)
L23	66.67-66.42	0.25	0.00	12	30.534	30.585	0.512	2.050	A607-65 (65 ksi)
L24	66.42-61.42	5.00	0.00	12	30.585	31.610	0.512	2.050	A607-65 (65 ksi)
L25	61.42-60.00	1.42	0.00	12	31.610	31.901	0.506	2.025	A607-65 (65 ksi)
L26	60.00-59.75	0.25	0.00	12	31.901	31.952	0.512	2.050	A607-65 (65 ksi)
L27	59.75-54.75	5.00	0.00	12	31.952	32.978	0.512	2.050	A607-65 (65 ksi)
L28	54.75-46.50	8.25	4.50	12	32.978	34.670	0.506	2.025	A607-65 (65 ksi)
L29	46.50-45.50	5.50	0.00	12	33.122	34.250	0.950	3.800	A607-65 (65 ksi)
L30	45.50-44.25	1.25	0.00	12	34.250	34.506	0.950	3.800	A607-65 (65 ksi)
L31	44.25-44.00	0.25	0.00	12	34.506	34.557	1.100	4.400	A607-65 (65 ksi)
L32	44.00-39.00	5.00	0.00	12	34.557	35.583	1.075	4.300	A607-65 (65 ksi)
L33	39.00-34.00	5.00	0.00	12	35.583	36.608	1.075	4.300	A607-65 (65 ksi)
L34	34.00-29.00	5.00	0.00	12	36.608	37.633	1.050	4.200	A607-65 (65 ksi)
L35	29.00-27.75	1.25	0.00	12	37.633	37.890	1.050	4.200	A607-65 (65 ksi)

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
L36	27.75-27.50	0.25	0.00	12	37.890	37.941	1.075	4.300	A607-65 (65 ksi)
L37	27.50-24.08	3.42	0.00	12	37.941	38.642	1.050	4.200	A607-65 (65 ksi)
L38	24.08-23.83	0.25	0.00	12	38.642	38.693	0.938	3.750	A607-65 (65 ksi)
L39	23.83-18.83	5.00	0.00	12	38.693	39.718	0.925	3.700	A607-65 (65 ksi)
L40	18.83-18.08	0.75	0.00	12	39.718	39.872	0.925	3.700	A607-65 (65 ksi)
L41	18.08-17.83	0.25	0.00	12	39.872	39.923	1.050	4.200	A607-65 (65 ksi)
L42	17.83-12.83	5.00	0.00	12	39.923	40.948	1.038	4.150	A607-65 (65 ksi)
L43	12.83-7.83	5.00	0.00	12	40.948	41.974	1.025	4.100	A607-65 (65 ksi)
L44	7.83-2.83	5.00	0.00	12	41.974	42.999	1.025	4.100	A607-65 (65 ksi)
L45	2.83-0.00	2.83		12	42.999	43.580	1.025	4.100	A607-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	16.564	12.679	401.443	5.638	8.288	48.437	813.432	6.240	3.618	14.472
	17.625	13.504	485.020	6.005	8.819	54.998	982.781	6.646	3.893	15.571
L2	17.625	13.504	485.020	6.005	8.819	54.998	982.781	6.646	3.893	15.571
	18.686	14.329	579.459	6.372	9.350	61.976	1174.141	7.052	4.167	16.669
L3	18.686	14.329	579.459	6.372	9.350	61.976	1174.141	7.052	4.167	16.669
	19.747	15.154	685.425	6.739	9.881	69.370	1388.857	7.458	4.442	17.768
L4	19.747	15.154	685.425	6.739	9.881	69.370	1388.857	7.458	4.442	17.768
	20.809	15.979	803.580	7.106	10.412	77.182	1628.272	7.864	4.717	18.867
L5	20.809	15.979	803.580	7.106	10.412	77.182	1628.272	7.864	4.717	18.867
	21.870	16.804	934.589	7.473	10.942	85.410	1893.732	8.270	4.991	19.965
L6	21.870	16.804	934.589	7.473	10.942	85.410	1893.732	8.270	4.991	19.965
	22.931	17.629	1079.116	7.840	11.473	94.055	2186.581	8.676	5.266	21.064
L7	22.931	17.629	1079.116	7.840	11.473	94.055	2186.581	8.676	5.266	21.064
	23.992	18.454	1237.822	8.207	12.004	103.116	2508.164	9.082	5.541	22.163
L8	23.992	18.454	1237.822	8.207	12.004	103.116	2508.164	9.082	5.541	22.163
	24.558	18.894	1328.505	8.403	12.287	108.120	2691.912	9.299	5.687	22.749
L9	24.558	29.114	2023.204	8.353	12.287	164.657	4099.560	14.329	5.319	13.726
	24.611	29.178	2036.563	8.372	12.314	165.387	4126.630	14.361	5.332	13.761
L10	24.611	28.252	1974.030	8.376	12.314	160.309	3999.920	13.905	5.366	14.309
	25.672	29.489	2244.967	8.743	12.845	174.777	4548.912	14.514	5.641	15.041
L11	25.672	29.489	2244.967	8.743	12.845	174.777	4548.912	14.514	5.641	15.041
	26.803	30.809	2560.117	9.134	13.411	190.897	5187.491	15.163	5.934	15.823
L12	26.286	27.953	2118.528	8.724	12.807	165.420	4292.711	13.757	5.671	15.919
	26.498	28.952	2354.016	9.036	13.258	177.550	4769.876	14.249	5.905	16.575
L13	26.498	28.952	2354.016	9.036	13.258	177.550	4769.876	14.249	5.905	16.575
	27.559	30.128	2652.659	9.403	13.789	192.371	5375.006	14.828	6.179	17.346
L14	27.559	30.128	2652.659	9.403	13.789	192.371	5375.006	14.828	6.179	17.346
	27.649	30.227	2678.836	9.433	13.834	193.643	5428.047	14.877	6.203	17.411
L15	27.649	41.157	3611.270	9.386	13.834	261.045	7317.411	20.256	5.851	12.002
	27.702	41.238	3632.490	9.405	13.860	262.076	7360.410	20.296	5.865	12.03
L16	27.702	41.238	3632.490	9.405	13.860	262.076	7360.410	20.296	5.865	12.03

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
	28.249	42.068	3856.362	9.594	14.134	272.834	7814.035	20.705	6.006	12.321
L17	28.249	42.597	3903.071	9.592	14.134	276.139	7908.679	20.965	5.990	12.131
	28.302	42.679	3925.514	9.610	14.161	277.206	7954.155	21.005	6.003	12.159
L18	28.302	41.086	3784.182	9.617	14.161	267.229	7667.778	20.221	6.053	12.744
	29.385	42.686	4243.696	9.991	14.703	288.635	8598.879	21.009	6.334	13.334
L19	29.385	42.686	4243.696	9.991	14.703	288.635	8598.879	21.009	6.334	13.334
	29.434	42.759	4265.562	10.008	14.727	289.634	8643.186	21.045	6.347	13.361
L20	29.434	42.759	4265.562	10.008	14.727	289.634	8643.186	21.045	6.347	13.361
	30.496	44.328	4752.418	10.376	15.259	311.457	9629.688	21.817	6.621	13.94
L21	30.496	43.180	4633.345	10.380	15.259	303.653	9388.413	21.252	6.655	14.389
	31.558	44.707	5142.584	10.747	15.790	325.689	10420.270	22.003	6.930	14.983
L22	31.558	44.707	5142.584	10.747	15.790	325.689	10420.270	22.003	6.930	14.983
	31.611	44.783	5168.949	10.765	15.816	326.809	10473.693	22.041	6.944	15.013
L23	31.611	49.542	5699.231	10.748	15.816	360.336	11548.187	24.383	6.810	13.287
	31.664	49.627	5728.484	10.766	15.843	361.579	11607.462	24.425	6.823	13.314
L24	31.664	49.627	5728.484	10.766	15.843	361.579	11607.462	24.425	6.823	13.314
	32.726	51.319	6334.758	11.133	16.374	386.874	12835.936	25.258	7.098	13.85
L25	32.726	50.704	6261.278	11.135	16.374	382.387	12687.047	24.955	7.115	14.054
	33.026	51.177	6438.438	11.239	16.525	389.624	13046.022	25.188	7.193	14.208
L26	33.026	51.799	6514.033	11.237	16.525	394.199	13199.198	25.494	7.176	14.002
	33.079	51.884	6546.010	11.255	16.551	395.498	13263.990	25.536	7.190	14.029
L27	33.079	51.884	6546.010	11.255	16.551	395.498	13263.990	25.536	7.190	14.029
	34.141	53.576	7207.702	11.623	17.083	421.934	14604.759	26.368	7.465	14.565
L28	34.141	52.933	7123.916	11.625	17.083	417.029	14434.985	26.052	7.481	14.778
	35.893	55.691	8296.663	12.231	17.959	461.976	16811.289	27.410	7.935	15.674
L29	35.246	98.414	13001.709	11.518	17.157	757.799	26344.988	48.436	6.331	6.664
	35.458	101.864	14417.566	11.921	17.741	812.650	29213.898	50.134	6.633	6.982
L30	35.458	101.864	14417.566	11.921	17.741	812.650	29213.898	50.134	6.633	6.982
	35.723	102.648	14753.070	12.013	17.874	825.384	29893.719	50.520	6.702	7.054
L31	35.723	118.325	16854.442	11.959	17.874	942.948	34151.669	58.236	6.300	5.727
	35.776	118.506	16932.155	11.978	17.901	945.891	34309.136	58.325	6.313	5.739
L32	35.776	115.899	16584.454	11.987	17.901	926.467	33604.601	57.042	6.380	5.935
	36.838	119.448	18155.121	12.354	18.432	984.986	36787.198	58.789	6.655	6.191
L33	36.838	119.448	18155.121	12.354	18.432	984.986	36787.198	58.789	6.655	6.191
	37.899	122.998	19821.952	12.721	18.963	1045.299	40164.649	60.536	6.930	6.446
L34	37.899	120.222	19401.871	12.730	18.963	1023.146	39313.450	59.169	6.997	6.664
	38.961	123.688	21129.050	13.097	19.494	1083.872	42813.184	60.876	7.272	6.925
L35	38.961	123.688	21129.050	13.097	19.494	1083.872	42813.184	60.876	7.272	6.925
	39.226	124.555	21576.295	13.189	19.627	1099.327	43719.423	61.302	7.340	6.991
L36	39.226	127.434	22045.075	13.180	19.627	1123.211	44669.298	62.719	7.273	6.766
	39.279	127.611	22137.297	13.198	19.653	1126.386	44856.165	62.806	7.287	6.779
L37	39.279	124.728	21666.494	13.207	19.653	1102.431	43902.192	61.387	7.354	7.004
	40.005	127.097	22924.654	13.458	20.016	1145.297	46451.565	62.553	7.542	7.183
L38	40.005	113.819	20652.759	13.498	20.016	1031.795	41848.089	56.018	7.843	8.366
	40.058	113.974	20737.116	13.516	20.043	1034.637	42019.019	56.095	7.857	8.381
L39	40.058	112.492	20480.950	13.521	20.043	1021.856	41499.957	55.365	7.891	8.53
	41.119	115.545	22194.644	13.888	20.574	1078.772	44972.366	56.868	8.165	8.828
L40	41.119	115.545	22194.644	13.888	20.574	1078.772	44972.366	56.868	8.165	8.828
	41.278	116.003	22459.661	13.943	20.654	1087.442	45509.363	57.093	8.207	8.872
L41	41.278	131.257	25250.062	13.898	20.654	1222.547	51163.471	64.601	7.872	7.497
	41.332	131.430	25350.222	13.917	20.680	1225.820	51366.424	64.686	7.885	7.51
L42	41.332	129.907	25072.605	13.921	20.680	1212.396	50803.896	63.936	7.919	7.633
	42.393	133.333	27108.612	14.288	21.211	1278.026	54929.397	65.622	8.194	7.898
L43	42.393	131.767	26807.174	14.293	21.211	1263.815	54318.602	64.852	8.227	8.027
	43.454	135.151	28926.008	14.660	21.742	1330.395	58611.935	66.517	8.502	8.295
L44	43.454	135.151	28926.008	14.660	21.742	1330.395	58611.935	66.517	8.502	8.295
	44.516	138.535	31153.649	15.027	22.274	1398.686	63125.739	68.183	8.777	8.563
L45	44.516	138.535	31153.649	15.027	22.274	1398.686	63125.739	68.183	8.777	8.563
	45.117	140.453	32465.154	15.235	22.574	1438.138	65783.204	69.127	8.932	8.715

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 140.00-135.00				1	1	1		
L2 135.00-130.00				1	1	1		
L3 130.00-125.00				1	1	1		
L4 125.00-120.00				1	1	1		
L5 120.00-115.00				1	1	1		
L6 115.00-110.00				1	1	1		
L7 110.00-105.00				1	1	1		
L8 105.00-102.33				1	1	1		
L9 102.33-102.08				1	1	0.949611		
L10 102.08-97.08				1	1	0.967561		
L11 97.08-91.75				1	1	0.96239		
L12 91.75-90.75				1	1	1.29378		
L13 90.75-85.75				1	1	1.27752		
L14 85.75-85.33				1	1	1.27622		
L15 85.33-85.08				1	1	1.14944		
L16 85.08-82.50				1	1	1.13941		
L17 82.50-82.25				1	1	1.12431		
L18 82.25-77.15				1	1	1.21727		
L19 77.15-76.92				1	1	1.21631		
L20 76.92-71.92				1	1	1.19655		
L21 71.92-66.92				1	1	1.20948		
L22 66.92-66.67				1	1	1.20857		
L23 66.67-66.42				1	1	0.955849		
L24 66.42-61.42				1	1	0.944436		
L25 61.42-60.00				1	1	0.952769		
L26 60.00-59.75				1	1	1.05661		
L27 59.75-54.75				1	1	1.04249		
L28 54.75-46.50				1	1	1.04503		
L29 46.50-45.50				1	1	0.960852		
L30				1	1	0.959543		

Tower Elevation ft	Gusset Area (per face) ft²	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
45.50-44.25								
L31				1	1	0.933592		
44.25-44.00								
L32				1	1	0.946957		
44.00-39.00								
L33				1	1	0.939764		
39.00-34.00								
L34				1	1	0.954535		
34.00-29.00								
L35				1	1	0.952863		
29.00-27.75								
L36				1	1	0.994772		
27.75-27.50								
L37				1	1	1.01211		
27.50-24.08								
L38				1	1	1.07394		
24.08-23.83								
L39				1	1	1.08076		
23.83-18.83								
L40				1	1	1.0797		
18.83-18.08								
L41				1	1	0.953907		
18.08-17.83								
L42				1	1	0.958868		
17.83-12.83								
L43 12.83-7.83				1	1	0.964285		
L44 7.83-2.83				1	1	0.958604		
L45 2.83-0.00				1	1	0.955506		

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
Safety Line 3/8	C	Surface Ar (CaAa)	140.00 - 0.00	1	1	0.000 0.000	0.375		0.22
HB158-1-08U8-S8J18(1-5/8)	C	Surface Ar (CaAa)	108.00 - 0.00	2	2	-0.400 -0.400	1.980		1.30
***									
LDF5-50A(7/8")	A	Surface Ar (CaAa)	100.00 - 0.00	12	2	-0.400 -0.300	1.090		0.33
MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	A	Surface Ar (CaAa)	100.00 - 0.00	1	1	-0.410 -0.410	1.625		1.07
***									
9207(5/16")	A	Surface Ar (CaAa)	70.00 - 0.00	2	1	-0.290 -0.280	0.330		0.60
***									
Aero MP305	A	Surface Af (CaAa)	45.50 - 0.00	1	1	0.100 0.100	2.090	14.840	0.00
Aero MP305	B	Surface Af (CaAa)	45.50 - 0.00	1	1	0.100 0.100	2.090	14.840	0.00
Aero MP305	C	Surface Af (CaAa)	46.70 - 11.70	1	1	-0.100 0.100	2.090	14.840	0.00
Aero MP305	C	Surface Af (CaAa)	20.50 - 0.00	1	1	0.400 0.500	2.090	14.840	0.00

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
Aero MP305	C	Surface Af (CaAa)	20.50 - 0.00	1	1	-0.500 -0.400	2.090	14.840	0.00
***									
Aero MP305	A	Surface Af (CaAa)	69.00 - 49.00	1	1	-0.100 0.100	2.090	14.840	0.00
Aero MP305	B	Surface Af (CaAa)	69.00 - 49.00	1	1	-0.100 0.100	2.090	14.840	0.00
Aero MP305	C	Surface Af (CaAa)	69.00 - 49.00	1	1	-0.100 0.100	2.090	14.840	0.00
***									
Aero MP305	A	Surface Af (CaAa)	49.00 - 45.00	1	1	-0.100 0.100	2.090	14.840	0.00
Aero MP305	B	Surface Af (CaAa)	49.00 - 46.70	1	1	-0.100 0.100	2.090	14.840	0.00
Aero MP305	C	Surface Af (CaAa)	49.00 - 46.50	1	1	-0.100 0.100	2.090	14.840	0.00
***									
Aero MP303	A	Surface Af (CaAa)	79.00 - 69.00	1	1	-0.100 0.100	1.570	11.260	0.00
Aero MP303	B	Surface Af (CaAa)	79.00 - 69.00	1	1	-0.100 0.100	1.570	11.260	0.00
Aero MP303	C	Surface Af (CaAa)	79.00 - 69.00	1	1	-0.100 0.100	1.570	11.260	0.00
***									
Aero MP305	A	Surface Af (CaAa)	26.50 - 16.50	1	1	-0.100 0.100	2.090	14.840	0.00
***									
Aero MP303	A	Surface Af (CaAa)	86.50 - 64.50	1	1	-0.100 0.100	1.570	11.260	0.00
***									
Aero MP303	B	Surface Af (CaAa)	86.50 - 76.50	1	1	-0.100 0.100	1.570	11.260	0.00
Aero MP303	C	Surface Af (CaAa)	86.50 - 76.50	1	1	-0.100 0.100	1.570	11.260	0.00
***									
Aero MP303	A	Surface Af (CaAa)	103.50 - 93.50	1	1	-0.100 0.100	1.570	11.260	0.00
Aero MP303	B	Surface Af (CaAa)	103.50 - 93.50	1	1	-0.100 0.100	1.570	11.260	0.00
Aero MP303	C	Surface Af (CaAa)	103.50 - 93.50	1	1	-0.100 0.100	1.570	11.260	0.00
***									
6" x 1.25" Flat Plate (F)	A	Surface Af (CaAa)	30.50 - 0.00	1	1	-0.100 0.100	1.250	14.500	0.00
***									
6" x 1.25" Flat Plate (F)	B	Surface Af (CaAa)	46.50 - 21.50	1	1	-0.400 -0.300	1.250	14.500	0.00
6" x 1.25" Flat Plate (F)	A	Surface Af (CaAa)	46.50 - 21.50	1	1	-0.400 -0.300	1.250	14.500	0.00
***									
6" x 1.25" Flat Plate (F)	A	Surface Af (CaAa)	62.00 - 47.00	1	1	-0.500 -0.400	1.250	14.500	0.00
***									
6" x 1.25" Flat Plate (F)	A	Surface Af (CaAa)	84.50 - 64.50	1	1	-0.500 -0.400	1.250	14.500	0.00
6" x 1.25" Flat Plate (F)	A	Surface Af (CaAa)	84.50 - 64.50	1	1	-0.500 -0.400	1.250	14.500	0.00
***									
6" x 1.25" Flat Plate (F)	C	Surface Af (CaAa)	95.00 - 80.00	1	1	-0.400 -0.300	1.250	14.500	0.00
6" x 1.25" Flat Plate (F)	C	Surface Af	95.00 - 80.00	1	1	-0.500	1.250	14.500	0.00

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
		(CaAa)				-0.400			

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
***								
HB114-1-08U4-M5J(1 1/4")	B	No	Inside Pole	139.00 - 0.00	3	No Ice	0.00	1.08
						1/2" Ice	0.00	1.08
						1" Ice	0.00	1.08
						2" Ice	0.00	1.08
						4" Ice	0.00	1.08
HB114-21U3M12-XXX F(1-1/4")	B	No	Inside Pole	139.00 - 0.00	1	No Ice	0.00	1.22
						1/2" Ice	0.00	1.22
						1" Ice	0.00	1.22
						2" Ice	0.00	1.22
						4" Ice	0.00	1.22
***								
LDF5-50A(7/8")	B	No	Inside Pole	128.00 - 0.00	9	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
						1" Ice	0.00	0.33
						2" Ice	0.00	0.33
						4" Ice	0.00	0.33
FB-L98B-002-75000(3/8")	B	No	Inside Pole	128.00 - 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
						4" Ice	0.00	0.06
WR-VG86ST-BRD(3/4)	B	No	Inside Pole	128.00 - 0.00	2	No Ice	0.00	0.58
						1/2" Ice	0.00	0.58
						1" Ice	0.00	0.58
						2" Ice	0.00	0.58
						4" Ice	0.00	0.58
2" Rigid Conduit	B	No	Inside Pole	128.00 - 0.00	1	No Ice	0.00	2.80
						1/2" Ice	0.00	2.80
						1" Ice	0.00	2.80
						2" Ice	0.00	2.80
						4" Ice	0.00	2.80
***								
***								
LDF7-50A(1-5/8")	C	No	Inside Pole	108.00 - 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
						4" Ice	0.00	0.82
***								
LDF4-50A(1/2")	B	No	Inside Pole	49.00 - 0.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
						2" Ice	0.00	0.15
						4" Ice	0.00	0.15
5/16"	B	No	Inside Pole	49.00 - 0.00	1	No Ice	0.00	0.20
						1/2" Ice	0.00	0.20
						1" Ice	0.00	0.20
						2" Ice	0.00	0.20
						4" Ice	0.00	0.20

