Robinson+Cole

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Also admitted in Massachusetts

January 5, 2016

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

Re: **Notice of Exempt Modification – Facility Modification**
371 Terryville Avenue, Bristol, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) wireless telecommunications antennas at the 140-foot level of the existing 168.5-foot tower at 371 Terryville Avenue in Bristol, Connecticut (the "Property"). The tower is owned by Crown Castle ("Crown"). The Council approved Cellco's use of the tower in 2006. Cellco now intends to modify its facility by replacing six (6) of its existing antennas with three (3) model SBNHH-1D65B, 700 MHz antennas and three (3) model SBNHH-1D65B, 1900/2100 MHz antennas, all at the same 140-foot level on the tower. Cellco also intends to install nine (9) remote radio heads ("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 Kenneth B. Cockayne, Mayor for the City of Bristol. A copy of this letter is also being sent to Bristol Hospital, 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. Cellco's replacement antennas and RRHs will be located at the 140-foot level on the 168.5-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/or 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. A cumulative General Power Density table for Cellco's modified facility is included behind Attachment 2.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The tower and its foundation, with certain modifications, can support Cellco's proposed modifications. (*See* Structural Modification 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:
Kenneth B. Cockayne, Bristol Mayor
Bristol Hospital
Crown
Tim Parks

ATTACHMENT 1

Product Specifications

COMMSCOPE®

POWERED BY ANDREW.

SBNH-1D65B

Andrew® Dualband Antenna, 698–896 MHz and 1710–2360 MHz, 65° horizontal beamwidth, internal RET.

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

Electrical Specifications

Frequency Band, MHz	698–806	806–896	1710–1880	1850–1990	1920–2200	2300–2360
Gain, dBi	14.8	14.6	17.8	18.1	18.5	18.5
Beamwidth, Horizontal, degrees	68	66	70	65	62	59
Beamwidth, Vertical, degrees	12.1	11.0	5.7	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	17	16	15	14	16	15
Front-to-Back Ratio at 180°, dB	29	32	31	28	30	31
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	1710–1880	1850–1990	1920–2200	2300–2360
Gain by all Beam Tilts, average, dBi	14.5	14.1	17.5	17.9	18.2	18.3
Gain by all Beam Tilts Tolerance, dB	±0.4	±0.9	±0.4	±0.3	±0.5	±0.4
Gain by Beam Tilt, average, dBi	0 ° | 14.6	0 ° | 14.3	0 ° | 17.5	0 ° | 17.8	0 ° | 18.0	0 ° | 18.0
	7 ° | 14.6	7 ° | 14.3	3 ° | 17.5	3 ° | 18.0	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	±1.7	±3.3	±2.3	±4.9	±4.5	±4.4
Beamwidth, Vertical Tolerance, degrees	±0.8	±0.7	±0.3	±0.2	±0.3	±0.1
USLS, beampeak to 20° above beampeak, dB	17	16	15	14	15	14
Front-to-Back Total Power at 180° ± 30°, dB	25	25	28	25	25	26
CPR at Boresight, dB	21	22	19	20	19	23
CPR at Sector, dB	13	11	16	13	13	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
Band	Multiband
Brand	DualPol® | Teletilt®
Operating Frequency Band	1710 – 2360 MHz | 698 – 896 MHz
Performance Note	Outdoor usage

Mechanical Specifications

Color	Light gray

Product Specifications

SBNH-1D65B

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	4
Wind Loading, maximum	618.0 N @ 150 km/h 138.9 lbf @ 150 km/h
Wind Speed, maximum	241 km/h | 150 mph

Dimensions

Depth	181.0 mm | 7.1 in
Length	1848.0 mm | 72.8 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

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

Product Specifications

SBNH-1D65B

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.

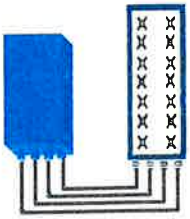
Its compactness and slim design makes the Alcatel-Lucent B13 RRH4x30-4R easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the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

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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 1900A HW version	2 Branch RX – LA6.0.1 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

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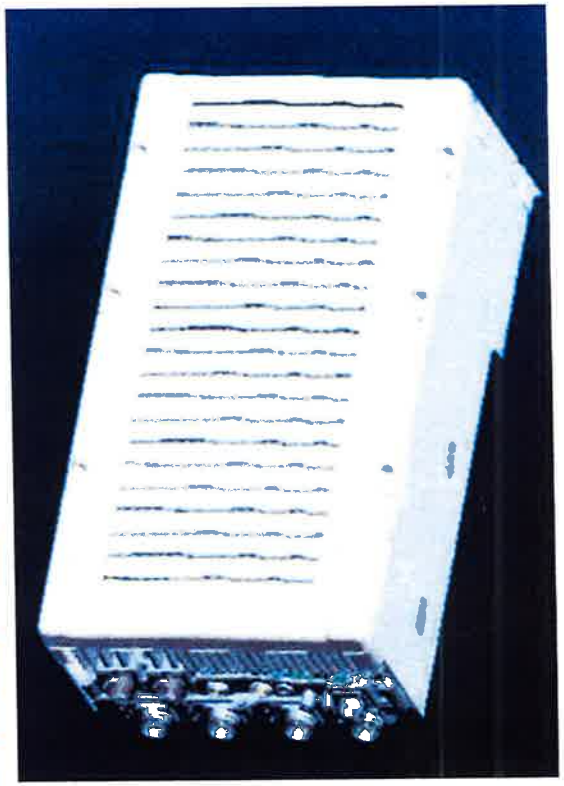
NEW PCS RF MODULES FOR VZW
RRH2X60 - HW CHARACTERISTICS

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.)

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ALCATEL-LUCENT WIRELESS PRODUCT DATASHEET

RRH2X60-AWS FOR BAND 4 APPLICATIONS

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

A distributed Node B expands the deployment options by using two components, a Base Band Unit (BBU) containing the digital assets and a separate RRH containing the radio-frequency (RF) elements. This modular design optimizes available space and allows the main components of a Node B to be installed separately, within the same site or several kilometers apart.

The Alcatel-Lucent RRH2x60-AWS is linked to the BBU by an optical-fiber connection carrying downlink and uplink digital radio signals along with operations, administration and maintenance (OA&M) information.

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.

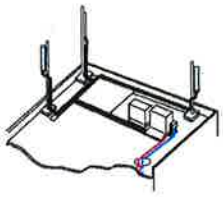
EASY INSTALLATION

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.

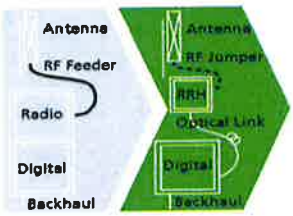
The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment. However, many of these sites can host an Alcatel-Lucent RRH2x60-AWS installation, providing more flexible site selection and improved network quality along with greatly reduced installation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

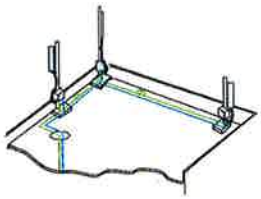
Installation can easily be done by a single person as the Alcatel–Lucent RRH2x60-AWS is compact and weighs about 20 kg, eliminating the need for a crane to hoist the BTS cabinet to the rooftop. A site can be in operation in less than one day.



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)		[mm (AWG)]	8.4 (8)
Quantity, Wire Count (Power)			16 (8 pairs)
Size (Alarm)		[mm (AWG)]	0.8 (18)
Quantity, Wire Count (Alarm)			4 (2 pairs)
Type			UV protected
Strands			19
Primary Jacket Diameter, Nominal		[mm (in)]	6.8 (0.27)
Standards (Meets or exceeds)			NFPA 130, ICEA S-95-658 UL Type XHHW-2, UL 44 UL-LS Limited Smoke, UL VW-1 IEEE-383 (1974), IEEE1202/FT4 RoHS Compliant
Installation Temperature		[°C (°F)]	-40 to +65 (-40 to149)
Operation Temperature		[°C (°F)]	-40 to +65 (-40 to149)

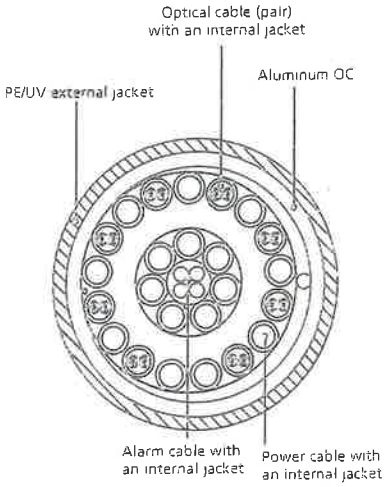


Figure 2: Construction Detail

* This data is provisional and subject to change

ATTACHMENT 2

	General	Power	Density					
Site Name: Bristol W 2								
Tower Height: 168.5'								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*Sprint CDMA/LTE	4	693	158	0.0431	1900	1.0000	0.43%	
*Sprint CDMA/LTE	1	526	158	0.0082	850	0.5667	0.14%	
*MetroPCS CDMA	3	727	156	0.0349	2135	1.0000	0.35%	
*MetroPCS LTE	1	1200	156	0.0192	2130	1.0000	0.19%	
*AT&T UMTS	2	565	169	0.0153	880	0.5867	0.26%	
*AT&T UMTS	2	1077	169	0.0292	1900	1.0000	0.29%	
*AT&T GSM	1	283	169	0.0038	880	0.5867	0.07%	
*AT&T GSM	4	646	169	0.0350	1900	1.0000	0.35%	
*AT&T LTE	1	1615	169	0.0219	734	0.4893	0.45%	
*T-Mobile GSM/UMTS	2	12	130	0.0006	1950	1.0000	0.01%	
*T-Mobile UMTS	2	12	130	0.0006	2100	1.0000	0.01%	
*T-Mobile LTE	2	24	130	0.0011	2100	1.0000	0.01%	
Verizon	**11**	**418**	**140**	**0.0844**	**1970**	**1.0000**	**8.44%**	
Verizon	**9**	**392**	**140**	**0.0647**	**869**	**0.5793**	**11.17%**	
Verizon	**1**	**3500**	**140**	**0.0642**	**2145**	**1.0000**	**6.42%**	
Verizon	**1**	**2100**	**140**	**0.0385**	**746**	**0.4973**	**7.75%**	
								36.3%
* Source: Siting Council								

ATTACHMENT 3

Date: **December 23, 2015**

Brittany Richardson
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277

BLACK & VEATCH
Building a world of difference.
Black & Veatch Corp.
10950 Grandview Drive
Overland Park, KS 66210
(913) 458-7245

Subject:	**Structural Modification Report**	
Carrier Designation:	***Verizon Wireless* Co-Locate**	
	Carrier Site Name:	Bristol West 2
Crown Castle Designation:	**Crown Castle BU Number:**	842859
	Crown Castle Site Name:	BRISTOL CENTER
	Crown Castle JDE Job Number:	343481
	Crown Castle Work Order Number:	1159456
	Crown Castle Application Number:	307095 Rev. 2
Engineering Firm Designation:	**Black & Veatch Corp. Project Number:**	182896
Site Data:	**371 Terryville Avenue, Bristol, Hartford County, CT** **Latitude *41° 40' 47.71"*, Longitude *-72° 57' 45.18"*** **168.5 Foot - Monopole Tower**	

Dear Brittany Richardson,

Black & Veatch Corp. is pleased to submit this **"Structural Modification 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 824273, in accordance with application 307095, revision 0.

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:

LC4: Modified Structure w/ Existing + Proposed **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

This analysis has been performed in accordance with the TIA/EIA-222-F standard and 2005 CT State Building Code with 2009 amendment based upon a wind speed of 80 mph fastest mile.

All modifications and equipment proposed in this report shall be installed in accordance with the attached drawings for the determined available structural capacity to be effective.

We at *Black & Veatch Corp.* 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.

Structural analysis prepared by: Andrew H. Siegel, E.I.T.

Respectfully submitted by: Ping Jiang, P.E.

12/23/2015

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 168.5 ft Monopole tower designed by Engineered Endeavors, Inc. in December of 2003. The tower was originally designed for a wind speed of 80 mph per TIA/EIA-222-F.

The tower has been modified multiple times in the past to accommodate additional loading. The tower has been modified per reinforcement drawings prepared by Black & Veatch Corp., in May of 2012. Reinforcement includes the addition of all new base plate stiffeners, anchor rods, and reinforcement plates. The tower was then modified per reinforcement drawings prepared by GPD Group, in February of 2013. Reinforcement consists of replacing existing base plate stiffeners, new transition stiffeners, and new reinforcement plates. The tower was later modified per reinforcement drawings prepared by GPD Group, in August of 2013. Reinforcement consists of new rebar into existing foundation.

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, 37.6 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
138.0	140.0	3	alcatel lucent	RRH2X60-PCS	2	1-5/8	-
		3	alcatel lucent	RRH2x60-700			
		3	alcatel lucent	RRH2x60-AWS			
		6	commscope	SBNHH-1D65B w/ Mount Pipe			
		1	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
168.0	169.0	1	andrew	SBNH-1D6565C w/ Mount Pipe	6 1 2 1	1-5/8 1/2 7/8 3/8	1
		3	ericsson	RRUS 11			
		3	kathrein	800 10121 w/ Mount Pipe			
		6	kathrein	860 10025			
		2	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe			
		6	powerwave technologies	LGP21401			
		1	raycap	DC6-48-60-18-8F			
	168.0	1	tower mounts	Platform Mount [LP 303-1]			
158.0	158.0	3	alcatel lucent	1900MHz RRH	3 1	1-1/4 1/2	1
		3	alcatel lucent	800 EXTERNAL NOTCH FILTER			
		3	alcatel lucent	800MHZ RRH			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
		2	powerwave technologies	P40-16-XLPP-RR-A w/ Mount Pipe			
		1	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe			
		1	tower mounts	T-Arm Mount [TA 602-3]			
148.0	148.0	3	rfs celwave	APXV18-206517S-C w/ Mount Pipe	6	1-5/8	1
		1	tower mounts	Pipe Mount [PM 601-3]			
138.0	140.0	1	antel	BXA-171063/8CF w/ Mount Pipe	1	1-1/4	2
		2	antel	BXA-171085-12BF w/ Mount Pipe	1	1-5/8	
		3	antel	BXA0171063-12CF w/ Mount Pipe			
		4	antel	BXA-70063/4CF w/ Mount Pipe	11	1-5/8	1
		2	antel	BXA-70080-6CF-4 w/ Mount Pipe			
		1	rfs celwave	DB-T1-6Z-8AB-0Z			
		6	rfs celwave	FD9R6004/2C-3L			
	138.0	1	tower mounts	Platform Mount [LP 303-1]			
128.0	130.0	3	andrew	ONEBASE TWIN DUAL DUPLEX TMA	13	1-5/8	1
		3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe			
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe			
	128.0	1	tower mounts	Platform Mount [LP 303-1]			
70.0	70.0	1	gps	GPS_A	-	-	1
		1	tower mounts	Side Arm Mount [SO 701-1]			

Notes:
1) Existing Equipment
2) Existing 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)
169	169	6	Allgon	7920.00 Panel Antenna	-	-
160	160	12	Decibel	DB 980 Panel Antenna	-	-
150	150	6	Unknown	4ft Panel Antenna	-	-
140	140	6	Unknown	4ft Panel Antenna	-	-
130	130	3	Unknown	4ft Panel Antenna	-	-
120	120	3	Unknown	4ft Panel Antenna	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH Engineering, Inc.	5452600	CCISITES
4-POST-MODIFICATION INSPECTION	Black & Veatch Corp.	5111172	CCISITES
4-POST-MODIFICATION INSPECTION	GPD Group.	5114340	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Engineered Endeavors Incorporated	4529295	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Engineered Endeavors Incorporated	5135435	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	GPD Group.	4964264	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	GPD Group.	5111173	CCISITES
4-POST-MODIFICATION INSPECTION	B+T Group	5595874	CCISITES
4-TOWER STRUCTURAL ANALYSIS REPORTS	AW Solutions	5864057	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 wind loads as allowed by TIA/EIA-222-F.
5) The existing baseplate grout was not considered in this analysis.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
168.5 - 163.5	Pole	TP19.834x19x0.1875	Pole	8.5%	Pass
163.5 - 158.5	Pole	TP20.668x19.834x0.1875	Pole	15.5%	Pass
158.5 - 153.5	Pole	TP21.502x20.668x0.1875	Pole	26.2%	Pass
153.5 - 148.5	Pole	TP22.336x21.502x0.1875	Pole	36.0%	Pass
148.5 - 143.5	Pole	TP23.17x22.336x0.1875	Pole	45.9%	Pass
143.5 - 138.5	Pole	TP24.004x23.17x0.1875	Pole	54.9%	Pass
138.5 - 134.33	Pole	TP25.31x24.004x0.1875	Pole	69.5%	Pass
134.33 - 129.33	Pole	TP25.147x24.325x0.25	Pole	64.8%	Pass
129.33 - 126.42	Pole	TP25.626x25.147x0.25	Pole	72.0%	Pass
126.42 - 126.17	Pole + Reinf.	TP25.668x25.626x0.4063	Reinf. 10 Compression	59.6%	Pass
126.17 - 121.17	Pole + Reinf.	TP26.49x25.668x0.4	Reinf. 10 Compression	69.6%	Pass
121.17 - 116.17	Pole + Reinf.	TP27.313x26.49x0.4	Reinf. 10 Compression	78.9%	Pass
116.17 - 113.83	Pole + Reinf.	TP27.697x27.313x0.3938	Reinf. 10 Compression	83.0%	Pass
113.83 - 113.58	Pole + Reinf.	TP27.738x27.697x0.65	Reinf. 10 Compression	52.4%	Pass
113.58 - 108.58	Pole + Reinf.	TP28.561x27.738x0.6375	Reinf. 10 Compression	58.1%	Pass
108.58 - 103.58	Pole + Reinf.	TP29.383x28.561x0.625	Reinf. 10 Compression	63.5%	Pass
103.58 - 98.58	Pole + Reinf.	TP30.206x29.383x0.6125	Reinf. 10 Compression	68.7%	Pass
98.58 - 93.58	Pole + Reinf.	TP31.029x30.206x0.6	Reinf. 10 Compression	73.6%	Pass
93.58 - 89.28	Pole + Reinf.	TP32.49x31.029x0.6	Reinf. 10 Compression	77.7%	Pass
89.28 - 83.7	Pole + Reinf.	TP32.151x31.236x0.575	Reinf. 2 Bolt Shear	87.5%	Pass
83.7 - 83.17	Pole + Reinf.	TP32.238x32.151x0.575	Reinf. 2 Tension Rupture	87.4%	Pass
83.17 - 82.92	Pole + Reinf.	TP32.279x32.238x0.6875	Reinf. 2 Tension Rupture	73.5%	Pass
82.92 - 77.92	Pole + Reinf.	TP33.098x32.279x0.675	Reinf. 2 Tension Rupture	77.1%	Pass
77.92 - 73.42	Pole + Reinf.	TP33.835x33.098x0.6625	Reinf. 2 Tension Rupture	80.3%	Pass
73.42 - 73.17	Pole + Reinf.	TP33.876x33.835x1.0375	Reinf. 3 Bolt Shear	55.2%	Pass
73.17 - 72.92	Pole + Reinf.	TP33.917x33.876x1.0125	Reinf. 2 Bolt Shear	55.5%	Pass
72.92 - 72.67	Pole + Reinf.	TP33.958x33.917x0.925	Reinf. 9 Compression	61.4%	Pass
72.67 - 67.67	Pole + Reinf.	TP34.777x33.958x0.9125	Reinf. 9 Compression	64.2%	Pass

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
67.67 - 64.42	Pole + Reinf.	TP35.309x34.777x0.9	Reinf. 9 Compression	65.9%	Pass
64.42 - 64.17	Pole + Reinf.	TP35.35x35.309x0.7375	Reinf. 3 Tension Rupture	75.6%	Pass
64.17 - 59.17	Pole + Reinf.	TP36.169x35.35x0.7375	Reinf. 3 Tension Rupture	78.4%	Pass
59.17 - 54.17	Pole + Reinf.	TP36.989x36.169x0.7125	Reinf. 3 Tension Rupture	81.1%	Pass
54.17 - 49.2	Pole + Reinf.	TP38.69x36.989x0.7125	Reinf. 3 Bolt Shear	84.2%	Pass
49.2 - 42.78	Pole + Reinf.	TP38.231x37.177x0.7625	Reinf. 4 Bolt Shear	80.1%	Pass
42.78 - 37.78	Pole + Reinf.	TP39.051x38.231x0.75	Reinf. 4 Tension Rupture	80.5%	Pass
37.78 - 32.78	Pole + Reinf.	TP39.871x39.051x0.75	Reinf. 4 Tension Rupture	82.5%	Pass
32.78 - 28.25	Pole + Reinf.	TP40.615x39.871x0.7375	Reinf. 4 Tension Rupture	84.1%	Pass
28.25 - 28	Pole + Reinf.	TP40.656x40.615x1.1	Reinf. 5 Bolt Shear	60.3%	Pass
28 - 27.83	Pole + Reinf.	TP40.683x40.656x1.075	Reinf. 4 Bolt Shear	60.8%	Pass
27.83 - 27.58	Pole + Reinf.	TP40.724x40.683x0.95	Reinf. 8 Compression	71.7%	Pass
27.58 - 22.58	Pole + Reinf.	TP41.545x40.724x0.95	Reinf. 8 Compression	73.4%	Pass
22.58 - 19.33	Pole + Reinf.	TP42.078x41.545x0.9375	Reinf. 8 Compression	74.4%	Pass
19.33 - 19.08	Pole + Reinf.	TP42.119x42.078x0.825	Reinf. 5 Tension Rupture	76.9%	Pass
19.08 - 14.08	Pole + Reinf.	TP42.94x42.119x0.8	Reinf. 5 Tension Rupture	78.4%	Pass
14.08 - 9.08	Pole + Reinf.	TP43.76x42.94x0.8	Reinf. 5 Tension Rupture	79.8%	Pass
9.08 - 4.08	Pole + Reinf.	TP44.581x43.76x0.7875	Reinf. 5 Tension Rupture	81.1%	Pass
4.08 - 0	Pole + Reinf.	TP45.25x44.581x0.775	Reinf. 5 Bolt Shear	83.8%	Pass
				Summary	
			Pole	72.0%	Pass
			Reinforcement	87.5%	Pass
			Overall	87.5%	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC4

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	63.3	Pass
	Base Plate		52.2	Pass
	Plate Stiffeners		59.6	Pass
	Base Foundation	0	84.1	Pass
	Base Foundation Soil Interaction		65.4	Pass

Structure Rating (max from all components) =	87.5%

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

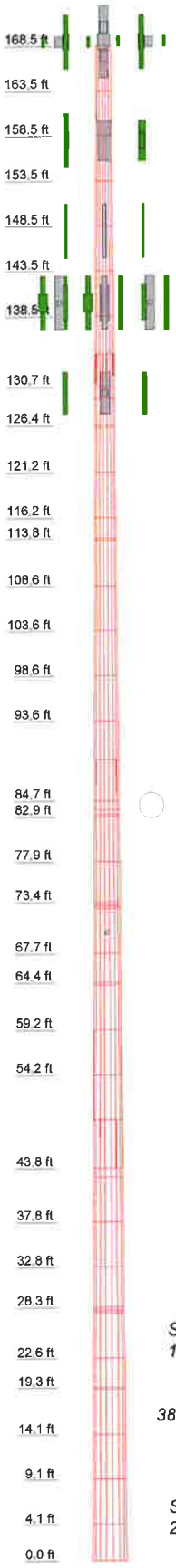
4.1) Recommendations

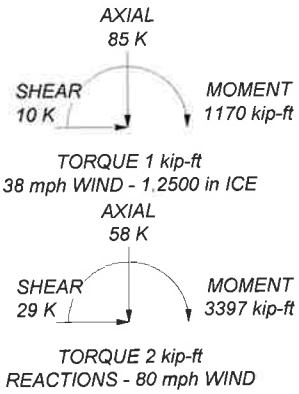
This tower will have sufficient capacity to carry the existing and proposed loads after proper installation of the reinforcements shown in Appendix D.

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	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	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	4.08
Number of Sides	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
Thickness (in)	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875	0.1875
Socket Length (ft)																																															
Top Dia (in)	19.8340	19.8340	20.6680	20.6680	21.5020	21.5020	22.3360	22.3360	23.1700	23.1700	24.0040	24.0040	24.8380	24.8380	25.6720	25.6720	26.5060	26.5060	27.3400	27.3400	28.1740	28.1740	29.0080	29.0080	29.8420	29.8420	30.6760	30.6760	31.5100	31.5100	32.3440	32.3440	33.1780	33.1780	34.0120	34.0120	34.8460	34.8460	35.6800	35.6800	36.5140	36.5140	37.3480	37.3480	38.1820	38.1820	39.0000
Bot Dia (in)	19.8340	20.6680	20.6680	21.5020	21.5020	22.3360	22.3360	23.1700	23.1700	24.0040	24.0040	24.8380	24.8380	25.6720	25.6720	26.5060	26.5060	27.3400	27.3400	28.1740	28.1740	29.0080	29.0080	29.8420	29.8420	30.6760	30.6760	31.5100	31.5100	32.3440	32.3440	33.1780	33.1780	34.0120	34.0120	34.8460	34.8460	35.6800	35.6800	36.5140	36.5140	37.3480	37.3480	38.1820	38.1820	39.0000
Grade	A572-65																																														
Weight (K)	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.3	0.2	0.6	0.3	0.9	0.9	1.0	1.7	1.3	1.2	1.6	1.1	1.3	2.8	2.1	1.7	1.7	1.6	2.0	1.3	1.8	1.8	1.5	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
SBNH-1D6565C w/ Mount Pipe	168	(2) FD9R6004/2C-3L	138
800 10121 w/ Mount Pipe	168	RRH2X60-PCS	138
(2) 860 10025	168	RRH2x60-700	138
(2) LGP21401	168	RRH2x60-AWS	138
DC6-48-60-18-8F	168	BXA-70063/4CF w/ Mount Pipe	138
RRUS 11	168	(2) SBNHH-1D65B w/ Mount Pipe	138
RRUS 11	168	BXA-70080-6CF-4 w/ Mount Pipe	138
RRUS 11	168	BXA-70080-6CF-4 w/ Mount Pipe	138
800 10121 w/ Mount Pipe	168	(2) FD9R6004/2C-3L	138
(2) 860 10025	168	(2) FD9R6004/2C-3L	138
AM-X-CD-16-65-00T-RET w/ Mount Pipe	168	RRH2x60-AWS	138
		RRH2x60-700	138
(2) LGP21401	168	Platform Mount [LP 303-1]	138
800 10121 w/ Mount Pipe	168	BXA-70063/4CF w/ Mount Pipe	138
(2) 860 10025	168	(2) SBNHH-1D65B w/ Mount Pipe	138
AM-X-CD-16-65-00T-RET w/ Mount Pipe	168	(2) SBNHH-1D65B w/ Mount Pipe	138
		(2) DB-T1-6Z-8AB-0Z	138
(2) LGP21401	168	BXA-70063/4CF w/ Mount Pipe	138
(2) 6' x 2" Mount Pipe	168	RRH2x60-700	138
(2) 6' x 2" Mount Pipe	168	RRH2x60-AWS	138
(2) 6' x 2" Mount Pipe	168	RRH2X60-PCS	138
Platform Mount [LP 303-1]	168	RRH2X60-PCS	138
1900MHz RRH	158	Platform Mount [LP 303-1]	128
1900MHz RRH	158	6' x 2" Mount Pipe	128
800 EXTERNAL NOTCH FILTER	158	6' x 2" Mount Pipe	128
800 EXTERNAL NOTCH FILTER	158	6' x 2" Mount Pipe	128
800MHZ RRH	158	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	128
800MHZ RRH	158	ONEBASE TWIN DUAL DUPLEX TMA	128
P40-16-XLPP-RR-A w/ Mount Pipe	158	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	128
APXVSPP18-C-A20 w/ Mount Pipe	158	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	128
1900MHz RRH	158	ONEBASE TWIN DUAL DUPLEX TMA	128
800 EXTERNAL NOTCH FILTER	158	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	128
800MHZ RRH	158	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	128
P40-16-XLPP-RR-A w/ Mount Pipe	158	ONEBASE TWIN DUAL DUPLEX TMA	128
6' x 2" Mount Pipe	158	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	128
6' x 2" Mount Pipe	158	GPS_A	70
6' x 2" Mount Pipe	158	Side Arm Mount [SO 701-1]	70
T-Arm Mount [TA 602-3]	158		
Pipe Mount [PM 601-3]	148		
APXV18-206517S-C w/ Mount Pipe	148		
APXV18-206517S-C w/ Mount Pipe	148		
APXV18-206517S-C w/ Mount Pipe	148		
BXA-70063/4CF w/ Mount Pipe	138		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

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

BLACK & VEATCH
Building a world of difference.

Black & Veatch Corp.
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Overland Park, KS 66211
Phone: (913) 458-7245
FAX: (913) 458-8136

Job: *182896*			
Project: *BU 842859 WO 1117732*			
Client: CROWN CASTLE	Drawn by: Andrew H. Siegel, EIT	App'd:	
Code: TIA/EIA-222-F	Date: 12/14/15 (Rev 1)	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:

1) Tower is located in Hartford County, Connecticut.
2) Basic wind speed of 80 mph.
3) Nominal ice thickness of 1.2500 in.
4) Ice thickness is considered to increase with height.
5) Ice density of 56 pcf.
6) A wind speed of 38 mph is used in combination with ice.
7) Temperature drop of 50 °F.
8) Deflections calculated using a wind speed of 50 mph.
9) A non-linear (P-delta) analysis was used.
10) Pressures are calculated at each section.
11) Stress ratio used in pole design is 1.333.
12) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

	Consider Moments - Legs		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	168.50-163.50	5.00	0.00	18	19.0000	19.8340	0.1875	0.7500	A572-65 (65 ksi)
L2	163.50-158.50	5.00	0.00	18	19.8340	20.6680	0.1875	0.7500	A572-65 (65 ksi)
L3	158.50-153.50	5.00	0.00	18	20.6680	21.5020	0.1875	0.7500	A572-65 (65 ksi)
L4	153.50-148.50	5.00	0.00	18	21.5020	22.3360	0.1875	0.7500	A572-65 (65 ksi)
L5	148.50-143.50	5.00	0.00	18	22.3360	23.1700	0.1875	0.7500	A572-65 (65 ksi)
L6	143.50-138.50	5.00	0.00	18	23.1700	24.0040	0.1875	0.7500	A572-65 (65 ksi)
L7	138.50-130.67	7.83	3.66	18	24.0040	25.3100	0.1875	0.7500	A572-65 (65 ksi)
L8	130.67-129.33	5.00	0.00	18	24.3245	25.1472	0.2500	1.0000	A572-65 (65 ksi)
L9	129.33-126.42	2.91	0.00	18	25.1472	25.6265	0.2500	1.0000	A572-65 (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
L10	126.42-126.17	0.25	0.00	18	25.6265	25.6676	0.4063	1.6250	A572-65 (65 ksi)
L11	126.17-121.17	5.00	0.00	18	25.6676	26.4902	0.4000	1.6000	A572-65 (65 ksi)
L12	121.17-116.17	5.00	0.00	18	26.4902	27.3129	0.4000	1.6000	A572-65 (65 ksi)
L13	116.17-113.83	2.33	0.00	18	27.3129	27.6968	0.3937	1.5750	A572-65 (65 ksi)
L14	113.83-113.58	0.25	0.00	18	27.6968	27.7380	0.6500	2.6000	A572-65 (65 ksi)
L15	113.58-108.58	5.00	0.00	18	27.7380	28.5606	0.6375	2.5500	A572-65 (65 ksi)
L16	108.58-103.58	5.00	0.00	18	28.5606	29.3832	0.6250	2.5000	A572-65 (65 ksi)
L17	103.58-98.58	5.00	0.00	18	29.3832	30.2059	0.6125	2.4500	A572-65 (65 ksi)
L18	98.58-93.58	5.00	0.00	18	30.2059	31.0285	0.6000	2.4000	A572-65 (65 ksi)
L19	93.58-84.70	8.88	4.58	18	31.0285	32.4900	0.6000	2.4000	A572-65 (65 ksi)
L20	84.70-83.70	5.58	0.00	18	31.2365	32.1505	0.5750	2.3000	A572-65 (65 ksi)
L21	83.70-83.17	0.53	0.00	18	32.1505	32.2379	0.5750	2.3000	A572-65 (65 ksi)
L22	83.17-82.92	0.25	0.00	18	32.2379	32.2788	0.6875	2.7500	A572-65 (65 ksi)
L23	82.92-77.92	5.00	0.00	18	32.2788	33.0979	0.6750	2.7000	A572-65 (65 ksi)
L24	77.92-73.42	4.50	0.00	18	33.0979	33.8351	0.6625	2.6500	A572-65 (65 ksi)
L25	73.42-73.17	0.25	0.00	18	33.8351	33.8760	1.0375	4.1500	A572-65 (65 ksi)
L26	73.17-72.92	0.25	0.00	18	33.8760	33.9170	1.0125	4.0500	A572-65 (65 ksi)
L27	72.92-72.67	0.25	0.00	18	33.9170	33.9580	0.9250	3.7000	A572-65 (65 ksi)
L28	72.67-67.67	5.00	0.00	18	33.9580	34.7770	0.9125	3.6500	A572-65 (65 ksi)
L29	67.67-64.42	3.25	0.00	18	34.7770	35.3094	0.9000	3.6000	A572-65 (65 ksi)
L30	64.42-64.17	0.25	0.00	18	35.3094	35.3504	0.7375	2.9500	A572-65 (65 ksi)
L31	64.17-59.17	5.00	0.00	18	35.3504	36.1694	0.7375	2.9500	A572-65 (65 ksi)
L32	59.17-54.17	5.00	0.00	18	36.1694	36.9885	0.7125	2.8500	A572-65 (65 ksi)
L33	54.17-43.78	10.39	5.42	18	36.9885	38.6900	0.7125	2.8500	A572-65 (65 ksi)
L34	43.78-42.78	6.42	0.00	18	37.1771	38.2305	0.7625	3.0500	A572-65 (65 ksi)
L35	42.78-37.78	5.00	0.00	18	38.2305	39.0510	0.7500	3.0000	A572-65 (65 ksi)
L36	37.78-32.78	5.00	0.00	18	39.0510	39.8714	0.7500	3.0000	A572-65 (65 ksi)
L37	32.78-28.25	4.53	0.00	18	39.8714	40.6147	0.7375	2.9500	A572-65 (65 ksi)
L38	28.25-28.00	0.25	0.00	18	40.6147	40.6557	1.1000	4.4000	A572-65 (65 ksi)
L39	28.00-27.83	0.17	0.00	18	40.6557	40.6831	1.0750	4.3000	A572-65 (65 ksi)
L40	27.83-27.58	0.25	0.00	18	40.6831	40.7241	0.9500	3.8000	A572-65 (65 ksi)
L41	27.58-22.58	5.00	0.00	18	40.7241	41.5445	0.9500	3.8000	A572-65 (65 ksi)
L42	22.58-19.33	3.25	0.00	18	41.5445	42.0783	0.9375	3.7500	A572-65 (65 ksi)
L43	19.33-19.08	0.25	0.00	18	42.0783	42.1193	0.8250	3.3000	A572-65 (65 ksi)
L44	19.08-14.08	5.00	0.00	18	42.1193	42.9397	0.8000	3.2000	A572-65

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
L45	14.08-9.08	5.00	0.00	18	42.9397	43.7601	0.8000	3.2000	(65 ksi) A572-65 (65 ksi)
L46	9.08-4.08	5.00	0.00	18	43.7601	44.5805	0.7875	3.1500	A572-65 (65 ksi)
L47	4.08-0.00	4.08		18	44.5805	45.2500	0.7750	3.1000	A572-65 (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	19.2931	11.1958	500.5935	6.6784	9.6520	51.8642	1001.8456	5.5990	3.0140	16.075
	20.1400	11.6921	570.1654	6.9745	10.0757	56.5883	1141.0809	5.8472	3.1608	16.858
L2	20.1400	11.6921	570.1654	6.9745	10.0757	56.5883	1141.0809	5.8472	3.1608	16.858
	20.9868	12.1885	645.9019	7.2706	10.4993	61.5183	1292.6536	6.0954	3.3076	17.64
L3	20.9868	12.1885	645.9019	7.2706	10.4993	61.5183	1292.6536	6.0954	3.3076	17.64
	21.8337	12.6848	728.0648	7.5666	10.9230	66.6542	1457.0877	6.3436	3.4543	18.423
L4	21.8337	12.6848	728.0648	7.5666	10.9230	66.6542	1457.0877	6.3436	3.4543	18.423
	22.6805	13.1811	816.9157	7.8627	11.3467	71.9960	1634.9063	6.5918	3.6011	19.206
L5	22.6805	13.1811	816.9157	7.8627	11.3467	71.9960	1634.9063	6.5918	3.6011	19.206
	23.5274	13.6774	912.7163	8.1588	11.7703	77.5437	1826.6336	6.8400	3.7479	19.989
L6	23.5274	13.6774	912.7163	8.1588	11.7703	77.5437	1826.6336	6.8400	3.7479	19.989
	24.3743	14.1738	1015.7283	8.4548	12.1940	83.2973	2032.7931	7.0882	3.8947	20.772
L7	24.3743	14.1738	1015.7283	8.4548	12.1940	83.2973	2032.7931	7.0882	3.8947	20.772
	25.7004	14.9510	1192.1591	8.9185	12.8575	92.7211	2385.8868	7.4769	4.1246	21.998
L8	25.3112	19.1031	1398.8047	8.5465	12.3569	113.2007	2799.4499	9.5534	3.8411	15.364
	25.5351	19.7559	1547.1535	8.8385	12.7748	121.1102	3096.3427	9.8798	3.9859	15.944
L9	25.5351	19.7559	1547.1535	8.8385	12.7748	121.1102	3096.3427	9.8798	3.9859	15.944
	26.0218	20.1362	1638.2416	9.0086	13.0182	125.8420	3278.6389	10.0700	4.0703	16.281
L10	26.0218	32.5199	2613.2701	8.9532	13.0182	200.7390	5229.9789	16.2630	3.7953	9.342
	26.0636	32.5729	2626.0771	8.9678	13.0391	201.3995	5255.6096	16.2896	3.8025	9.36
L11	26.0636	32.0797	2587.5955	8.9700	13.0391	198.4483	5178.5959	16.0429	3.8135	9.534
	26.8989	33.1242	2848.6457	9.2620	13.4570	211.6844	5701.0397	16.5652	3.9583	9.896
L12	26.8989	33.1242	2848.6457	9.2620	13.4570	211.6844	5701.0397	16.5652	3.9583	9.896
	27.7342	34.1686	3126.6880	9.5541	13.8749	225.3479	6257.4902	17.0875	4.1031	10.258
L13	27.7342	33.6425	3079.9783	9.5563	13.8749	221.9814	6164.0094	16.8245	4.1141	10.448
	28.1241	34.1224	3213.6595	9.6926	14.0700	228.4053	6431.5477	17.0644	4.1816	10.62
L14	28.1241	55.8003	5157.1153	9.6016	14.0700	366.5330	10321.016 5	27.9055	3.7306	5.739
	28.1659	55.8852	5180.6795	9.6162	14.0909	367.6618	10368.175 8	27.9479	3.7379	5.751
L15	28.1659	54.8358	5088.0884	9.6207	14.0909	361.0908	10182.871 8	27.4231	3.7599	5.898
	29.0012	56.5003	5565.6426	9.9127	14.5088	383.6051	11138.608 7	28.2555	3.9047	6.125
L16	29.0012	55.4172	5463.8436	9.9171	14.5088	376.5887	10934.876 7	27.7139	3.9267	6.283
	29.8365	57.0491	5960.8883	10.2092	14.9267	399.3445	11929.620 1	28.5300	4.0714	6.514
L17	29.8365	55.9325	5849.2912	10.2136	14.9267	391.8681	11706.279 1	27.9715	4.0934	6.683
	30.6718	57.5317	6365.5172	10.5056	15.3446	414.8381	12739.410 2	28.7713	4.2382	6.92
L18	30.6718	56.3814	6243.5136	10.5101	15.3446	406.8872	12495.242 6	28.1961	4.2602	7.1
	31.5072	57.9480	6778.5604	10.8021	15.7625	430.0440	13566.040 2	28.9795	4.4050	7.342
L19	31.5072	57.9480	6778.5604	10.8021	15.7625	430.0440	13566.040 2	28.9795	4.4050	7.342
	32.9912	60.7313	7802.9564	11.3210	16.5049	472.7655	15616.180 1	30.3714	4.6622	7.77
L20	32.4802	55.9587	6646.4687	10.8848	15.8681	418.8566	13301.683 0	27.9847	4.4856	7.801
	32.6465	57.6270	7258.8006	11.2093	16.3325	444.4396	14527.152	28.8190	4.6465	8.081

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
L21	32.6465	57.6270	7258.8006	11.2093	16.3325	444.4396	14527.1525	28.8190	4.6465	8.081
	32.7352	57.7863	7319.1836	11.2403	16.3768	446.9230	14647.9979	28.8986	4.6619	8.108
L22	32.7352	68.8468	8658.2482	11.2004	16.3768	528.6888	17327.8892	34.4300	4.4639	6.493
	32.7768	68.9362	8692.0086	11.2149	16.3976	530.0769	17395.4543	34.4746	4.4711	6.503
L23	32.7768	67.7096	8544.1062	11.2194	16.3976	521.0571	17099.4549	33.8612	4.4931	6.656
	33.6085	69.4644	9225.7787	11.5101	16.8137	548.7052	18463.6969	34.7388	4.6372	6.87
L24	33.6085	68.2043	9065.4078	11.5146	16.8137	539.1671	18142.7442	34.1086	4.6592	7.033
	34.3571	69.7545	9697.6966	11.7763	17.1882	564.2057	19408.1538	34.8839	4.7890	7.229
L25	34.3571	108.0033	14677.7158	11.6431	17.1882	853.9400	29374.7449	54.0119	4.1290	3.98
	34.3986	108.1382	14732.7682	11.6577	17.2090	856.1067	29484.9221	54.0794	4.1362	3.987
L26	34.3986	105.6128	14410.6241	11.6666	17.2090	837.3872	28840.2101	52.8164	4.1802	4.129
	34.4402	105.7444	14464.5648	11.6811	17.2298	839.5068	28948.1624	52.8822	4.1874	4.136
L27	34.4402	96.8629	13320.2420	11.7122	17.2298	773.0916	26658.0111	48.4406	4.3414	4.693
	34.4818	96.9831	13369.9081	11.7267	17.2506	775.0383	26757.4087	48.5008	4.3486	4.701
L28	34.4818	95.7087	13204.2121	11.7311	17.2506	765.4331	26425.7987	47.8635	4.3706	4.79
	35.3135	98.0810	14210.5933	12.0219	17.6667	804.3704	28439.8853	49.0498	4.5148	4.948
L29	35.3135	96.7731	14031.4540	12.0263	17.6667	794.2305	28081.3709	48.3958	4.5368	5.041
	35.8541	98.2940	14703.4408	12.2153	17.9372	819.7184	29426.2287	49.1563	4.6305	5.145
L30	35.8541	80.9268	12220.1611	12.2730	17.9372	681.2753	24456.4019	40.4711	4.9165	6.666
	35.8957	81.0227	12263.6397	12.2876	17.9580	682.9071	24543.4162	40.5190	4.9237	6.676
L31	35.8957	81.0227	12263.6397	12.2876	17.9580	682.9071	24543.4162	40.5190	4.9237	6.676
	36.7274	82.9400	13155.0148	12.5783	18.3741	715.9551	26327.3392	41.4779	5.0678	6.872
L32	36.7274	80.1850	12736.0028	12.5872	18.3741	693.1506	25488.7639	40.1001	5.1118	7.174
	37.5591	82.0373	13639.1694	12.8780	18.7902	725.8675	27296.2856	41.0264	5.2560	7.377
L33	37.5591	82.0373	13639.1694	12.8780	18.7902	725.8675	27296.2856	41.0264	5.2560	7.377
	39.2869	85.8852	15649.7844	13.4820	19.6545	796.2435	31320.1612	42.9507	5.5554	7.797
L34	38.6537	88.1298	14764.2658	12.9272	18.8860	781.7579	29547.9587	44.0733	5.2012	6.821
	38.8203	90.6792	16083.0031	13.3012	19.4211	828.1195	32187.1687	45.3482	5.3866	7.064
L35	38.8203	89.2224	15835.1855	13.3056	19.4211	815.3593	31691.2073	44.6197	5.4086	7.211
	39.6534	91.1754	16897.9638	13.5968	19.8379	851.8027	33818.1625	45.5964	5.5530	7.404
L36	39.6534	91.1754	16897.9638	13.5968	19.8379	851.8027	33818.1625	45.5964	5.5530	7.404
	40.4864	93.1284	18007.2627	13.8881	20.2547	889.0432	36038.2199	46.5731	5.6974	7.596
L37	40.4864	91.6055	17724.1204	13.8925	20.2547	875.0641	35471.5626	45.8115	5.7194	7.755
	41.2412	93.3455	18753.3615	14.1564	20.6322	908.9345	37531.3991	46.6816	5.8502	7.932
L38	41.2412	137.9615	27215.221	14.0277	20.6322	1319.0623	54466.253	68.9939	5.2122	4.738