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	140.00-135.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.02
		C	0.000	0.000	0.188	0.000	0.00
L2	135.00-130.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.02
		C	0.000	0.000	0.188	0.000	0.00
L3	130.00-125.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.04
		C	0.000	0.000	0.188	0.000	0.00
L4	125.00-120.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.06
		C	0.000	0.000	0.188	0.000	0.00
L5	120.00-115.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.06
		C	0.000	0.000	0.188	0.000	0.00
L6	115.00-110.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.06
		C	0.000	0.000	0.188	0.000	0.00
L7	110.00-105.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.06
		C	0.000	0.000	1.375	0.000	0.04
L8	105.00-102.33	A	0.000	0.000	0.305	0.000	0.00
		B	0.000	0.000	0.305	0.000	0.03
		C	0.000	0.000	1.462	0.000	0.03
L9	102.33-102.08	A	0.000	0.000	0.065	0.000	0.00
		B	0.000	0.000	0.065	0.000	0.00
		C	0.000	0.000	0.174	0.000	0.00
L10	102.08-97.08	A	0.000	0.000	2.418	0.000	0.01
		B	0.000	0.000	1.308	0.000	0.06
		C	0.000	0.000	3.476	0.000	0.06
L11	97.08-91.75	A	0.000	0.000	2.967	0.000	0.03
		B	0.000	0.000	0.938	0.000	0.06
		C	0.000	0.000	4.604	0.000	0.07
L12	91.75-90.75	A	0.000	0.000	0.381	0.000	0.01
		B	0.000	0.000	0.000	0.000	0.01
		C	0.000	0.000	0.850	0.000	0.01
L13	90.75-85.75	A	0.000	0.000	2.099	0.000	0.03
		B	0.000	0.000	0.196	0.000	0.06
		C	0.000	0.000	4.447	0.000	0.06
L14	85.75-85.33	A	0.000	0.000	0.270	0.000	0.00
		B	0.000	0.000	0.110	0.000	0.00
		C	0.000	0.000	0.467	0.000	0.01
L15	85.33-85.08	A	0.000	0.000	0.161	0.000	0.00
		B	0.000	0.000	0.065	0.000	0.00
		C	0.000	0.000	0.278	0.000	0.00
L16	85.08-82.50	A	0.000	0.000	2.490	0.000	0.01
		B	0.000	0.000	0.675	0.000	0.03
		C	0.000	0.000	2.869	0.000	0.03
L17	82.50-82.25	A	0.000	0.000	0.265	0.000	0.00
		B	0.000	0.000	0.065	0.000	0.00
		C	0.000	0.000	0.278	0.000	0.00
L18	82.25-77.15	A	0.000	0.000	5.884	0.000	0.03
		B	0.000	0.000	1.819	0.000	0.06
		C	0.000	0.000	4.967	0.000	0.06
L19	77.15-76.92	A	0.000	0.000	0.308	0.000	0.00

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		B	0.000	0.000	0.122	0.000	0.00
		C	0.000	0.000	0.223	0.000	0.00
L20	76.92-71.92	A	0.000	0.000	6.603	0.000	0.03
		B	0.000	0.000	1.417	0.000	0.06
		C	0.000	0.000	3.585	0.000	0.06
L21	71.92-66.92	A	0.000	0.000	6.885	0.000	0.03
		B	0.000	0.000	1.489	0.000	0.06
		C	0.000	0.000	3.656	0.000	0.06
L22	66.92-66.67	A	0.000	0.000	0.360	0.000	0.00
		B	0.000	0.000	0.087	0.000	0.00
		C	0.000	0.000	0.195	0.000	0.00
L23	66.67-66.42	A	0.000	0.000	0.360	0.000	0.00
		B	0.000	0.000	0.087	0.000	0.00
		C	0.000	0.000	0.195	0.000	0.00
L24	66.42-61.42	A	0.000	0.000	5.231	0.000	0.03
		B	0.000	0.000	1.742	0.000	0.06
		C	0.000	0.000	3.909	0.000	0.06
L25	61.42-60.00	A	0.000	0.000	1.375	0.000	0.01
		B	0.000	0.000	0.494	0.000	0.02
		C	0.000	0.000	1.108	0.000	0.02
L26	60.00-59.75	A	0.000	0.000	0.243	0.000	0.00
		B	0.000	0.000	0.087	0.000	0.00
		C	0.000	0.000	0.195	0.000	0.00
L27	59.75-54.75	A	0.000	0.000	4.851	0.000	0.03
		B	0.000	0.000	1.742	0.000	0.06
		C	0.000	0.000	3.909	0.000	0.06
L28	54.75-46.50	A	0.000	0.000	7.900	0.000	0.05
		B	0.000	0.000	2.804	0.000	0.10
		C	0.000	0.000	6.520	0.000	0.10
L29	46.50-45.50	A	0.000	0.000	0.970	0.000	0.01
		B	0.000	0.000	0.208	0.000	0.01
		C	0.000	0.000	0.782	0.000	0.01
L30	45.50-44.25	A	0.000	0.000	1.387	0.000	0.01
		B	0.000	0.000	0.696	0.000	0.01
		C	0.000	0.000	0.977	0.000	0.02
L31	44.25-44.00	A	0.000	0.000	0.243	0.000	0.00
		B	0.000	0.000	0.139	0.000	0.00
		C	0.000	0.000	0.195	0.000	0.00
L32	44.00-39.00	A	0.000	0.000	4.851	0.000	0.03
		B	0.000	0.000	2.783	0.000	0.06
		C	0.000	0.000	3.909	0.000	0.06
L33	39.00-34.00	A	0.000	0.000	4.851	0.000	0.03
		B	0.000	0.000	2.783	0.000	0.06
		C	0.000	0.000	3.909	0.000	0.06
L34	34.00-29.00	A	0.000	0.000	5.163	0.000	0.03
		B	0.000	0.000	2.783	0.000	0.06
		C	0.000	0.000	3.909	0.000	0.06
L35	29.00-27.75	A	0.000	0.000	1.473	0.000	0.01
		B	0.000	0.000	0.696	0.000	0.01
		C	0.000	0.000	0.977	0.000	0.02
L36	27.75-27.50	A	0.000	0.000	0.295	0.000	0.00
		B	0.000	0.000	0.139	0.000	0.00
		C	0.000	0.000	0.195	0.000	0.00
L37	27.50-24.08	A	0.000	0.000	4.869	0.000	0.02
		B	0.000	0.000	1.902	0.000	0.04
		C	0.000	0.000	2.672	0.000	0.04
L38	24.08-23.83	A	0.000	0.000	0.382	0.000	0.00
		B	0.000	0.000	0.139	0.000	0.00
		C	0.000	0.000	0.195	0.000	0.00
L39	23.83-18.83	A	0.000	0.000	7.079	0.000	0.03
		B	0.000	0.000	2.228	0.000	0.06

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C	0.000	0.000	5.071	0.000	0.06
L40	18.83-18.08	A	0.000	0.000	0.989	0.000	0.00
		B	0.000	0.000	0.261	0.000	0.01
		C	0.000	0.000	1.109	0.000	0.01
L41	18.08-17.83	A	0.000	0.000	0.330	0.000	0.00
		B	0.000	0.000	0.087	0.000	0.00
		C	0.000	0.000	0.370	0.000	0.00
L42	17.83-12.83	A	0.000	0.000	5.315	0.000	0.03
		B	0.000	0.000	1.742	0.000	0.06
		C	0.000	0.000	7.393	0.000	0.06
L43	12.83-7.83	A	0.000	0.000	4.851	0.000	0.03
		B	0.000	0.000	1.742	0.000	0.06
		C	0.000	0.000	6.045	0.000	0.06
L44	7.83-2.83	A	0.000	0.000	4.851	0.000	0.03
		B	0.000	0.000	1.742	0.000	0.06
		C	0.000	0.000	5.651	0.000	0.06
L45	2.83-0.00	A	0.000	0.000	2.748	0.000	0.02
		B	0.000	0.000	0.987	0.000	0.03
		C	0.000	0.000	3.202	0.000	0.04

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	140.00-135.00	A	1.187	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.02
		C		0.000	0.000	1.374	0.000	0.01
L2	135.00-130.00	A	1.182	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.02
		C		0.000	0.000	1.369	0.000	0.01
L3	130.00-125.00	A	1.176	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.04
		C		0.000	0.000	1.364	0.000	0.01
L4	125.00-120.00	A	1.170	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.06
		C		0.000	0.000	1.358	0.000	0.01
L5	120.00-115.00	A	1.165	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.06
		C		0.000	0.000	1.352	0.000	0.01
L6	115.00-110.00	A	1.159	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.06
		C		0.000	0.000	1.346	0.000	0.01
L7	110.00-105.00	A	1.152	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.06
		C		0.000	0.000	5.757	0.000	0.07
L8	105.00-102.33	A	1.147	0.000	0.000	0.752	0.000	0.01
		B		0.000	0.000	0.752	0.000	0.04
		C		0.000	0.000	5.384	0.000	0.06
L9	102.33-102.08	A	1.145	0.000	0.000	0.161	0.000	0.00
		B		0.000	0.000	0.161	0.000	0.00
		C		0.000	0.000	0.595	0.000	0.01
L10	102.08-97.08	A	1.142	0.000	0.000	7.505	0.000	0.09
		B		0.000	0.000	3.211	0.000	0.09
		C		0.000	0.000	11.875	0.000	0.14
L11	97.08-91.75	A	1.134	0.000	0.000	10.115	0.000	0.12
		B		0.000	0.000	2.292	0.000	0.09
		C		0.000	0.000	15.317	0.000	0.19

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight K
L12	91.75-90.75	A	1.130	0.000	0.000	1.467	0.000	0.02
		B		0.000	0.000	0.000	0.000	0.01
		C		0.000	0.000	2.900	0.000	0.04
L13	90.75-85.75	A	1.125	0.000	0.000	7.778	0.000	0.10
		B		0.000	0.000	0.478	0.000	0.06
		C		0.000	0.000	14.915	0.000	0.19
L14	85.75-85.33	A	1.121	0.000	0.000	0.879	0.000	0.01
		B		0.000	0.000	0.267	0.000	0.01
		C		0.000	0.000	1.477	0.000	0.02
L15	85.33-85.08	A	1.121	0.000	0.000	0.523	0.000	0.01
		B		0.000	0.000	0.159	0.000	0.00
		C		0.000	0.000	0.879	0.000	0.01
L16	85.08-82.50	A	1.118	0.000	0.000	7.715	0.000	0.10
		B		0.000	0.000	1.637	0.000	0.05
		C		0.000	0.000	9.062	0.000	0.11
L17	82.50-82.25	A	1.116	0.000	0.000	0.812	0.000	0.01
		B		0.000	0.000	0.158	0.000	0.00
		C		0.000	0.000	0.877	0.000	0.01
L18	82.25-77.15	A	1.112	0.000	0.000	17.693	0.000	0.22
		B		0.000	0.000	4.394	0.000	0.10
		C		0.000	0.000	15.723	0.000	0.19
L19	77.15-76.92	A	1.107	0.000	0.000	0.901	0.000	0.01
		B		0.000	0.000	0.294	0.000	0.01
		C		0.000	0.000	0.693	0.000	0.01
L20	76.92-71.92	A	1.102	0.000	0.000	19.266	0.000	0.24
		B		0.000	0.000	3.408	0.000	0.09
		C		0.000	0.000	11.928	0.000	0.14
L21	71.92-66.92	A	1.093	0.000	0.000	20.128	0.000	0.25
		B		0.000	0.000	3.311	0.000	0.09
		C		0.000	0.000	11.797	0.000	0.14
L22	66.92-66.67	A	1.088	0.000	0.000	1.039	0.000	0.01
		B		0.000	0.000	0.178	0.000	0.00
		C		0.000	0.000	0.600	0.000	0.01
L23	66.67-66.42	A	1.088	0.000	0.000	1.040	0.000	0.01
		B		0.000	0.000	0.178	0.000	0.00
		C		0.000	0.000	0.601	0.000	0.01
L24	66.42-61.42	A	1.083	0.000	0.000	15.644	0.000	0.20
		B		0.000	0.000	3.546	0.000	0.10
		C		0.000	0.000	11.993	0.000	0.14
L25	61.42-60.00	A	1.076	0.000	0.000	4.174	0.000	0.05
		B		0.000	0.000	1.002	0.000	0.03
		C		0.000	0.000	3.389	0.000	0.04
L26	60.00-59.75	A	1.074	0.000	0.000	0.736	0.000	0.01
		B		0.000	0.000	0.177	0.000	0.00
		C		0.000	0.000	0.597	0.000	0.01
L27	59.75-54.75	A	1.068	0.000	0.000	14.669	0.000	0.19
		B		0.000	0.000	3.522	0.000	0.10
		C		0.000	0.000	11.917	0.000	0.14
L28	54.75-46.50	A	1.053	0.000	0.000	23.717	0.000	0.31
		B		0.000	0.000	5.629	0.000	0.16
		C		0.000	0.000	19.664	0.000	0.23
L29	46.50-45.50	A	1.041	0.000	0.000	2.909	0.000	0.04
		B		0.000	0.000	0.559	0.000	0.02
		C		0.000	0.000	2.367	0.000	0.03
L30	45.50-44.25	A	1.038	0.000	0.000	3.953	0.000	0.05
		B		0.000	0.000	1.560	0.000	0.03
		C		0.000	0.000	2.938	0.000	0.03
L31	44.25-44.00	A	1.035	0.000	0.000	0.720	0.000	0.01
		B		0.000	0.000	0.312	0.000	0.01
		C		0.000	0.000	0.587	0.000	0.01
L32	44.00-39.00	A	1.028	0.000	0.000	14.345	0.000	0.18

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		B		0.000	0.000	6.209	0.000	0.13
		C		0.000	0.000	11.701	0.000	0.14
L33	39.00-34.00	A	1.012	0.000	0.000	14.220	0.000	0.18
		B		0.000	0.000	6.157	0.000	0.13
		C		0.000	0.000	11.617	0.000	0.14
L34	34.00-29.00	A	1.000	0.000	0.000	14.935	0.000	0.19
		B		0.000	0.000	6.117	0.000	0.13
		C		0.000	0.000	11.553	0.000	0.14
L35	29.00-27.75	A	1.000	0.000	0.000	4.208	0.000	0.05
		B		0.000	0.000	1.529	0.000	0.03
		C		0.000	0.000	2.888	0.000	0.03
L36	27.75-27.50	A	1.000	0.000	0.000	0.842	0.000	0.01
		B		0.000	0.000	0.306	0.000	0.01
		C		0.000	0.000	0.578	0.000	0.01
L37	27.50-24.08	A	1.000	0.000	0.000	13.150	0.000	0.16
		B		0.000	0.000	4.180	0.000	0.09
		C		0.000	0.000	7.895	0.000	0.09
L38	24.08-23.83	A	1.000	0.000	0.000	1.012	0.000	0.01
		B		0.000	0.000	0.306	0.000	0.01
		C		0.000	0.000	0.578	0.000	0.01
L39	23.83-18.83	A	1.000	0.000	0.000	18.795	0.000	0.23
		B		0.000	0.000	4.672	0.000	0.11
		C		0.000	0.000	13.825	0.000	0.16
L40	18.83-18.08	A	1.000	0.000	0.000	2.630	0.000	0.03
		B		0.000	0.000	0.511	0.000	0.01
		C		0.000	0.000	2.755	0.000	0.03
L41	18.08-17.83	A	1.000	0.000	0.000	0.877	0.000	0.01
		B		0.000	0.000	0.170	0.000	0.00
		C		0.000	0.000	0.918	0.000	0.01
L42	17.83-12.83	A	1.000	0.000	0.000	15.031	0.000	0.19
		B		0.000	0.000	3.408	0.000	0.10
		C		0.000	0.000	18.369	0.000	0.21
L43	12.83-7.83	A	1.000	0.000	0.000	14.123	0.000	0.18
		B		0.000	0.000	3.408	0.000	0.10
		C		0.000	0.000	15.733	0.000	0.18
L44	7.83-2.83	A	1.000	0.000	0.000	14.122	0.000	0.18
		B		0.000	0.000	3.408	0.000	0.10
		C		0.000	0.000	14.961	0.000	0.17
L45	2.83-0.00	A	1.000	0.000	0.000	8.002	0.000	0.10
		B		0.000	0.000	1.931	0.000	0.05
		C		0.000	0.000	8.477	0.000	0.10

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	140.00-135.00	0.000	0.056	0.000	0.314
L2	135.00-130.00	0.000	0.056	0.000	0.317
L3	130.00-125.00	0.000	0.056	0.000	0.320
L4	125.00-120.00	0.000	0.056	0.000	0.323
L5	120.00-115.00	0.000	0.056	0.000	0.325
L6	115.00-110.00	0.000	0.056	0.000	0.327
L7	110.00-105.00	0.253	0.278	0.447	0.642
L8	105.00-102.33	0.343	0.349	0.521	0.637
L9	102.33-102.08	0.296	0.302	0.427	0.522
L10	102.08-97.08	0.055	0.343	0.028	0.550

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L11	97.08-91.75	0.217	0.423	0.238	0.637
L12	91.75-90.75	0.461	0.504	0.580	0.768
L13	90.75-85.75	0.448	0.489	0.564	0.744
L14	85.75-85.33	0.380	0.414	0.464	0.611
L15	85.33-85.08	0.381	0.414	0.465	0.612
L16	85.08-82.50	0.177	0.700	0.185	0.978
L17	82.50-82.25	0.124	0.778	0.115	1.077
L18	82.25-77.15	-0.117	0.740	-0.208	1.038
L19	77.15-76.92	-0.287	0.674	-0.434	0.947
L20	76.92-71.92	-0.499	0.645	-0.708	0.950
L21	71.92-66.92	-0.527	0.635	-0.788	0.949
L22	66.92-66.67	-0.523	0.620	-0.812	0.939
L23	66.67-66.42	-0.523	0.620	-0.813	0.940
L24	66.42-61.42	-0.302	0.502	-0.550	0.792
L25	61.42-60.00	-0.242	0.589	-0.485	0.918
L26	60.00-59.75	-0.242	0.591	-0.486	0.920
L27	59.75-54.75	-0.243	0.594	-0.489	0.929
L28	54.75-46.50	-0.245	0.603	-0.494	0.948
L29	46.50-45.50	-0.673	0.486	-1.005	0.707
L30	45.50-44.25	-0.320	0.234	-0.589	0.413
L31	44.25-44.00	-0.214	0.308	-0.482	0.499
L32	44.00-39.00	-0.215	0.310	-0.485	0.504
L33	39.00-34.00	-0.216	0.314	-0.490	0.514
L34	34.00-29.00	-0.269	0.283	-0.565	0.469
L35	29.00-27.75	-0.385	0.207	-0.724	0.356
L36	27.75-27.50	-0.386	0.208	-0.726	0.357
L37	27.50-24.08	-0.567	0.087	-0.909	0.221
L38	24.08-23.83	-0.638	0.040	-0.984	0.169
L39	23.83-18.83	-0.525	0.064	-0.834	0.211
L40	18.83-18.08	-0.410	0.069	-0.669	0.224
L41	18.08-17.83	-0.410	0.069	-0.670	0.224
L42	17.83-12.83	-0.226	0.189	-0.478	0.368
L43	12.83-7.83	-0.163	-0.017	-0.429	0.149
L44	7.83-2.83	-0.166	-0.097	-0.441	0.063
L45	2.83-0.00	-0.166	-0.098	-0.445	0.064

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Lightning Rod	C	From Leg	0.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.25 0.66 0.97 1.49 2.68	0.25 0.66 0.97 1.49 2.68	0.03 0.03 0.04 0.06 0.14
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APXV9ERR18-C-A20	A	From Leg	4.00 0.00 1.00	0.0000	139.00	No Ice 1/2" Ice 1" Ice	8.26 8.81 9.36	5.81 6.27 6.73	0.06 0.11 0.17

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	10.50	7.68	0.31
						4" Ice	12.88	9.95	0.66
APXV9ERR18-C-A20	B	From Leg	4.00 0.00 1.00	0.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.26 8.81 9.36 10.50 12.88	5.81 6.27 6.73 7.68 9.95	0.06 0.11 0.17 0.31 0.66
APXV9ERR18-C-A20	C	From Leg	4.00 0.00 1.00	0.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.26 8.81 9.36 10.50 12.88	5.81 6.27 6.73 7.68 9.95	0.06 0.11 0.17 0.31 0.66
APXVTM14-C-120	A	From Leg	4.00 0.00 1.00	0.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.90 7.35 7.81 8.75 10.75	3.61 3.97 4.33 5.14 6.97	0.06 0.10 0.14 0.25 0.53
APXVTM14-C-120	B	From Leg	4.00 0.00 1.00	0.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.90 7.35 7.81 8.75 10.75	3.61 3.97 4.33 5.14 6.97	0.06 0.10 0.14 0.25 0.53
APXVTM14-C-120	C	From Leg	4.00 0.00 1.00	0.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.90 7.35 7.81 8.75 10.75	3.61 3.97 4.33 5.14 6.97	0.06 0.10 0.14 0.25 0.53
TD-RRH8x20-25	A	From Leg	4.00 0.00 0.00	0.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.72 5.01 5.32 5.95 7.31	1.70 1.92 2.14 2.62 3.68	0.07 0.10 0.13 0.20 0.40
TD-RRH8x20-25	B	From Leg	4.00 0.00 0.00	0.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.72 5.01 5.32 5.95 7.31	1.70 1.92 2.14 2.62 3.68	0.07 0.10 0.13 0.20 0.40
TD-RRH8x20-25	C	From Leg	4.00 0.00 0.00	0.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.72 5.01 5.32 5.95 7.31	1.70 1.92 2.14 2.62 3.68	0.07 0.10 0.13 0.20 0.40
Platform Mount [LP 1201-1]	C	None		0.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	23.10 26.80 30.50 37.90 52.70	23.10 26.80 30.50 37.90 52.70	2.10 2.50 2.90 3.70 5.30
Miscellaneous [NA 510-3]	C	None		0.0000	139.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	19.70 28.20 36.70 53.70 87.70	19.70 28.20 36.70 53.70 87.70	0.52 0.72 0.92 1.33 2.14
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PCS 1900MHz 4x45W-65MHz	A	From Leg	2.00 0.00	0.0000	137.00	No Ice 1/2" Ice	2.71 2.95	2.61 2.85	0.06 0.08

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1" Ice	3.20	3.09	0.11
						2" Ice	3.72	3.61	0.17
						4" Ice	4.86	4.74	0.35
PCS 1900MHz 4x45W-65MHz	B	From Leg	2.00 0.00 0.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.71 2.95 3.20 3.72 4.86	2.61 2.85 3.09 3.61 4.74	0.06 0.08 0.11 0.17 0.35
PCS 1900MHz 4x45W-65MHz	C	From Leg	2.00 0.00 0.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.71 2.95 3.20 3.72 4.86	2.61 2.85 3.09 3.61 4.74	0.06 0.08 0.11 0.17 0.35
800MHz 2X50W RRH W/FILTER	A	From Leg	2.00 0.00 3.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.40 2.61 2.83 3.30 4.34	2.25 2.46 2.68 3.13 4.15	0.06 0.09 0.11 0.17 0.34
800MHz 2X50W RRH W/FILTER	B	From Leg	2.00 0.00 3.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.40 2.61 2.83 3.30 4.34	2.25 2.46 2.68 3.13 4.15	0.06 0.09 0.11 0.17 0.34
800MHz 2X50W RRH W/FILTER	C	From Leg	2.00 0.00 3.00	0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.40 2.61 2.83 3.30 4.34	2.25 2.46 2.68 3.13 4.15	0.06 0.09 0.11 0.17 0.34
Side Arm Mount [SO 102-3]	C	None		0.0000	137.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 3.48 3.96 4.92 6.84	3.00 3.48 3.96 4.92 6.84	0.08 0.11 0.14 0.20 0.32
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RRUS-11	A	From Leg	2.00 0.00 1.00	0.0000	129.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.94 3.17 3.41 3.91 5.02	1.25 1.41 1.59 1.96 2.82	0.06 0.07 0.10 0.15 0.30
RRUS-11	B	From Leg	2.00 0.00 1.00	0.0000	129.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.94 3.17 3.41 3.91 5.02	1.25 1.41 1.59 1.96 2.82	0.06 0.07 0.10 0.15 0.30
RRUS-11	C	From Leg	2.00 0.00 1.00	0.0000	129.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.94 3.17 3.41 3.91 5.02	1.25 1.41 1.59 1.96 2.82	0.06 0.07 0.10 0.15 0.30
Side Arm Mount [SO 102-3]	C	None		0.0000	129.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 3.48 3.96 4.92 6.84	3.00 3.48 3.96 4.92 6.84	0.08 0.11 0.14 0.20 0.32
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Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
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7770.00 w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.12 6.63 7.13 8.16 10.36	4.25 5.01 5.71 7.16 10.41	0.06 0.10 0.16 0.29 0.66
7770.00 w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.12 6.63 7.13 8.16 10.36	4.25 5.01 5.71 7.16 10.41	0.06 0.10 0.16 0.29 0.66
7770.00 w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.12 6.63 7.13 8.16 10.36	4.25 5.01 5.71 7.16 10.41	0.06 0.10 0.16 0.29 0.66
SBNH-1D6565C w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.68 12.40 13.14 14.60 17.87	9.84 11.37 12.91 15.27 20.14	0.10 0.19 0.29 0.52 1.17
AM-X-CD-16-65-00T-RET w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.30 7.48 8.37 10.18 14.02	0.07 0.14 0.21 0.38 0.87
AM-X-CD-16-65-00T-RET w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.30 7.48 8.37 10.18 14.02	0.07 0.14 0.21 0.38 0.87
RRUS-11	A	From Leg	4.00 0.00 2.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.94 3.17 3.41 3.91 5.02	1.25 1.41 1.59 1.96 2.82	0.06 0.07 0.10 0.15 0.30
RRUS-11	B	From Leg	4.00 0.00 2.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.94 3.17 3.41 3.91 5.02	1.25 1.41 1.59 1.96 2.82	0.06 0.07 0.10 0.15 0.30
RRUS-11	C	From Leg	4.00 0.00 2.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.94 3.17 3.41 3.91 5.02	1.25 1.41 1.59 1.96 2.82	0.06 0.07 0.10 0.15 0.30
(2) LGP21401	A	From Leg	4.00 0.00 0.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.29 1.45 1.61 1.97 2.79	0.23 0.31 0.40 0.61 1.12	0.01 0.02 0.03 0.05 0.14
(2) LGP21401	B	From Leg	4.00 0.00 0.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.29 1.45 1.61 1.97 2.79	0.23 0.31 0.40 0.61 1.12	0.01 0.02 0.03 0.05 0.14

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(2) LGP21401	C	From Leg	4.00 0.00 0.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.29 1.45 1.61 1.97 2.79	0.23 0.31 0.40 0.61 1.12	0.01 0.02 0.03 0.05 0.14
DC6-48-60-18-8F	A	From Leg	4.00 0.00 2.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.57 2.80 3.04 3.54 4.66	4.32 4.60 4.88 5.49 6.80	0.03 0.06 0.10 0.18 0.40
Empty Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.40 2.13 2.68 3.56 5.42	1.40 2.13 2.68 3.56 5.42	0.03 0.04 0.06 0.10 0.26
Empty Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.40 2.13 2.68 3.56 5.42	1.40 2.13 2.68 3.56 5.42	0.03 0.04 0.06 0.10 0.26
Empty Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.40 2.13 2.68 3.56 5.42	1.40 2.13 2.68 3.56 5.42	0.03 0.04 0.06 0.10 0.26
T-Arm Mount [TA 602-3]	C	None		0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.59 15.44 19.29 26.99 42.39	11.59 15.44 19.29 26.99 42.39	0.77 0.99 1.21 1.64 2.50
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(3) SBNHH-1D65B w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	108.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.86 9.62 10.34 11.73 14.64	7.30 8.58 9.72 11.66 15.92	0.07 0.14 0.22 0.41 0.94
(3) SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	108.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.86 9.62 10.34 11.73 14.64	7.30 8.58 9.72 11.66 15.92	0.07 0.14 0.22 0.41 0.94
(3) SBNHH-1D65B w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	108.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.86 9.62 10.34 11.73 14.64	7.30 8.58 9.72 11.66 15.92	0.07 0.14 0.22 0.41 0.94
RRH2X60-PCS	A	From Leg	4.00 0.00 1.00	0.0000	108.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.57 2.79 3.02 3.52 4.61	1.93 2.13 2.34 2.80 3.81	0.05 0.07 0.09 0.14 0.30
RRH2X60-PCS	B	From Leg	4.00 0.00	0.0000	108.00	No Ice 1/2" Ice	2.57 2.79	1.93 2.13	0.05 0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			1.00			1" Ice	3.02	2.34	0.09
						2" Ice	3.52	2.80	0.14
						4" Ice	4.61	3.81	0.30
RRH2X60-PCS	C	From Leg	4.00	0.0000	108.00	No Ice	2.57	1.93	0.05
			0.00			1/2" Ice	2.79	2.13	0.07
			1.00			1" Ice	3.02	2.34	0.09
						2" Ice	3.52	2.80	0.14
						4" Ice	4.61	3.81	0.30
RRH2x60-700	A	From Leg	4.00	0.0000	108.00	No Ice	3.96	1.82	0.06
			0.00			1/2" Ice	4.27	2.08	0.08
			1.00			1" Ice	4.60	2.36	0.11
						2" Ice	5.27	2.96	0.17
						4" Ice	6.72	4.25	0.35
RRH2x60-700	B	From Leg	4.00	0.0000	108.00	No Ice	3.96	1.82	0.06
			0.00			1/2" Ice	4.27	2.08	0.08
			1.00			1" Ice	4.60	2.36	0.11
						2" Ice	5.27	2.96	0.17
						4" Ice	6.72	4.25	0.35
RRH2x60-700	C	From Leg	4.00	0.0000	108.00	No Ice	3.96	1.82	0.06
			0.00			1/2" Ice	4.27	2.08	0.08
			1.00			1" Ice	4.60	2.36	0.11
						2" Ice	5.27	2.96	0.17
						4" Ice	6.72	4.25	0.35
RRH4X45-AWS4 B66	A	From Leg	4.00	0.0000	108.00	No Ice	3.10	1.76	0.06
			0.00			1/2" Ice	3.36	1.98	0.08
			1.00			1" Ice	3.62	2.21	0.11
						2" Ice	4.17	2.69	0.17
						4" Ice	5.38	3.77	0.33
RRH4X45-AWS4 B66	B	From Leg	4.00	0.0000	108.00	No Ice	3.10	1.76	0.06
			0.00			1/2" Ice	3.36	1.98	0.08
			1.00			1" Ice	3.62	2.21	0.11
						2" Ice	4.17	2.69	0.17
						4" Ice	5.38	3.77	0.33
RRH4X45-AWS4 B66	C	From Leg	4.00	0.0000	108.00	No Ice	3.10	1.76	0.06
			0.00			1/2" Ice	3.36	1.98	0.08
			1.00			1" Ice	3.62	2.21	0.11
						2" Ice	4.17	2.69	0.17
						4" Ice	5.38	3.77	0.33
(2) DB-T1-6Z-8AB-0Z	A	From Leg	4.00	0.0000	108.00	No Ice	5.60	2.33	0.04
			0.00			1/2" Ice	5.92	2.56	0.08
			1.00			1" Ice	6.24	2.79	0.12
						2" Ice	6.91	3.28	0.21
						4" Ice	8.37	4.37	0.45
BXA-70063-4CF-EDIN-X w/ Mount Pipe	A	From Leg	4.00	0.0000	108.00	No Ice	5.89	4.18	0.04
			0.00			1/2" Ice	6.59	5.21	0.08
			1.00			1" Ice	7.17	5.95	0.14
						2" Ice	8.36	7.53	0.27
						4" Ice	10.91	10.98	0.65
BXA-70063-4CF-EDIN-X w/ Mount Pipe	B	From Leg	4.00	0.0000	108.00	No Ice	5.89	4.18	0.04
			0.00			1/2" Ice	6.59	5.21	0.08
			1.00			1" Ice	7.17	5.95	0.14
						2" Ice	8.36	7.53	0.27
						4" Ice	10.91	10.98	0.65
BXA-70063-4CF-EDIN-X w/ Mount Pipe	C	From Leg	4.00	0.0000	108.00	No Ice	5.89	4.18	0.04
			0.00			1/2" Ice	6.59	5.21	0.08
			1.00			1" Ice	7.17	5.95	0.14
						2" Ice	8.36	7.53	0.27

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice	10.91	10.98	0.65
Platform Mount [LP 304-1]	C	None		0.0000	108.00	No Ice	17.46	17.46	1.35
						1/2" Ice	22.44	22.44	1.62
						1" Ice	27.42	27.42	1.90
						2" Ice	37.38	37.38	2.45
						4" Ice	57.30	57.30	3.55
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ERICSSON AIR 21 B2A	A	From Leg	4.00	0.0000	100.00	No Ice	6.83	5.64	0.11
B4P w/ Mount Pipe			0.00			1/2" Ice	7.35	6.48	0.17
			0.00			1" Ice	7.86	7.26	0.23
						2" Ice	8.93	8.86	0.38
						4" Ice	11.18	12.29	0.81
ERICSSON AIR 21 B2A	B	From Leg	4.00	0.0000	100.00	No Ice	6.83	5.64	0.11
B4P w/ Mount Pipe			0.00			1/2" Ice	7.35	6.48	0.17
			0.00			1" Ice	7.86	7.26	0.23
						2" Ice	8.93	8.86	0.38
						4" Ice	11.18	12.29	0.81
ERICSSON AIR 21 B2A	C	From Leg	4.00	0.0000	100.00	No Ice	6.83	5.64	0.11
B4P w/ Mount Pipe			0.00			1/2" Ice	7.35	6.48	0.17
			0.00			1" Ice	7.86	7.26	0.23
						2" Ice	8.93	8.86	0.38
						4" Ice	11.18	12.29	0.81
ERICSSON AIR 21 B4A	A	From Leg	4.00	0.0000	100.00	No Ice	6.83	5.64	0.11
B2P w/ Mount Pipe			0.00			1/2" Ice	7.35	6.48	0.17
			0.00			1" Ice	7.86	7.26	0.23
						2" Ice	8.93	8.86	0.38
						4" Ice	11.18	12.29	0.81
ERICSSON AIR 21 B4A	B	From Leg	4.00	0.0000	100.00	No Ice	6.83	5.64	0.11
B2P w/ Mount Pipe			0.00			1/2" Ice	7.35	6.48	0.17
			0.00			1" Ice	7.86	7.26	0.23
						2" Ice	8.93	8.86	0.38
						4" Ice	11.18	12.29	0.81
ERICSSON AIR 21 B4A	C	From Leg	4.00	0.0000	100.00	No Ice	6.83	5.64	0.11
B2P w/ Mount Pipe			0.00			1/2" Ice	7.35	6.48	0.17
			0.00			1" Ice	7.86	7.26	0.23
						2" Ice	8.93	8.86	0.38
						4" Ice	11.18	12.29	0.81
LNX-6515DS-VTM w/	A	From Leg	4.00	0.0000	100.00	No Ice	11.68	9.84	0.08
Mount Pipe			0.00			1/2" Ice	12.40	11.37	0.17
			0.00			1" Ice	13.14	12.91	0.27
						2" Ice	14.60	15.27	0.51
						4" Ice	17.87	20.14	1.15
LNX-6515DS-VTM w/	B	From Leg	4.00	0.0000	100.00	No Ice	11.68	9.84	0.08
Mount Pipe			0.00			1/2" Ice	12.40	11.37	0.17
			0.00			1" Ice	13.14	12.91	0.27
						2" Ice	14.60	15.27	0.51
						4" Ice	17.87	20.14	1.15
LNX-6515DS-VTM w/	C	From Leg	4.00	0.0000	100.00	No Ice	11.68	9.84	0.08
Mount Pipe			0.00			1/2" Ice	12.40	11.37	0.17
			0.00			1" Ice	13.14	12.91	0.27
						2" Ice	14.60	15.27	0.51
						4" Ice	17.87	20.14	1.15
RRUS 11 B12	A	From Leg	4.00	0.0000	100.00	No Ice	3.31	1.36	0.05
			0.00			1/2" Ice	3.55	1.54	0.07
			0.00			1" Ice	3.80	1.73	0.10

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	4.33	2.13	0.15
						4" Ice	5.50	3.04	0.31
RRUS 11 B12	B	From Leg	4.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.31 3.55 3.80 4.33 5.50	1.36 1.54 1.73 2.13 3.04	0.05 0.07 0.10 0.15 0.31
RRUS 11 B12	C	From Leg	4.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.31 3.55 3.80 4.33 5.50	1.36 1.54 1.73 2.13 3.04	0.05 0.07 0.10 0.15 0.31
KRY 112 144/1	A	From Leg	4.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.41 0.50 0.60 0.82 1.36	0.19 0.26 0.33 0.51 0.97	0.01 0.01 0.02 0.03 0.08
KRY 112 144/1	B	From Leg	4.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.41 0.50 0.60 0.82 1.36	0.19 0.26 0.33 0.51 0.97	0.01 0.01 0.02 0.03 0.08
KRY 112 144/1	C	From Leg	4.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.41 0.50 0.60 0.82 1.36	0.19 0.26 0.33 0.51 0.97	0.01 0.01 0.02 0.03 0.08
T-Arm Mount [TA 602-3]	C	None		0.0000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.59 15.44 19.29 26.99 42.39	11.59 15.44 19.29 26.99 42.39	0.77 0.99 1.21 1.64 2.50
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Pipe Mount [PM 601-3]	C	None		0.0000	90.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.39 5.48 6.57 8.75 13.11	4.39 5.48 6.57 8.75 13.11	0.20 0.24 0.28 0.36 0.53
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KS24019-L112A	A	From Leg	3.00 0.00 2.00	0.0000	70.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.16 0.22 0.30 0.48 0.95	0.16 0.22 0.30 0.48 0.95	0.01 0.01 0.01 0.02 0.06
Side Arm Mount [SO 701-1]	A	From Leg	1.50 0.00 0.00	0.0000	70.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.85 1.14 1.43 2.01 3.17	1.67 2.34 3.01 4.35 7.03	0.07 0.08 0.09 0.12 0.18
KS24019-L112A	C	From Leg	3.00 0.00 2.00	0.0000	70.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.16 0.22 0.30 0.48	0.16 0.22 0.30 0.48	0.01 0.01 0.01 0.02

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice	0.95	0.95	0.06
Side Arm Mount [SO 701-1]	C	From Leg	1.50 0.00 0.00	0.0000	70.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.85 1.14 1.43 2.01 3.17	1.67 2.34 3.01 4.35 7.03	0.07 0.08 0.09 0.12 0.18
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KS24019-L112A	B	From Leg	3.00 0.00 2.00	0.0000	49.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.16 0.22 0.30 0.48 0.95	0.16 0.22 0.30 0.48 0.95	0.01 0.01 0.01 0.02 0.06
Side Arm Mount [SO 701-1]	B	From Leg	1.50 0.00 0.00	0.0000	49.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.85 1.14 1.43 2.01 3.17	1.67 2.34 3.01 4.35 7.03	0.07 0.08 0.09 0.12 0.18

Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	31.90					
Bracing Weight	0.00					
Total Member Self-Weight	31.90			-0.15	0.63	
Total Weight	45.82			-0.15	0.63	
Wind 0 deg - No Ice		-0.00	-35.89	-3135.04	0.94	-0.28
Wind 30 deg - No Ice		17.86	-31.08	-2714.89	-1558.45	-1.20
Wind 60 deg - No Ice		30.93	-17.94	-1567.33	-2700.09	-1.79
Wind 90 deg - No Ice		35.72	0.00	0.16	-3118.08	-1.91
Wind 120 deg - No Ice		30.93	17.94	1567.56	-2700.40	-1.51
Wind 150 deg - No Ice		17.86	31.08	2714.90	-1558.99	-0.71
Wind 180 deg - No Ice		0.00	35.89	3134.74	0.32	0.28
Wind 210 deg - No Ice		-17.86	31.08	2714.58	1559.71	1.20
Wind 240 deg - No Ice		-30.93	17.94	1567.02	2701.35	1.79
Wind 270 deg - No Ice		-35.72	-0.00	-0.47	3119.34	1.91
Wind 300 deg - No Ice		-30.93	-17.94	-1567.87	2701.67	1.51
Wind 330 deg - No Ice		-17.86	-31.08	-2715.20	1560.26	0.71
Member Ice	5.80					
Total Weight Ice	68.45			-0.12	3.03	
Wind 0 deg - Ice		-0.00	-10.02	-902.37	3.18	-0.14
Wind 30 deg - Ice		5.00	-8.68	-781.42	-446.62	-0.33
Wind 60 deg - Ice		8.65	-5.01	-451.12	-775.93	-0.44
Wind 90 deg - Ice		9.99	0.00	0.02	-896.52	-0.42
Wind 120 deg - Ice		8.65	5.01	451.13	-776.07	-0.30
Wind 150 deg - Ice		5.00	8.68	781.32	-446.87	-0.09
Wind 180 deg - Ice		0.00	10.02	902.13	2.89	0.14