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
	41.2829	138.1047	27300.0674	14.0423	20.6531	1321.8396	54636.0573	69.0655	5.2194	4.745
L39	41.2829	135.0513	26730.2295	14.0511	20.6531	1294.2486	53495.6315	67.5385	5.2634	4.896
	41.3107	135.1448	26785.7846	14.0609	20.6670	1296.0650	53606.8147	67.5852	5.2682	4.901
L40	41.3107	119.8072	23895.9795	14.1052	20.6670	1156.2380	47823.4019	59.9150	5.4882	5.777
	41.3523	119.9309	23970.0658	14.1198	20.6878	1158.6545	47971.6720	59.9768	5.4954	5.785
L41	41.3523	119.9309	23970.0658	14.1198	20.6878	1158.6545	47971.6720	59.9768	5.4954	5.785
	42.1854	122.4047	25484.1515	14.4111	21.1046	1207.5155	51001.8356	61.2140	5.6398	5.937
L42	42.1854	120.8313	25172.0726	14.4155	21.1046	1192.7283	50377.2672	60.4271	5.6618	6.039
	42.7274	122.4195	26177.8041	14.6050	21.3758	1224.6487	52390.0536	61.2214	5.7558	6.139
L43	42.7274	108.0238	23225.9654	14.6449	21.3758	1086.5559	46482.4921	54.0222	5.9538	7.217
	42.7691	108.1312	23295.3199	14.6595	21.3966	1088.7391	46621.2924	54.0759	5.9610	7.225
L44	42.7691	104.9180	22630.4535	14.6684	21.3966	1057.6656	45290.6848	52.4690	6.0050	7.506
	43.6021	107.0012	24005.4108	14.9596	21.8134	1100.4904	48042.4085	53.5107	6.1494	7.687
L45	43.6021	107.0012	24005.4108	14.9596	21.8134	1100.4904	48042.4085	53.5107	6.1494	7.687
	44.4352	109.0844	25434.9618	15.2508	22.2301	1144.1653	50903.3916	54.5525	6.2938	7.867
L46	44.4352	107.4112	25059.4022	15.2553	22.2301	1127.2712	50151.7783	53.7158	6.3158	8.02
	45.2683	109.4618	26522.2446	15.5465	22.6469	1171.1195	53079.3879	54.7413	6.4602	8.203
L47	45.2683	107.7551	26123.6135	15.5510	22.6469	1153.5175	52281.6011	53.8878	6.4822	8.364
	45.9481	109.4018	27339.7126	15.7886	22.9870	1189.3554	54715.3996	54.7113	6.6000	8.516

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 168.50-163.50				1	1	1		
L2 163.50-158.50				1	1	1		
L3 158.50-153.50				1	1	1		
L4 153.50-148.50				1	1	1		
L5 148.50-143.50				1	1	1		
L6 143.50-138.50				1	1	1		
L7 138.50-130.67				1	1	1		
L8 130.67-129.33				1	1	1		
L9 129.33-126.42				1	1	1		
L10 126.42-126.17				1	1	1.03366		
L11 126.17-121.17				1	1	1.03617		
L12 121.17-116.17				1	1	1.0236		

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals
ft	ft^2	in					in	in
L13 116.17-113.83				1	1	1.03391		
L14 113.83-113.58				1	1	0.967392		
L15 113.58-108.58				1	1	0.968413		
L16 108.58-103.58				1	1	0.970538		
L17 103.58-98.58				1	1	0.973743		
L18 98.58-93.58				1	1	0.978012		
L19 93.58-84.70				1	1	0.965249		
L20 84.70-83.70				1	1	0.981837		
L21 83.70-83.17				1	1	0.980628		
L22 83.17-82.92				1	1	1.08373		
L23 82.92-77.92				1	1	1.08718		
L24 77.92-73.42				1	1	1.09315		
L25 73.42-73.17				1	1	0.936703		
L26 73.17-72.92				1	1	0.958291		
L27 72.92-72.67				1	1	0.9731		
L28 72.67-67.67				1	1	0.970491		
L29 67.67-64.42				1	1	0.973761		
L30 64.42-64.17				1	1	0.959666		
L31 64.17-59.17				1	1	0.947277		
L32 59.17-54.17				1	1	0.967603		
L33 54.17-43.78				1	1	0.955999		
L34 43.78-42.78				1	1	1.09242		
L35 42.78-37.78				1	1	1.09718		
L36 37.78-32.78				1	1	1.08466		
L37 32.78-28.25				1	1	1.09161		
L38 28.25-28.00				1	1	0.955414		
L39 28.00-27.83				1	1	0.97658		
L40 27.83-27.58				1	1	1.00081		
L41 27.58-22.58				1	1	0.988562		
L42 22.58-19.33				1	1	0.993632		
L43 19.33-19.08				1	1	0.95891		
L44 19.08-14.08				1	1	0.978163		
L45 14.08-9.08				1	1	0.968435		
L46 9.08-4.08				1	1	0.974016		

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals
ft	ft^2	in					in	in
L47 4.08-0.00				1	1	0.981834		

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
70								
LDF4-50A(1/2")	C	No	CaAa (Out Of Face)	70.00 - 0.00	1	No Ice	0.06	0.15
						1/2" Ice	0.16	0.84
						1" Ice	0.26	2.14
						2" Ice	0.46	6.58
						4" Ice	0.86	22.78
128								
LDF7-50A(1-5/8")	B	No	Inside Pole	128.00 - 0.00	13	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
138								
LDF7-50A(1-5/8")	A	No	Inside Pole	138.00 - 0.00	11	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
HB158-1-08U8-S8J18(1-5/8)	A	No	CaAa (Out Of Face)	138.00 - 0.00	2	No Ice	0.20	1.30
						1/2" Ice	0.30	2.81
						1" Ice	0.40	4.94
						2" Ice	0.60	11.03
						4" Ice	1.00	30.52
148								
LDF7-50A(1-5/8")	C	No	Inside Pole	148.00 - 0.00	6	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
158								
LDF4-50A(1/2")	C	No	CaAa (Out Of Face)	158.00 - 0.00	1	No Ice	0.06	0.15
						1/2" Ice	0.16	0.84
						1" Ice	0.26	2.14
						2" Ice	0.46	6.58
						4" Ice	0.86	22.78
LDF6-50A(1-1/4")	C	No	Inside Pole	158.00 - 0.00	3	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
						1" Ice	0.00	0.66
						2" Ice	0.00	0.66
						4" Ice	0.00	0.66
168								
LDF2-50(3/8")	C	No	Inside Pole	168.00 - 0.00	1	No Ice	0.00	0.08
						1/2" Ice	0.00	0.08
						1" Ice	0.00	0.08
						2" Ice	0.00	0.08
						4" Ice	0.00	0.08
LDF4-50A(1/2")	C	No	Inside Pole	168.00 - 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
LDF5-50A(7/8")	C	No	Inside Pole	168.00 - 0.00	2	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

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
LDF7-50A(1-5/8")	C	No	Inside Pole	168.00 - 0.00	6	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
MISC 3" Rigid Conduit	C	No	Inside Pole	168.00 - 0.00	1	No Ice	0.00	3.00
						1/2" Ice	0.00	3.00
						1" Ice	0.00	3.00
						2" Ice	0.00	3.00
						4" Ice	0.00	3.00
Safety Line 3/8	C	No	Inside Pole	168.50 - 0.00	1	No Ice	0.00	0.22
						1/2" Ice	0.00	0.22
						1" Ice	0.00	0.22
						2" Ice	0.00	0.22
						4" Ice	0.00	0.22
PL1.25x5 Reinforcement - Wind Area	A	No	CaAa (Out Of Face)	115.83 - 85.83	1	No Ice	0.21	0.00
						1/2" Ice	0.29	0.00
						1" Ice	0.37	0.00
						2" Ice	0.54	0.00
						4" Ice	0.88	0.00
PL1.25x5 Reinforcement - Wind Area	B	No	CaAa (Out Of Face)	115.83 - 85.83	1	No Ice	0.21	0.00
						1/2" Ice	0.29	0.00
						1" Ice	0.37	0.00
						2" Ice	0.54	0.00
						4" Ice	0.88	0.00
PL1.25x5 Reinforcement - Wind Area	C	No	CaAa (Out Of Face)	115.83 - 85.83	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
PL1.25x5 Reinforcement - Wind Area	A	No	CaAa (Out Of Face)	87.92 - 72.92	1	No Ice	0.21	0.00
						1/2" Ice	0.29	0.00
						1" Ice	0.37	0.00
						2" Ice	0.54	0.00
						4" Ice	0.88	0.00
PL1.25x5 Reinforcement - Wind Area	B	No	CaAa (Out Of Face)	87.92 - 72.92	1	No Ice	0.21	0.00
						1/2" Ice	0.29	0.00
						1" Ice	0.37	0.00
						2" Ice	0.54	0.00
						4" Ice	0.88	0.00
PL1.25x5 Reinforcement - Wind Area	B	No	CaAa (Out Of Face)	87.92 - 72.92	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
PL1.25x5 Reinforcement - Wind Area	C	No	CaAa (Out Of Face)	87.92 - 72.92	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
PL1.25x5 Reinforcement - Wind Area	A	No	CaAa (Out Of Face)	75.42 - 45.38	1	No Ice	0.21	0.00
						1/2" Ice	0.29	0.00
						1" Ice	0.37	0.00
						2" Ice	0.54	0.00
						4" Ice	0.88	0.00
PL1.25x5 Reinforcement - Wind Area	B	No	CaAa (Out Of Face)	75.42 - 45.38	1	No Ice	0.21	0.00
						1/2" Ice	0.29	0.00
						1" Ice	0.37	0.00
						2" Ice	0.54	0.00
						4" Ice	0.88	0.00
PL1.25x5 Reinforcement - Wind Area	C	No	CaAa (Out Of Face)	75.42 - 45.38	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
PL1.25x5 Reinforcement - Wind Area	C	No	CaAa (Out Of Face)	75.42 - 45.38	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
PL1.25x6 Reinforcement - Wind Area	A	No	CaAa (Out Of Face)	47.92 - 27.83	1	No Ice	0.21	0.00
						1/2" Ice	0.29	0.00
						1" Ice	0.37	0.00
						2" Ice	0.54	0.00
						4" Ice	0.88	0.00
PL1.25x6 Reinforcement - Wind Area	B	No	CaAa (Out Of Face)	47.92 - 27.83	1	No Ice	0.21	0.00
						1/2" Ice	0.29	0.00
						1" Ice	0.37	0.00
						2" Ice	0.54	0.00
						4" Ice	0.88	0.00
PL1.25x6 Reinforcement - Wind Area	B	No	CaAa (Out Of Face)	47.92 - 27.83	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
PL1.25x6 Reinforcement - Wind Area	C	No	CaAa (Out Of Face)	47.92 - 27.83	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
PL1.25x6 Reinforcement - Wind Area	A	No	CaAa (Out Of Face)	30.75 - 0.00	1	No Ice	0.21	0.00
						1/2" Ice	0.29	0.00
						1" Ice	0.37	0.00
						2" Ice	0.54	0.00
						4" Ice	0.88	0.00
PL1.25x6 Reinforcement - Wind Area	B	No	CaAa (Out Of Face)	30.75 - 0.00	1	No Ice	0.21	0.00
						1/2" Ice	0.29	0.00
						1" Ice	0.37	0.00
						2" Ice	0.54	0.00
						4" Ice	0.88	0.00
PL1.25x6 Reinforcement - Wind Area	C	No	CaAa (Out Of Face)	30.75 - 0.00	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
PL1.25x6 Reinforcement - Wind Area	C	No	CaAa (Out Of Face)	30.75 - 0.00	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
**								
PL0.625x5 Reinforcement - Wind Area/Weight	A	No	CaAa (Out Of Face)	120.00 - 84.67	1	No Ice	0.00	10.63
						1/2" Ice	0.00	12.83
						1" Ice	0.00	15.37
						2" Ice	0.00	21.50
						4" Ice	0.00	37.90
PL0.625x5 Reinforcement - Wind Area/Weight	B	No	CaAa (Out Of Face)	120.00 - 84.67	1	No Ice	0.00	10.63
						1/2" Ice	0.00	12.83
						1" Ice	0.00	15.37
						2" Ice	0.00	21.50
						4" Ice	0.00	37.90
PL0.625x5 Reinforcement - Wind Area/Weight	C	No	CaAa (Out Of Face)	120.00 - 84.67	1	No Ice	0.00	10.63
						1/2" Ice	0.00	12.83
						1" Ice	0.00	15.37
						2" Ice	0.00	21.50
						4" Ice	0.00	37.90
PL0.625x5 Reinforcement - Wind Area/Weight	A	No	CaAa (Out Of Face)	84.67 - 0.00	1	No Ice	0.00	10.63
						1/2" Ice	0.00	12.83
						1" Ice	0.00	15.37
						2" Ice	0.00	21.50
						4" Ice	0.00	37.90
PL0.625x5 Reinforcement - Wind Area/Weight	B	No	CaAa (Out Of Face)	84.67 - 0.00	1	No Ice	0.00	10.63
						1/2" Ice	0.00	12.83
						1" Ice	0.00	15.37
						2" Ice	0.00	21.50
						4" Ice	0.00	37.90
PL0.625x5	C	No	CaAa (Out Of	84.67 - 0.00	2	No Ice	0.00	10.63

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
Reinforcement - Wind Area/Weight			Face)			1/2" Ice	0.00	12.83
						1" Ice	0.00	15.37
						2" Ice	0.00	21.50
						4" Ice	0.00	37.90
**								
CCI-SFP-060100	A	No	CaAa (Out Of Face)	43.75 - 0.00	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
CCI-SFP-060100	B	No	CaAa (Out Of Face)	43.75 - 0.00	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
CCI-SFP-060100	B	No	CaAa (Out Of Face)	43.75 - 0.00	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
CCI-SFP-060100	C	No	CaAa (Out Of Face)	43.75 - 0.00	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
CCI-SFP-045100	A	No	CaAa (Out Of Face)	115.83 - 43.75	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
CCI-SFP-045100	B	No	CaAa (Out Of Face)	115.83 - 43.75	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
CCI-SFP-045100	B	No	CaAa (Out Of Face)	115.83 - 43.75	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
CCI-SFP-045100	C	No	CaAa (Out Of Face)	115.83 - 43.75	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
CCI-SFP-045100	A	No	CaAa (Out Of Face)	127.92 - 115.83	1	No Ice	0.17	0.00
						1/2" Ice	0.25	0.00
						1" Ice	0.33	0.00
						2" Ice	0.50	0.00
						4" Ice	0.83	0.00
CCI-SFP-045100	B	No	CaAa (Out Of Face)	127.92 - 115.83	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
CCI-SFP-045100	B	No	CaAa (Out Of Face)	127.92 - 115.83	1	No Ice	0.00	0.00
						1/2" Ice	0.25	0.00
						1" Ice	0.33	0.00
						2" Ice	0.50	0.00
						4" Ice	0.83	0.00
CCI-SFP-045100	C	No	CaAa (Out Of Face)	127.92 - 115.83	1	No Ice	0.17	0.00
						1/2" Ice	0.25	0.00
						1" Ice	0.33	0.00
						2" Ice	0.50	0.00
						4" Ice	0.83	0.00

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	168.50-163.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.04
L2	163.50-158.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.05
L3	158.50-153.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.283	0.05
L4	153.50-148.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.315	0.06
L5	148.50-143.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.315	0.08
L6	143.50-138.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.315	0.08
L7	138.50-130.67	A	0.000	0.000	0.000	2.903	0.09
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.493	0.13
L8	130.67-129.33	A	0.000	0.000	0.000	0.531	0.02
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.084	0.02
L9	129.33-126.42	A	0.000	0.000	0.000	1.404	0.03
		B	0.000	0.000	0.000	0.000	0.02
		C	0.000	0.000	0.000	0.434	0.05
L10	126.42-126.17	A	0.000	0.000	0.000	0.141	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.057	0.00
L11	126.17-121.17	A	0.000	0.000	0.000	2.813	0.06
		B	0.000	0.000	0.000	0.000	0.05
		C	0.000	0.000	0.000	1.148	0.08
L12	121.17-116.17	A	0.000	0.000	0.000	2.813	0.10
		B	0.000	0.000	0.000	0.000	0.09
		C	0.000	0.000	0.000	1.148	0.12
L13	116.17-113.83	A	0.000	0.000	0.000	1.396	0.05
		B	0.000	0.000	0.000	0.416	0.05
		C	0.000	0.000	0.000	0.203	0.06
L14	113.83-113.58	A	0.000	0.000	0.000	0.151	0.01
		B	0.000	0.000	0.000	0.052	0.01
		C	0.000	0.000	0.000	0.016	0.01
L15	113.58-108.58	A	0.000	0.000	0.000	3.022	0.11
		B	0.000	0.000	0.000	1.042	0.11
		C	0.000	0.000	0.000	0.315	0.13
L16	108.58-103.58	A	0.000	0.000	0.000	3.022	0.11
		B	0.000	0.000	0.000	1.042	0.11
		C	0.000	0.000	0.000	0.315	0.13
L17	103.58-98.58	A	0.000	0.000	0.000	3.022	0.11
		B	0.000	0.000	0.000	1.042	0.11
		C	0.000	0.000	0.000	0.315	0.13
L18	98.58-93.58	A	0.000	0.000	0.000	3.022	0.11
		B	0.000	0.000	0.000	1.042	0.11
		C	0.000	0.000	0.000	0.315	0.13
L19	93.58-84.70	A	0.000	0.000	0.000	5.803	0.20
		B	0.000	0.000	0.000	2.285	0.19
		C	0.000	0.000	0.000	0.560	0.24
L20	84.70-83.70	A	0.000	0.000	0.000	0.604	0.02
		B	0.000	0.000	0.000	0.208	0.02
		C	0.000	0.000	0.000	0.063	0.04
L21	83.70-83.17	A	0.000	0.000	0.000	0.322	0.01
		B	0.000	0.000	0.000	0.111	0.01
		C	0.000	0.000	0.000	0.034	0.02
L22	83.17-82.92	A	0.000	0.000	0.000	0.151	0.01
		B	0.000	0.000	0.000	0.052	0.01
		C	0.000	0.000	0.000	0.016	0.01

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
L23	82.92-77.92	A	0.000	0.000	0.000	3.022	0.11
		B	0.000	0.000	0.000	1.042	0.11
		C	0.000	0.000	0.000	0.315	0.19
L24	77.92-73.42	A	0.000	0.000	0.000	3.136	0.10
		B	0.000	0.000	0.000	1.354	0.10
		C	0.000	0.000	0.000	0.284	0.17
L25	73.42-73.17	A	0.000	0.000	0.000	0.203	0.01
		B	0.000	0.000	0.000	0.104	0.01
		C	0.000	0.000	0.000	0.016	0.01
L26	73.17-72.92	A	0.000	0.000	0.000	0.203	0.01
		B	0.000	0.000	0.000	0.104	0.01
		C	0.000	0.000	0.000	0.016	0.01
L27	72.92-72.67	A	0.000	0.000	0.000	0.151	0.01
		B	0.000	0.000	0.000	0.052	0.01
		C	0.000	0.000	0.000	0.016	0.01
L28	72.67-67.67	A	0.000	0.000	0.000	3.022	0.11
		B	0.000	0.000	0.000	1.042	0.11
		C	0.000	0.000	0.000	0.462	0.19
L29	67.67-64.42	A	0.000	0.000	0.000	1.964	0.07
		B	0.000	0.000	0.000	0.677	0.07
		C	0.000	0.000	0.000	0.409	0.12
L30	64.42-64.17	A	0.000	0.000	0.000	0.151	0.01
		B	0.000	0.000	0.000	0.052	0.01
		C	0.000	0.000	0.000	0.032	0.01
L31	64.17-59.17	A	0.000	0.000	0.000	3.022	0.11
		B	0.000	0.000	0.000	1.042	0.11
		C	0.000	0.000	0.000	0.630	0.19
L32	59.17-54.17	A	0.000	0.000	0.000	3.022	0.11
		B	0.000	0.000	0.000	1.042	0.11
		C	0.000	0.000	0.000	0.630	0.19
L33	54.17-43.78	A	0.000	0.000	0.000	6.805	0.23
		B	0.000	0.000	0.000	2.692	0.22
		C	0.000	0.000	0.000	1.309	0.39
L34	43.78-42.78	A	0.000	0.000	0.000	0.604	0.02
		B	0.000	0.000	0.000	0.208	0.02
		C	0.000	0.000	0.000	0.126	0.04
L35	42.78-37.78	A	0.000	0.000	0.000	3.020	0.11
		B	0.000	0.000	0.000	1.040	0.11
		C	0.000	0.000	0.000	0.630	0.19
L36	37.78-32.78	A	0.000	0.000	0.000	3.020	0.11
		B	0.000	0.000	0.000	1.040	0.11
		C	0.000	0.000	0.000	0.630	0.19
L37	32.78-28.25	A	0.000	0.000	0.000	3.257	0.10
		B	0.000	0.000	0.000	1.463	0.10
		C	0.000	0.000	0.000	0.571	0.17
L38	28.25-28.00	A	0.000	0.000	0.000	0.203	0.01
		B	0.000	0.000	0.000	0.104	0.01
		C	0.000	0.000	0.000	0.032	0.01
L39	28.00-27.83	A	0.000	0.000	0.000	0.136	0.00
		B	0.000	0.000	0.000	0.070	0.00
		C	0.000	0.000	0.000	0.021	0.01
L40	27.83-27.58	A	0.000	0.000	0.000	0.152	0.01
		B	0.000	0.000	0.000	0.053	0.01
		C	0.000	0.000	0.000	0.032	0.01
L41	27.58-22.58	A	0.000	0.000	0.000	3.022	0.11
		B	0.000	0.000	0.000	1.042	0.11
		C	0.000	0.000	0.000	0.630	0.19
L42	22.58-19.33	A	0.000	0.000	0.000	1.966	0.07
		B	0.000	0.000	0.000	0.678	0.07
		C	0.000	0.000	0.000	0.410	0.12
L43	19.33-19.08	A	0.000	0.000	0.000	0.151	0.01
		B	0.000	0.000	0.000	0.052	0.01
		C	0.000	0.000	0.000	0.032	0.01
L44	19.08-14.08	A	0.000	0.000	0.000	3.022	0.11
		B	0.000	0.000	0.000	1.042	0.11
		C	0.000	0.000	0.000	0.630	0.19
L45	14.08-9.08	A	0.000	0.000	0.000	3.022	0.11
		B	0.000	0.000	0.000	1.042	0.11
		C	0.000	0.000	0.000	0.630	0.19

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
L46	9.08-4.08	A	0.000	0.000	0.000	3.022	0.11
		B	0.000	0.000	0.000	1.042	0.11
		C	0.000	0.000	0.000	0.630	0.19
L47	4.08-0.00	A	0.000	0.000	0.000	2.466	0.09
		B	0.000	0.000	0.000	0.850	0.09
		C	0.000	0.000	0.000	0.514	0.15