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Wind 210 deg - Ice		-5.00	8.68	781.18	452.68	0.33
Wind 240 deg - Ice		-8.65	5.01	450.88	781.99	0.44
Wind 270 deg - Ice		-9.99	-0.00	-0.26	902.58	0.42
Wind 300 deg - Ice		-8.65	-5.01	-451.37	782.13	0.30
Wind 330 deg - Ice		-5.00	-8.68	-781.56	452.93	0.09
Total Weight	45.82			-0.15	0.63	
Wind 0 deg - Service		-0.00	-14.02	-1225.23	0.13	-0.11
Wind 30 deg - Service		6.98	-12.14	-1061.11	-609.01	-0.47
Wind 60 deg - Service		12.08	-7.01	-612.84	-1054.96	-0.70
Wind 90 deg - Service		13.95	0.00	-0.54	-1218.24	-0.75
Wind 120 deg - Service		12.08	7.01	611.72	-1055.09	-0.59
Wind 150 deg - Service		6.98	12.14	1059.90	-609.22	-0.28
Wind 180 deg - Service		0.00	14.02	1223.90	-0.12	0.11
Wind 210 deg - Service		-6.98	12.14	1059.78	609.02	0.47
Wind 240 deg - Service		-12.08	7.01	611.51	1054.98	0.70
Wind 270 deg - Service		-13.95	-0.00	-0.79	1218.25	0.75
Wind 300 deg - Service		-12.08	-7.01	-613.05	1055.10	0.59
Wind 330 deg - Service		-6.98	-12.14	-1061.23	609.23	0.28

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
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

Comb. No.	Description
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	140 - 135	Pole	Max Tension	27	0.00	-0.00	-0.00
			Max. Compression	14	-6.86	0.03	-0.02
			Max. Mx	11	-3.37	21.12	0.00
			Max. My	8	-3.37	0.02	-21.11
			Max. Vy	11	-5.18	21.12	0.00
			Max. Vx	2	-5.18	0.02	21.09
			Max. Torque	13			0.01
L2	135 - 130	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-7.27	0.03	-0.01
			Max. Mx	11	-3.60	47.86	0.02
			Max. My	8	-3.60	0.02	-47.86
			Max. Vy	11	-5.52	47.86	0.02
			Max. Vx	2	-5.52	0.02	47.84
			Max. Torque	25			0.01
L3	130 - 125	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-11.66	0.03	0.95
			Max. Mx	11	-5.34	91.76	0.16
			Max. My	2	-5.35	0.02	91.60
			Max. Vy	11	-9.38	91.76	0.16
			Max. Vx	2	-9.29	0.02	91.60
			Max. Torque	5			1.55
L4	125 - 120	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-12.15	0.03	0.95
			Max. Mx	11	-5.66	139.51	0.18
			Max. My	2	-5.67	0.02	138.93
			Max. Vy	11	-9.73	139.51	0.18
			Max. Vx	2	-9.65	0.02	138.93
			Max. Torque	5			1.55
L5	120 - 115	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-12.65	0.03	0.95
			Max. Mx	11	-6.01	189.06	0.20
			Max. My	2	-6.02	0.02	188.06
			Max. Vy	11	-10.10	189.06	0.20
			Max. Vx	2	-10.01	0.02	188.06
			Max. Torque	5			1.54
L6	115 - 110	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-13.18	0.04	0.96
			Max. Mx	11	-6.38	240.45	0.22
			Max. My	2	-6.38	0.02	239.02
			Max. Vy	11	-10.47	240.45	0.22
			Max. Vx	2	-10.38	0.02	239.02
			Max. Torque	5			1.54
L7	110 - 105	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-19.75	0.02	2.27
			Max. Mx	11	-9.06	314.42	0.55
			Max. My	2	-9.04	0.02	313.99
			Max. Vy	11	-16.26	314.42	0.55
			Max. Vx	2	-16.43	0.02	313.99

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Torque	5			2.46
L8	105 - 102.333	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-20.13	0.00	2.25
			Max. Mx	11	-9.32	358.13	0.55
			Max. My	2	-9.30	0.01	358.15
			Max. Vy	11	-16.54	358.13	0.55
			Max. Vx	2	-16.71	0.01	358.15
			Max. Torque	5			2.46
L9	102.333 - 102.083	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-20.17	0.00	2.25
			Max. Mx	11	-9.36	362.26	0.55
			Max. My	2	-9.34	0.01	362.33
			Max. Vy	11	-16.56	362.26	0.55
			Max. Vx	2	-16.73	0.01	362.33
			Max. Torque	5			2.45
L10	102.083 - 97.083	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-25.23	0.03	2.20
			Max. Mx	11	-11.59	456.99	0.55
			Max. My	2	-11.57	0.02	457.90
			Max. Vy	11	-20.75	456.99	0.55
			Max. Vx	2	-20.92	0.02	457.90
			Max. Torque	5			2.45
L11	97.083 - 91.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-25.67	0.04	2.17
			Max. Mx	11	-11.88	500.50	0.55
			Max. My	2	-11.86	0.03	501.75
			Max. Vy	11	-21.03	500.50	0.55
			Max. Vx	2	-21.21	0.03	501.75
			Max. Torque	5			2.43
L12	91.75 - 90.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-27.12	0.03	2.09
			Max. Mx	11	-12.88	591.25	0.55
			Max. My	2	-12.86	0.05	593.19
			Max. Vy	11	-21.65	591.25	0.55
			Max. Vx	2	-21.82	0.05	593.19
			Max. Torque	5			2.40
L13	90.75 - 85.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-28.60	-0.02	2.00
			Max. Mx	11	-13.94	701.78	0.55
			Max. My	2	-13.93	0.07	704.55
			Max. Vy	11	-22.45	701.78	0.55
			Max. Vx	2	-22.62	0.07	704.55
			Max. Torque	5			2.39
L14	85.75 - 85.33	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-28.71	-0.03	1.99
			Max. Mx	11	-14.03	711.22	0.55
			Max. My	2	-14.01	0.08	714.06
			Max. Vy	11	-22.51	711.22	0.55
			Max. Vx	2	-22.68	0.08	714.06
			Max. Torque	5			2.36
L15	85.33 - 85.08	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-28.78	-0.03	1.98
			Max. Mx	11	-14.08	716.85	0.55
			Max. My	2	-14.06	0.08	719.73
			Max. Vy	11	-22.54	716.85	0.55
			Max. Vx	2	-22.72	0.08	719.73
			Max. Torque	5			2.36
L16	85.08 - 82.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-29.56	-0.03	1.89

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	11	-14.59	775.55	0.55
			Max. My	2	-14.58	0.09	778.86
			Max. Vy	11	-22.96	775.55	0.55
			Max. Vx	2	-23.14	0.09	778.86
			Max. Torque	5			2.36
L17	82.5 - 82.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-29.63	-0.02	1.87
			Max. Mx	11	-14.66	781.30	0.55
			Max. My	2	-14.64	0.09	784.64
			Max. Vy	11	-23.00	781.30	0.55
			Max. Vx	2	-23.17	0.09	784.64
			Max. Torque	5			2.34
L18	82.25 - 77.15	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-31.24	0.07	1.66
			Max. Mx	11	-15.76	900.67	0.54
			Max. My	2	-15.74	0.12	904.85
			Max. Vy	11	-23.82	900.67	0.54
			Max. Vx	2	-23.99	0.12	904.85
			Max. Torque	5			2.33
L19	77.15 - 76.9167	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-31.32	0.08	1.65
			Max. Mx	11	-15.82	906.23	0.54
			Max. My	2	-15.80	0.12	910.45
			Max. Vy	11	-23.85	906.23	0.54
			Max. Vx	2	-24.03	0.12	910.45
			Max. Torque	5			2.28
L20	76.9167 - 71.9167	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-32.88	0.27	1.46
			Max. Mx	11	-16.92	1027.51	0.53
			Max. My	2	-16.91	0.14	1032.55
			Max. Vy	11	-24.66	1027.51	0.53
			Max. Vx	2	-24.84	0.14	1032.55
			Max. Torque	5			2.28
L21	71.9167 - 66.9167	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-34.70	0.75	1.42
			Max. Mx	11	-18.21	1153.34	0.65
			Max. My	2	-18.20	0.37	1159.08
			Max. Vy	11	-25.58	1153.34	0.65
			Max. Vx	2	-25.73	0.37	1159.08
			Max. Torque	5			2.31
L22	66.9167 - 66.667	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-34.78	0.77	1.41
			Max. Mx	11	-18.28	1159.73	0.65
			Max. My	2	-18.27	0.38	1165.50
			Max. Vy	11	-25.61	1159.73	0.65
			Max. Vx	2	-25.77	0.38	1165.50
			Max. Torque	5			2.28
L23	66.667 - 66.417	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-34.86	0.78	1.40
			Max. Mx	11	-18.33	1166.14	0.65
			Max. My	2	-18.32	0.38	1171.95
			Max. Vy	11	-25.65	1166.14	0.65
			Max. Vx	2	-25.81	0.38	1171.95
			Max. Torque	5			2.28
L24	66.417 - 61.417	Pole	Max Tension	1	0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	14	-36.33	0.95	1.26
			Max. Mx	11	-19.39	1296.28	0.70
			Max. My	2	-19.37	0.47	1302.82
			Max. Vy	11	-26.41	1296.28	0.70
			Max. Vx	2	-26.57	0.47	1302.82
			Max. Torque	5			2.27
L25	61.417 - 60	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-36.75	0.99	1.22
			Max. Mx	11	-19.69	1333.84	0.71
			Max. My	2	-19.68	0.50	1340.59
			Max. Vy	11	-26.62	1333.84	0.71
			Max. Vx	2	-26.78	0.50	1340.59
			Max. Torque	5			2.24
L26	60 - 59.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-36.83	1.00	1.21
			Max. Mx	11	-19.76	1340.50	0.71
			Max. My	2	-19.75	0.51	1347.29
			Max. Vy	11	-26.65	1340.50	0.71
			Max. Vx	2	-26.80	0.51	1347.29
			Max. Torque	5			2.23
L27	59.75 - 54.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-38.42	1.16	1.05
			Max. Mx	11	-20.95	1475.55	0.75
			Max. My	2	-20.94	0.60	1483.07
			Max. Vy	11	-27.38	1475.55	0.75
			Max. Vx	2	-27.53	0.60	1483.07
			Max. Torque	5			2.23
L28	54.75 - 46.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-39.62	1.28	0.93
			Max. Mx	11	-21.86	1579.17	0.78
			Max. My	2	-21.86	0.67	1587.23
			Max. Vy	11	-27.90	1579.17	0.78
			Max. Vx	2	-28.06	0.67	1587.23
			Max. Torque	5			2.19
L29	46.5 - 45.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-43.33	1.21	0.61
			Max. Mx	11	-24.83	1734.98	0.69
			Max. My	2	-24.82	0.56	1743.97
			Max. Vy	11	-28.81	1734.98	0.69
			Max. Vx	2	-28.98	0.56	1743.97
			Max. Torque	11			-2.04
L30	45.5 - 44.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-43.92	1.26	0.59
			Max. Mx	11	-25.30	1771.12	0.68
			Max. My	2	-25.29	0.57	1780.30
			Max. Vy	11	-29.01	1771.12	0.68
			Max. Vx	2	-29.18	0.57	1780.30
			Max. Torque	11			-2.03
L31	44.25 - 44	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-44.05	1.26	0.59
			Max. Mx	11	-25.42	1778.37	0.68
			Max. My	2	-25.41	0.57	1787.59
			Max. Vy	11	-29.04	1778.37	0.68
			Max. Vx	2	-29.21	0.57	1787.59
			Max. Torque	11			-2.03
L32	44 - 39	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-46.63	1.44	0.51
			Max. Mx	11	-27.52	1925.48	0.66
			Max. My	2	-27.51	0.61	1935.49
			Max. Vy	11	-29.80	1925.48	0.66
			Max. Vx	2	-29.97	0.61	1935.49

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Torque	11			-2.02
L33	39 - 34	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-49.26	1.61	0.43
			Max. Mx	11	-29.68	2076.32	0.65
			Max. My	2	-29.67	0.66	2087.12
			Max. Vy	11	-30.54	2076.32	0.65
			Max. Vx	2	-30.71	0.66	2087.12
			Max. Torque	11			-2.00
L34	34 - 29	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-51.93	1.81	0.36
			Max. Mx	11	-31.88	2230.81	0.63
			Max. My	2	-31.87	0.70	2242.39
			Max. Vy	11	-31.26	2230.81	0.63
			Max. Vx	2	-31.43	0.70	2242.39
			Max. Torque	11			-1.98
L35	29 - 27.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-52.61	1.87	0.35
			Max. Mx	11	-32.43	2270.00	0.62
			Max. My	2	-32.43	0.71	2281.78
			Max. Vy	11	-31.45	2270.00	0.62
			Max. Vx	2	-31.62	0.71	2281.78
			Max. Torque	11			-1.96
L36	27.75 - 27.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-52.76	1.88	0.35
			Max. Mx	11	-32.56	2277.87	0.62
			Max. My	2	-32.56	0.71	2289.69
			Max. Vy	11	-31.48	2277.87	0.62
			Max. Vx	2	-31.65	0.71	2289.69
			Max. Torque	11			-1.96
L37	27.5 - 24.083	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-54.75	2.07	0.33
			Max. Mx	11	-34.19	2386.36	0.61
			Max. My	2	-34.18	0.74	2398.71
			Max. Vy	11	-32.02	2386.36	0.61
			Max. Vx	2	-32.19	0.74	2398.71
			Max. Torque	11			-1.96
L38	24.083 - 23.833	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-54.90	2.09	0.33
			Max. Mx	11	-34.31	2394.37	0.61
			Max. My	2	-34.31	0.75	2406.76
			Max. Vy	11	-32.05	2394.37	0.61
			Max. Vx	2	-32.22	0.75	2406.76
			Max. Torque	11			-1.96
L39	23.833 - 18.833	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-57.75	2.35	0.31
			Max. Mx	11	-36.64	2556.63	0.58
			Max. My	2	-36.64	0.79	2569.80
			Max. Vy	11	-32.85	2556.63	0.58
			Max. Vx	2	-33.02	0.79	2569.80
			Max. Torque	11			-1.96
L40	18.833 - 18.083	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-58.18	2.39	0.30
			Max. Mx	11	-37.00	2581.31	0.58
			Max. My	2	-36.99	0.80	2594.59
			Max. Vy	11	-32.97	2581.31	0.58
			Max. Vx	2	-33.14	0.80	2594.59
			Max. Torque	11			-1.95
L41	18.083 -	Pole	Max Tension	1	0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
	17.833						
			Max. Compression	14	-58.33	2.40	0.30
			Max. Mx	11	-37.12	2589.56	0.58
			Max. My	2	-37.12	0.80	2602.88
			Max. Vy	11	-33.01	2589.56	0.58
			Max. Vx	2	-33.17	0.80	2602.88
			Max. Torque	11			-1.95
L42	17.833 - 12.833	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-61.23	2.59	0.24
			Max. Mx	11	-39.49	2756.61	0.56
			Max. My	2	-39.49	0.85	2770.70
			Max. Vy	11	-33.81	2756.61	0.56
			Max. Vx	2	-33.98	0.85	2770.70
			Max. Torque	11			-1.95
L43	12.833 - 7.833	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-64.14	2.77	0.23
			Max. Mx	11	-41.92	2927.54	0.53
			Max. My	2	-41.92	0.89	2942.41
			Max. Vy	11	-34.57	2927.54	0.53
			Max. Vx	2	-34.73	0.89	2942.41
			Max. Torque	11			-1.94
L44	7.833 - 2.833	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-67.09	2.95	0.23
			Max. Mx	11	-44.39	3102.21	0.51
			Max. My	2	-44.39	0.94	3117.84
			Max. Vy	11	-35.31	3102.21	0.51
			Max. Vx	2	-35.48	0.94	3117.84
			Max. Torque	11			-1.94
L45	2.833 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-68.78	3.05	0.23
			Max. Mx	11	-45.80	3202.83	0.49
			Max. My	2	-45.80	0.97	3218.89
			Max. Vy	11	-35.74	3202.83	0.49
			Max. Vx	2	-35.90	0.97	3218.89
			Max. Torque	11			-1.95

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	15	68.78	0.00	10.02
	Max. H_x	11	45.82	35.72	0.00
	Max. H_z	2	45.82	0.00	35.89
	Max. M_x	2	3218.89	0.00	35.89
	Max. M_z	5	3201.54	-35.72	-0.00
	Max. Torsion	5	1.95	-35.72	-0.00
	Min. Vert	1	45.82	0.00	0.00
	Min. H_x	5	45.82	-35.72	-0.00
	Min. H_z	8	45.82	-0.00	-35.89
	Min. M_x	8	-3218.52	-0.00	-35.89
	Min. M_z	11	-3202.83	35.72	0.00
	Min. Torsion	11	-1.95	35.72	0.00

Tower Mast Reaction Summary

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
Dead Only	45.82	0.00	0.00	-0.15	0.63	0.00
Dead+Wind 0 deg - No Ice	45.82	-0.00	-35.89	-3218.89	0.97	-0.29
Dead+Wind 30 deg - No Ice	45.82	17.86	-31.08	-2787.51	-1600.16	-1.22
Dead+Wind 60 deg - No Ice	45.82	30.93	-17.94	-1609.26	-2772.37	-1.83
Dead+Wind 90 deg - No Ice	45.82	35.72	0.00	0.15	-3201.54	-1.95
Dead+Wind 120 deg - No Ice	45.82	30.93	17.94	1609.47	-2772.67	-1.54
Dead+Wind 150 deg - No Ice	45.82	17.86	31.08	2787.47	-1600.71	-0.73
Dead+Wind 180 deg - No Ice	45.82	0.00	35.89	3218.52	0.33	0.29
Dead+Wind 210 deg - No Ice	45.82	-17.86	31.08	2787.15	1601.44	1.22
Dead+Wind 240 deg - No Ice	45.82	-30.93	17.94	1608.91	2773.65	1.83
Dead+Wind 270 deg - No Ice	45.82	-35.72	-0.00	-0.49	3202.83	1.95
Dead+Wind 300 deg - No Ice	45.82	-30.93	-17.94	-1609.81	2773.98	1.54
Dead+Wind 330 deg - No Ice	45.82	-17.86	-31.08	-2787.83	1602.01	0.73
Dead+Ice+Temp	68.78	-0.00	-0.00	-0.23	3.05	0.00
Dead+Wind 0 deg+Ice+Temp	68.78	-0.00	-10.02	-950.04	3.29	-0.14
Dead+Wind 30 deg+Ice+Temp	68.78	5.00	-8.68	-822.72	-470.21	-0.37
Dead+Wind 60 deg+Ice+Temp	68.78	8.65	-5.01	-475.03	-816.88	-0.50
Dead+Wind 90 deg+Ice+Temp	68.78	9.99	0.00	-0.13	-943.82	-0.49
Dead+Wind 120 deg+Ice+Temp	68.78	8.65	5.01	474.72	-817.03	-0.35
Dead+Wind 150 deg+Ice+Temp	68.78	5.00	8.68	822.30	-470.47	-0.12
Dead+Wind 180 deg+Ice+Temp	68.78	0.00	10.02	949.47	2.99	0.14
Dead+Wind 210 deg+Ice+Temp	68.78	-5.00	8.68	822.15	476.48	0.37
Dead+Wind 240 deg+Ice+Temp	68.78	-8.65	5.01	474.46	823.15	0.50
Dead+Wind 270 deg+Ice+Temp	68.78	-9.99	-0.00	-0.44	950.10	0.49
Dead+Wind 300 deg+Ice+Temp	68.78	-8.65	-5.01	-475.29	823.30	0.35
Dead+Wind 330 deg+Ice+Temp	68.78	-5.00	-8.68	-822.87	476.75	0.12
Dead+Wind 0 deg - Service	45.82	-0.00	-14.02	-1258.68	0.77	-0.11
Dead+Wind 30 deg - Service	45.82	6.98	-12.14	-1090.01	-625.26	-0.48
Dead+Wind 60 deg - Service	45.82	12.08	-7.01	-629.32	-1083.58	-0.72
Dead+Wind 90 deg - Service	45.82	13.95	0.00	-0.06	-1251.38	-0.77
Dead+Wind 120 deg - Service	45.82	12.08	7.01	629.17	-1083.70	-0.61
Dead+Wind 150 deg - Service	45.82	6.98	12.14	1089.76	-625.47	-0.29
Dead+Wind 180 deg - Service	45.82	0.00	14.02	1258.30	0.52	0.11
Dead+Wind 210 deg - Service	45.82	-6.98	12.14	1089.64	626.55	0.48
Dead+Wind 240 deg - Service	45.82	-12.08	7.01	628.95	1084.87	0.72
Dead+Wind 270 deg - Service	45.82	-13.95	-0.00	-0.31	1252.67	0.77
Dead+Wind 300 deg - Service	45.82	-12.08	-7.01	-629.54	1085.00	0.61
Dead+Wind 330 deg - Service	45.82	-6.98	-12.14	-1090.14	626.77	0.29