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	168.50-163.50	A	1.517	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.04
L2	163.50-158.50	A	1.512	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.05
L3	158.50-153.50	A	1.506	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	1.639	0.07
L4	153.50-148.50	A	1.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	1.815	0.08
L5	148.50-143.50	A	1.494	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	1.809	0.10
L6	143.50-138.50	A	1.488	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	1.803	0.10
L7	138.50-130.67	A	1.480	0.000	0.000	0.000	7.241	0.18
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	2.810	0.16
L8	130.67-129.33	A	1.474	0.000	0.000	0.000	1.324	0.03
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.481	0.03
L9	129.33-126.42	A	1.471	0.000	0.000	0.000	3.485	0.07
		B		0.000	0.000	0.000	0.618	0.02
		C		0.000	0.000	0.000	1.658	0.06
L10	126.42-126.17	A	1.468	0.000	0.000	0.000	0.349	0.01
		B		0.000	0.000	0.000	0.103	0.00
		C		0.000	0.000	0.000	0.192	0.01
L11	126.17-121.17	A	1.465	0.000	0.000	0.000	6.963	0.12
		B		0.000	0.000	0.000	2.054	0.05
		C		0.000	0.000	0.000	3.834	0.10
L12	121.17-116.17	A	1.457	0.000	0.000	0.000	6.943	0.19
		B		0.000	0.000	0.000	2.048	0.12
		C		0.000	0.000	0.000	3.820	0.17
L13	116.17-113.83	A	1.452	0.000	0.000	0.000	3.316	0.10
		B		0.000	0.000	0.000	1.037	0.07
		C		0.000	0.000	0.000	0.962	0.09
L14	113.83-113.58	A	1.450	0.000	0.000	0.000	0.357	0.01
		B		0.000	0.000	0.000	0.113	0.01
		C		0.000	0.000	0.000	0.088	0.01
L15	113.58-108.58	A	1.446	0.000	0.000	0.000	7.119	0.21
		B		0.000	0.000	0.000	2.247	0.14
		C		0.000	0.000	0.000	1.761	0.19
L16	108.58-103.58	A	1.438	0.000	0.000	0.000	7.096	0.21
		B		0.000	0.000	0.000	2.240	0.14
		C		0.000	0.000	0.000	1.753	0.19
L17	103.58-98.58	A	1.430	0.000	0.000	0.000	7.072	0.21
		B		0.000	0.000	0.000	2.233	0.14
		C		0.000	0.000	0.000	1.745	0.19
L18	98.58-93.58	A	1.421	0.000	0.000	0.000	7.048	0.21
		B		0.000	0.000	0.000	2.226	0.14
		C		0.000	0.000	0.000	1.736	0.19

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
L19	93.58-84.70	A	1.408	0.000	0.000	0.000	13.381	0.37
		B		0.000	0.000	0.000	4.860	0.25
		C		0.000	0.000	0.000	3.062	0.34
L20	84.70-83.70	A	1.399	0.000	0.000	0.000	1.402	0.04
		B		0.000	0.000	0.000	0.443	0.03
		C		0.000	0.000	0.000	0.345	0.06
L21	83.70-83.17	A	1.397	0.000	0.000	0.000	0.744	0.02
		B		0.000	0.000	0.000	0.235	0.02
		C		0.000	0.000	0.000	0.183	0.03
L22	83.17-82.92	A	1.396	0.000	0.000	0.000	0.349	0.01
		B		0.000	0.000	0.000	0.110	0.01
		C		0.000	0.000	0.000	0.086	0.01
L23	82.92-77.92	A	1.391	0.000	0.000	0.000	6.963	0.21
		B		0.000	0.000	0.000	2.201	0.14
		C		0.000	0.000	0.000	1.706	0.28
L24	77.92-73.42	A	1.381	0.000	0.000	0.000	7.118	0.19
		B		0.000	0.000	0.000	2.850	0.13
		C		0.000	0.000	0.000	1.526	0.25
L25	73.42-73.17	A	1.376	0.000	0.000	0.000	0.455	0.01
		B		0.000	0.000	0.000	0.219	0.01
		C		0.000	0.000	0.000	0.085	0.01
L26	73.17-72.92	A	1.375	0.000	0.000	0.000	0.455	0.01
		B		0.000	0.000	0.000	0.219	0.01
		C		0.000	0.000	0.000	0.085	0.01
L27	72.92-72.67	A	1.374	0.000	0.000	0.000	0.346	0.01
		B		0.000	0.000	0.000	0.110	0.01
		C		0.000	0.000	0.000	0.084	0.01
L28	72.67-67.67	A	1.368	0.000	0.000	0.000	6.899	0.21
		B		0.000	0.000	0.000	2.182	0.14
		C		0.000	0.000	0.000	2.469	0.28
L29	67.67-64.42	A	1.359	0.000	0.000	0.000	4.466	0.13
		B		0.000	0.000	0.000	1.413	0.09
		C		0.000	0.000	0.000	2.176	0.19
L30	64.42-64.17	A	1.354	0.000	0.000	0.000	0.343	0.01
		B		0.000	0.000	0.000	0.109	0.01
		C		0.000	0.000	0.000	0.167	0.01
L31	64.17-59.17	A	1.347	0.000	0.000	0.000	6.839	0.20
		B		0.000	0.000	0.000	2.164	0.14
		C		0.000	0.000	0.000	3.325	0.29
L32	59.17-54.17	A	1.334	0.000	0.000	0.000	6.801	0.20
		B		0.000	0.000	0.000	2.153	0.14
		C		0.000	0.000	0.000	3.298	0.29
L33	54.17-43.78	A	1.311	0.000	0.000	0.000	15.075	0.41
		B		0.000	0.000	0.000	5.517	0.29
		C		0.000	0.000	0.000	6.754	0.60
L34	43.78-42.78	A	1.291	0.000	0.000	0.000	1.347	0.04
		B		0.000	0.000	0.000	0.427	0.03
		C		0.000	0.000	0.000	0.650	0.06
L35	42.78-37.78	A	1.280	0.000	0.000	0.000	6.649	0.20
		B		0.000	0.000	0.000	2.109	0.14
		C		0.000	0.000	0.000	3.190	0.28
L36	37.78-32.78	A	1.260	0.000	0.000	0.000	6.592	0.20
		B		0.000	0.000	0.000	2.092	0.14
		C		0.000	0.000	0.000	3.150	0.28
L37	32.78-28.25	A	1.250	0.000	0.000	0.000	6.988	0.18
		B		0.000	0.000	0.000	2.929	0.12
		C		0.000	0.000	0.000	2.836	0.25
L38	28.25-28.00	A	1.250	0.000	0.000	0.000	0.432	0.01
		B		0.000	0.000	0.000	0.208	0.01
		C		0.000	0.000	0.000	0.157	0.01
L39	28.00-27.83	A	1.250	0.000	0.000	0.000	0.289	0.01
		B		0.000	0.000	0.000	0.139	0.00
		C		0.000	0.000	0.000	0.105	0.01
L40	27.83-27.58	A	1.250	0.000	0.000	0.000	0.329	0.01
		B		0.000	0.000	0.000	0.105	0.01
		C		0.000	0.000	0.000	0.157	0.01
L41	27.58-22.58	A	1.250	0.000	0.000	0.000	6.563	0.19
		B		0.000	0.000	0.000	2.083	0.14
		C		0.000	0.000	0.000	3.130	0.28

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
L42	22.58-19.33	A	1.250	0.000	0.000	0.000	4.270	0.13
		B		0.000	0.000	0.000	1.355	0.09
		C		0.000	0.000	0.000	2.036	0.18
L43	19.33-19.08	A	1.250	0.000	0.000	0.000	0.328	0.01
		B		0.000	0.000	0.000	0.104	0.01
		C		0.000	0.000	0.000	0.157	0.01
L44	19.08-14.08	A	1.250	0.000	0.000	0.000	6.563	0.19
		B		0.000	0.000	0.000	2.083	0.14
		C		0.000	0.000	0.000	3.130	0.28
L45	14.08-9.08	A	1.250	0.000	0.000	0.000	6.563	0.19
		B		0.000	0.000	0.000	2.083	0.14
		C		0.000	0.000	0.000	3.130	0.28
L46	9.08-4.08	A	1.250	0.000	0.000	0.000	6.563	0.19
		B		0.000	0.000	0.000	2.083	0.14
		C		0.000	0.000	0.000	3.130	0.28
L47	4.08-0.00	A	1.250	0.000	0.000	0.000	5.356	0.16
		B		0.000	0.000	0.000	1.700	0.11
		C		0.000	0.000	0.000	2.554	0.23

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	168.50-163.50	0.0000	0.0000	0.0000	0.0000
L2	163.50-158.50	0.0000	0.0000	0.0000	0.0000
L3	158.50-153.50	-0.0715	0.0413	-0.3209	0.1853
L4	153.50-148.50	-0.0791	0.0457	-0.3531	0.2039
L5	148.50-143.50	-0.0792	0.0457	-0.3555	0.2053
L6	143.50-138.50	-0.0793	0.0458	-0.3577	0.2065
L7	138.50-130.67	-0.0676	-0.4209	-0.2672	-0.6421
L8	130.67-129.33	-0.0671	-0.4482	-0.2644	-0.6875
L9	129.33-126.42	-0.1493	-0.4710	-0.2262	-0.5894
L10	126.42-126.17	-0.2177	-0.4901	-0.1998	-0.5207
L11	126.17-121.17	-0.2186	-0.4923	-0.2015	-0.5254
L12	121.17-116.17	-0.2204	-0.4963	-0.2046	-0.5342
L13	116.17-113.83	0.0864	-0.5074	0.0200	-0.7095
L14	113.83-113.58	0.1369	-0.5097	0.0609	-0.7425
L15	113.58-108.58	0.1375	-0.5119	0.0615	-0.7480
L16	108.58-103.58	0.1385	-0.5159	0.0627	-0.7582
L17	103.58-98.58	0.1396	-0.5197	0.0639	-0.7679
L18	98.58-93.58	0.1406	-0.5234	0.0651	-0.7772
L19	93.58-84.70	0.1850	-0.5411	0.1326	-0.7979
L20	84.70-83.70	0.1422	-0.5295	0.0670	-0.7931
L21	83.70-83.17	0.1423	-0.5300	0.0675	-0.7931
L22	83.17-82.92	0.1424	-0.5303	0.0676	-0.7938
L23	82.92-77.92	0.1429	-0.5320	0.0683	-0.7980
L24	77.92-73.42	0.2244	-0.5599	0.1920	-0.8227
L25	73.42-73.17	0.3151	-0.5893	0.3235	-0.8448
L26	73.17-72.92	0.3152	-0.5895	0.3237	-0.8453
L27	72.92-72.67	0.1447	-0.5370	0.0709	-0.8098
L28	72.67-67.67	0.1143	-0.5173	-0.0402	-0.7270
L29	67.67-64.42	0.0809	-0.4962	-0.1583	-0.6402
L30	64.42-64.17	0.0811	-0.4972	-0.1583	-0.6424
L31	64.17-59.17	0.0813	-0.4987	-0.1584	-0.6456
L32	59.17-54.17	0.0818	-0.5014	-0.1584	-0.6514
L33	54.17-43.78	0.1306	-0.5220	-0.0805	-0.6784
L34	43.78-42.78	0.0822	-0.5062	-0.1585	-0.6623
L35	42.78-37.78	0.0825	-0.5076	-0.1554	-0.6635
L36	37.78-32.78	0.0829	-0.5100	-0.1542	-0.6679
L37	32.78-28.25	0.1902	-0.5504	0.0147	-0.7153
L38	28.25-28.00	0.2694	-0.5798	0.1345	-0.7486
L39	28.00-27.83	0.2694	-0.5799	0.1345	-0.7489
L40	27.83-27.58	0.0862	-0.5145	-0.1509	-0.6770
L41	27.58-22.58	0.0840	-0.5148	-0.1556	-0.6791

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L42	22.58-19.33	0.0843	-0.5166	-0.1567	-0.6838
L43	19.33-19.08	0.0844	-0.5173	-0.1571	-0.6858
L44	19.08-14.08	0.0846	-0.5184	-0.1578	-0.6888
L45	14.08-9.08	0.0849	-0.5205	-0.1591	-0.6943
L46	9.08-4.08	0.0852	-0.5225	-0.1603	-0.6997
L47	4.08-0.00	0.0855	-0.5243	-0.1614	-0.7045

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
70									
GPS_A	A	From Leg	4.00 0.00 0.00	0.0000	70.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.30 0.37 0.46 0.65 1.15	0.30 0.37 0.46 0.65 1.15	0.00 0.00 0.01 0.02 0.08
128									
ONEBASE TWIN DUAL DUPLEX TMA	A	From Leg	4.00 0.00 2.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.67 0.79 0.91 1.18 1.82	0.31 0.39 0.49 0.70 1.23	0.01 0.02 0.02 0.04 0.10
ERICSSON AIR 21 B2A B4P 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	6.83 7.35 7.86 8.93 11.18	5.64 6.48 7.26 8.86 12.29	0.11 0.17 0.23 0.38 0.81
ERICSSON AIR 21 B4A B2P 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	6.81 7.33 7.85 8.91 11.16	5.63 6.47 7.24 8.85 12.27	0.11 0.17 0.23 0.38 0.81
ONEBASE TWIN DUAL DUPLEX TMA	B	From Leg	4.00 0.00 2.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.67 0.79 0.91 1.18 1.82	0.31 0.39 0.49 0.70 1.23	0.01 0.02 0.02 0.04 0.10
ERICSSON AIR 21 B2A B4P 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	6.83 7.35 7.86 8.93 11.18	5.64 6.48 7.26 8.86 12.29	0.11 0.17 0.23 0.38 0.81
ERICSSON AIR 21 B4A B2P 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	6.81 7.33 7.85 8.91 11.16	5.63 6.47 7.24 8.85 12.27	0.11 0.17 0.23 0.38 0.81
ONEBASE TWIN DUAL DUPLEX TMA	C	From Leg	4.00 0.00 2.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.67 0.79 0.91 1.18 1.82	0.31 0.39 0.49 0.70 1.23	0.01 0.02 0.02 0.04 0.10

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice			
ERICSSON AIR 21 B2A B4P 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	6.83 7.35 7.86 8.93 11.18	5.64 6.48 7.26 8.86 12.29	0.11 0.17 0.23 0.38 0.81
ERICSSON AIR 21 B4A B2P 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	6.81 7.33 7.85 8.91 11.16	5.63 6.47 7.24 8.85 12.27	0.11 0.17 0.23 0.38 0.81
138 BXA-70080-6CF-4 w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.01 6.56 7.08 8.17 10.69	6.20 7.36 8.23 10.02 13.84	0.04 0.10 0.16 0.31 0.75
BXA-70080-6CF-4 w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.01 6.56 7.08 8.17 10.69	6.20 7.36 8.23 10.02 13.84	0.04 0.10 0.16 0.31 0.75
(2) FD9R6004/2C-3L	A	From Leg	4.00 0.00 2.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.37 0.45 0.54 0.75 1.28	0.08 0.14 0.20 0.34 0.74	0.00 0.01 0.01 0.02 0.06
(2) FD9R6004/2C-3L	C	From Leg	4.00 0.00 2.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.37 0.45 0.54 0.75 1.28	0.08 0.14 0.20 0.34 0.74	0.00 0.01 0.01 0.02 0.06
RRH2x60-AWS	A	From Leg	4.00 0.00 2.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.96 4.27 4.60 5.27 6.72	2.16 2.44 2.73 3.34 4.66	0.06 0.08 0.11 0.18 0.37
RRH2x60-700	A	From Leg	4.00 0.00 2.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.96 4.27 4.60 5.27 6.72	1.82 2.08 2.36 2.96 4.25	0.06 0.08 0.11 0.17 0.35
RRH2x60-700	C	From Leg	4.00 0.00 2.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.96 4.27 4.60 5.27 6.72	1.82 2.08 2.36 2.96 4.25	0.06 0.08 0.11 0.17 0.35
RRH2x60-AWS	C	From Leg	4.00 0.00 2.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.96 4.27 4.60 5.27 6.72	2.16 2.44 2.73 3.34 4.66	0.06 0.08 0.11 0.18 0.37
RRH2X60-PCS	A	From Leg	4.00 0.00 2.00	0.0000	138.00	No Ice 1/2" Ice	2.57 2.79 3.02	2.01 2.22 2.43	0.06 0.08 0.10

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
							1" Ice	3.52	2.89	0.16
							2" Ice	4.61	3.92	0.31
							4" Ice			
RRH2X60-PCS	C	From Leg	4.00	0.00	0.0000	138.00	No Ice	2.57	2.01	0.06
							1/2" Ice	2.79	2.22	0.08
				2.00				3.02	2.43	0.10
							1" Ice	3.52	2.89	0.16
							2" Ice	4.61	3.92	0.31
							4" Ice			
*										
BXA-70063/4CF w/ Mount Pipe	A	From Leg	4.00	0.00	0.0000	138.00	No Ice	5.40	3.62	0.03
							1/2" Ice	5.84	4.22	0.07
				2.00				6.30	4.83	0.12
							1" Ice	7.24	6.16	0.23
							2" Ice	9.26	9.18	0.57
							4" Ice			
BXA-70063/4CF w/ Mount Pipe	C	From Leg	4.00	0.00	0.0000	138.00	No Ice	5.40	3.62	0.03
							1/2" Ice	5.84	4.22	0.07
				2.00				6.30	4.83	0.12
							1" Ice	7.24	6.16	0.23
							2" Ice	9.26	9.18	0.57
							4" Ice			
(2) SBNHH-1D65B w/ Mount Pipe	A	From Leg	4.00	0.00	0.0000	138.00	No Ice	8.57	7.00	0.07
							1/2" Ice	9.22	8.19	0.13
				2.00				9.84	9.08	0.21
							1" Ice	11.10	10.90	0.39
							2" Ice	13.75	14.93	0.90
							4" Ice			
(2) SBNHH-1D65B w/ Mount Pipe	C	From Leg	4.00	0.00	0.0000	138.00	No Ice	8.57	7.00	0.07
							1/2" Ice	9.22	8.19	0.13
				2.00				9.84	9.08	0.21
							1" Ice	11.10	10.90	0.39
							2" Ice	13.75	14.93	0.90
							4" Ice			
(2) DB-T1-6Z-8AB-0Z	C	From Leg	4.00	0.00	0.0000	138.00	No Ice	5.60	2.33	0.04
							1/2" Ice	5.92	2.56	0.08
				2.00				6.24	2.79	0.12
							1" Ice	6.91	3.28	0.21
							2" Ice	8.37	4.37	0.45
							4" Ice			
BXA-70063/4CF w/ Mount Pipe	B	From Leg	4.00	0.00	0.0000	138.00	No Ice	5.40	3.62	0.03
							1/2" Ice	5.84	4.22	0.07
				2.00				6.30	4.83	0.12
							1" Ice	7.24	6.16	0.23
							2" Ice	9.26	9.18	0.57
							4" Ice			
(2) FD9R6004/2C-3L	B	From Leg	4.00	0.00	0.0000	138.00	No Ice	0.37	0.08	0.00
							1/2" Ice	0.45	0.14	0.01
				2.00				0.54	0.20	0.01
							1" Ice	0.75	0.34	0.02
							2" Ice	1.28	0.74	0.06
							4" Ice			
RRH2X60-PCS	B	From Leg	4.00	0.00	0.0000	138.00	No Ice	2.57	2.01	0.06
							1/2" Ice	2.79	2.22	0.08
				2.00				3.02	2.43	0.10
							1" Ice	3.52	2.89	0.16
							2" Ice	4.61	3.92	0.31
							4" Ice			
RRH2x60-700	B	From Leg	4.00	0.00	0.0000	138.00	No Ice	3.96	1.82	0.06
							1/2" Ice	4.27	2.08	0.08
				2.00				4.60	2.36	0.11
							1" Ice	5.27	2.96	0.17
							2" Ice	6.72	4.25	0.35
							4" Ice			
RRH2x60-AWS	B	From Leg	4.00	0.00	0.0000	138.00	No Ice	3.96	2.16	0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00 2.00			1/2" Ice 1" Ice 2" Ice 4" Ice	4.27 4.60 5.27 6.72	2.44 2.73 3.34 4.66	0.08 0.11 0.18 0.37
*									
BXA-70063/4CF w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.40 5.84 6.30 7.24 9.26	3.62 4.22 4.83 6.16 9.18	0.03 0.07 0.12 0.23 0.57
(2) SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.57 9.22 9.84 11.10 13.75	7.00 8.19 9.08 10.90 14.93	0.07 0.13 0.21 0.39 0.90
148									
APXV18-206517S-C w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.40 5.96 6.48 7.55 9.92	4.70 5.86 6.73 8.51 12.28	0.05 0.10 0.15 0.28 0.68
APXV18-206517S-C w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.40 5.96 6.48 7.55 9.92	4.70 5.86 6.73 8.51 12.28	0.05 0.10 0.15 0.28 0.68
APXV18-206517S-C w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.40 5.96 6.48 7.55 9.92	4.70 5.86 6.73 8.51 12.28	0.05 0.10 0.15 0.28 0.68
158									
1900MHz RRH	A	From Leg	4.00 0.00 0.00	0.0000	158.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.91 3.14 3.39 3.91 5.05	3.80 4.06 4.34 4.91 6.15	0.04 0.08 0.11 0.19 0.41
1900MHz RRH	B	From Leg	4.00 0.00 0.00	0.0000	158.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.91 3.14 3.39 3.91 5.05	3.80 4.06 4.34 4.91 6.15	0.04 0.08 0.11 0.19 0.41
800 EXTERNAL NOTCH FILTER	A	From Leg	4.00 0.00 0.00	0.0000	158.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.77 0.89 1.02 1.30 1.97	0.37 0.46 0.56 0.79 1.34	0.01 0.02 0.02 0.04 0.11
800 EXTERNAL NOTCH FILTER	B	From Leg	4.00 0.00 0.00	0.0000	158.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.77 0.89 1.02 1.30 1.97	0.37 0.46 0.56 0.79 1.34	0.01 0.02 0.02 0.04 0.11
800MHZ RRH	A	From Leg	4.00 0.00	0.0000	158.00	No Ice 1/2"	2.49 2.71	2.07 2.27	0.05 0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			Ice	2.93	2.48	0.10
						1" Ice	3.41	2.93	0.16
						2" Ice	4.46	3.93	0.32
						4" Ice			
800MHZ RRH	B	From Leg	4.00	0.0000	158.00	No Ice	2.49	2.07	0.05
			0.00			1/2"	2.71	2.27	0.07
			0.00			Ice	2.93	2.48	0.10
						1" Ice	3.41	2.93	0.16
						2" Ice	4.46	3.93	0.32
						4" Ice			
P40-16-XLPP-RR-A w/ Mount Pipe	A	From Leg	4.00	0.0000	158.00	No Ice	9.37	4.83	0.07
			0.00			1/2"	9.91	5.57	0.14
			0.00			Ice	10.45	6.27	0.21
						1" Ice	11.56	7.80	0.37
						2" Ice	13.89	11.11	0.82
						4" Ice			
*									
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.00	0.0000	158.00	No Ice	8.50	6.95	0.08
			0.00			1/2"	9.15	8.13	0.15
			0.00			Ice	9.77	9.02	0.23
						1" Ice	11.03	10.84	0.41
						2" Ice	13.68	14.85	0.91
						4" Ice			
1900MHz RRH	C	From Leg	4.00	0.0000	158.00	No Ice	2.91	3.80	0.04
			0.00			1/2"	3.14	4.06	0.08
			0.00			Ice	3.39	4.34	0.11
						1" Ice	3.91	4.91	0.19
						2" Ice	5.05	6.15	0.41
						4" Ice			
800 EXTERNAL NOTCH FILTER	C	From Leg	4.00	0.0000	158.00	No Ice	0.77	0.37	0.01
			0.00			1/2"	0.89	0.46	0.02
			0.00			Ice	1.02	0.56	0.02
						1" Ice	1.30	0.79	0.04
						2" Ice	1.97	1.34	0.11
						4" Ice			
800MHZ RRH	C	From Leg	4.00	0.0000	158.00	No Ice	2.49	2.07	0.05
			0.00			1/2"	2.71	2.27	0.07
			0.00			Ice	2.93	2.48	0.10
						1" Ice	3.41	2.93	0.16
						2" Ice	4.46	3.93	0.32
						4" Ice			
P40-16-XLPP-RR-A w/ Mount Pipe	B	From Leg	4.00	0.0000	158.00	No Ice	9.37	4.83	0.07
			0.00			1/2"	9.91	5.57	0.14
			0.00			Ice	10.45	6.27	0.21
						1" Ice	11.56	7.80	0.37
						2" Ice	13.89	11.11	0.82
						4" Ice			
168 SBNH-1D6565C w/ Mount Pipe	A	From Leg	4.00	0.0000	168.00	No Ice	11.68	9.84	0.10
			0.00			1/2"	12.40	11.37	0.19
			1.00			Ice	13.14	12.91	0.29
						1" Ice	14.60	15.27	0.52
						2" Ice	17.87	20.14	1.17
						4" Ice			
800 10121 w/ Mount Pipe	A	From Leg	4.00	0.0000	168.00	No Ice	5.69	4.60	0.07
			0.00			1/2"	6.18	5.35	0.11
			1.00			Ice	6.68	6.05	0.17
						1" Ice	7.70	7.53	0.30
						2" Ice	9.86	10.83	0.68
						4" Ice			
(2) 860 10025	A	From Leg	4.00	0.0000	168.00	No Ice	0.16	0.14	0.00
			0.00			1/2"	0.23	0.20	0.00
			1.00			Ice	0.30	0.27	0.01
						1" Ice	0.48	0.44	0.01
						2" Ice	0.93	0.88	0.05

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice			
(2) LGP21401	A	From Leg	4.00 0.00 1.00	0.0000	168.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.29 1.45 1.61 1.97 2.79	0.36 0.48 0.60 0.87 1.52	0.01 0.02 0.03 0.05 0.14
DC6-48-60-18-8F	A	From Leg	4.00 0.00 1.00	0.0000	168.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.57 2.80 3.04 3.54 4.66	2.57 2.80 3.04 3.54 4.66	0.02 0.04 0.07 0.13 0.30
RRUS 11	A	From Leg	4.00 0.00 1.00	0.0000	168.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.25 3.49 3.74 4.27 5.43	1.37 1.55 1.74 2.14 3.04	0.05 0.07 0.10 0.15 0.31
RRUS 11	B	From Leg	4.00 0.00 1.00	0.0000	168.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.25 3.49 3.74 4.27 5.43	1.37 1.55 1.74 2.14 3.04	0.05 0.07 0.10 0.15 0.31
RRUS 11	C	From Leg	4.00 0.00 1.00	0.0000	168.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.25 3.49 3.74 4.27 5.43	1.37 1.55 1.74 2.14 3.04	0.05 0.07 0.10 0.15 0.31
800 10121 w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	168.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.69 6.18 6.68 7.70 9.86	4.60 5.35 6.05 7.53 10.83	0.07 0.11 0.17 0.30 0.68
(2) 860 10025	B	From Leg	4.00 0.00 1.00	0.0000	168.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.16 0.23 0.30 0.48 0.93	0.14 0.20 0.27 0.44 0.88	0.00 0.00 0.01 0.01 0.05
AM-X-CD-16-65-00T-RET w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	168.00	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
(2) LGP21401	B	From Leg	4.00 0.00 1.00	0.0000	168.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.29 1.45 1.61 1.97 2.79	0.36 0.48 0.60 0.87 1.52	0.01 0.02 0.03 0.05 0.14
800 10121 w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	168.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.69 6.18 6.68 7.70 9.86	4.60 5.35 6.05 7.53 10.83	0.07 0.11 0.17 0.30 0.68
(2) 860 10025	C	From Leg	4.00 0.00 1.00	0.0000	168.00	No Ice 1/2" Ice 1" Ice	0.16 0.23 0.30 0.48	0.14 0.20 0.27 0.44	0.00 0.00 0.01 0.01

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	0.93	0.88	0.05
						4" Ice			
AM-X-CD-16-65-00T-RET w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	168.00	No Ice	8.50	6.30	0.07
						1/2" Ice	9.15	7.48	0.14
						1" Ice	9.77	8.37	0.21
						2" Ice	11.03	10.18	0.38
						4" Ice	13.68	14.02	0.87
(2) LGP21401	C	From Leg	4.00 0.00 1.00	0.0000	168.00	No Ice	1.29	0.36	0.01
						1/2" Ice	1.45	0.48	0.02
						1" Ice	1.61	0.60	0.03
						2" Ice	1.97	0.87	0.05
						4" Ice	2.79	1.52	0.14
MISC Side Arm Mount [SO 701-1]	C	None		0.0000	70.00	No Ice	0.85	1.67	0.07
						1/2" Ice	1.14	2.34	0.08
						1" Ice	1.43	3.01	0.09
						2" Ice	2.01	4.35	0.12
						4" Ice	3.17	7.03	0.18
Platform Mount [LP 303-1]	C	None		0.0000	128.00	No Ice	14.66	14.66	1.25
						1/2" Ice	18.87	18.87	1.48
						1" Ice	23.08	23.08	1.71
						2" Ice	31.50	31.50	2.18
						4" Ice	48.34	48.34	3.10
6' x 2" Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	128.00	No Ice	1.43	1.43	0.02
						1/2" Ice	1.92	1.92	0.03
						1" Ice	2.29	2.29	0.05
						2" Ice	3.06	3.06	0.09
						4" Ice	4.70	4.70	0.23
6' x 2" Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	128.00	No Ice	1.43	1.43	0.02
						1/2" Ice	1.92	1.92	0.03
						1" Ice	2.29	2.29	0.05
						2" Ice	3.06	3.06	0.09
						4" Ice	4.70	4.70	0.23
6' x 2" Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	128.00	No Ice	1.43	1.43	0.02
						1/2" Ice	1.92	1.92	0.03
						1" Ice	2.29	2.29	0.05
						2" Ice	3.06	3.06	0.09
						4" Ice	4.70	4.70	0.23
Platform Mount [LP 303-1]	C	None		0.0000	138.00	No Ice	14.66	14.66	1.25
						1/2" Ice	18.87	18.87	1.48
						1" Ice	23.08	23.08	1.71
						2" Ice	31.50	31.50	2.18
						4" Ice	48.34	48.34	3.10
Pipe Mount [PM 601-3]	C	None		0.0000	148.00	No Ice	4.39	4.39	0.20
						1/2" Ice	5.48	5.48	0.24
						1" Ice	6.57	6.57	0.28
						2" Ice	8.75	8.75	0.36
						4" Ice	13.11	13.11	0.53
6' x 2" Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	158.00	No Ice	1.43	1.43	0.02
						1/2" Ice	1.92	1.92	0.03
						1" Ice	2.29	2.29	0.05
						2" Ice	3.06	3.06	0.09
						4" Ice	4.70	4.70	0.23
6' x 2" Mount Pipe	B	From Leg	4.00 0.00	0.0000	158.00	No Ice	1.43	1.43	0.02
						1/2" Ice	1.92	1.92	0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			Ice	2.29	2.29	0.05
						1" Ice	3.06	3.06	0.09
						2" Ice	4.70	4.70	0.23
						4" Ice			
6' x 2" Mount Pipe	C	From Leg	4.00	0.0000	158.00	No Ice	1.43	1.43	0.02
			0.00			1/2"	1.92	1.92	0.03
			0.00			Ice	2.29	2.29	0.05
						1" Ice	3.06	3.06	0.09
						2" Ice	4.70	4.70	0.23
						4" Ice			
T-Arm Mount [TA 602-3]	C	None		0.0000	158.00	No Ice	11.59	11.59	0.77
						1/2"	15.44	15.44	0.99
						Ice	19.29	19.29	1.21
						1" Ice	26.99	26.99	1.64
						2" Ice	42.39	42.39	2.50
						4" Ice			
(2) 6' x 2" Mount Pipe	A	From Leg	4.00	0.0000	168.00	No Ice	1.43	1.43	0.02
			0.00			1/2"	1.92	1.92	0.03
			0.00			Ice	2.29	2.29	0.05
						1" Ice	3.06	3.06	0.09
						2" Ice	4.70	4.70	0.23
						4" Ice			
(2) 6' x 2" Mount Pipe	B	From Leg	4.00	0.0000	168.00	No Ice	1.43	1.43	0.02
			0.00			1/2"	1.92	1.92	0.03
			0.00			Ice	2.29	2.29	0.05
						1" Ice	3.06	3.06	0.09
						2" Ice	4.70	4.70	0.23
						4" Ice			
(2) 6' x 2" Mount Pipe	C	From Leg	4.00	0.0000	168.00	No Ice	1.43	1.43	0.02
			0.00			1/2"	1.92	1.92	0.03
			0.00			Ice	2.29	2.29	0.05
						1" Ice	3.06	3.06	0.09
						2" Ice	4.70	4.70	0.23
						4" Ice			
Platform Mount [LP 303-1]	C	None		0.0000	168.00	No Ice	14.66	14.66	1.25
						1/2"	18.87	18.87	1.48
						Ice	23.08	23.08	1.71
						1" Ice	31.50	31.50	2.18
						2" Ice	48.34	48.34	3.10
						4" Ice			

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

Comb. No.	Description
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
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	168.5 - 163.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-5.31	0.01	1.00
			Max. Mx	11	-1.87	19.86	0.11
			Max. My	2	-1.87	0.01	20.00
			Max. Vy	11	-3.98	19.86	0.11
			Max. Vx	2	-3.96	0.01	20.00
			Max. Torque	11			-1.27
L2	163.5 - 158.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-5.77	0.01	1.01
			Max. Mx	11	-2.10	40.39	0.11
			Max. My	2	-2.10	0.01	40.46
			Max. Vy	11	-4.24	40.39	0.11
			Max. Vx	2	-4.22	0.01	40.46
			Max. Torque	11			-1.27
L3	158.5 - 153.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-9.73	0.17	0.93
			Max. Mx	11	-3.43	73.76	0.38
			Max. My	2	-3.43	0.28	73.96
			Max. Vy	11	-7.06	73.76	0.38
			Max. Vx	2	-7.11	0.28	73.96
			Max. Torque	11			-1.27
L4	153.5 - 148.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-10.25	0.20	0.93
			Max. Mx	11	-3.70	109.76	0.67
			Max. My	2	-3.70	0.57	110.20
			Max. Vy	11	-7.34	109.76	0.67
			Max. Vx	2	-7.39	0.57	110.20
			Max. Torque	4			1.10
L5	148.5 - 143.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-11.76	0.23	0.92
			Max. Mx	11	-4.27	151.07	0.95
			Max. My	2	-4.27	0.86	151.75

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	11	-8.50	151.07	0.95
			Max. Vx	2	-8.54	0.86	151.75
			Max. Torque	4			1.10
L6	143.5 - 138.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-12.33	0.27	0.92
			Max. Mx	11	-4.59	194.27	1.24
			Max. My	2	-4.59	1.16	195.18
			Max. Vy	11	-8.79	194.27	1.24
			Max. Vx	2	-8.83	1.16	195.18
			Max. Torque	4			1.10
L7	138.5 - 130.67	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-19.45	1.99	0.30
			Max. Mx	11	-6.94	261.69	0.87
			Max. My	2	-6.95	1.20	261.24
			Max. Vy	11	-14.64	261.69	0.87
			Max. Vx	2	-14.51	1.20	261.24
			Max. Torque	3			1.89
L8	130.67 - 129.33	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-20.60	2.03	0.37
			Max. Mx	11	-7.60	335.91	0.75
			Max. My	2	-7.62	1.08	334.81
			Max. Vy	11	-15.05	335.91	0.75
			Max. Vx	2	-14.91	1.08	334.81
			Max. Torque	3			1.90
L9	129.33 - 126.417	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-25.13	2.05	0.42
			Max. Mx	11	-9.72	387.24	0.69
			Max. My	2	-9.73	1.02	385.77
			Max. Vy	11	-17.81	387.24	0.69
			Max. Vx	2	-17.67	1.02	385.77
			Max. Torque	3			1.90
L10	126.417 - 126.167	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-25.19	2.06	0.42
			Max. Mx	11	-9.77	391.70	0.68
			Max. My	2	-9.79	1.01	390.19
			Max. Vy	11	-17.82	391.70	0.68
			Max. Vx	2	-17.69	1.01	390.19
			Max. Torque	3			1.91
L11	126.167 - 121.167	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-26.29	2.10	0.51
			Max. Mx	11	-10.56	481.97	0.57
			Max. My	2	-10.58	0.89	479.80
			Max. Vy	11	-18.29	481.97	0.57
			Max. Vx	2	-18.16	0.89	479.80
			Max. Torque	3			1.92
L12	121.167 - 116.167	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-27.61	2.14	0.59
			Max. Mx	11	-11.51	574.58	0.45
			Max. My	2	-11.52	0.77	571.76
			Max. Vy	11	-18.76	574.58	0.45
			Max. Vx	2	-18.63	0.77	571.76
			Max. Torque	3			1.94
L13	116.167 - 113.833	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-28.27	2.16	0.63
			Max. Mx	11	-11.97	618.61	0.40
			Max. My	2	-11.99	0.71	615.48
			Max. Vy	11	-18.99	618.61	0.40
			Max. Vx	2	-18.85	0.71	615.48
			Max. Torque	3			1.94
L14	113.833 - 113.583	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	-28.36	2.16	0.63
			Max. Mx	11	-12.04	623.35	0.39
			Max. My	2	-12.06	0.70	620.20
			Max. Vy	11	-19.01	623.35	0.39
			Max. Vx	2	-18.87	0.70	620.20
			Max. Torque	3			1.94
L15	113.583 - 108.583	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-30.08	2.20	0.72
			Max. Mx	11	-13.33	719.68	0.28
			Max. My	2	-13.35	0.58	715.87
			Max. Vy	11	-19.53	719.68	0.28
			Max. Vx	2	-19.39	0.58	715.87
			Max. Torque	3			1.94
L16	108.583 - 103.583	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-31.83	2.24	0.80
			Max. Mx	11	-14.64	818.57	0.16
			Max. My	2	-14.66	0.45	814.11
			Max. Vy	11	-20.04	818.57	0.16
			Max. Vx	2	-19.91	0.45	814.11
			Max. Torque	3			1.95
L17	103.583 - 98.583	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-33.59	2.28	0.89
			Max. Mx	11	-15.97	920.00	0.05
			Max. My	2	-15.99	0.33	914.88
			Max. Vy	11	-20.54	920.00	0.05
			Max. Vx	2	-20.41	0.33	914.88
			Max. Torque	3			1.95
L18	98.583 - 93.583	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-35.36	2.32	0.98
			Max. Mx	11	-17.32	1023.92	-0.07
			Max. My	2	-17.33	0.20	1018.14
			Max. Vy	11	-21.04	1023.92	-0.07
			Max. Vx	2	-20.90	0.20	1018.14
			Max. Torque	3			1.96
L19	93.583 - 84.7	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-36.90	2.36	1.06
			Max. Mx	11	-18.49	1115.33	-0.17
			Max. My	2	-18.51	0.09	1108.98
			Max. Vy	11	-21.46	1115.33	-0.17
			Max. Vx	2	-21.33	0.09	1108.98
			Max. Torque	3			1.96
L20	84.7 - 83.7	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-40.07	2.40	1.14
			Max. Mx	11	-20.88	1236.87	-0.31
			Max. My	2	-20.89	-0.04	1229.77
			Max. Vy	11	-22.09	1236.87	-0.31
			Max. Vx	2	-21.96	-0.04	1229.77
			Max. Torque	3			1.97
L21	83.7 - 83.167	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-40.27	2.42	1.15
			Max. Mx	11	-21.04	1248.66	-0.32
			Max. My	2	-21.05	-0.04	1241.48
			Max. Vy	11	-22.14	1248.66	-0.32
			Max. Vx	2	-22.00	-0.04	1241.48
			Max. Torque	3			1.97
L22	83.167 - 82.917	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-40.38	2.42	1.15
			Max. Mx	11	-21.13	1254.20	-0.33
			Max. My	2	-21.14	-0.05	1246.98
			Max. Vy	11	-22.16	1254.20	-0.33
			Max. Vx	2	-22.02	-0.05	1246.98
			Max. Torque	3			1.97

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L23	82.917 - 77.917	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-42.57	2.55	1.17
			Max. Mx	11	-22.85	1366.24	-0.48
			Max. My	2	-22.86	-0.11	1358.26
			Max. Vy	11	-22.64	1366.24	-0.48
			Max. Vx	2	-22.50	-0.11	1358.26
			Max. Torque	3			1.97
L24	77.917 - 73.4167	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-44.55	2.67	1.20
			Max. Mx	11	-24.42	1469.14	-0.62
			Max. My	2	-24.43	-0.17	1460.48
			Max. Vy	11	-23.09	1469.14	-0.62
			Max. Vx	2	-22.95	-0.17	1460.48
			Max. Torque	3			1.97
L25	73.4167 - 73.1667	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-44.68	2.67	1.20
			Max. Mx	11	-24.54	1474.92	-0.63
			Max. My	2	-24.55	-0.17	1466.22
			Max. Vy	11	-23.11	1474.92	-0.63
			Max. Vx	2	-22.97	-0.17	1466.22
			Max. Torque	3			1.97
L26	73.1667 - 72.9167	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-44.82	2.68	1.20
			Max. Mx	11	-24.65	1480.70	-0.64
			Max. My	2	-24.66	-0.18	1471.96
			Max. Vy	11	-23.14	1480.70	-0.64
			Max. Vx	2	-23.00	-0.18	1471.96
			Max. Torque	3			1.97
L27	72.9167 - 72.6667	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-44.94	2.69	1.20
			Max. Mx	11	-24.75	1486.49	-0.64
			Max. My	2	-24.76	-0.18	1477.72
			Max. Vy	11	-23.16	1486.49	-0.64
			Max. Vx	2	-23.03	-0.18	1477.72
			Max. Torque	3			1.97
L28	72.6667 - 67.6667	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-47.59	2.83	1.31
			Max. Mx	11	-26.85	1603.74	-0.80
			Max. My	2	-26.86	-0.24	1594.20
			Max. Vy	11	-23.73	1603.74	-0.80
			Max. Vx	2	-23.59	-0.24	1594.20
			Max. Torque	3			2.01
L29	67.6667 - 64.4167	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-49.26	2.93	1.31
			Max. Mx	11	-28.20	1681.38	-0.90
			Max. My	2	-28.21	-0.28	1671.34
			Max. Vy	11	-24.04	1681.38	-0.90
			Max. Vx	2	-23.90	-0.28	1671.34
			Max. Torque	3			2.01
L30	64.4167 - 64.1667	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-49.37	2.94	1.31
			Max. Mx	11	-28.29	1687.39	-0.90
			Max. My	2	-28.30	-0.29	1677.32
			Max. Vy	11	-24.06	1687.39	-0.90
			Max. Vx	2	-23.92	-0.29	1677.32
			Max. Torque	3			2.01
L31	64.1667 - 59.1667	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-51.63	3.10	1.33
			Max. Mx	11	-30.07	1808.84	-1.06
			Max. My	2	-30.09	-0.35	1798.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	11	-24.51	1808.84	-1.06
			Max. Vx	8	24.37	1.97	-1797.79
			Max. Torque	3			2.02
L32	59.1667 - 54.1667	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-53.91	3.26	1.34
			Max. Mx	11	-31.88	1932.44	-1.22
			Max. My	2	-31.89	-0.41	1920.83
			Max. Vy	11	-24.93	1932.44	-1.22
			Max. Vx	8	24.79	2.18	-1920.67
			Max. Torque	3			2.03
L33	54.1667 - 43.78	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-56.19	3.43	1.35
			Max. Mx	11	-33.70	2057.30	-1.37
			Max. My	2	-33.71	-0.46	2044.92
			Max. Vy	11	-25.34	2057.30	-1.37
			Max. Vx	8	25.21	2.39	-2044.80
			Max. Torque	3			2.03
L34	43.78 - 42.78	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-61.37	3.64	1.37
			Max. Mx	11	-37.90	2222.14	-1.58
			Max. My	2	-37.90	-0.53	2208.77
			Max. Vy	11	-25.98	2222.14	-1.58
			Max. Vx	8	25.85	2.67	-2208.71
			Max. Torque	3			2.04
L35	42.78 - 37.78	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-63.99	3.81	1.38
			Max. Mx	11	-40.06	2352.95	-1.73
			Max. My	2	-40.07	-0.59	2338.81
			Max. Vy	11	-26.34	2352.95	-1.73
			Max. Vx	8	26.21	2.88	-2338.80
			Max. Torque	3			2.05
L36	37.78 - 32.78	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-66.63	3.98	1.39
			Max. Mx	11	-42.25	2485.52	-1.89
			Max. My	8	-42.26	3.10	-2470.64
			Max. Vy	11	-26.68	2485.52	-1.89
			Max. Vx	8	26.55	3.10	-2470.64
			Max. Torque	3			2.05
L37	32.78 - 28.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-69.03	4.13	1.40
			Max. Mx	11	-44.25	2607.11	-2.04
			Max. My	8	-44.25	3.29	-2591.58
			Max. Vy	11	-27.00	2607.11	-2.04
			Max. Vx	8	26.87	3.29	-2591.58
			Max. Torque	3			2.06
L38	28.25 - 28	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-69.19	4.14	1.40
			Max. Mx	11	-44.39	2613.86	-2.05
			Max. My	8	-44.40	3.30	-2598.30
			Max. Vy	11	-27.01	2613.86	-2.05
			Max. Vx	8	26.88	3.30	-2598.30
			Max. Torque	3			2.06
L39	28 - 27.833	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-69.29	4.15	1.40
			Max. Mx	11	-44.48	2618.38	-2.05
			Max. My	8	-44.49	3.31	-2602.79
			Max. Vy	11	-27.02	2618.38	-2.05
			Max. Vx	8	26.89	3.31	-2602.79
			Max. Torque	3			2.06
L40	27.833 - 27.583	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-69.44	4.15	1.40
			Max. Mx	11	-44.61	2625.14	-2.06