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-45.82	0.00	0.00	45.82	0.00	0.000%
2	-0.00	-45.82	-35.89	0.00	45.82	35.89	0.000%
3	17.86	-45.82	-31.08	-17.86	45.82	31.08	0.000%
4	30.93	-45.82	-17.94	-30.93	45.82	17.94	0.000%
5	35.72	-45.82	0.00	-35.72	45.82	-0.00	0.000%
6	30.93	-45.82	17.94	-30.93	45.82	-17.94	0.000%
7	17.86	-45.82	31.08	-17.86	45.82	-31.08	0.000%
8	0.00	-45.82	35.89	-0.00	45.82	-35.89	0.000%
9	-17.86	-45.82	31.08	17.86	45.82	-31.08	0.000%
10	-30.93	-45.82	17.94	30.93	45.82	-17.94	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
11	-35.72	-45.82	-0.00	35.72	45.82	0.00	0.000%
12	-30.93	-45.82	-17.94	30.93	45.82	17.94	0.000%
13	-17.86	-45.82	-31.08	17.86	45.82	31.08	0.000%
14	0.00	-68.78	0.00	0.00	68.78	0.00	0.000%
15	-0.00	-68.78	-10.02	0.00	68.78	10.02	0.000%
16	5.00	-68.78	-8.68	-5.00	68.78	8.68	0.000%
17	8.65	-68.78	-5.01	-8.65	68.78	5.01	0.000%
18	9.99	-68.78	0.00	-9.99	68.78	-0.00	0.000%
19	8.65	-68.78	5.01	-8.65	68.78	-5.01	0.000%
20	5.00	-68.78	8.68	-5.00	68.78	-8.68	0.000%
21	0.00	-68.78	10.02	-0.00	68.78	-10.02	0.000%
22	-5.00	-68.78	8.68	5.00	68.78	-8.68	0.000%
23	-8.65	-68.78	5.01	8.65	68.78	-5.01	0.000%
24	-9.99	-68.78	-0.00	9.99	68.78	0.00	0.000%
25	-8.65	-68.78	-5.01	8.65	68.78	5.01	0.000%
26	-5.00	-68.78	-8.68	5.00	68.78	8.68	0.000%
27	-0.00	-45.82	-14.02	0.00	45.82	14.02	0.000%
28	6.98	-45.82	-12.14	-6.98	45.82	12.14	0.000%
29	12.08	-45.82	-7.01	-12.08	45.82	7.01	0.000%
30	13.95	-45.82	0.00	-13.95	45.82	-0.00	0.000%
31	12.08	-45.82	7.01	-12.08	45.82	-7.01	0.000%
32	6.98	-45.82	12.14	-6.98	45.82	-12.14	0.000%
33	0.00	-45.82	14.02	-0.00	45.82	-14.02	0.000%
34	-6.98	-45.82	12.14	6.98	45.82	-12.14	0.000%
35	-12.08	-45.82	7.01	12.08	45.82	-7.01	0.000%
36	-13.95	-45.82	-0.00	13.95	45.82	0.00	0.000%
37	-12.08	-45.82	-7.01	12.08	45.82	7.01	0.000%
38	-6.98	-45.82	-12.14	6.98	45.82	12.14	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00005257
3	Yes	6	0.00000001	0.00016506
4	Yes	6	0.00000001	0.00017880
5	Yes	5	0.00000001	0.00039782
6	Yes	6	0.00000001	0.00016244
7	Yes	6	0.00000001	0.00017421
8	Yes	5	0.00000001	0.00005163
9	Yes	6	0.00000001	0.00017499
10	Yes	6	0.00000001	0.00016214
11	Yes	5	0.00000001	0.00040024
12	Yes	6	0.00000001	0.00017853
13	Yes	6	0.00000001	0.00016587
14	Yes	4	0.00000001	0.00011349
15	Yes	6	0.00000001	0.00022415
16	Yes	6	0.00000001	0.00027308
17	Yes	6	0.00000001	0.00027612
18	Yes	6	0.00000001	0.00022295
19	Yes	6	0.00000001	0.00027023
20	Yes	6	0.00000001	0.00027248
21	Yes	6	0.00000001	0.00022182
22	Yes	6	0.00000001	0.00027385
23	Yes	6	0.00000001	0.00027107

24	Yes	6	0.00000001	0.00022376
25	Yes	6	0.00000001	0.00027706
26	Yes	6	0.00000001	0.00027451
27	Yes	4	0.00000001	0.00072898
28	Yes	5	0.00000001	0.00046869
29	Yes	5	0.00000001	0.00053883
30	Yes	5	0.00000001	0.00010348
31	Yes	5	0.00000001	0.00045573
32	Yes	5	0.00000001	0.00051314
33	Yes	4	0.00000001	0.00072615
34	Yes	5	0.00000001	0.00051798
35	Yes	5	0.00000001	0.00045493
36	Yes	5	0.00000001	0.00010379
37	Yes	5	0.00000001	0.00053757
38	Yes	5	0.00000001	0.00047299

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	140 - 135	33.2889	27	2.4092	0.0119
L2	135 - 130	30.7699	27	2.3987	0.0119
L3	130 - 125	28.2755	27	2.3630	0.0119
L4	125 - 120	25.8304	27	2.3030	0.0109
L5	120 - 115	23.4627	27	2.2165	0.0094
L6	115 - 110	21.1957	27	2.1114	0.0082
L7	110 - 105	19.0462	27	1.9929	0.0071
L8	105 - 102.333	17.0269	27	1.8609	0.0058
L9	102.333 - 102.083	16.0092	27	1.7828	0.0051
L10	102.083 - 97.083	15.9160	27	1.7778	0.0051
L11	97.083 - 91.75	14.1101	27	1.6698	0.0042
L12	95 - 90.75	13.3922	27	1.6214	0.0039
L13	90.75 - 85.75	11.9747	27	1.5517	0.0036
L14	85.75 - 85.33	10.4250	27	1.4070	0.0029
L15	85.33 - 85.08	10.3018	27	1.3946	0.0028
L16	85.08 - 82.5	10.2289	27	1.3891	0.0028
L17	82.5 - 82.25	9.4939	27	1.3315	0.0026
L18	82.25 - 77.15	9.4243	27	1.3259	0.0025
L19	77.15 - 76.9167	8.0718	27	1.2062	0.0021
L20	76.9167 - 71.9167	8.0130	27	1.2007	0.0021
L21	71.9167 - 66.9167	6.8184	27	1.0805	0.0018
L22	66.9167 - 66.667	5.7522	27	0.9555	0.0014
L23	66.667 - 66.417	5.7024	27	0.9493	0.0014
L24	66.417 - 61.417	5.6529	27	0.9436	0.0014
L25	61.417 - 60	4.7246	27	0.8292	0.0011
L26	60 - 59.75	4.4833	27	0.7968	0.0011
L27	59.75 - 54.75	4.4418	27	0.7911	0.0010
L28	54.75 - 46.5	3.6734	27	0.6764	0.0008
L29	51 - 45.5	3.1763	27	0.5895	0.0007
L30	45.5 - 44.25	2.5245	27	0.5376	0.0006
L31	44.25 - 44	2.3860	27	0.5210	0.0006
L32	44 - 39	2.3588	27	0.5181	0.0005
L33	39 - 34	1.8475	27	0.4584	0.0005
L34	34 - 29	1.3985	27	0.3994	0.0004
L35	29 - 27.75	1.0114	27	0.3399	0.0003
L36	27.75 - 27.5	0.9243	27	0.3253	0.0003
L37	27.5 - 24.083	0.9074	27	0.3225	0.0003
L38	24.083 - 23.833	0.6909	27	0.2825	0.0003
L39	23.833 - 18.833	0.6762	27	0.2792	0.0003

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L40	18.833 - 18.083	0.4179	27	0.2143	0.0002
L41	18.083 - 17.833	0.3850	27	0.2047	0.0002
L42	17.833 - 12.833	0.3743	27	0.2019	0.0002
L43	12.833 - 7.833	0.1930	27	0.1446	0.0001
L44	7.833 - 2.833	0.0715	27	0.0875	0.0001
L45	2.833 - 0	0.0093	27	0.0314	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
140.00	Lightning Rod	27	33.2889	2.4092	0.0119	12156
139.00	APXV9ERR18-C-A20	27	32.7843	2.4082	0.0119	12156
137.00	PCS 1900MHz 4x45W-65MHz	27	31.7759	2.4050	0.0119	12156
129.00	RRUS-11	27	27.7817	2.3529	0.0118	5495
128.00	7770.00 w/ Mount Pipe	27	27.2900	2.3420	0.0116	4976
108.00	(3) SBNHH-1D65B w/ Mount Pipe	27	18.2219	1.9443	0.0066	2190
100.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	27	15.1497	1.7357	0.0047	2512
90.00	Pipe Mount [PM 601-3]	27	11.7331	1.5349	0.0035	2280
70.00	KS24019-L112A	27	6.3943	1.0333	0.0016	2322
49.00	KS24019-L112A	27	2.9307	0.5663	0.0006	4510

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	140 - 135	84.8852	2	6.1427	0.0303
L2	135 - 130	78.4729	2	6.1158	0.0303
L3	130 - 125	72.1232	2	6.0247	0.0303
L4	125 - 120	65.8982	2	5.8723	0.0277
L5	120 - 115	59.8690	2	5.6528	0.0240
L6	115 - 110	54.0947	2	5.3856	0.0208
L7	110 - 105	48.6178	2	5.0841	0.0180
L8	105 - 102.333	43.4714	2	4.7485	0.0148
L9	102.333 - 102.083	40.8766	2	4.5498	0.0130
L10	102.083 - 97.083	40.6390	2	4.5373	0.0129
L11	97.083 - 91.75	36.0334	2	4.2624	0.0108
L12	95 - 90.75	34.2022	2	4.1390	0.0100
L13	90.75 - 85.75	30.5861	2	3.9616	0.0090
L14	85.75 - 85.33	26.6316	2	3.5929	0.0073
L15	85.33 - 85.08	26.3172	2	3.5613	0.0072
L16	85.08 - 82.5	26.1312	2	3.5473	0.0071
L17	82.5 - 82.25	24.2550	2	3.4004	0.0065
L18	82.25 - 77.15	24.0775	2	3.3862	0.0065
L19	77.15 - 76.9167	20.6246	2	3.0809	0.0054
L20	76.9167 - 71.9167	20.4745	2	3.0667	0.0054
L21	71.9167 - 66.9167	17.4243	2	2.7602	0.0045
L22	66.9167 - 66.667	14.7014	2	2.4412	0.0036
L23	66.667 - 66.417	14.5741	2	2.4253	0.0036

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L24	66.417 - 61.417	14.4476	2	2.4108	0.0035
L25	61.417 - 60	12.0763	2	2.1189	0.0029
L26	60 - 59.75	11.4598	2	2.0361	0.0027
L27	59.75 - 54.75	11.3536	2	2.0215	0.0026
L28	54.75 - 46.5	9.3903	2	1.7287	0.0021
L29	51 - 45.5	8.1198	2	1.5068	0.0017
L30	45.5 - 44.25	6.4541	2	1.3743	0.0015
L31	44.25 - 44	6.0999	2	1.3318	0.0014
L32	44 - 39	6.0303	2	1.3243	0.0014
L33	39 - 34	4.7236	2	1.1718	0.0012
L34	34 - 29	3.5756	2	1.0211	0.0010
L35	29 - 27.75	2.5861	2	0.8691	0.0008
L36	27.75 - 27.5	2.3635	2	0.8318	0.0008
L37	27.5 - 24.083	2.3201	2	0.8244	0.0008
L38	24.083 - 23.833	1.7667	2	0.7222	0.0006
L39	23.833 - 18.833	1.7291	2	0.7140	0.0006
L40	18.833 - 18.083	1.0685	2	0.5480	0.0005
L41	18.083 - 17.833	0.9844	2	0.5235	0.0004
L42	17.833 - 12.833	0.9571	2	0.5162	0.0004
L43	12.833 - 7.833	0.4935	2	0.3697	0.0003
L44	7.833 - 2.833	0.1829	2	0.2238	0.0002
L45	2.833 - 0	0.0238	2	0.0803	0.0001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
140.00	Lightning Rod	2	84.8852	6.1427	0.0303	4867
139.00	APXV9ERR18-C-A20	2	83.6007	6.1400	0.0302	4867
137.00	PCS 1900MHz 4x45W-65MHz	2	81.0337	6.1319	0.0302	4867
129.00	RRUS-11	2	70.8660	5.9992	0.0300	2199
128.00	7770.00 w/ Mount Pipe	2	69.6143	5.9714	0.0296	1992
108.00	(3) SBNHH-1D65B w/ Mount Pipe	2	46.5172	4.9604	0.0168	870
100.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	2	38.6850	4.4302	0.0120	997
90.00	Pipe Mount [PM 601-3]	2	29.9696	3.9187	0.0088	902
70.00	KS24019-L112A	2	16.3412	2.6397	0.0041	913
49.00	KS24019-L112A	2	7.4921	1.4476	0.0016	1768

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	140 - 135 (1)	TP17.025x16x0.25	5.00	0.00	0.0	36.000	13.504	-3.37	486.14	0.007
L2	135 - 130 (2)	TP18.05x17.025x0.25	5.00	0.00	0.0	36.000	14.329	-3.60	515.84	0.007
L3	130 - 125 (3)	TP19.075x18.05x0.25	5.00	0.00	0.0	36.000	15.154	-5.34	545.54	0.010

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 $\frac{P}{P_a}$
L4	125 - 120 (4)	TP20.099x19.075x0.25	5.00	0.00	0.0	36.000	15.979	-5.66	575.24	0.010
L5	120 - 115 (5)	TP21.124x20.099x0.25	5.00	0.00	0.0	36.000	16.804	-6.01	604.94	0.010
L6	115 - 110 (6)	TP22.149x21.124x0.25	5.00	0.00	0.0	36.000	17.629	-6.38	634.64	0.010
L7	110 - 105 (7)	TP23.174x22.149x0.25	5.00	0.00	0.0	36.000	18.454	-9.05	664.34	0.014
L8	105 - 102.333 (8)	TP23.721x23.174x0.25	2.67	0.00	0.0	36.000	18.894	-9.31	680.18	0.014
L9	102.333 - 102.083 (9)	TP23.772x23.721x0.388	0.25	0.00	0.0	36.000	29.178	-9.36	1050.41	0.009
L10	102.083 - 97.083 (10)	TP24.797x23.772x0.375	5.00	0.00	0.0	36.000	29.489	-11.57	1061.62	0.011
L11	97.083 - 91.75 (11)	TP25.89x24.797x0.375	5.33	0.00	0.0	36.000	30.005	-11.86	1080.18	0.011
L12	91.75 - 90.75 (12)	TP25.595x24.724x0.356	4.25	0.00	0.0	39.000	28.952	-12.86	1129.14	0.011
L13	90.75 - 85.75 (13)	TP26.62x25.595x0.356	5.00	0.00	0.0	39.000	30.128	-13.93	1175.00	0.012
L14	85.75 - 85.33 (14)	TP26.706x26.62x0.356	0.42	0.00	0.0	39.000	30.227	-14.01	1178.85	0.012
L15	85.33 - 85.08 (15)	TP26.758x26.706x0.488	0.25	0.00	0.0	39.000	41.238	-14.06	1608.27	0.009
L16	85.08 - 82.5 (16)	TP27.287x26.758x0.488	2.58	0.00	0.0	39.000	42.068	-14.58	1640.65	0.009
L17	82.5 - 82.25 (17)	TP27.338x27.287x0.494	0.25	0.00	0.0	39.000	42.679	-14.64	1664.47	0.009
L18	82.25 - 77.15 (18)	TP28.383x27.337x0.475	5.10	0.00	0.0	39.000	42.686	-15.74	1664.76	0.009
L19	77.15 - 76.9167 (19)	TP28.431x28.383x0.475	0.23	0.00	0.0	39.000	42.759	-15.80	1667.61	0.009
L20	76.9167 - 71.9167 (20)	TP29.457x28.431x0.475	5.00	0.00	0.0	39.000	44.328	-16.91	1728.78	0.010
L21	71.9167 - 66.9167 (21)	TP30.482x29.457x0.463	5.00	0.00	0.0	39.000	44.707	-18.20	1743.58	0.010
L22	66.9167 - 66.667 (22)	TP30.534x30.482x0.463	0.25	0.00	0.0	39.000	44.783	-18.27	1746.55	0.010
L23	66.667 - 66.417 (23)	TP30.585x30.534x0.513	0.25	0.00	0.0	39.000	49.627	-18.32	1935.45	0.009
L24	66.417 - 61.417 (24)	TP31.61x30.585x0.513	5.00	0.00	0.0	39.000	51.319	-19.37	2001.45	0.010
L25	61.417 - 60 (25)	TP31.901x31.61x0.506	1.42	0.00	0.0	39.000	51.178	-19.68	1995.92	0.010
L26	60 - 59.75 (26)	TP31.952x31.901x0.513	0.25	0.00	0.0	39.000	51.884	-19.75	2023.46	0.010
L27	59.75 - 54.75 (27)	TP32.978x31.952x0.513	5.00	0.00	0.0	39.000	53.576	-20.94	2089.46	0.010
L28	54.75 - 46.5 (28)	TP34.67x32.978x0.506	8.25	0.00	0.0	39.000	54.187	-21.86	2113.28	0.010
L29	46.5 - 45.5 (29)	TP34.25x33.122x0.95	5.50	0.00	0.0	39.000	101.864	-24.82	3972.70	0.006
L30	45.5 - 44.25 (30)	TP34.506x34.25x0.95	1.25	0.00	0.0	39.000	102.648	-25.30	4003.28	0.006
L31	44.25 - 44 (31)	TP34.557x34.506x1.1	0.25	0.00	0.0	39.000	118.506	-25.41	4621.74	0.005
L32	44 - 39 (32)	TP35.583x34.557x1.075	5.00	0.00	0.0	39.000	119.448	-27.51	4658.49	0.006
L33	39 - 34 (33)	TP36.608x35.583x1.075	5.00	0.00	0.0	39.000	122.998	-29.67	4796.90	0.006
L34	34 - 29 (34)	TP37.633x36.608x1.05	5.00	0.00	0.0	39.000	123.688	-31.87	4823.84	0.007
L35	29 - 27.75 (35)	TP37.89x37.633x1.05	1.25	0.00	0.0	39.000	124.555	-32.43	4857.64	0.007
L36	27.75 - 27.5 (36)	TP37.941x37.89x1.075	0.25	0.00	0.0	39.000	127.611	-32.56	4976.84	0.007
L37	27.5 - 24.083 (37)	TP38.642x37.941x1.05	3.42	0.00	0.0	39.000	127.097	-34.19	4956.79	0.007
L38	24.083 - 23.833 (38)	TP38.693x38.642x0.938	0.25	0.00	0.0	39.000	113.974	-34.31	4444.98	0.008
L39	23.833 - 18.833 (39)	TP39.718x38.693x0.925	5.00	0.00	0.0	39.000	115.545	-36.64	4506.27	0.008
L40	18.833 - 18.083 (40)	TP39.872x39.718x0.925	0.75	0.00	0.0	39.000	116.003	-36.99	4524.13	0.008
L41	18.083 - 17.833 (41)	TP39.923x39.872x1.05	0.25	0.00	0.0	39.000	131.430	-37.12	5125.78	0.007
L42	17.833 - 12.833	TP40.948x39.923x1.038	5.00	0.00	0.0	39.000	133.333	-39.49	5199.97	0.008

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 $\frac{P}{P_a}$
	(42)									
L43	12.833 - 7.833 (43)	TP41.974x40.948x1.025	5.00	0.00	0.0	39.000	135.151	-41.92	5270.91	0.008
L44	7.833 - 2.833 (44)	TP42.999x41.974x1.025	5.00	0.00	0.0	39.000	138.535	-44.39	5402.88	0.008
L45	2.833 - 0 (45)	TP43.58x42.999x1.025	2.83	0.00	0.0	39.000	140.453	-45.80	5477.66	0.008

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	140 - 135 (1)	TP17.025x16x0.25	21.12	4.608	36.000	0.128	0.00	0.000	36.000	0.000
L2	135 - 130 (2)	TP18.05x17.025x0.25	47.87	9.268	36.000	0.257	0.00	0.000	36.000	0.000
L3	130 - 125 (3)	TP19.075x18.05x0.25	91.79	15.879	36.000	0.441	0.00	0.000	36.000	0.000
L4	125 - 120 (4)	TP20.099x19.075x0.25	139.51	21.691	36.000	0.603	0.00	0.000	36.000	0.000
L5	120 - 115 (5)	TP21.124x20.099x0.25	189.06	26.563	36.000	0.738	0.00	0.000	36.000	0.000
L6	115 - 110 (6)	TP22.149x21.124x0.25	240.45	30.677	36.000	0.852	0.00	0.000	36.000	0.000
L7	110 - 105 (7)	TP23.174x22.149x0.25	314.48	36.597	36.000	1.017	0.00	0.000	36.000	0.000
L8	105 - 102.333 (8)	TP23.721x23.174x0.25	358.30	39.767	36.000	1.105	0.00	0.000	36.000	0.000
L9	102.333 - 102.083 (9)	TP23.772x23.721x0.388	362.45	26.298	36.000	0.731	0.00	0.000	36.000	0.000
L10	102.083 - 97.083 (10)	TP24.797x23.772x0.375	457.90	31.439	36.000	0.873	0.00	0.000	36.000	0.000
L11	97.083 - 91.75 (11)	TP25.89x24.797x0.375	501.75	33.267	36.000	0.924	0.00	0.000	36.000	0.000
L12	91.75 - 90.75 (12)	TP25.595x24.724x0.356	593.19	40.092	39.000	1.028	0.00	0.000	39.000	0.000
L13	90.75 - 85.75 (13)	TP26.62x25.595x0.356	704.55	43.950	39.000	1.127	0.00	0.000	39.000	0.000
L14	85.75 - 85.33 (14)	TP26.706x26.62x0.356	714.06	44.250	39.000	1.135	0.00	0.000	39.000	0.000
L15	85.33 - 85.08 (15)	TP26.758x26.706x0.488	719.73	32.955	39.000	0.845	0.00	0.000	39.000	0.000
L16	85.08 - 82.5 (16)	TP27.287x26.758x0.488	778.86	34.256	39.000	0.878	0.00	0.000	39.000	0.000
L17	82.5 - 82.25 (17)	TP27.338x27.287x0.494	784.64	33.967	39.000	0.871	0.00	0.000	39.000	0.000
L18	82.25 - 77.15 (18)	TP28.383x27.337x0.475	904.85	37.619	39.000	0.965	0.00	0.000	39.000	0.000
L19	77.15 - 76.9167 (19)	TP28.431x28.383x0.475	910.45	37.721	39.000	0.967	0.00	0.000	39.000	0.000
L20	76.9167 - 71.9167 (20)	TP29.457x28.431x0.475	1032.55	39.783	39.000	1.020	0.00	0.000	39.000	0.000
L21	71.9167 - 66.9167 (21)	TP30.482x29.457x0.463	1159.08	42.706	39.000	1.095	0.00	0.000	39.000	0.000
L22	66.9167 - 66.667 (22)	TP30.534x30.482x0.463	1165.50	42.796	39.000	1.097	0.00	0.000	39.000	0.000
L23	66.667 - 66.417 (23)	TP30.585x30.534x0.513	1171.95	38.894	39.000	0.997	0.00	0.000	39.000	0.000
L24	66.417 - 61.417 (24)	TP31.61x30.585x0.513	1302.83	40.411	39.000	1.036	0.00	0.000	39.000	0.000
L25	61.417 - 60 (25)	TP31.901x31.61x0.506	1340.59	41.289	39.000	1.059	0.00	0.000	39.000	0.000
L26	60 - 59.75 (26)	TP31.952x31.901x0.513	1347.29	40.879	39.000	1.048	0.00	0.000	39.000	0.000

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 $\frac{f_{by}}{F_{by}}$
L27	59.75 - 54.75 (27)	TP32.978x31.952x0.513	1483.07	42.179	39.000	1.082	0.00	0.000	39.000	0.000
L28	54.75 - 46.5 (28)	TP34.67x32.978x0.506	1587.23	43.568	39.000	1.117	0.00	0.000	39.000	0.000
L29	46.5 - 45.5 (29)	TP34.25x33.122x0.95	1743.97	25.752	39.000	0.660	0.00	0.000	39.000	0.000
L30	45.5 - 44.25 (30)	TP34.506x34.25x0.95	1780.30	25.883	39.000	0.664	0.00	0.000	39.000	0.000
L31	44.25 - 44 (31)	TP34.557x34.506x1.1	1787.59	22.678	39.000	0.581	0.00	0.000	39.000	0.000
L32	44 - 39 (32)	TP35.583x34.557x1.075	1935.48	23.580	39.000	0.605	0.00	0.000	39.000	0.000
L33	39 - 34 (33)	TP36.608x35.583x1.075	2087.12	23.960	39.000	0.614	0.00	0.000	39.000	0.000
L34	34 - 29 (34)	TP37.633x36.608x1.05	2242.39	24.826	39.000	0.637	0.00	0.000	39.000	0.000
L35	29 - 27.75 (35)	TP37.89x37.633x1.05	2281.78	24.907	39.000	0.639	0.00	0.000	39.000	0.000
L36	27.75 - 27.5 (36)	TP37.941x37.89x1.075	2289.68	24.393	39.000	0.625	0.00	0.000	39.000	0.000
L37	27.5 - 24.083 (37)	TP38.642x37.941x1.05	2398.72	25.133	39.000	0.644	0.00	0.000	39.000	0.000
L38	24.083 - 23.833 (38)	TP38.693x38.642x0.938	2406.77	27.914	39.000	0.716	0.00	0.000	39.000	0.000
L39	23.833 - 18.833 (39)	TP39.718x38.693x0.925	2569.79	28.586	39.000	0.733	0.00	0.000	39.000	0.000
L40	18.833 - 18.083 (40)	TP39.872x39.718x0.925	2594.59	28.631	39.000	0.734	0.00	0.000	39.000	0.000
L41	18.083 - 17.833 (41)	TP39.923x39.872x1.05	2602.88	25.480	39.000	0.653	0.00	0.000	39.000	0.000
L42	17.833 - 12.833 (42)	TP40.948x39.923x1.038	2770.70	26.015	39.000	0.667	0.00	0.000	39.000	0.000
L43	12.833 - 7.833 (43)	TP41.974x40.948x1.025	2942.41	26.540	39.000	0.681	0.00	0.000	39.000	0.000
L44	7.833 - 2.833 (44)	TP42.999x41.974x1.025	3117.84	26.750	39.000	0.686	0.00	0.000	39.000	0.000
L45	2.833 - 0 (45)	TP43.58x42.999x1.025	3218.89	26.859	39.000	0.689	0.00	0.000	39.000	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	140 - 135 (1)	TP17.025x16x0.25	5.18	0.384	24.000	0.032	0.00	0.000	24.000	0.000
L2	135 - 130 (2)	TP18.05x17.025x0.25	5.52	0.385	24.000	0.033	0.00	0.000	24.000	0.000
L3	130 - 125 (3)	TP19.075x18.05x0.25	9.35	0.617	24.000	0.052	1.33	0.108	24.000	0.004
L4	125 - 120 (4)	TP20.099x19.075x0.25	9.73	0.609	24.000	0.052	1.54	0.113	24.000	0.005
L5	120 - 115 (5)	TP21.124x20.099x0.25	10.10	0.601	24.000	0.051	1.54	0.102	24.000	0.004
L6	115 - 110 (6)	TP22.149x21.124x0.25	10.47	0.594	24.000	0.050	1.54	0.092	24.000	0.004
L7	110 - 105 (7)	TP23.174x22.149x0.25	16.30	0.884	24.000	0.075	2.13	0.117	24.000	0.005
L8	105 - 102.333 (8)	TP23.721x23.174x0.25	16.58	0.877	24.000	0.074	2.13	0.111	24.000	0.005
L9	102.333 - 102.083 (9)	TP23.772x23.721x0.388	16.60	0.569	24.000	0.048	2.12	0.072	24.000	0.003
L10	102.083 - 97.083 (10)	TP24.797x23.772x0.375	20.92	0.709	24.000	0.060	0.01	0.000	24.000	0.000
L11	97.083 - 91.75 (11)	TP25.89x24.797x0.375	21.21	0.707	24.000	0.060	0.02	0.001	24.000	0.000
L12	91.75 - 90.75 (12)	TP25.595x24.724x0.356	21.82	0.754	26.000	0.059	0.03	0.001	26.000	0.000
L13	90.75 - 85.75 (13)	TP26.62x25.595x0.356	22.62	0.751	26.000	0.059	0.06	0.002	26.000	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 $\frac{f_{vt}}{F_{vt}}$
L14	85.75 - 85.33 (14)	TP26.706x26.62x0.356	22.68	0.750	26.000	0.059	0.06	0.002	26.000	0.000
L15	85.33 - 85.08 (15)	TP26.758x26.706x0.488	22.72	0.551	26.000	0.043	0.06	0.001	26.000	0.000
L16	85.08 - 82.5 (16)	TP27.287x26.758x0.488	23.14	0.550	26.000	0.043	0.07	0.001	26.000	0.000
L17	82.5 - 82.25 (17)	TP27.338x27.287x0.494	23.17	0.543	26.000	0.042	0.07	0.001	26.000	0.000
L18	82.25 - 77.15 (18)	TP28.383x27.337x0.475	23.99	0.562	26.000	0.044	0.06	0.001	26.000	0.000
L19	77.15 - 76.9167 (19)	TP28.431x28.383x0.475	24.03	0.562	26.000	0.044	0.06	0.001	26.000	0.000
L20	76.9167 - 71.9167 (20)	TP29.457x28.431x0.475	24.84	0.560	26.000	0.044	0.03	0.001	26.000	0.000
L21	71.9167 - 66.9167 (21)	TP30.482x29.457x0.463	25.73	0.576	26.000	0.045	0.18	0.003	26.000	0.000
L22	66.9167 - 66.667 (22)	TP30.534x30.482x0.463	25.77	0.575	26.000	0.045	0.18	0.003	26.000	0.000
L23	66.667 - 66.417 (23)	TP30.585x30.534x0.513	25.81	0.520	26.000	0.041	0.18	0.003	26.000	0.000
L24	66.417 - 61.417 (24)	TP31.61x30.585x0.513	26.57	0.518	26.000	0.040	0.20	0.003	26.000	0.000
L25	61.417 - 60 (25)	TP31.901x31.61x0.506	26.78	0.523	26.000	0.041	0.20	0.003	26.000	0.000
L26	60 - 59.75 (26)	TP31.952x31.901x0.513	26.80	0.517	26.000	0.040	0.20	0.003	26.000	0.000
L27	59.75 - 54.75 (27)	TP32.978x31.952x0.513	27.53	0.514	26.000	0.040	0.22	0.003	26.000	0.000
L28	54.75 - 46.5 (28)	TP34.67x32.978x0.506	28.06	0.518	26.000	0.040	0.23	0.003	26.000	0.000
L29	46.5 - 45.5 (29)	TP34.25x33.122x0.95	28.98	0.284	26.000	0.022	0.11	0.001	26.000	0.000
L30	45.5 - 44.25 (30)	TP34.506x34.25x0.95	29.18	0.284	26.000	0.022	0.11	0.001	26.000	0.000
L31	44.25 - 44 (31)	TP34.557x34.506x1.1	29.21	0.246	26.000	0.019	0.11	0.001	26.000	0.000
L32	44 - 39 (32)	TP35.583x34.557x1.075	29.97	0.251	26.000	0.020	0.13	0.001	26.000	0.000
L33	39 - 34 (33)	TP36.608x35.583x1.075	30.71	0.250	26.000	0.020	0.14	0.001	26.000	0.000
L34	34 - 29 (34)	TP37.633x36.608x1.05	31.43	0.254	26.000	0.020	0.16	0.001	26.000	0.000
L35	29 - 27.75 (35)	TP37.89x37.633x1.05	31.62	0.254	26.000	0.020	0.17	0.001	26.000	0.000
L36	27.75 - 27.5 (36)	TP37.941x37.89x1.075	31.65	0.248	26.000	0.019	0.17	0.001	26.000	0.000
L37	27.5 - 24.083 (37)	TP38.642x37.941x1.05	32.19	0.253	26.000	0.020	0.19	0.001	26.000	0.000
L38	24.083 - 23.833 (38)	TP38.693x38.642x0.938	32.22	0.283	26.000	0.022	0.20	0.001	26.000	0.000
L39	23.833 - 18.833 (39)	TP39.718x38.693x0.925	33.02	0.286	26.000	0.022	0.23	0.001	26.000	0.000
L40	18.833 - 18.083 (40)	TP39.872x39.718x0.925	33.14	0.286	26.000	0.022	0.24	0.001	26.000	0.000
L41	18.083 - 17.833 (41)	TP39.923x39.872x1.05	33.17	0.252	26.000	0.020	0.24	0.001	26.000	0.000
L42	17.833 - 12.833 (42)	TP40.948x39.923x1.038	33.98	0.255	26.000	0.020	0.26	0.001	26.000	0.000
L43	12.833 - 7.833 (43)	TP41.974x40.948x1.025	34.73	0.257	26.000	0.020	0.27	0.001	26.000	0.000
L44	7.833 - 2.833 (44)	TP42.999x41.974x1.025	35.48	0.256	26.000	0.020	0.28	0.001	26.000	0.000
L45	2.833 - 0 (45)	TP43.58x42.999x1.025	35.90	0.256	26.000	0.020	0.29	0.001	26.000	0.000

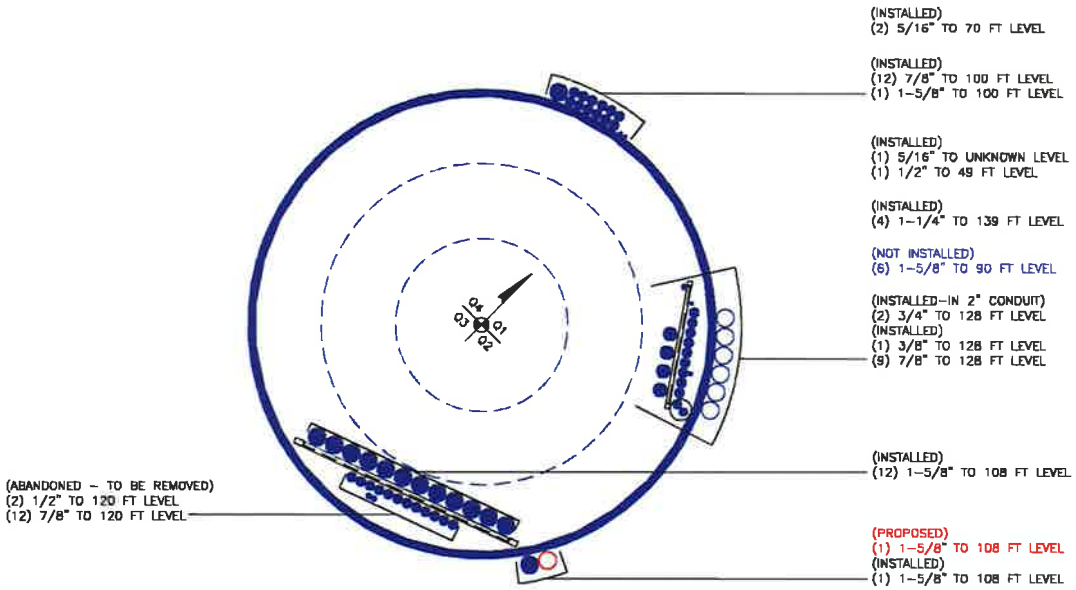
Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	140 - 135 (1)	0.007	0.128	0.000	0.032	0.000	0.135 ✔	1.333	H1-3+VT ✔
L2	135 - 130 (2)	0.007	0.257	0.000	0.033	0.000	0.265 ✔	1.333	H1-3+VT ✔
L3	130 - 125 (3)	0.010	0.441	0.000	0.052	0.004	0.452 ✔	1.333	H1-3+VT ✔
L4	125 - 120 (4)	0.010	0.603	0.000	0.052	0.005	0.613 ✔	1.333	H1-3+VT ✔
L5	120 - 115 (5)	0.010	0.738	0.000	0.051	0.004	0.749 ✔	1.333	H1-3+VT ✔
L6	115 - 110 (6)	0.010	0.852	0.000	0.050	0.004	0.863 ✔	1.333	H1-3+VT ✔
L7	110 - 105 (7)	0.014	1.017	0.000	0.075	0.005	1.032 ✔	1.333	H1-3+VT ✔
L8	105 - 102.333 (8)	0.014	1.105	0.000	0.074	0.005	1.120 ✔	1.333	H1-3+VT ✔
L9	102.333 - 102.083 (9)	0.009	0.731	0.000	0.048	0.003	0.740 ✔	1.333	H1-3+VT ✔
L10	102.083 - 97.083 (10)	0.011	0.873	0.000	0.060	0.000	0.885 ✔	1.333	H1-3+VT ✔
L11	97.083 - 91.75 (11)	0.011	0.924	0.000	0.060	0.000	0.936 ✔	1.333	H1-3+VT ✔
L12	91.75 - 90.75 (12)	0.011	1.028	0.000	0.059	0.000	1.040 ✔	1.333	H1-3+VT ✔
L13	90.75 - 85.75 (13)	0.012	1.127	0.000	0.059	0.000	1.140 ✔	1.333	H1-3+VT ✔
L14	85.75 - 85.33 (14)	0.012	1.135	0.000	0.059	0.000	1.147 ✔	1.333	H1-3+VT ✔
L15	85.33 - 85.08 (15)	0.009	0.845	0.000	0.043	0.000	0.854 ✔	1.333	H1-3+VT ✔
L16	85.08 - 82.5 (16)	0.009	0.878	0.000	0.043	0.000	0.888 ✔	1.333	H1-3+VT ✔
L17	82.5 - 82.25 (17)	0.009	0.871	0.000	0.042	0.000	0.880 ✔	1.333	H1-3+VT ✔
L18	82.25 - 77.15 (18)	0.009	0.965	0.000	0.044	0.000	0.975 ✔	1.333	H1-3+VT ✔
L19	77.15 - 76.9167 (19)	0.009	0.967	0.000	0.044	0.000	0.977 ✔	1.333	H1-3+VT ✔
L20	76.9167 - 71.9167 (20)	0.010	1.020	0.000	0.044	0.000	1.030 ✔	1.333	H1-3+VT ✔
L21	71.9167 - 66.9167 (21)	0.010	1.095	0.000	0.045	0.000	1.106 ✔	1.333	H1-3+VT ✔
L22	66.9167 - 66.667 (22)	0.010	1.097	0.000	0.045	0.000	1.108 ✔	1.333	H1-3+VT ✔
L23	66.667 - 66.417 (23)	0.009	0.997	0.000	0.041	0.000	1.007 ✔	1.333	H1-3+VT ✔
L24	66.417 - 61.417 (24)	0.010	1.036	0.000	0.040	0.000	1.046 ✔	1.333	H1-3+VT ✔

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L25	61.417 - 60 (25)	0.010	1.059	0.000	0.041	0.000	1.069 ✔	1.333	H1-3+VT ✔
L26	60 - 59.75 (26)	0.010	1.048	0.000	0.040	0.000	1.058 ✔	1.333	H1-3+VT ✔
L27	59.75 - 54.75 (27)	0.010	1.082	0.000	0.040	0.000	1.092 ✔	1.333	H1-3+VT ✔
L28	54.75 - 46.5 (28)	0.010	1.117	0.000	0.040	0.000	1.128 ✔	1.333	H1-3+VT ✔
L29	46.5 - 45.5 (29)	0.006	0.660	0.000	0.022	0.000	0.667 ✔	1.333	H1-3+VT ✔
L30	45.5 - 44.25 (30)	0.006	0.664	0.000	0.022	0.000	0.670 ✔	1.333	H1-3+VT ✔
L31	44.25 - 44 (31)	0.005	0.581	0.000	0.019	0.000	0.587 ✔	1.333	H1-3+VT ✔
L32	44 - 39 (32)	0.006	0.605	0.000	0.020	0.000	0.611 ✔	1.333	H1-3+VT ✔
L33	39 - 34 (33)	0.006	0.614	0.000	0.020	0.000	0.621 ✔	1.333	H1-3+VT ✔
L34	34 - 29 (34)	0.007	0.637	0.000	0.020	0.000	0.643 ✔	1.333	H1-3+VT ✔
L35	29 - 27.75 (35)	0.007	0.639	0.000	0.020	0.000	0.645 ✔	1.333	H1-3+VT ✔
L36	27.75 - 27.5 (36)	0.007	0.625	0.000	0.019	0.000	0.632 ✔	1.333	H1-3+VT ✔
L37	27.5 - 24.083 (37)	0.007	0.644	0.000	0.020	0.000	0.651 ✔	1.333	H1-3+VT ✔
L38	24.083 - 23.833 (38)	0.008	0.716	0.000	0.022	0.000	0.724 ✔	1.333	H1-3+VT ✔
L39	23.833 - 18.833 (39)	0.008	0.733	0.000	0.022	0.000	0.741 ✔	1.333	H1-3+VT ✔
L40	18.833 - 18.083 (40)	0.008	0.734	0.000	0.022	0.000	0.742 ✔	1.333	H1-3+VT ✔
L41	18.083 - 17.833 (41)	0.007	0.653	0.000	0.020	0.000	0.661 ✔	1.333	H1-3+VT ✔
L42	17.833 - 12.833 (42)	0.008	0.667	0.000	0.020	0.000	0.675 ✔	1.333	H1-3+VT ✔
L43	12.833 - 7.833 (43)	0.008	0.681	0.000	0.020	0.000	0.689 ✔	1.333	H1-3+VT ✔
L44	7.833 - 2.833 (44)	0.008	0.686	0.000	0.020	0.000	0.694 ✔	1.333	H1-3+VT ✔
L45	2.833 - 0 (45)	0.008	0.689	0.000	0.020	0.000	0.697 ✔	1.333	H1-3+VT ✔