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	8	-44.61	3.32	-2609.51
			Max. Vy	11	-27.04	2625.14	-2.06
			Max. Vx	8	26.91	3.32	-2609.51
			Max. Torque	3			2.06
L41	27.583 - 22.583	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-72.42	4.33	1.41
			Max. Mx	11	-47.11	2761.29	-2.22
			Max. My	8	-47.12	3.54	-2744.95
			Max. Vy	11	-27.40	2761.29	-2.22
			Max. Vx	8	27.27	3.54	-2744.95
			Max. Torque	3			2.06
L42	22.583 - 19.33	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-74.37	4.44	1.42
			Max. Mx	11	-48.76	2850.81	-2.32
			Max. My	8	-48.76	3.68	-2834.00
			Max. Vy	11	-27.63	2850.81	-2.32
			Max. Vx	8	27.50	3.68	-2834.00
			Max. Torque	3			2.07
L43	19.33 - 19.08	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-74.51	4.45	1.42
			Max. Mx	11	-48.88	2857.72	-2.33
			Max. My	8	-48.88	3.69	-2840.87
			Max. Vy	11	-27.63	2857.72	-2.33
			Max. Vx	8	27.50	3.69	-2840.87
			Max. Torque	3			2.07
L44	19.08 - 14.08	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-77.22	4.63	1.43
			Max. Mx	11	-51.12	2996.75	-2.49
			Max. My	8	-51.12	3.91	-2979.18
			Max. Vy	11	-27.96	2996.75	-2.49
			Max. Vx	8	27.83	3.91	-2979.18
			Max. Torque	3			2.07
L45	14.08 - 9.08	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-79.96	4.81	1.44
			Max. Mx	11	-53.39	3137.34	-2.65
			Max. My	8	-53.39	4.13	-3119.06
			Max. Vy	11	-28.27	3137.34	-2.65
			Max. Vx	8	28.14	4.13	-3119.06
			Max. Torque	3			2.08
L46	9.08 - 4.08	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-82.72	5.00	1.45
			Max. Mx	11	-55.68	3279.46	-2.81
			Max. My	8	-55.68	4.35	-3260.46
			Max. Vy	11	-28.57	3279.46	-2.81
			Max. Vx	8	28.44	4.35	-3260.46
			Max. Torque	3			2.09
L47	4.08 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-84.99	5.15	1.46
			Max. Mx	11	-57.56	3396.54	-2.94
			Max. My	8	-57.56	4.53	-3376.96
			Max. Vy	11	-28.82	3396.54	-2.94
			Max. Vx	8	28.69	4.53	-3376.96
			Max. Torque	3			2.09

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	24	84.99	9.58	-0.00
	Max. H_x	11	57.57	28.80	-0.03

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Max. H_z	2	57.57	-0.03	28.67
	Max. M_x	2	3376.60	-0.03	28.67
	Max. M_z	5	3392.96	-28.80	0.03
	Max. Torsion	3	2.09	-14.42	24.84
	Min. Vert	1	57.57	0.00	0.00
	Min. H_x	5	57.57	-28.80	0.03
	Min. H_z	8	57.57	0.03	-28.67
	Min. M_x	8	-3376.96	0.03	-28.67
	Min. M_z	11	-3396.54	28.80	-0.03
	Min. Torsion	9	-2.07	14.42	-24.84

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	57.57	0.00	0.00	0.19	1.73	0.00
Dead+Wind 0 deg - No Ice	57.57	0.03	-28.67	-3376.60	-0.96	-1.59
Dead+Wind 30 deg - No Ice	57.57	14.42	-24.84	-2925.55	-1697.99	-2.09
Dead+Wind 60 deg - No Ice	57.57	24.95	-14.36	-1690.55	-2939.53	-2.03
Dead+Wind 90 deg - No Ice	57.57	28.80	-0.03	-2.55	-3392.96	-1.42
Dead+Wind 120 deg - No Ice	57.57	24.93	14.31	1686.18	-2936.78	-0.44
Dead+Wind 150 deg - No Ice	57.57	14.38	24.81	2923.18	-1693.23	0.66
Dead+Wind 180 deg - No Ice	57.57	-0.03	28.67	3376.96	4.53	1.57
Dead+Wind 210 deg - No Ice	57.57	-14.42	24.84	2925.93	1701.55	2.07
Dead+Wind 240 deg - No Ice	57.57	-24.95	14.36	1690.94	2943.10	2.02
Dead+Wind 270 deg - No Ice	57.57	-28.80	0.03	2.94	3396.54	1.44
Dead+Wind 300 deg - No Ice	57.57	-24.93	-14.31	-1685.81	2940.37	0.46
Dead+Wind 330 deg - No Ice	57.57	-14.38	-24.81	-2922.81	1696.80	-0.65
Dead+Ice+Temp	84.99	-0.00	-0.00	-1.46	5.15	0.00
Dead+Wind 0 deg+Ice+Temp	84.99	0.00	-9.54	-1159.59	5.26	-0.51
Dead+Wind 30 deg+Ice+Temp	84.99	4.79	-8.26	-1004.50	-576.99	-0.70
Dead+Wind 60 deg+Ice+Temp	84.99	8.30	-4.77	-580.65	-1003.20	-0.71
Dead+Wind 90 deg+Ice+Temp	84.99	9.58	-0.00	-1.63	-1159.17	-0.52
Dead+Wind 120 deg+Ice+Temp	84.99	8.29	4.77	577.41	-1003.10	-0.20
Dead+Wind 150 deg+Ice+Temp	84.99	4.79	8.26	1001.33	-576.81	0.18
Dead+Wind 180 deg+Ice+Temp	84.99	-0.00	9.54	1156.53	5.47	0.51
Dead+Wind 210 deg+Ice+Temp	84.99	-4.79	8.26	1001.43	587.73	0.70
Dead+Wind 240 deg+Ice+Temp	84.99	-8.30	4.77	577.59	1013.94	0.71
Dead+Wind 270 deg+Ice+Temp	84.99	-9.58	0.00	-1.42	1169.90	0.52
Dead+Wind 300 deg+Ice+Temp	84.99	-8.29	-4.77	-580.47	1013.83	0.20
Dead+Wind 330 deg+Ice+Temp	84.99	-4.79	-8.26	-1004.39	587.55	-0.18
Dead+Wind 0 deg - Service	57.57	0.01	-11.20	-1320.43	0.72	-0.63
Dead+Wind 30 deg - Service	57.57	5.63	-9.70	-1144.03	-662.96	-0.82
Dead+Wind 60 deg - Service	57.57	9.75	-5.61	-661.05	-1148.52	-0.80
Dead+Wind 90 deg - Service	57.57	11.25	-0.01	-0.89	-1325.85	-0.56
Dead+Wind 120 deg - Service	57.57	9.74	5.59	659.56	-1147.44	-0.17
Dead+Wind 150 deg - Service	57.57	5.62	9.69	1143.33	-661.10	0.26
Dead+Wind 180 deg - Service	57.57	-0.01	11.20	1320.79	2.87	0.62
Dead+Wind 210 deg -	57.57	-5.63	9.70	1144.40	666.55	0.82

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
Service Dead+Wind 240 deg - Service	57.57	-9.75	5.61	661.42	1152.11	0.80
Dead+Wind 270 deg - Service	57.57	-11.25	0.01	1.26	1329.45	0.56
Dead+Wind 300 deg - Service	57.57	-9.74	-5.59	-659.19	1151.04	0.18
Dead+Wind 330 deg - Service	57.57	-5.62	-9.69	-1142.96	664.69	-0.26

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.00	-57.57	0.00	0.00	57.57	0.00	0.000%
2	0.03	-57.57	-28.67	-0.03	57.57	28.67	0.000%
3	14.42	-57.57	-24.84	-14.42	57.57	24.84	0.000%
4	24.95	-57.57	-14.36	-24.95	57.57	14.36	0.000%
5	28.80	-57.57	-0.03	-28.80	57.57	0.03	0.000%
6	24.93	-57.57	14.31	-24.93	57.57	-14.31	0.000%
7	14.38	-57.57	24.81	-14.38	57.57	-24.81	0.000%
8	-0.03	-57.57	28.67	0.03	57.57	-28.67	0.000%
9	-14.42	-57.57	24.84	14.42	57.57	-24.84	0.000%
10	-24.95	-57.57	14.36	24.95	57.57	-14.36	0.000%
11	-28.80	-57.57	0.03	28.80	57.57	-0.03	0.000%
12	-24.93	-57.57	-14.31	24.93	57.57	14.31	0.000%
13	-14.38	-57.57	-24.81	14.38	57.57	24.81	0.000%
14	0.00	-84.99	0.00	0.00	84.99	0.00	0.000%
15	0.00	-84.99	-9.54	-0.00	84.99	9.54	0.000%
16	4.79	-84.99	-8.26	-4.79	84.99	8.26	0.000%
17	8.30	-84.99	-4.77	-8.30	84.99	4.77	0.000%
18	9.58	-84.99	-0.00	-9.58	84.99	0.00	0.000%
19	8.29	-84.99	4.77	-8.29	84.99	-4.77	0.000%
20	4.79	-84.99	8.26	-4.79	84.99	-8.26	0.000%
21	-0.00	-84.99	9.54	0.00	84.99	-9.54	0.000%
22	-4.79	-84.99	8.26	4.79	84.99	-8.26	0.000%
23	-8.30	-84.99	4.77	8.30	84.99	-4.77	0.000%
24	-9.58	-84.99	0.00	9.58	84.99	-0.00	0.000%
25	-8.29	-84.99	-4.77	8.29	84.99	4.77	0.000%
26	-4.79	-84.99	-8.26	4.79	84.99	8.26	0.000%
27	0.01	-57.57	-11.20	-0.01	57.57	11.20	0.000%
28	5.63	-57.57	-9.70	-5.63	57.57	9.70	0.000%
29	9.75	-57.57	-5.61	-9.75	57.57	5.61	0.000%
30	11.25	-57.57	-0.01	-11.25	57.57	0.01	0.000%
31	9.74	-57.57	5.59	-9.74	57.57	-5.59	0.000%
32	5.62	-57.57	9.69	-5.62	57.57	-9.69	0.000%
33	-0.01	-57.57	11.20	0.01	57.57	-11.20	0.000%
34	-5.63	-57.57	9.70	5.63	57.57	-9.70	0.000%
35	-9.75	-57.57	5.61	9.75	57.57	-5.61	0.000%
36	-11.25	-57.57	0.01	11.25	57.57	-0.01	0.000%
37	-9.74	-57.57	-5.59	9.74	57.57	5.59	0.000%
38	-5.62	-57.57	-9.69	5.62	57.57	9.69	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	0.00056877
3	Yes	6	0.00000001	0.00045313
4	Yes	6	0.00000001	0.00048632

5	Yes	5	0.00000001	0.00043969
6	Yes	6	0.00000001	0.00046673
7	Yes	6	0.00000001	0.00046095
8	Yes	5	0.00000001	0.00060039
9	Yes	6	0.00000001	0.00048780
10	Yes	6	0.00000001	0.00045535
11	Yes	5	0.00000001	0.00040887
12	Yes	6	0.00000001	0.00047071
13	Yes	6	0.00000001	0.00047573
14	Yes	4	0.00000001	0.00047095
15	Yes	6	0.00000001	0.00094328
16	Yes	7	0.00000001	0.00011598
17	Yes	7	0.00000001	0.00011747
18	Yes	6	0.00000001	0.00094044
19	Yes	7	0.00000001	0.00011621
20	Yes	7	0.00000001	0.00011585
21	Yes	6	0.00000001	0.00093879
22	Yes	7	0.00000001	0.00011810
23	Yes	7	0.00000001	0.00011703
24	Yes	6	0.00000001	0.00095141
25	Yes	7	0.00000001	0.00011830
26	Yes	7	0.00000001	0.00011822
27	Yes	5	0.00000001	0.00014005
28	Yes	5	0.00000001	0.00094350
29	Yes	6	0.00000001	0.00005217
30	Yes	5	0.00000001	0.00011298
31	Yes	5	0.00000001	0.00099679
32	Yes	5	0.00000001	0.00097316
33	Yes	5	0.00000001	0.00014235
34	Yes	6	0.00000001	0.00005260
35	Yes	5	0.00000001	0.00095399
36	Yes	5	0.00000001	0.00011115
37	Yes	6	0.00000001	0.00004909
38	Yes	6	0.00000001	0.00005015

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	168.5 - 163.5 (1)	TP19.834x19x0.1875	5.00	0.00	0.0	39.000	11.6921	-1.87	455.99	0.004
L2	163.5 - 158.5 (2)	TP20.668x19.834x0.1875	5.00	0.00	0.0	39.000	12.1885	-2.10	475.35	0.004
L3	158.5 - 153.5 (3)	TP21.502x20.668x0.1875	5.00	0.00	0.0	39.000	12.6848	-3.43	494.71	0.007
L4	153.5 - 148.5 (4)	TP22.336x21.502x0.1875	5.00	0.00	0.0	39.000	13.1811	-3.70	514.06	0.007
L5	148.5 - 143.5 (5)	TP23.17x22.336x0.1875	5.00	0.00	0.0	39.000	13.6774	-4.26	533.42	0.008
L6	143.5 - 138.5 (6)	TP24.004x23.17x0.1875	5.00	0.00	0.0	39.000	14.1738	-4.59	552.78	0.008
L7	138.5 - 130.67 (7)	TP25.31x24.004x0.1875	7.83	0.00	0.0	39.000	14.5877	-6.94	568.92	0.012
L8	130.67 - 129.33 (8)	TP25.1472x24.3245x0.25	5.00	0.00	0.0	39.000	19.7559	-7.61	770.48	0.010
L9	129.33 - 126.417 (9)	TP25.6265x25.1472x0.25	2.91	0.00	0.0	39.000	20.1362	-9.72	785.31	0.012
L10	126.417 - 126.167 (10)	TP25.6676x25.6265x0.406 3	0.25	0.00	0.0	39.000	32.5729	-9.78	1270.34	0.008
L11	126.167 - 121.167 (11)	TP26.4902x25.6676x0.4	5.00	0.00	0.0	39.000	33.1242	-10.56	1291.84	0.008
L12	121.167 - 116.167 (12)	TP27.3129x26.4902x0.4	5.00	0.00	0.0	39.000	34.1686	-11.51	1332.57	0.009

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 $\frac{P}{P_a}$
L13	116.167 - 113.833 (13)	TP27.6968x27.3129x0.3938	2.33	0.00	0.0	39.000	34.1224	-11.97	1330.77	0.009
L14	113.833 - 113.583 (14)	TP27.738x27.6968x0.65	0.25	0.00	0.0	39.000	55.8852	-12.04	2179.52	0.006
L15	113.583 - 108.583 (15)	TP28.5606x27.738x0.6375	5.00	0.00	0.0	39.000	56.5003	-13.33	2203.51	0.006
L16	108.583 - 103.583 (16)	TP29.3832x28.5606x0.625	5.00	0.00	0.0	39.000	57.0491	-14.64	2224.92	0.007
L17	103.583 - 98.583 (17)	TP30.2059x29.3832x0.6125	5.00	0.00	0.0	39.000	57.5317	-15.97	2243.74	0.007
L18	98.583 - 93.583 (18)	TP31.0285x30.2059x0.6	5.00	0.00	0.0	39.000	57.9480	-17.32	2259.97	0.008
L19	93.583 - 84.7 (19)	TP32.49x31.0285x0.6	8.88	0.00	0.0	39.000	59.2963	-18.49	2312.56	0.008
L20	84.7 - 83.7 (20)	TP32.1505x31.2365x0.575	5.58	0.00	0.0	39.000	57.6270	-20.88	2247.45	0.009
L21	83.7 - 83.167 (21)	TP32.2379x32.1505x0.575	0.53	0.00	0.0	39.000	57.7863	-21.04	2253.67	0.009
L22	83.167 - 82.917 (22)	TP32.2788x32.2379x0.6875	0.25	0.00	0.0	39.000	68.9362	-21.13	2688.51	0.008
L23	82.917 - 77.917 (23)	TP33.0979x32.2788x0.675	5.00	0.00	0.0	39.000	69.4644	-22.85	2709.11	0.008
L24	77.917 - 73.4167 (24)	TP33.8351x33.0979x0.6625	4.50	0.00	0.0	39.000	69.7545	-24.42	2720.43	0.009
L25	73.4167 - 73.1667 (25)	TP33.876x33.8351x1.0375	0.25	0.00	0.0	39.000	108.1380	-24.54	4217.39	0.006
L26	73.1667 - 72.9167 (26)	TP33.917x33.876x1.0125	0.25	0.00	0.0	39.000	105.7440	-24.65	4124.03	0.006
L27	72.9167 - 72.6667 (27)	TP33.958x33.917x0.925	0.25	0.00	0.0	39.000	96.9831	-24.75	3782.34	0.007
L28	72.6667 - 67.6667 (28)	TP34.777x33.958x0.9125	5.00	0.00	0.0	39.000	98.0810	-26.85	3825.16	0.007
L29	67.6667 - 64.4167 (29)	TP35.3094x34.777x0.9	3.25	0.00	0.0	39.000	98.2940	-28.20	3833.46	0.007
L30	64.4167 - 64.1667 (30)	TP35.3504x35.3094x0.7375	0.25	0.00	0.0	39.000	81.0227	-28.29	3159.88	0.009
L31	64.1667 - 59.1667 (31)	TP36.1694x35.3504x0.7375	5.00	0.00	0.0	39.000	82.9400	-30.07	3234.66	0.009
L32	59.1667 - 54.1667 (32)	TP36.9885x36.1694x0.7125	5.00	0.00	0.0	39.000	82.0373	-31.88	3199.45	0.010
L33	54.1667 - 43.78 (33)	TP38.69x36.9885x0.7125	10.39	0.00	0.0	39.000	83.8773	-33.70	3271.21	0.010
L34	43.78 - 42.78 (34)	TP38.2305x37.1771x0.7625	6.42	0.00	0.0	39.000	90.6792	-37.90	3536.49	0.011
L35	42.78 - 37.78 (35)	TP39.051x38.2305x0.75	5.00	0.00	0.0	39.000	91.1754	-40.06	3555.84	0.011
L36	37.78 - 32.78 (36)	TP39.8714x39.051x0.75	5.00	0.00	0.0	39.000	93.1284	-42.25	3632.01	0.012
L37	32.78 - 28.25 (37)	TP40.6147x39.8714x0.7375	4.53	0.00	0.0	39.000	93.3455	-44.25	3640.47	0.012
L38	28.25 - 28 (38)	TP40.6557x40.6147x1.1	0.25	0.00	0.0	39.000	138.1050	-44.39	5386.08	0.008
L39	28 - 27.833 (39)	TP40.6831x40.6557x1.075	0.17	0.00	0.0	39.000	135.1450	-44.48	5270.65	0.008
L40	27.833 - 27.583 (40)	TP40.7241x40.6831x0.95	0.25	0.00	0.0	39.000	119.9310	-44.61	4677.30	0.010
L41	27.583 - 22.583 (41)	TP41.5445x40.7241x0.95	5.00	0.00	0.0	39.000	122.4050	-47.11	4773.78	0.010
L42	22.583 - 19.33 (42)	TP42.0783x41.5445x0.9375	3.25	0.00	0.0	39.000	122.4200	-48.76	4774.36	0.010
L43	19.33 - 19.08 (43)	TP42.1193x42.0783x0.825	0.25	0.00	0.0	39.000	108.1310	-48.88	4217.12	0.012
L44	19.08 - 14.08 (44)	TP42.9397x42.1193x0.8	5.00	0.00	0.0	39.000	107.0010	-51.12	4173.05	0.012
L45	14.08 - 9.08 (45)	TP43.7601x42.9397x0.8	5.00	0.00	0.0	39.000	109.0840	-53.39	4254.29	0.013
L46	9.08 - 4.08 (46)	TP44.5805x43.7601x0.7875	5.00	0.00	0.0	39.000	109.4620	-55.68	4269.01	0.013
L47	4.08 - 0 (47)	TP45.25x44.5805x0.775	4.08	0.00	0.0	39.000	109.402	-57.56	4266.67	0.013