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 876335 TOWER ID: C_BASELEVEL

10/01/14	AS-BUILT INFORMATION ADDED PER WORK ORDER # 683342	MAG
10/02/14	UPDATED PER WORK ORDER # 730149	ALK
27/10/14	UPDATED PER WORK ORDER # 693397	DMB
10/11/2014	UPDATED PER WORK ORDER 884643	ADC
10/12/2014	UPDATED PER WORK ORDER 873491	ADC
12/12/2014	UPDATED PER WORK ORDER 878533	LNB
10/12/2014	UPDATED PER WORK ORDER 881792	DMK

DRAWN BY: TJH
CHECKED BY: CDB
DRAWING DATE: 31/08/07

SITE NUMBER:
SITE NAME:

SITE NAME

EAST FARMINGTON

BUSINESS UNIT NUMBER

876335

SITE ADDRESS

3 A BIRDSEYE ROAD
FARMINGTON CT, 06032
HARTFORD COUNTY
USA

SHEET TITLE

BASE LEVEL

SHEET NUMBER

A1-0

BASE LEVEL DRAWING

SCALE: 1" = 1'-0" | 1

PLOT DATE: 9/11/2015 FILE NAME: 876335_BASELEVEL.dwg
V:\TEMPLATES\TYPICAL BLOCKS FOR TEMPLATES\TITLE BLOCK STS-WEB S.T.dwg

APPENDIX C

ADDITIONAL CALCULATIONS

Additional Calculations

CCIpole

per TIA-222- F

Site BU: 876335

Work Order: 1118722

CROWN CASTLE

Pole Geometry

	Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material
1	140	48.25	3.25	12	16	25.89	0.25	1	A607-60
2	95	17.833	0	12	24.72	28.38	0.3125	1.25	A607-65
3	77.167	30.667	4.5	12	28.38	34.67	0.3125	1.25	A607-65
4	51	51	0	12	33.12	43.58	0.75	3	A607-65

Reinforcement Configuration

	Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number	1	2	3	4	5	6	7	8	9	10	11	12
1	0	18.083	channel	MP3-05 (1.1875")	4	3				3			3		3		
2	18.083	24.083	channel	MP3-05 (1.1875")	4	3				3				3		3	
3	24.083	44.25	channel	MP3-05 (1.1875")	3	3				3				3			
4	44.25	66.667	channel	MP3-05 (1.1875")	3		3				3				3		
5	66.667	77.1667	channel	MP3-03 (1.1875")	4		3	3			3				3		
6	77.1667	85.33	channel	MP3-03 (1.1875")	3			3				3				3	
7	94.667	102.333	channel	MP3-03 (1.1875")	3				3				3				3
8	0	27.75	plate	CCI-SFP-065125	1						4						
9	24.083	44.25	plate	CCI-SFP-060100	2			4				4					
10	49	60	plate	CCI-SFP-060100	1				4								
11	66.667	82.5	plate	CCI-SFP-060100	2				4				4				
12	82.5	93	plate	CCI-SFP-060100	2					4				4			
13																	

Reinforcement Details

	B (in)	H (in)	Gross Area (in^2)	Pole Face to Centroid (in)	Bottom Termination Length (in)	Top Termination Length (in)	L_u (in)	Net Area (in^2)	Bolt Hole Size (in)	Reinforcement Material
1	5.33	2.09	5.65	0.79	29.000	29.000	18.000	5.025	1.1875	A572-65
2	5.33	2.09	5.65	0.79	29.000	29.000	18.000	5.025	1.1875	A572-65
3	5.33	2.09	5.65	0.79	29.000	29.000	18.000	5.025	1.1875	A572-65
4	5.33	2.09	5.65	0.79	29.000	29.000	18.000	5.025	1.1875	A572-65
5	4.06	1.57	2.92	0.59	14.000	14.000	18.000	2.545	1.1875	A572-65
6	4.06	1.57	2.92	0.59	14.000	14.000	18.000	2.545	1.1875	A572-65
7	4.06	1.57	2.92	0.59	14.000	14.000	18.000	2.545	1.1875	A572-65
8	6.5	1.25	8.125	0.625	33.000	33.000	19.000	6.563	1.1875	A572-65
9	6	1	6	0.5	24.000	24.000	16.000	4.750	1.1875	A572-65
10	6	1	6	0.5	24.000	24.000	16.000	4.750	1.1875	A572-65
11	6	1	6	0.5	24.000	24.000	16.000	4.750	1.1875	A572-65
12	6	1	6	0.5	24.000	24.000	16.000	4.750	1.1875	A572-65

TNX Geometry Input

Increment (ft): 5

	Section Height (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Tapered Pole Grade	Weight Multiplier
1	140 - 135	5		12	16.000	17.025	0.25	A607-60	1.000
2	135 - 130	5		12	17.025	18.050	0.25	A607-60	1.000
3	130 - 125	5		12	18.050	19.075	0.25	A607-60	1.000
4	125 - 120	5		12	19.075	20.099	0.25	A607-60	1.000
5	120 - 115	5		12	20.099	21.124	0.25	A607-60	1.000
6	115 - 110	5		12	21.124	22.149	0.25	A607-60	1.000
7	110 - 105	5		12	22.149	23.174	0.25	A607-60	1.000
8	105 - 102.333	2.667		12	23.174	23.721	0.25	A607-60	1.000
9	102.333 - 102.083	0.25		12	23.721	23.772	0.3875	A607-60	0.950
10	102.083 - 97.083	5		12	23.772	24.797	0.375	A607-60	0.968
11	97.083 - 95	5.333	3.25	12	24.797	25.890	0.375	A607-60	0.962
12	95 - 90.75	4.25		12	24.724	25.595	0.35625	A607-65	1.294
13	90.75 - 85.75	5		12	25.595	26.620	0.35625	A607-65	1.278
14	85.75 - 85.33	0.42		12	26.620	26.706	0.35625	A607-65	1.276
15	85.33 - 85.08	0.25		12	26.706	26.758	0.4875	A607-65	1.149
16	85.08 - 82.5	2.58		12	26.758	27.287	0.4875	A607-65	1.139
17	82.5 - 82.25	0.25	0	12	27.287	27.338	0.49375	A607-65	1.124
18	82.25 - 77.15	5.1		12	27.337	28.383	0.475	A607-65	1.217
19	77.15 - 76.9167	0.2333		12	28.383	28.431	0.475	A607-65	1.216
20	76.9167 - 71.9167	5		12	28.431	29.457	0.475	A607-65	1.197
21	71.9167 - 66.9167	5		12	29.457	30.482	0.4625	A607-65	1.209
22	66.9167 - 66.667	0.2497		12	30.482	30.534	0.4625	A607-65	1.209
23	66.667 - 66.417	0.25		12	30.534	30.585	0.5125	A607-65	0.956
24	66.417 - 61.417	5		12	30.585	31.610	0.5125	A607-65	0.944
25	61.417 - 60	1.417		12	31.610	31.901	0.50625	A607-65	0.953
26	60 - 59.75	0.25		12	31.901	31.952	0.5125	A607-65	1.057
27	59.75 - 54.75	5		12	31.952	32.978	0.5125	A607-65	1.042
28	54.75 - 51	8.25	4.5	12	32.978	34.670	0.50625	A607-65	1.045
29	51 - 45.5	5.5		12	33.122	34.250	0.95	A607-65	0.961
30	45.5 - 44.25	1.25		12	34.250	34.506	0.95	A607-65	0.960
31	44.25 - 44	0.25		12	34.506	34.557	1.1	A607-65	0.934
32	44 - 39	5		12	34.557	35.583	1.075	A607-65	0.947
33	39 - 34	5		12	35.583	36.608	1.075	A607-65	0.940
34	34 - 29	5		12	36.608	37.633	1.05	A607-65	0.955
35	29 - 27.75	1.25		12	37.633	37.890	1.05	A607-65	0.953
36	27.75 - 27.5	0.25		12	37.890	37.941	1.075	A607-65	0.995
37	27.5 - 24.083	3.417		12	37.941	38.642	1.05	A607-65	1.012
38	24.083 - 23.833	0.25		12	38.642	38.693	0.9375	A607-65	1.074
39	23.833 - 18.833	5		12	38.693	39.718	0.925	A607-65	1.081
40	18.833 - 18.083	0.75		12	39.718	39.872	0.925	A607-65	1.080
41	18.083 - 17.833	0.25		12	39.872	39.923	1.05	A607-65	0.954
42	17.833 - 12.833	5		12	39.923	40.948	1.0375	A607-65	0.959
43	12.833 - 7.833	5		12	40.948	41.974	1.025	A607-65	0.964
44	7.833 - 2.833	5		12	41.974	42.999	1.025	A607-65	0.959
45	2.833 - 0	2.833		12	42.999	43.580	1.025	A607-65	0.956

TNX Section Forces

Increment (ft):	5	TNX Output		
	Section Height (ft)	P_u (K)	M_{ux} (kip-ft)	V_u (K)
1	140 - 135	3.3698	21.121	5.1816
2	135 - 130	3.603	47.865	5.5198
3	130 - 125	5.3421	91.793	9.355
4	125 - 120	5.6633	139.51	9.732
5	120 - 115	6.0101	189.06	10.095
6	115 - 110	6.3798	240.45	10.466
7	110 - 105	9.0514	314.48	16.305
8	105 - 102.333	9.3138	358.3	16.579
9	102.333 - 102.083	9.3574	362.45	16.604
10	102.083 - 97.083	11.571	457.9	20.922
11	97.083 - 95	11.857	501.75	21.205
12	95 - 90.75	12.858	593.19	21.825
13	90.75 - 85.75	13.926	704.55	22.623
14	85.75 - 85.33	14.01	714.06	22.68
15	85.33 - 85.08	14.064	719.73	22.716
16	85.08 - 82.5	14.576	778.86	23.136
17	82.5 - 82.25	14.64	784.64	23.168
18	82.25 - 77.15	15.739	904.85	23.994
19	77.15 - 76.9167	15.801	910.45	24.026
20	76.9167 - 71.9167	16.91	1032.5	24.836
21	71.9167 - 66.9167	18.199	1159.1	25.735
22	66.9167 - 66.667	18.269	1165.5	25.767
23	66.667 - 66.417	18.322	1171.9	25.808
24	66.417 - 61.417	19.375	1302.8	26.567
25	61.417 - 60	19.676	1340.6	26.778
26	60 - 59.75	19.752	1347.3	26.803
27	59.75 - 54.75	20.94	1483.1	27.534
28	54.75 - 51	21.856	1587.2	28.055
29	51 - 45.5	24.825	1744	28.977
30	45.5 - 44.25	25.295	1780.3	29.175
31	44.25 - 44	25.409	1787.6	29.207
32	44 - 39	27.513	1935.5	29.972
33	39 - 34	29.669	2087.1	30.708
34	34 - 29	31.873	2242.4	31.431
35	29 - 27.75	32.429	2281.8	31.62
36	27.75 - 27.5	32.557	2289.7	31.649
37	27.5 - 24.083	34.185	2398.7	32.191
38	24.083 - 23.833	34.308	2406.8	32.223
39	23.833 - 18.833	36.6	2569.8	33.0
40	18.833 - 18.083	37.0	2594.6	33.1
41	18.083 - 17.833	37.1	2602.9	33.2
42	17.833 - 12.833	39.5	2770.7	34.0
43	12.833 - 7.833	41.9	2942.4	34.7
44	7.833 - 2.833	44.4	3117.8	35.5
45	2.833 - 0	45.8	3218.9	35.9

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
140 - 135	Pole	TP17.025x16x0.25	Pole	10.1%	Pass
135 - 130	Pole	TP18.05x17.025x0.25	Pole	19.8%	Pass
130 - 125	Pole	TP19.075x18.05x0.25	Pole	33.7%	Pass
125 - 120	Pole	TP20.099x19.075x0.25	Pole	45.8%	Pass
120 - 115	Pole	TP21.124x20.099x0.25	Pole	55.9%	Pass
115 - 110	Pole	TP22.149x21.124x0.25	Pole	64.5%	Pass
110 - 105	Pole	TP23.174x22.149x0.25	Pole	77.1%	Pass
105 - 102.33	Pole	TP23.721x23.174x0.25	Pole	83.6%	Pass
102.33 - 102.08	Pole + Reinf.	TP23.772x23.721x0.3875	Reinf. 7 Tension Rupture	61.4%	Pass
102.08 - 97.08	Pole + Reinf.	TP24.797x23.772x0.375	Reinf. 7 Tension Rupture	72.2%	Pass
97.08 - 95	Pole + Reinf.	TP25.89x24.797x0.375	Reinf. 7 Tension Rupture	76.8%	Pass
95 - 90.75	Pole + Reinf.	TP25.595x24.724x0.3563	Pole	84.6%	Pass
90.75 - 85.75	Pole + Reinf.	TP26.62x25.595x0.3563	Pole	92.9%	Pass
85.75 - 85.33	Pole + Reinf.	TP26.706x26.62x0.3563	Pole	93.5%	Pass
85.33 - 85.08	Pole + Reinf.	TP26.758x26.706x0.4875	Pole	69.7%	Pass
85.08 - 82.5	Pole + Reinf.	TP27.287x26.758x0.4875	Pole	72.9%	Pass
82.5 - 82.25	Pole + Reinf.	TP27.338x27.287x0.4938	Reinf. 6 Tension Rupture	83.1%	Pass
82.25 - 77.15	Pole + Reinf.	TP28.383x27.337x0.475	Pole	79.3%	Pass
77.15 - 76.92	Pole + Reinf.	TP28.431x28.383x0.475	Pole	79.5%	Pass
76.92 - 71.92	Pole + Reinf.	TP29.457x28.431x0.475	Pole	84.8%	Pass
71.92 - 66.92	Pole + Reinf.	TP30.482x29.457x0.4625	Pole	89.7%	Pass
66.92 - 66.67	Pole + Reinf.	TP30.534x30.482x0.4625	Pole	90.0%	Pass
66.67 - 66.42	Pole + Reinf.	TP30.585x30.534x0.5125	Reinf. 4 Tension Rupture	85.9%	Pass
66.42 - 61.42	Pole + Reinf.	TP31.61x30.585x0.5125	Reinf. 4 Tension Rupture	90.4%	Pass
61.42 - 60	Pole + Reinf.	TP31.901x31.61x0.5063	Reinf. 4 Tension Rupture	91.6%	Pass
60 - 59.75	Pole + Reinf.	TP31.952x31.901x0.5125	Reinf. 4 Tension Rupture	84.6%	Pass
59.75 - 54.75	Pole + Reinf.	TP32.978x31.952x0.5125	Reinf. 4 Tension Rupture	88.5%	Pass
54.75 - 51	Pole + Reinf.	TP34.67x32.978x0.5063	Reinf. 4 Tension Rupture	91.2%	Pass
51 - 45.5	Pole + Reinf.	TP34.25x33.122x0.95	Reinf. 4 Tension Rupture	57.3%	Pass
45.5 - 44.25	Pole + Reinf.	TP34.506x34.25x0.95	Reinf. 4 Tension Rupture	57.7%	Pass
44.25 - 44	Pole + Reinf.	TP34.557x34.506x1.1	Reinf. 9 Bolt Shear	53.0%	Pass
44 - 39	Pole + Reinf.	TP35.583x34.557x1.075	Reinf. 9 Compression	53.7%	Pass
39 - 34	Pole + Reinf.	TP36.608x35.583x1.075	Reinf. 9 Compression	55.2%	Pass
34 - 29	Pole + Reinf.	TP37.633x36.608x1.05	Reinf. 9 Compression	56.5%	Pass
29 - 27.75	Pole + Reinf.	TP37.89x37.633x1.05	Reinf. 9 Compression	56.8%	Pass
27.75 - 27.5	Pole + Reinf.	TP37.941x37.89x1.075	Reinf. 9 Compression	56.8%	Pass
27.5 - 24.08	Pole + Reinf.	TP38.642x37.941x1.05	Reinf. 9 Bolt Shear	58.6%	Pass
24.08 - 23.83	Pole + Reinf.	TP38.693x38.642x0.9375	Reinf. 2 Tension Rupture	59.7%	Pass
23.83 - 18.83	Pole + Reinf.	TP39.718x38.693x0.925	Reinf. 2 Tension Rupture	60.7%	Pass
18.83 - 18.08	Pole + Reinf.	TP39.872x39.718x0.925	Reinf. 2 Tension Rupture	60.8%	Pass
18.08 - 17.83	Pole + Reinf.	TP39.923x39.872x1.05	Reinf. 1 Tension Rupture	59.6%	Pass
17.83 - 12.83	Pole + Reinf.	TP40.948x39.923x1.0375	Reinf. 1 Tension Rupture	60.5%	Pass
12.83 - 7.83	Pole + Reinf.	TP41.974x40.948x1.025	Reinf. 1 Tension Rupture	61.4%	Pass
7.83 - 2.83	Pole + Reinf.	TP42.999x41.974x1.025	Reinf. 1 Tension Rupture	62.2%	Pass
2.83 - 0	Pole + Reinf.	TP43.58x42.999x1.025	Reinf. 1 Tension Rupture	62.7%	Pass
				Summary	
			Pole	93.5%	Pass
			Reinforcement	91.6%	Pass
			Overall	93.5%	Pass

Additional Calculations

Section Elevation (ft)	Moment of Inertia (in^4)			Area (in^2)			% Capacity											
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12
140 - 135	486	n/a	486	13.48	n/a	13.48	10.1%												
135 - 130	580	n/a	580	14.31	n/a	14.31	19.8%												
130 - 125	686	n/a	686	15.13	n/a	15.13	33.7%												
125 - 120	805	n/a	805	15.96	n/a	15.96	45.8%												
120 - 115	936	n/a	936	16.78	n/a	16.78	56.9%												
115 - 110	1081	n/a	1081	17.60	n/a	17.60	64.5%												
110 - 105	1240	n/a	1240	18.43	n/a	18.43	77.1%												
105 - 102.33	1330	n/a	1330	18.87	n/a	18.87	83.6%												
102.33 - 102.08	1339	684	2024	18.91	8.76	27.67	53.9%							61.4%					
102.08 - 97.08	1522	742	2263	19.73	8.76	28.49	63.6%							72.2%					
97.08 - 95	1603	766	2369	20.08	8.76	28.84	67.7%							76.8%					
95 - 90.75	2193	282	2475	25.40	12.00	37.40	84.6%												64.1%
90.75 - 85.75	2464	309	2772	26.43	12.00	38.43	92.9%												70.3%
85.75 - 85.33	2487	311	2798	26.52	12.00	38.52	93.5%												70.9%
85.33 - 85.08	2458	1275	3733	26.57	20.76	47.33	69.7%						67.6%						58.6%
85.08 - 82.5	2607	1325	3931	27.10	20.76	47.86	72.9%						70.8%						62.4%
82.5 - 82.25	2618	1382	4000	27.16	20.76	47.92	72.4%						83.1%					62.7%	
82.25 - 77.15	2938	1429	4367	28.21	23.68	51.89	79.3%					76.7%						65.3%	
77.15 - 76.92	2953	1434	4387	28.25	23.68	51.93	79.5%					77.0%						65.6%	
76.92 - 71.92	3284	1537	4820	29.28	23.68	52.96	84.8%					82.2%						70.5%	
71.92 - 66.92	3638	1644	5282	30.32	23.68	54.00	89.7%					87.1%						75.1%	
66.92 - 66.67	3656	1649	5305	30.37	23.68	54.05	90.0%					87.3%						76.5%	
66.67 - 66.42	3568	2203	5771	30.42	16.95	47.37	72.4%				85.9%								
66.42 - 61.42	3943	2345	6288	31.45	16.95	48.40	76.4%				90.4%								
61.42 - 60	4054	2386	6440	31.74	16.95	48.69	77.4%				91.6%								
60 - 59.75	4081	2500	6581	31.79	22.95	54.74	81.0%				84.6%						73.1%		
59.75 - 54.75	4496	2725	7221	32.82	22.95	55.77	84.3%				88.5%						75.6%		
54.75 - 51	4820	2847	7667	33.60	22.95	56.55	86.9%				91.2%						79.5%		
51 - 45.5	11606	2731	14337	80.79	16.95	97.74	48.6%				57.3%								
45.5 - 44.25	11874	2770	14644	81.40	16.95	98.35	48.9%				57.7%								
44.25 - 44	11953	4955	16909	81.53	28.95	110.48	44.8%			51.7%						53.0%			
44 - 39	13073	5242	18315	84.00	28.95	112.95	46.1%			53.1%						53.7%			
39 - 34	14260	5537	19797	86.47	28.95	115.42	47.3%			54.4%						55.2%			
34 - 29	15517	5840	21357	88.95	28.95	117.90	48.4%			55.6%						56.5%			
29 - 27.75	15843	5917	21760	89.56	28.95	118.51	48.6%			55.9%						56.8%			
27.75 - 27.5	15899	6160	22059	89.69	37.08	126.76	47.1%			56.2%					49.4%	56.8%			
27.5 - 24.08	16814	6381	23194	91.38	37.08	128.45	47.7%			56.9%					49.4%	58.6%			
24.08 - 23.83	16886	3859	20745	91.50	30.73	122.23	54.7%		59.7%						52.6%				
23.83 - 18.83	18291	4057	22348	93.97	30.73	124.70	55.6%		60.7%						53.9%				
18.83 - 18.08	18508	4087	22595	94.34	30.73	125.07	55.8%		60.8%						54.1%				
18.08 - 17.83	18766	6715	25481	94.47	30.73	125.19	52.0%	59.6%							53.4%				
17.83 - 12.83	20269	7059	27328	96.94	30.73	127.67	52.9%	60.5%							54.4%				
12.83 - 7.83	21850	7412	29262	99.41	30.73	130.14	53.8%	61.4%							55.4%				
7.83 - 2.83	23511	7773	31285	101.89	30.73	132.61	54.5%	62.3%							56.4%				
2.83 - 0	24489	7982	32471	103.29	30.73	134.01	54.9%	62.7%							57.8%				

Note: Section capacity checked in 5 degree increments.

FDH VELOCITEL
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Anchor Rod Design

Site Name:	BU# 876335
Job No. :	15BZUJ1400
Elevation:	0

*Note: Use Anchor Rod Transfer Plate Design Tab in Conjunction

Legend
Input
Output/ Notes

Code (F or G):	F	
Anchor Bolts (Yes or No)	Yes	
P (from RISA)	46	kips
V (from RISA)	36	kips
M (from RISA)	3219	ft-kips
Pier Diameter	8	ft

Existing Rods		
y	25.5	in
No. Bolts	12	
BC	51	in
I	15527.97	in^4
Bolt Grade	A615-75	
Thread Form	Non-Upset	
Diameter (in)	2.25	
Ag	3.98	in^2
Ae	3.25	in^2
Fy	75	ksi
Fu	100	ksi

T	191.068	kips
V	2.303	kips

Itot	20206.97	in^4

New Rods		
y new	27	in
No. Bolts new	6	
BC new	54	in
Inew	4,679	in^4
Bolt Grade	A193 B7	
Thread Form	Non-Upset	
Diameter, new (in)	1.75	
Ag new	2.41	in^2
Ae new	1.90	in^2
Fy new	105	ksi
Fu new	125	ksi

Tnew	122.607	kips
Vnew	1.394	kips

Capacity (%)				
Tn/Ω	194.5	kips	OK	98.2%
Tn/Ω, new	132.55	kips	OK	92.5%
øTn	260	kips		
øTn, new	190	kips		

Equations:

$T = (M*y*Ag)/Itot-P*(Ag/Atotal)$

$Tn/\Omega = 0.33*Fu*Ag*(4/3)$

$øTn = 0.8*Fu*Ae$ (anchor bolts only) $øTn = 0.75*Fu*Ae$ (non anchor bolts)

$I = (No.\ Bolts/8)*BC^2*Ag$

Notes:

*Ag and Ae are taken from AISC 13th Ed. Manual (pg. 7-83)

*I calc. will only work for symmetric bolt group, otherwise use CAD

Req'd Embedment Length for New Rods		
f'c, caisson's concrete strength	3000	psi
fy, rebar yield strength	6000	psi
d_b, diameter of vertical rebar	1	in
vertical rebar cage BC ø	24	in
vertical rebar top cover distance	3	in
τ, Ultimate Hilti Bond Resistance	1.8	ksi
Clear Cover	36	in

Note For New Anchor Rods:
Williams Bars (Upset)
A722 (Fy=127.7 ksi, Fu=150 ksi)
A615-75 (Fy=75 ksi, Fu=100 ksi)

l_d (vertical rebar dev. Length)	3.286	in
l_{dh} (Hilti dev. length)	40.183	in
G/1.5	-10.000	in

Total Embed. Length of New Bolts	40.18	in
	3.35	ft

Bearing Strength Check of Pipe Sleeve		
New Anchor Rod Diameter	1.75	in
Selected Pipe Sleeve Area	6.72	in^2
Selected Pipe Sleeve Fy	42	ksi
Rn/Ω (Rev F) or øRn (Rev G)	338.69	k
% Capacity (Analysis)	36.20%	OK
% Capacity (Design)	39.14%	OK

Equivalent BC		
No. Existing Rebar		
Existing Rebar BC		in
Area rebar		in^2
Irebar	0	in^4
Itot	4,679	in^4
Equivalent Area	2.410	in^2
Equivalent BC	50.879	in
Total Area	14.46	in^2

(assuming new bolts are reinforcement)

$l_d = [(fy*\psi_t\psi_e\lambda)/(20*\sqrt{f'c})]*d_b$ PER ACI 12.2.2

$l_{dh} = (øTn*FS)/(\tau*pi*d_{new})$

See Worksheet "New (Design Procedure)"

FDH VELOCITEL
ENGINEERING INNOVATION
Velocitel, Inc., d.b.a. FDH Velocitel, 6521 Meridien Drive Raleigh, NC 27616, Ph. 919.755.1012, Fax 919.755.1031

Anchor Rod Transfer Stiffeners

Site Name:	BU# 876335
Job No. :	15BZUJ1400
Elevation:	0

Code	F	F or G

Monopole and Flat Plate Properties		
Monopole Ø	43.58	in
Monopole Thickness	0.375	in
No. of Sides	12	
No. of Flat Plates	3	
No. of Term Bolts at Btm	9	

Transfer Stiffener Input		
Gap Between BP and Bottom of FP	6	in
Width of Transfer Stiffener	3.25	in
Stiffener Thickness	1.25	in
No. of Transfer Sitffeners	6	
Notch Length	0.75	in
Height of Stiffener	36	in
Transfer Stiffener Plate Fy	65	ksi
Transfer Stiffener Plate Fu	80	ksi

Transfer Stiffener Section Properties		
Gross Cross Sectional Area (Ag)	4.0625	in^2
Ø of Stiffeners	46.83	in
Outermost Fiber (y)	25.04	in
$I_{stiffeners\ from\ CAD}$	6086.372	in^4

Check Tension		
Tu	122.60	k
Tn/Ω	162.46	k
%Capacity	75.47%	Pass

Check Compression		
Pu	137.93	k
b/a	0.090278	
z	1.201556	
Pn/Ω	253.77	k
%Capacity	54.35%	Pass

Check Stress		
σu	36.17817	ksi
σn/Ω	51.99	ksi
%Capacity	69.59%	Pass

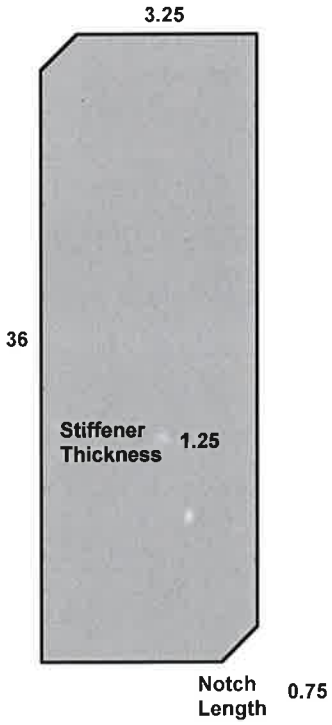
Check Eccentric Weld		
Tu	122.60	k
Rn/Ω	539.34	k
%Capacity	22.73%	Pass

Reactions:		
Moment	2113.1148	k-ft
Axial	46	k
Shear	36	k

*Moment adjusted to match tension in A.R.

Eccentric Weld Properties		
Weld Thk	6	No. of 1/16ths (whole number)
L_{weld}	35.25	in
e_x	1.625	in
a	0.0460993	use in Table 8-4, pg 8-66 AISC
C	3.7146099	From Table 8-4, pg 8-66 AISC
C1	1.03	70 ksi weld = 1, 80 ksi = 1.03

Legend
Input
Output
Notes



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FDH Velocitel, 6521 Meridien Drive Raleigh, NC 27616, Ph. 919.755.1012, Fax 919.755.1031

Base Transfer Stiffeners for Flat Plate Reinforcement Termination

Site Name:	BU# 876335
Job No. :	15BZUJ1400
Elevation:	0

Reactions:		
Moment	3219	k-ft
Axial	46	k
Shear	36	k

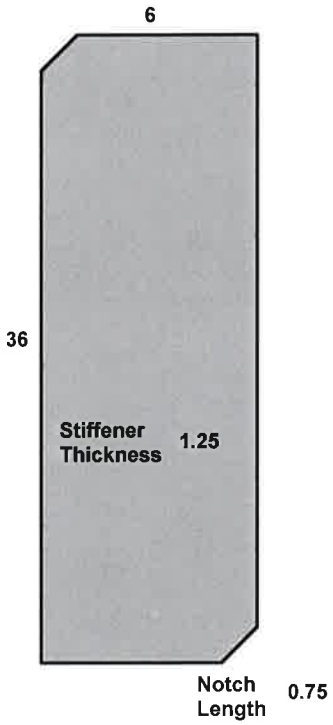
Code	F	F or G

Monopole and Flat Plate Properties		
Monopole Ø	43.58	in
Monopole Thickness	0.375	in
No. of Sides	12	
No. of Flat Plates	3	
No. of Term Bolts at Btm	9	

Eccentric Weld Properties		
Weld Thk	6	No. of 1/16ths (whole number)
L_{weld}	35.25	in
e_x	3	in
a	0.0851064	use in Table 8-4, pg 8-66 AISC
C	3.7185106	From Table 8-4, pg. 8-66 AISC
C1	1.03	70 ksi weld = 1, 80 ksi = 1.03

Transfer Stiffener Input		
Gap Between BP and Bottom of FP	6	in
Width of Transfer Stiffener	6	in
Stiffener Thickness	1.25	in
No. of Transfer Sitffeners	7	
Notch Length	0.75	in
Height of Stiffener	36	in
Transfer Stiffener Plate Fy	65	ksi
Transfer Stiffener Plate Fu	80	ksi

Legend
Input
Output
Notes



Transfer Stiffener Section Properties		
Gross Cross Sectional Area (Ag)	7.5	in^2
Ø of Stiffeners	49.58	in
Outermost Fiber (y)	27.79	in
$I_{stiffeners}$	13788.74	in^4

Check Tension		
Tu	267.35	k
Tn/Ω	341.16	k
%Capacity	78.36%	Pass

Check Compression		
Pu	280.49	k
b/a	0.166667	
z	1.057454	
Pn/Ω	412.30	k
%Capacity	68.03%	Pass

Check Stress		
σu	41.81895	ksi
σn/Ω	51.99	ksi
%Capacity	80.44%	Pass

Check Eccentric Weld		
Tu	267.35	k
Rn/Ω	539.90	k
%Capacity	49.52%	Pass

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

Site ID: *BU#876335*
Site Name: *East Farmington*
Job No. *15BZUJ1400*

Anchor Rod Data		
Qty:	12	
Diam:	2.25	in
Rod Material:	A615-J	
Yield, Fy:	75	ksi
Strength, Fu:	100	ksi
Bolt Circle:	51	in
Anchor Spacing:	6	in

Plate Data		
W=Side:	49.5	in
Thick:	3	in
Grade:	50	ksi
Clip Distance:	6	in

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

Pole Data		
Diam:	43.58	in
Thick:	0.375	in
Grade:	65	ksi
# of Sides:	12	"0" IF Round

Stress Increase Factor		
ASD ASIF:	1.333	

Base Reactions		
TIA Revision:	F	
Unfactored Moment, M:	2485.4	ft-kips
Unfactored Axial, P:	46	kips
Unfactored Shear, V:	36	kips

Anchor Rod Results

TIA F --> Maximum Rod Tension	191.1 Kips
Allowable Tension:	195.0 Kips
Anchor Rod Stress Ratio:	98.0% **Pass**

Base Plate Results Flexural Check

Base Plate Stress:	47.9 ksi
Allowable PL Bending Stress:	50.0 ksi
Base Plate Stress Ratio:	95.9% **Pass**

PL Ref. Data
Yield Line (in): 26.42
Max PL Length: 26.42

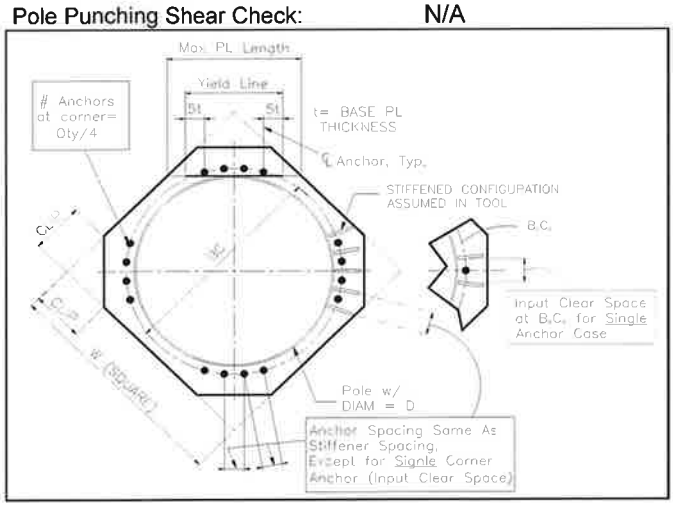
N/A - Unstiffened

Stiffener Results

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

Pole Results

Pole Punching Shear Check: N/A



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

(Bearing and Stability Checks) Tool for TIA Rev F or G - Application (MP, SST with unitbase)

Site Data

Site ID: *BU# 876335*
Site Name: *East Farmington*
Job No.: *15BZUJ1400*

Enter Load Factors Below:		
For P (DL)	1.2	<---- Enter Factor
For P,V, and M (WL)	1.35	<---- Enter Factor

Pad & Pier Data		
Base PL Dist. Above Pier:	3	in
Pier Dist. Above Grade:	6	in
Pad Bearing Depth, D:	9	ft
Pad Thickness, T:	4	ft
Pad Width=Length, L:	20	ft
Pier Cross Section Shape:	Square	<--Pull Down
Enter Pier Side Width:	8	ft
Concrete Density:	150.0	pcf
Pier Cross Section Area:	64.00	ft^2
Pier Height:	5.50	ft
Soil (above pad) Height:	5.00	ft

Soil Parameters		
Unit Weight, γ:	67.0	pcf
Ultimate Bearing Capacity, qn:	30.00	ksf
Strength Reduct. factor, ϕ:	0.75	
Angle of Friction, Φ:	30.0	degrees
Undrained Shear Strength, Cu:	0.00	ksf
Allowable Bearing: ϕ*qn:	22.50	ksf
Passive Pres. Coeff., Kp	3.00	

Forces/Moments due to Wind and Lateral Soil		
Minimum of (φ*Ultimate Pad Passive Force, Vu):	48.6	kips
Pad Force Location Above D:	1.81	ft
ϕ(Passive Pressure Moment):	87.94	ft-kips
Factored O.T. M(WL), "1.6W":	4819.5	ft-kips
Factored OT (MW-Msoil), M1	4731.56	ft-kips

Resistance due to Foundation Gravity		
Soil Wedge Projection grade, a:	2.89	ft
Sum of Soil Wedges Wt:	32.12	kips
Soil Wedges ecc, K1:	3.53	ft
Ftg+Soil above Pad wt:	405.4	kips
Unfactored (Total ftg-soil Wt):	437.48	kips
1.2D. **No Soil Wedges**.	541.42	kips
0.9D. **With Soil Wedges**	434.97	kips

Resistance due to Cohesion (Vertical)		
ϕ*(1/2*Cu)(Total Vert. Planes)	0.00	kips
Cohesion Force Eccentricity, K2	0.00	ft

Monopole Base Reaction Forces		
TIA Revision:	F	<--Pull Down
Unfactored DL Axial, PD:	45.82	kips
Unfactored WL Axial, PW:		kips
Unfactored WL Shear, V:	36	kips
Unfactored WL Moment, M:	3219	ft-kips

Load Factor	Shaft Factored Loads		
1.20	1.2D+1.6W, Pu:	54.984	kips
0.90	0.9D+1.6W, Pu:	41.238	kips
1.35	Vu:	48.6	kips
	Mu:	4345.65	ft-kips

1.2D+1.6W Load Combination, Bearing Results:

(**No Soil Wedges**) [Reaction+Conc+Soil]	541.42	P1="1.2D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil), M1	4731.56	ft-kips

Orthogonal Direction:

ecc1 = M1/P1 =	8.74	ft
Orthogonal qu=	10.74	ksf
qu/ϕ*qn Ratio=	**47.71%**	**Pass**

Diagonal Direction:

ecc2 = (0.707M1)/P1 =	6.18	ft
Diagonal qu=	9.27	ksf
qu/ϕ*qn Ratio=	**41.20%**	**Pass**

Run <-- Press Upon Completing All Input

FDH VELOCITY

ENGINEERING INNOVATION

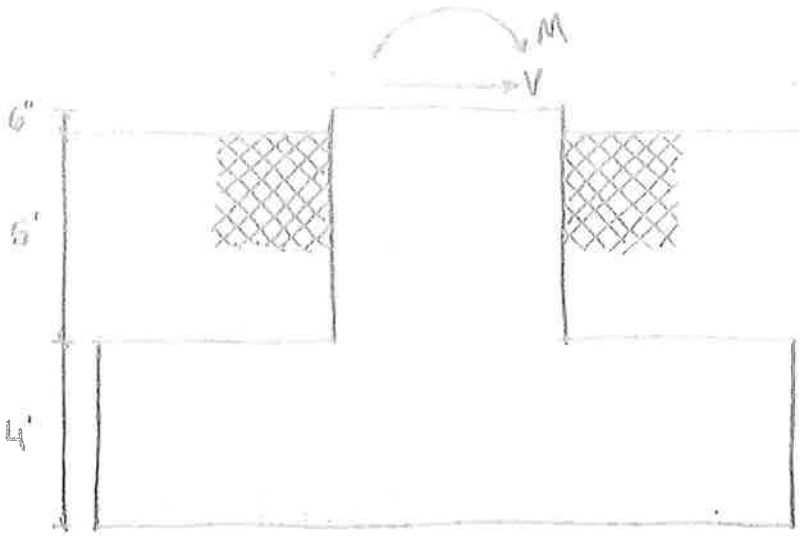
Project: East Farmington

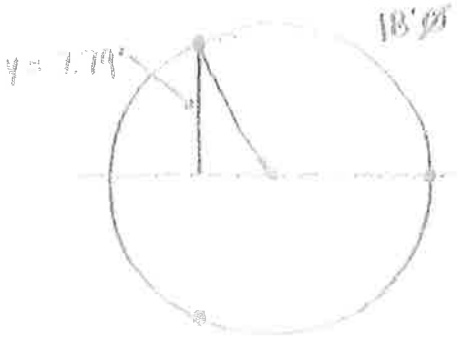
Sheet: 1 of 1 Date:

By: Project #:

Checked By: Drawing #:

Overturn Check





Allowable Uplift = 262 kips

TNX Reactions: M = 3,219 k-ft
V = 36 k

$M_T = M + 9.5V$
$= 3,561 k\text{-}ft$

$I = \Sigma y^2$
$= 2(7.79^2)$
$= 121.5 ft^2$

$T_u = \frac{M_T y}{I}$
$= 228.3 k$

$\frac{T_u}{\phi T_n} = \frac{228.3}{262} = 87.1\%$ PASS