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 $\frac{P}{P_a}$
							0			

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	168.5 - 163.5 (1)	TP19.834x19x0.1875	20.00	4.240	39.000	0.109	0.00	0.000	39.000	0.000
L2	163.5 - 158.5 (2)	TP20.668x19.834x0.1875	40.47	7.894	39.000	0.202	0.00	0.000	39.000	0.000
L3	158.5 - 153.5 (3)	TP21.502x20.668x0.1875	74.17	13.353	39.000	0.342	0.00	0.000	39.000	0.000
L4	153.5 - 148.5 (4)	TP22.336x21.502x0.1875	110.59	18.433	39.000	0.473	0.00	0.000	39.000	0.000
L5	148.5 - 143.5 (5)	TP23.17x22.336x0.1875	152.33	23.573	39.000	0.604	0.00	0.000	39.000	0.000
L6	143.5 - 138.5 (6)	TP24.004x23.17x0.1875	195.94	28.227	39.000	0.724	0.00	0.000	39.000	0.000
L7	138.5 - 130.67 (7)	TP25.31x24.004x0.1875	262.39	35.678	39.000	0.915	0.00	0.000	39.000	0.000
L8	130.67 - 129.33 (8)	TP25.1472x24.3245x0.25	336.34	33.325	39.000	0.854	0.00	0.000	39.000	0.000
L9	129.33 - 126.417 (9)	TP25.6265x25.1472x0.25	387.51	36.952	39.000	0.947	0.00	0.000	39.000	0.000
L10	126.417 - 126.167 (10)	TP25.6676x25.6265x0.4063	391.95	23.354	39.000	0.599	0.00	0.000	39.000	0.000
L11	126.167 - 121.167 (11)	TP26.4902x25.6676x0.4	481.97	27.322	39.000	0.701	0.00	0.000	39.000	0.000
L12	121.167 - 116.167 (12)	TP27.3129x26.4902x0.4	574.58	30.597	39.000	0.785	0.00	0.000	39.000	0.000
L13	116.167 - 113.833 (13)	TP27.6968x27.3129x0.3938	618.61	32.501	39.000	0.833	0.00	0.000	39.000	0.000
L14	113.833 - 113.583 (14)	TP27.738x27.6968x0.65	623.36	20.346	39.000	0.522	0.00	0.000	39.000	0.000
L15	113.583 - 108.583 (15)	TP28.5606x27.738x0.6375	719.68	22.513	39.000	0.577	0.00	0.000	39.000	0.000
L16	108.583 - 103.583 (16)	TP29.3832x28.5606x0.625	818.57	24.598	39.000	0.631	0.00	0.000	39.000	0.000
L17	103.583 - 98.583 (17)	TP30.2059x29.3832x0.6125	920.00	26.613	39.000	0.682	0.00	0.000	39.000	0.000
L18	98.583 - 93.583 (18)	TP31.0285x30.2059x0.6	1023.92	28.572	39.000	0.733	0.00	0.000	39.000	0.000
L19	93.583 - 84.7 (19)	TP32.49x31.0285x0.6	1115.33	29.710	39.000	0.762	0.00	0.000	39.000	0.000
L20	84.7 - 83.7 (20)	TP32.1505x31.2365x0.575	1236.88	33.396	39.000	0.856	0.00	0.000	39.000	0.000
L21	83.7 - 83.167 (21)	TP32.2379x32.1505x0.575	1248.67	33.527	39.000	0.860	0.00	0.000	39.000	0.000
L22	83.167 - 82.917 (22)	TP32.2788x32.2379x0.6875	1254.20	28.393	39.000	0.728	0.00	0.000	39.000	0.000
L23	82.917 - 77.917 (23)	TP33.0979x32.2788x0.675	1366.23	29.879	39.000	0.766	0.00	0.000	39.000	0.000
L24	77.917 - 73.4167 (24)	TP33.8351x33.0979x0.6625	1469.14	31.247	39.000	0.801	0.00	0.000	39.000	0.000
L25	73.4167 - 73.1667 (25)	TP33.876x33.8351x1.0375	1474.92	20.674	39.000	0.530	0.00	0.000	39.000	0.000
L26	73.1667 - 72.9167 (26)	TP33.917x33.876x1.0125	1480.70	21.165	39.000	0.543	0.00	0.000	39.000	0.000
L27	72.9167 - 72.6667 (27)	TP33.958x33.917x0.925	1486.49	23.015	39.000	0.590	0.00	0.000	39.000	0.000
L28	72.6667 - 67.6667 (28)	TP34.777x33.958x0.9125	1603.74	23.925	39.000	0.613	0.00	0.000	39.000	0.000
L29	67.6667 - 64.4167 (29)	TP35.3094x34.777x0.9	1681.38	24.614	39.000	0.631	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 $\frac{f_{by}}{F_{by}}$
L30	64.4167 - 64.1667 (30)	TP35.3504x35.3094x0.7375	1687.39	29.651	39.000	0.760	0.00	0.000	39.000	0.000
L31	64.1667 - 59.1667 (31)	TP36.1694x35.3504x0.7375	1808.83	30.318	39.000	0.777	0.00	0.000	39.000	0.000
L32	59.1667 - 54.1667 (32)	TP36.9885x36.1694x0.7125	1932.44	31.947	39.000	0.819	0.00	0.000	39.000	0.000
L33	54.1667 - 43.78 (33)	TP38.69x36.9885x0.7125	2057.30	32.522	39.000	0.834	0.00	0.000	39.000	0.000
L34	43.78 - 42.78 (34)	TP38.2305x37.1771x0.7625	2222.13	32.200	39.000	0.826	0.00	0.000	39.000	0.000
L35	42.78 - 37.78 (35)	TP39.051x38.2305x0.75	2352.95	33.148	39.000	0.850	0.00	0.000	39.000	0.000
L36	37.78 - 32.78 (36)	TP39.8714x39.051x0.75	2485.52	33.549	39.000	0.860	0.00	0.000	39.000	0.000
L37	32.78 - 28.25 (37)	TP40.6147x39.8714x0.7375	2607.11	34.420	39.000	0.883	0.00	0.000	39.000	0.000
L38	28.25 - 28 (38)	TP40.6557x40.6147x1.1	2613.87	23.729	39.000	0.608	0.00	0.000	39.000	0.000
L39	28 - 27.833 (39)	TP40.6831x40.6557x1.075	2618.38	24.243	39.000	0.622	0.00	0.000	39.000	0.000
L40	27.833 - 27.583 (40)	TP40.7241x40.6831x0.95	2625.14	27.188	39.000	0.697	0.00	0.000	39.000	0.000
L41	27.583 - 22.583 (41)	TP41.5445x40.7241x0.95	2761.29	27.441	39.000	0.704	0.00	0.000	39.000	0.000
L42	22.583 - 19.33 (42)	TP42.0783x41.5445x0.9375	2850.82	27.934	39.000	0.716	0.00	0.000	39.000	0.000
L43	19.33 - 19.08 (43)	TP42.1193x42.0783x0.825	2857.72	31.498	39.000	0.808	0.00	0.000	39.000	0.000
L44	19.08 - 14.08 (44)	TP42.9397x42.1193x0.8	2996.75	32.677	39.000	0.838	0.00	0.000	39.000	0.000
L45	14.08 - 9.08 (45)	TP43.7601x42.9397x0.8	3137.34	32.904	39.000	0.844	0.00	0.000	39.000	0.000
L46	9.08 - 4.08 (46)	TP44.5805x43.7601x0.7875	3279.46	33.603	39.000	0.862	0.00	0.000	39.000	0.000
L47	4.08 - 0 (47)	TP45.25x44.5805x0.775	3396.54	34.269	39.000	0.879	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	168.5 - 163.5 (1)	TP19.834x19x0.1875	3.96	0.339	26.000	0.026	0.64	0.066	26.000	0.003
L2	163.5 - 158.5 (2)	TP20.668x19.834x0.1875	4.23	0.347	26.000	0.027	1.10	0.105	26.000	0.004
L3	158.5 - 153.5 (3)	TP21.502x20.668x0.1875	7.14	0.563	26.000	0.043	0.19	0.017	26.000	0.001
L4	153.5 - 148.5 (4)	TP22.336x21.502x0.1875	7.43	0.564	26.000	0.043	0.19	0.016	26.000	0.001
L5	148.5 - 143.5 (5)	TP23.17x22.336x0.1875	8.58	0.627	26.000	0.048	0.19	0.014	26.000	0.001
L6	143.5 - 138.5 (6)	TP24.004x23.17x0.1875	8.87	0.626	26.000	0.048	0.19	0.013	26.000	0.001
L7	138.5 - 130.67 (7)	TP25.31x24.004x0.1875	14.59	1.000	26.000	0.077	0.10	0.007	26.000	0.000
L8	130.67 - 129.33 (8)	TP25.1472x24.3245x0.25	14.99	0.759	26.000	0.058	0.09	0.004	26.000	0.000
L9	129.33 - 126.417 (9)	TP25.6265x25.1472x0.25	17.75	0.882	26.000	0.068	0.08	0.004	26.000	0.000
L10	126.417 - 126.167 (10)	TP25.6676x25.6265x0.4063	17.77	0.546	26.000	0.042	0.08	0.002	26.000	0.000
L11	126.167 - 121.167 (11)	TP26.4902x25.6676x0.4	18.29	0.552	26.000	0.042	0.90	0.025	26.000	0.001
L12	121.167 -	TP27.3129x26.4902x0.4	18.76	0.549	26.000	0.042	0.91	0.024	26.000	0.001

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 $\frac{f_{vt}}{F_{vt}}$
L13	116.167 (12) 116.167 - 113.833 (13)	TP27.6968x27.3129x0.3938	18.99	0.556	26.000	0.043	0.92	0.023	26.000	0.001
L14	113.833 - 113.583 (14)	TP27.738x27.6968x0.65	19.01	0.340	26.000	0.026	0.92	0.014	26.000	0.001
L15	113.583 - 108.583 (15)	TP28.5606x27.738x0.6375	19.53	0.346	26.000	0.027	0.94	0.014	26.000	0.001
L16	108.583 - 103.583 (16)	TP29.3832x28.5606x0.625	20.04	0.351	26.000	0.027	0.96	0.014	26.000	0.001
L17	103.583 - 98.583 (17)	TP30.2059x29.3832x0.6125	20.54	0.357	26.000	0.027	0.98	0.014	26.000	0.001
L18	98.583 - 93.583 (18)	TP31.0285x30.2059x0.6	21.04	0.363	26.000	0.028	1.00	0.014	26.000	0.001
L19	93.583 - 84.7 (19)	TP32.49x31.0285x0.6	21.46	0.362	26.000	0.028	1.02	0.013	26.000	0.001
L20	84.7 - 83.7 (20)	TP32.1505x31.2365x0.575	22.09	0.383	26.000	0.029	1.05	0.014	26.000	0.001
L21	83.7 - 83.167 (21)	TP32.2379x32.1505x0.575	22.14	0.383	26.000	0.029	1.05	0.014	26.000	0.001
L22	83.167 - 82.917 (22)	TP32.2788x32.2379x0.6875	22.16	0.321	26.000	0.025	1.05	0.011	26.000	0.000
L23	82.917 - 77.917 (23)	TP33.0979x32.2788x0.675	22.64	0.326	26.000	0.025	1.07	0.011	26.000	0.000
L24	77.917 - 73.4167 (24)	TP33.8351x33.0979x0.6625	23.09	0.331	26.000	0.025	1.09	0.011	26.000	0.000
L25	73.4167 - 73.1667 (25)	TP33.876x33.8351x1.0375	23.11	0.214	26.000	0.016	1.09	0.007	26.000	0.000
L26	73.1667 - 72.9167 (26)	TP33.917x33.876x1.0125	23.14	0.219	26.000	0.017	1.09	0.007	26.000	0.000
L27	72.9167 - 72.6667 (27)	TP33.958x33.917x0.925	23.16	0.239	26.000	0.018	1.09	0.008	26.000	0.000
L28	72.6667 - 67.6667 (28)	TP34.777x33.958x0.9125	23.73	0.242	26.000	0.019	1.17	0.008	26.000	0.000
L29	67.6667 - 64.4167 (29)	TP35.3094x34.777x0.9	24.04	0.245	26.000	0.019	1.18	0.008	26.000	0.000
L30	64.4167 - 64.1667 (30)	TP35.3504x35.3094x0.7375	24.06	0.297	26.000	0.023	1.18	0.010	26.000	0.000
L31	64.1667 - 59.1667 (31)	TP36.1694x35.3504x0.7375	24.51	0.295	26.000	0.023	1.20	0.010	26.000	0.000
L32	59.1667 - 54.1667 (32)	TP36.9885x36.1694x0.7125	24.93	0.304	26.000	0.023	1.22	0.010	26.000	0.000
L33	54.1667 - 43.78 (33)	TP38.69x36.9885x0.7125	25.34	0.302	26.000	0.023	1.24	0.009	26.000	0.000
L34	43.78 - 42.78 (34)	TP38.2305x37.1771x0.7625	25.98	0.287	26.000	0.022	1.27	0.009	26.000	0.000
L35	42.78 - 37.78 (35)	TP39.051x38.2305x0.75	26.34	0.289	26.000	0.022	1.29	0.009	26.000	0.000
L36	37.78 - 32.78 (36)	TP39.8714x39.051x0.75	26.68	0.286	26.000	0.022	1.31	0.009	26.000	0.000
L37	32.78 - 28.25 (37)	TP40.6147x39.8714x0.7375	27.00	0.289	26.000	0.022	1.33	0.008	26.000	0.000
L38	28.25 - 28 (38)	TP40.6557x40.6147x1.1	27.01	0.196	26.000	0.015	1.33	0.006	26.000	0.000
L39	28 - 27.833 (39)	TP40.6831x40.6557x1.075	27.02	0.200	26.000	0.015	1.33	0.006	26.000	0.000
L40	27.833 - 27.583 (40)	TP40.7241x40.6831x0.95	27.04	0.225	26.000	0.017	1.33	0.007	26.000	0.000
L41	27.583 - 22.583 (41)	TP41.5445x40.7241x0.95	27.40	0.224	26.000	0.017	1.35	0.006	26.000	0.000
L42	22.583 - 19.33 (42)	TP42.0783x41.5445x0.9375	27.63	0.226	26.000	0.017	1.36	0.006	26.000	0.000
L43	19.33 - 19.08 (43)	TP42.1193x42.0783x0.825	27.64	0.256	26.000	0.020	1.36	0.007	26.000	0.000
L44	19.08 - 14.08 (44)	TP42.9397x42.1193x0.8	27.96	0.261	26.000	0.020	1.38	0.007	26.000	0.000
L45	14.08 - 9.08 (45)	TP43.7601x42.9397x0.8	28.27	0.259	26.000	0.020	1.40	0.007	26.000	0.000
L46	9.08 - 4.08 (46)	TP44.5805x43.7601x0.7875	28.57	0.261	26.000	0.020	1.42	0.007	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 $\frac{f_{vt}}{F_{vt}}$
L47	4.08 - 0 (47)	TP45.25x44.5805x0.775	28.82	0.263	26.000	0.020	1.44	0.007	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	168.5 - 163.5 (1)	0.004	0.109	0.000	0.026	0.003	0.113 ✔	1.333	H1-3+VT ✔
L2	163.5 - 158.5 (2)	0.004	0.202	0.000	0.027	0.004	0.207 ✔	1.333	H1-3+VT ✔
L3	158.5 - 153.5 (3)	0.007	0.342	0.000	0.043	0.001	0.350 ✔	1.333	H1-3+VT ✔
L4	153.5 - 148.5 (4)	0.007	0.473	0.000	0.043	0.001	0.480 ✔	1.333	H1-3+VT ✔
L5	148.5 - 143.5 (5)	0.008	0.604	0.000	0.048	0.001	0.613 ✔	1.333	H1-3+VT ✔
L6	143.5 - 138.5 (6)	0.008	0.724	0.000	0.048	0.001	0.733 ✔	1.333	H1-3+VT ✔
L7	138.5 - 130.67 (7)	0.012	0.915	0.000	0.077	0.000	0.929 ✔	1.333	H1-3+VT ✔
L8	130.67 - 129.33 (8)	0.010	0.854	0.000	0.058	0.000	0.865 ✔	1.333	H1-3+VT ✔
L9	129.33 - 126.417 (9)	0.012	0.947	0.000	0.068	0.000	0.961 ✔	1.333	H1-3+VT ✔
L10	126.417 - 126.167 (10)	0.008	0.599	0.000	0.042	0.000	0.607 ✔	1.333	H1-3+VT ✔
L11	126.167 - 121.167 (11)	0.008	0.701	0.000	0.042	0.001	0.709 ✔	1.333	H1-3+VT ✔
L12	121.167 - 116.167 (12)	0.009	0.785	0.000	0.042	0.001	0.794 ✔	1.333	H1-3+VT ✔
L13	116.167 - 113.833 (13)	0.009	0.833	0.000	0.043	0.001	0.843 ✔	1.333	H1-3+VT ✔
L14	113.833 - 113.583 (14)	0.006	0.522	0.000	0.026	0.001	0.527 ✔	1.333	H1-3+VT ✔
L15	113.583 - 108.583 (15)	0.006	0.577	0.000	0.027	0.001	0.583 ✔	1.333	H1-3+VT ✔
L16	108.583 - 103.583 (16)	0.007	0.631	0.000	0.027	0.001	0.637 ✔	1.333	H1-3+VT ✔
L17	103.583 - 98.583 (17)	0.007	0.682	0.000	0.027	0.001	0.690 ✔	1.333	H1-3+VT ✔
L18	98.583 - 93.583 (18)	0.008	0.733	0.000	0.028	0.001	0.740 ✔	1.333	H1-3+VT ✔
L19	93.583 - 84.7 (19)	0.008	0.762	0.000	0.028	0.001	0.770 ✔	1.333	H1-3+VT ✔
L20	84.7 - 83.7 (20)	0.009	0.856	0.000	0.029	0.001	0.866 ✔	1.333	H1-3+VT ✔
L21	83.7 - 83.167 (21)	0.009	0.860	0.000	0.029	0.001	0.869 ✔	1.333	H1-3+VT ✔
L22	83.167 - 82.917 (22)	0.008	0.728	0.000	0.025	0.000	0.736 ✔	1.333	H1-3+VT ✔
L23	82.917 - 77.917 (23)	0.008	0.766	0.000	0.025	0.000	0.775 ✔	1.333	H1-3+VT ✔
L24	77.917 - 73.4167 (24)	0.009	0.801	0.000	0.025	0.000	0.810 ✔	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	73.4167 - 73.1667 (25)	0.006	0.530	0.000	0.016	0.000	0.536 ✔	1.333	H1-3+VT ✔
L26	73.1667 - 72.9167 (26)	0.006	0.543	0.000	0.017	0.000	0.549 ✔	1.333	H1-3+VT ✔
L27	72.9167 - 72.6667 (27)	0.007	0.590	0.000	0.018	0.000	0.597 ✔	1.333	H1-3+VT ✔
L28	72.6667 - 67.6667 (28)	0.007	0.613	0.000	0.019	0.000	0.621 ✔	1.333	H1-3+VT ✔
L29	67.6667 - 64.4167 (29)	0.007	0.631	0.000	0.019	0.000	0.639 ✔	1.333	H1-3+VT ✔
L30	64.4167 - 64.1667 (30)	0.009	0.760	0.000	0.023	0.000	0.769 ✔	1.333	H1-3+VT ✔
L31	64.1667 - 59.1667 (31)	0.009	0.777	0.000	0.023	0.000	0.787 ✔	1.333	H1-3+VT ✔
L32	59.1667 - 54.1667 (32)	0.010	0.819	0.000	0.023	0.000	0.829 ✔	1.333	H1-3+VT ✔
L33	54.1667 - 43.78 (33)	0.010	0.834	0.000	0.023	0.000	0.844 ✔	1.333	H1-3+VT ✔
L34	43.78 - 42.78 (34)	0.011	0.826	0.000	0.022	0.000	0.836 ✔	1.333	H1-3+VT ✔
L35	42.78 - 37.78 (35)	0.011	0.850	0.000	0.022	0.000	0.861 ✔	1.333	H1-3+VT ✔
L36	37.78 - 32.78 (36)	0.012	0.860	0.000	0.022	0.000	0.872 ✔	1.333	H1-3+VT ✔
L37	32.78 - 28.25 (37)	0.012	0.883	0.000	0.022	0.000	0.895 ✔	1.333	H1-3+VT ✔
L38	28.25 - 28 (38)	0.008	0.608	0.000	0.015	0.000	0.617 ✔	1.333	H1-3+VT ✔
L39	28 - 27.833 (39)	0.008	0.622	0.000	0.015	0.000	0.630 ✔	1.333	H1-3+VT ✔
L40	27.833 - 27.583 (40)	0.010	0.697	0.000	0.017	0.000	0.707 ✔	1.333	H1-3+VT ✔
L41	27.583 - 22.583 (41)	0.010	0.704	0.000	0.017	0.000	0.714 ✔	1.333	H1-3+VT ✔
L42	22.583 - 19.33 (42)	0.010	0.716	0.000	0.017	0.000	0.727 ✔	1.333	H1-3+VT ✔
L43	19.33 - 19.08 (43)	0.012	0.808	0.000	0.020	0.000	0.819 ✔	1.333	H1-3+VT ✔
L44	19.08 - 14.08 (44)	0.012	0.838	0.000	0.020	0.000	0.850 ✔	1.333	H1-3+VT ✔
L45	14.08 - 9.08 (45)	0.013	0.844	0.000	0.020	0.000	0.856 ✔	1.333	H1-3+VT ✔
L46	9.08 - 4.08 (46)	0.013	0.862	0.000	0.020	0.000	0.875 ✔	1.333	H1-3+VT ✔
L47	4.08 - 0 (47)	0.013	0.879	0.000	0.020	0.000	0.892 ✔	1.333	H1-3+VT ✔

Section Capacity Table

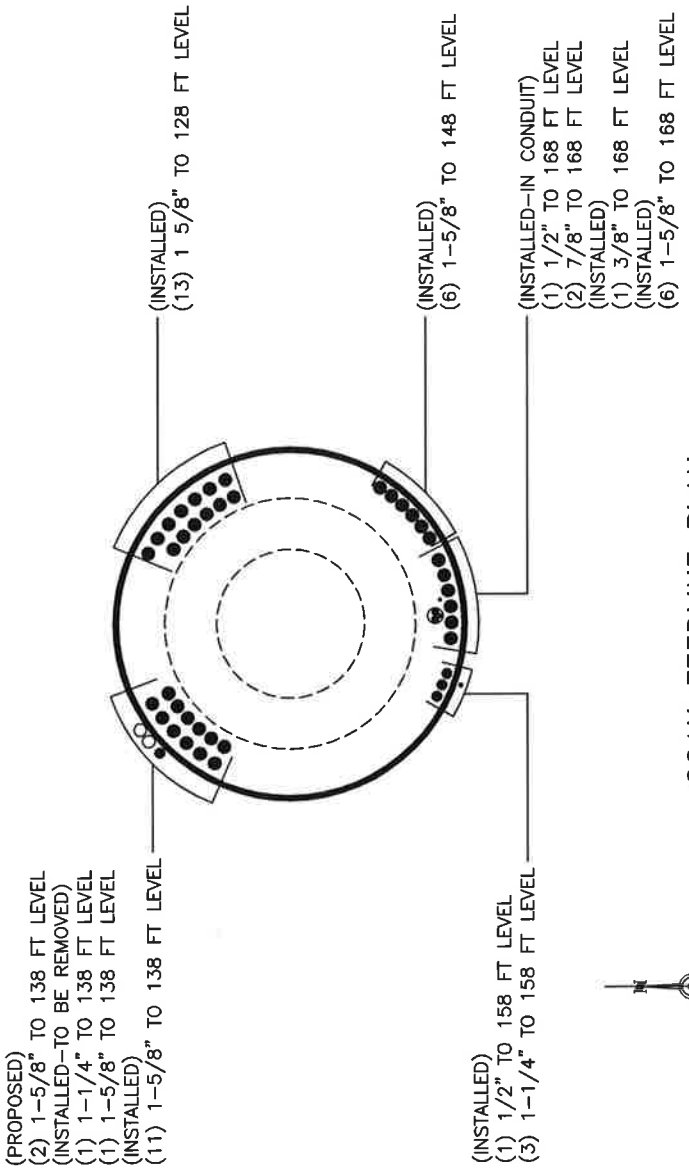
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	168.5 - 163.5	Pole	TP19.834x19x0.1875	1	-1.87	607.84	8.5	Pass
L2	163.5 - 158.5	Pole	TP20.668x19.834x0.1875	2	-2.10	633.64	15.5	Pass
L3	158.5 - 153.5	Pole	TP21.502x20.668x0.1875	3	-3.43	659.44	26.2	Pass
L4	153.5 - 148.5	Pole	TP22.336x21.502x0.1875	4	-3.70	685.25	36.0	Pass
L5	148.5 - 143.5	Pole	TP23.17x22.336x0.1875	5	-4.26	711.05	46.0	Pass
L6	143.5 - 138.5	Pole	TP24.004x23.17x0.1875	6	-4.59	736.85	55.0	Pass
L7	138.5 - 130.67	Pole	TP25.31x24.004x0.1875	7	-6.94	758.37	69.7	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L8	130.67 - 129.33	Pole	TP25.1472x24.3245x0.25	8	-7.61	1027.05	64.9	Pass
L9	129.33 - 126.417	Pole	TP25.6265x25.1472x0.25	9	-9.72	1046.82	72.1	Pass
L10	126.417 - 126.167	Pole	TP25.6676x25.6265x0.4063	10	-9.78	1693.36	45.5	Pass
L11	126.167 - 121.167	Pole	TP26.4902x25.6676x0.4	11	-10.56	1722.02	53.2	Pass
L12	121.167 - 116.167	Pole	TP27.3129x26.4902x0.4	12	-11.51	1776.32	59.5	Pass
L13	116.167 - 113.833	Pole	TP27.6968x27.3129x0.3938	13	-11.97	1773.92	63.2	Pass
L14	113.833 - 113.583	Pole	TP27.738x27.6968x0.65	14	-12.04	2905.30	39.6	Pass
L15	113.583 - 108.583	Pole	TP28.5606x27.738x0.6375	15	-13.33	2937.28	43.8	Pass
L16	108.583 - 103.583	Pole	TP29.3832x28.5606x0.625	16	-14.64	2965.82	47.8	Pass
L17	103.583 - 98.583	Pole	TP30.2059x29.3832x0.6125	17	-15.97	2990.91	51.7	Pass
L18	98.583 - 93.583	Pole	TP31.0285x30.2059x0.6	18	-17.32	3012.54	55.5	Pass
L19	93.583 - 84.7	Pole	TP32.49x31.0285x0.6	19	-18.49	3082.64	57.8	Pass
L20	84.7 - 83.7	Pole	TP32.1505x31.2365x0.575	20	-20.88	2995.85	65.0	Pass
L21	83.7 - 83.167	Pole	TP32.2379x32.1505x0.575	21	-21.04	3004.14	65.2	Pass
L22	83.167 - 82.917	Pole	TP32.2788x32.2379x0.6875	22	-21.13	3583.78	55.2	Pass
L23	82.917 - 77.917	Pole	TP33.0979x32.2788x0.675	23	-22.85	3611.24	58.1	Pass
L24	77.917 - 73.4167	Pole	TP33.8351x33.0979x0.6625	24	-24.42	3626.33	60.8	Pass
L25	73.4167 - 73.1667	Pole	TP33.876x33.8351x1.0375	25	-24.54	5621.78	40.2	Pass
L26	73.1667 - 72.9167	Pole	TP33.917x33.876x1.0125	26	-24.65	5497.33	41.2	Pass
L27	72.9167 - 72.6667	Pole	TP33.958x33.917x0.925	27	-24.75	5041.86	44.8	Pass
L28	72.6667 - 67.6667	Pole	TP34.777x33.958x0.9125	28	-26.85	5098.94	46.6	Pass
L29	67.6667 - 64.4167	Pole	TP35.3094x34.777x0.9	29	-28.20	5110.00	47.9	Pass
L30	64.4167 - 64.1667	Pole	TP35.3504x35.3094x0.7375	30	-28.29	4212.12	57.7	Pass
L31	64.1667 - 59.1667	Pole	TP36.1694x35.3504x0.7375	31	-30.07	4311.80	59.0	Pass
L32	59.1667 - 54.1667	Pole	TP36.9885x36.1694x0.7125	32	-31.88	4264.87	62.2	Pass
L33	54.1667 - 43.78	Pole	TP38.69x36.9885x0.7125	33	-33.70	4360.52	63.3	Pass
L34	43.78 - 42.78	Pole	TP38.2305x37.1771x0.7625	34	-37.90	4714.14	62.8	Pass
L35	42.78 - 37.78	Pole	TP39.051x38.2305x0.75	35	-40.06	4739.93	64.6	Pass
L36	37.78 - 32.78	Pole	TP39.8714x39.051x0.75	36	-42.25	4841.47	65.4	Pass
L37	32.78 - 28.25	Pole	TP40.6147x39.8714x0.7375	37	-44.25	4852.75	67.1	Pass
L38	28.25 - 28	Pole	TP40.6557x40.6147x1.1	38	-44.39	7179.64	46.3	Pass
L39	28 - 27.833	Pole	TP40.6831x40.6557x1.075	39	-44.48	7025.78	47.3	Pass
L40	27.833 - 27.583	Pole	TP40.7241x40.6831x0.95	40	-44.61	6234.84	53.0	Pass
L41	27.583 - 22.583	Pole	TP41.5445x40.7241x0.95	41	-47.11	6363.45	53.5	Pass
L42	22.583 - 19.33	Pole	TP42.0783x41.5445x0.9375	42	-48.76	6364.22	54.5	Pass
L43	19.33 - 19.08	Pole	TP42.1193x42.0783x0.825	43	-48.88	5621.42	61.5	Pass
L44	19.08 - 14.08	Pole	TP42.9397x42.1193x0.8	44	-51.12	5562.68	63.8	Pass
L45	14.08 - 9.08	Pole	TP43.7601x42.9397x0.8	45	-53.39	5670.97	64.2	Pass
L46	9.08 - 4.08	Pole	TP44.5805x43.7601x0.7875	46	-55.68	5690.59	65.6	Pass
L47	4.08 - 0	Pole	TP45.25x44.5805x0.775	47	-57.56	5687.47	66.9	Pass
							Summary	
						Pole (L9)	72.1	Pass
						RATING =	**72.1**	**Pass**

Note: The above stress ratios for reinforced sections are approximate. More exact calculations are presented in Appendix C.

APPENDIX B

BASE LEVEL DRAWING



COAX FEEDLINE PLAN

NO SCALE

APPENDIX C

ADDITIONAL CALCULATIONS

Additional Calculations

CCIpole

per TIA-222- F

Site BU: 842859

Work Order: 1117732

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	168.5	37.83	3.66	18	19	25.31	0.1875	0.75	A572-65
2	134.33	49.63	4.58	18	24.32	32.49	0.25	1	A572-65
3	89.28	45.5	5.42	18	31.24	38.69	0.3125	1.25	A572-65
4	49.2	49.2	0	18	37.18	45.25	0.375	1.5	A572-65

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	13	14	15	16	17	18
1	87.833	113.833	plate	5x1.25	3				E						E						E		
2	72.9167	87.9167	plate	5x1.25	4			E					E						E				E
3	47.375	73.4167	plate	5x1.25	4		E				E					E				E			
4	27.833	45.4167	plate	6x1.25	4			E					E						E				E
5	0	28.25	plate	6x1.25	4		E				E					E				E			
6	0	43.75	plate	CCI-SFP-060100	4	P						P			P						P		
7	43.75	83.167	plate	CCI-SFP-045100	4	P						P			P						P		
8	19.33	27.833	plate	CCI-SFP-045100	4			P					P						P				P
9	64.4167	72.9167	plate	CCI-SFP-045100	4			P					P						P				P
10	87.9167	126.4167	plate	CCI-SFP-045100	3			P					P						P				
11																							

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	1.25	6.25	0.625	24.000	24.000	18.000	4.688	1.1875	A572-65
2	5	1.25	6.25	0.625	24.000	24.000	18.000	4.688	1.1875	A572-65
3	5	1.25	6.25	0.625	24.000	24.000	18.000	4.688	1.1875	A572-65
4	6	1.25	7.5	0.625	30.000	30.000	18.000	5.938	1.1875	A572-65
5	6	1.25	7.5	0.625	30.000	30.000	18.000	5.938	1.1875	A572-65
6	6	1	6	0.5	24.000	24.000	16.000	4.750	1.1875	A572-65
7	4.5	1	4.5	0.5	18.000	18.000	20.000	3.250	1.1875	A572-65
8	4.5	1	4.5	0.5	18.000	18.000	20.000	3.250	1.1875	A572-65
9	4.5	1	4.5	0.5	18.000	18.000	20.000	3.250	1.1875	A572-65
10	4.5	1	4.5	0.5	18.000	18.000	20.000	3.250	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	168.5 - 163.5	5		18	19.000	19.834	0.1875	A572-65	1.000
2	163.5 - 158.5	5		18	19.834	20.668	0.1875	A572-65	1.000
3	158.5 - 153.5	5		18	20.668	21.502	0.1875	A572-65	1.000
4	153.5 - 148.5	5		18	21.502	22.336	0.1875	A572-65	1.000
5	148.5 - 143.5	5		18	22.336	23.170	0.1875	A572-65	1.000
6	143.5 - 138.5	5		18	23.170	24.004	0.1875	A572-65	1.000
7	138.5 - 134.33	7.83	3.66	18	24.004	25.310	0.1875	A572-65	1.000
8	134.33 - 129.33	5		18	24.325	25.147	0.25	A572-65	1.000
9	129.33 - 126.4167	2.9133		18	25.147	25.626	0.25	A572-65	1.000
10	126.4167 - 126.1667	0.25		18	25.626	25.668	0.40625	A572-65	1.034
11	126.1667 - 121.1667	5		18	25.668	26.490	0.4	A572-65	1.036
12	121.1667 - 116.1667	5		18	26.490	27.313	0.4	A572-65	1.024
13	116.1667 - 113.833	2.3337		18	27.313	27.697	0.39375	A572-65	1.034
14	113.833 - 113.583	0.25		18	27.697	27.738	0.65	A572-65	0.967
15	113.583 - 108.583	5		18	27.738	28.561	0.6375	A572-65	0.968
16	108.583 - 103.583	5		18	28.561	29.383	0.625	A572-65	0.971
17	103.583 - 98.583	5		18	29.383	30.206	0.6125	A572-65	0.974
18	98.583 - 93.583	5		18	30.206	31.029	0.6	A572-65	0.978
19	93.583 - 89.28	8.883	4.58	18	31.029	32.490	0.6	A572-65	0.965
20	89.28 - 83.7	5.58		18	31.236	32.151	0.575	A572-65	0.982
21	83.7 - 83.167	0.533		18	32.151	32.238	0.575	A572-65	0.981
22	83.167 - 82.917	0.25		18	32.238	32.279	0.6875	A572-65	1.084
23	82.917 - 77.917	5		18	32.279	33.098	0.675	A572-65	1.087
24	77.917 - 73.4167	4.5003		18	33.098	33.835	0.6625	A572-65	1.093
25	73.4167 - 73.1667	0.25		18	33.835	33.876	1.0375	A572-65	0.937
26	73.1667 - 72.9167	0.25		18	33.876	33.917	1.0125	A572-65	0.958
27	72.9167 - 72.6667	0.25		18	33.917	33.958	0.925	A572-65	0.973
28	72.6667 - 67.6667	5		18	33.958	34.777	0.9125	A572-65	0.970
29	67.6667 - 64.4167	3.25		18	34.777	35.309	0.9	A572-65	0.974
30	64.4167 - 64.1667	0.25		18	35.309	35.350	0.7375	A572-65	0.960
31	64.1667 - 59.1667	5		18	35.350	36.169	0.7375	A572-65	0.947
32	59.1667 - 54.1667	5		18	36.169	36.989	0.7125	A572-65	0.968
33	54.1667 - 49.2	10.3867	5.42	18	36.989	38.690	0.7125	A572-65	0.956
34	49.2 - 42.78	6.42		18	37.177	38.231	0.7625	A572-65	1.092
35	42.78 - 37.78	5		18	38.231	39.051	0.75	A572-65	1.097
36	37.78 - 32.78	5		18	39.051	39.871	0.75	A572-65	1.085
37	32.78 - 28.25	4.53		18	39.871	40.615	0.7375	A572-65	1.092
38	28.25 - 28	0.25		18	40.615	40.656	1.1	A572-65	0.955
39	28 - 27.833	0.167		18	40.656	40.683	1.075	A572-65	0.977
40	27.833 - 27.583	0.25		18	40.683	40.724	0.95	A572-65	1.001
41	27.583 - 22.583	5		18	40.724	41.545	0.95	A572-65	0.989
42	22.583 - 19.33	3.253		18	41.545	42.078	0.9375	A572-65	0.994
43	19.33 - 19.08	0.25		18	42.078	42.119	0.825	A572-65	0.959
44	19.08 - 14.08	5		18	42.119	42.940	0.8	A572-65	0.978
45	14.08 - 9.08	5		18	42.940	43.760	0.8	A572-65	0.968
46	9.08 - 4.08	5		18	43.760	44.581	0.7875	A572-65	0.974
47	4.08 - 0	4.08		18	44.581	45.250	0.775	A572-65	0.982

TNX Section Forces

Increment (ft):	5	TNX Output		
	Section Height (ft)	P_u (K)	M_{ux} (kip-ft)	V_u (K)
1	168.5 - 163.5	1.8748	20.004	3.9604
2	163.5 - 158.5	2.0994	40.468	4.2267
3	158.5 - 153.5	3.4278	74.167	7.1445
4	153.5 - 148.5	3.6953	110.59	7.4287
5	148.5 - 143.5	4.2616	152.33	8.5793
6	143.5 - 138.5	4.5888	195.94	8.8702
7	138.5 - 134.33	6.942	262.39	14.587
8	134.33 - 129.33	7.6061	336.34	14.99
9	129.33 - 126.417	9.7223	387.51	17.751
10	126.417 - 126.167	9.7752	391.95	17.77
11	126.167 - 121.167	10.562	481.97	18.292
12	121.167 - 116.167	11.505	574.58	18.761
13	116.167 - 113.833	11.97	618.61	18.986
14	113.833 - 113.583	12.044	623.35	19.006
15	113.583 - 108.583	13.331	719.68	19.528
16	108.583 - 103.583	14.642	818.57	20.04
17	103.583 - 98.583	15.971	920	20.543
18	98.583 - 93.583	17.319	1023.9	21.036
19	93.583 - 89.28	18.492	1115.3	21.464
20	89.28 - 83.7	20.88	1236.9	22.092
21	83.7 - 83.167	21.037	1248.7	22.137
22	83.167 - 82.917	21.127	1254.2	22.159
23	82.917 - 77.917	22.85	1366.2	22.64
24	77.917 - 73.4167	24.421	1469.1	23.086
25	73.4167 - 73.1667	24.537	1474.9	23.107
26	73.1667 - 72.9167	24.645	1480.7	23.136
27	72.9167 - 72.6667	24.748	1486.5	23.161
28	72.6667 - 67.6667	26.853	1603.7	23.725
29	67.6667 - 64.4167	28.197	1681.4	24.04
30	64.4167 - 64.1667	28.291	1687.4	24.058
31	64.1667 - 59.1667	30.075	1808.8	24.506
32	59.1667 - 54.1667	31.885	1932.4	24.93
33	54.1667 - 49.2	33.697	2057.3	25.343
34	49.2 - 42.78	37.897	2222.1	25.98
35	42.78 - 37.78	40.064	2353	26.342
36	37.78 - 32.78	42.252	2485.5	26.681
37	32.78 - 28.25	44.249	2607.1	27.003
38	28.25 - 28	44.394	2613.9	27.01
39	28 - 27.833	44.5	2618.4	27.0
40	27.833 - 27.583	44.6	2625.1	27.0
41	27.583 - 22.583	47.1	2761.3	27.4
42	22.583 - 19.33	48.8	2850.8	27.6
43	19.33 - 19.08	48.9	2857.7	27.6
44	19.08 - 14.08	51.1	2996.8	28.0
45	14.08 - 9.08	53.4	3137.3	28.3
46	9.08 - 4.08	55.7	3279.5	28.6
47	4.08 - 0	57.6	3396.5	28.8

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
168.5 - 163.5	Pole	TP19.834x19x0.1875	Pole	8.5%	Pass
163.5 - 158.5	Pole	TP20.668x19.834x0.1875	Pole	15.5%	Pass
158.5 - 153.5	Pole	TP21.502x20.668x0.1875	Pole	26.2%	Pass
153.5 - 148.5	Pole	TP22.336x21.502x0.1875	Pole	36.0%	Pass
148.5 - 143.5	Pole	TP23.17x22.336x0.1875	Pole	45.9%	Pass
143.5 - 138.5	Pole	TP24.004x23.17x0.1875	Pole	54.9%	Pass
138.5 - 134.33	Pole	TP25.31x24.004x0.1875	Pole	69.5%	Pass
134.33 - 129.33	Pole	TP25.147x24.325x0.25	Pole	64.8%	Pass
129.33 - 126.42	Pole	TP25.626x25.147x0.25	Pole	72.0%	Pass
126.42 - 126.17	Pole + Reinf.	TP25.668x25.626x0.4063	Reinf. 10 Compression	59.6%	Pass
126.17 - 121.17	Pole + Reinf.	TP26.49x25.668x0.4	Reinf. 10 Compression	69.6%	Pass
121.17 - 116.17	Pole + Reinf.	TP27.313x26.49x0.4	Reinf. 10 Compression	78.9%	Pass
116.17 - 113.83	Pole + Reinf.	TP27.697x27.313x0.3938	Reinf. 10 Compression	83.0%	Pass
113.83 - 113.58	Pole + Reinf.	TP27.738x27.697x0.65	Reinf. 10 Compression	52.4%	Pass
113.58 - 108.58	Pole + Reinf.	TP28.561x27.738x0.6375	Reinf. 10 Compression	58.1%	Pass
108.58 - 103.58	Pole + Reinf.	TP29.383x28.561x0.625	Reinf. 10 Compression	63.5%	Pass
103.58 - 98.58	Pole + Reinf.	TP30.206x29.383x0.6125	Reinf. 10 Compression	68.7%	Pass
98.58 - 93.58	Pole + Reinf.	TP31.029x30.206x0.6	Reinf. 10 Compression	73.6%	Pass
93.58 - 89.28	Pole + Reinf.	TP32.49x31.029x0.6	Reinf. 10 Compression	77.7%	Pass
89.28 - 83.7	Pole + Reinf.	TP32.151x31.236x0.575	Reinf. 2 Bolt Shear	87.5%	Pass
83.7 - 83.17	Pole + Reinf.	TP32.238x32.151x0.575	Reinf. 2 Tension Rupture	87.4%	Pass
83.17 - 82.92	Pole + Reinf.	TP32.279x32.238x0.6875	Reinf. 2 Tension Rupture	73.5%	Pass
82.92 - 77.92	Pole + Reinf.	TP33.098x32.279x0.675	Reinf. 2 Tension Rupture	77.1%	Pass
77.92 - 73.42	Pole + Reinf.	TP33.835x33.098x0.6625	Reinf. 2 Tension Rupture	80.3%	Pass
73.42 - 73.17	Pole + Reinf.	TP33.876x33.835x1.0375	Reinf. 3 Bolt Shear	55.2%	Pass
73.17 - 72.92	Pole + Reinf.	TP33.917x33.876x1.0125	Reinf. 2 Bolt Shear	55.5%	Pass
72.92 - 72.67	Pole + Reinf.	TP33.958x33.917x0.925	Reinf. 9 Compression	61.4%	Pass
72.67 - 67.67	Pole + Reinf.	TP34.777x33.958x0.9125	Reinf. 9 Compression	64.2%	Pass
67.67 - 64.42	Pole + Reinf.	TP35.309x34.777x0.9	Reinf. 9 Compression	65.9%	Pass
64.42 - 64.17	Pole + Reinf.	TP35.35x35.309x0.7375	Reinf. 3 Tension Rupture	75.6%	Pass
64.17 - 59.17	Pole + Reinf.	TP36.169x35.35x0.7375	Reinf. 3 Tension Rupture	78.4%	Pass
59.17 - 54.17	Pole + Reinf.	TP36.989x36.169x0.7125	Reinf. 3 Tension Rupture	81.1%	Pass
54.17 - 49.2	Pole + Reinf.	TP38.69x36.989x0.7125	Reinf. 3 Bolt Shear	84.2%	Pass
49.2 - 42.78	Pole + Reinf.	TP38.231x37.177x0.7625	Reinf. 4 Bolt Shear	80.1%	Pass
42.78 - 37.78	Pole + Reinf.	TP39.051x38.231x0.75	Reinf. 4 Tension Rupture	80.5%	Pass
37.78 - 32.78	Pole + Reinf.	TP39.871x39.051x0.75	Reinf. 4 Tension Rupture	82.5%	Pass
32.78 - 28.25	Pole + Reinf.	TP40.615x39.871x0.7375	Reinf. 4 Tension Rupture	84.1%	Pass
28.25 - 28	Pole + Reinf.	TP40.656x40.615x1.1	Reinf. 5 Bolt Shear	60.3%	Pass
28 - 27.83	Pole + Reinf.	TP40.683x40.656x1.075	Reinf. 4 Bolt Shear	60.8%	Pass
27.83 - 27.58	Pole + Reinf.	TP40.724x40.683x0.95	Reinf. 8 Compression	71.7%	Pass
27.58 - 22.58	Pole + Reinf.	TP41.545x40.724x0.95	Reinf. 8 Compression	73.4%	Pass
22.58 - 19.33	Pole + Reinf.	TP42.078x41.545x0.9375	Reinf. 8 Compression	74.4%	Pass
19.33 - 19.08	Pole + Reinf.	TP42.119x42.078x0.825	Reinf. 5 Tension Rupture	76.9%	Pass
19.08 - 14.08	Pole + Reinf.	TP42.94x42.119x0.8	Reinf. 5 Tension Rupture	78.4%	Pass
14.08 - 9.08	Pole + Reinf.	TP43.76x42.94x0.8	Reinf. 5 Tension Rupture	79.8%	Pass
9.08 - 4.08	Pole + Reinf.	TP44.581x43.76x0.7875	Reinf. 5 Tension Rupture	81.1%	Pass
4.08 - 0	Pole + Reinf.	TP45.25x44.581x0.775	Reinf. 5 Bolt Shear	83.8%	Pass
				Summary	
			Pole	72.0%	Pass
			Reinforcement	87.5%	Pass
			Overall	87.5%	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
168.5 - 163.5	570	n/a	570	11.69	n/a	11.69	8.5%										
163.5 - 158.5	646	n/a	646	12.19	n/a	12.19	15.5%										
158.5 - 153.5	728	n/a	728	12.68	n/a	12.68	26.2%										
153.5 - 148.5	817	n/a	817	13.18	n/a	13.18	36.0%										
148.5 - 143.5	912	n/a	912	13.68	n/a	13.68	45.9%										
143.5 - 138.5	1015	n/a	1015	14.17	n/a	14.17	54.9%										
138.5 - 134.33	1107	n/a	1107	14.59	n/a	14.59	69.5%										
134.33 - 129.33	1547	n/a	1547	19.76	n/a	19.76	64.8%										
129.33 - 126.42	1638	n/a	1638	20.14	n/a	20.14	72.0%										
126.42 - 126.17	1652	987	2639	20.17	13.50	33.67	47.0%										59.6%
126.17 - 121.17	1817	1049	2866	20.82	13.50	34.32	54.9%										69.6%
121.17 - 116.17	1993	1112	3105	21.47	13.50	34.97	62.1%										78.9%
116.17 - 113.83	2079	1142	3221	21.78	13.50	35.28	65.4%										83.0%
113.83 - 113.58	2085	3144	5228	21.81	32.25	54.06	40.1%	52.2%									52.4%
113.58 - 108.58	2277	3323	5600	22.46	32.25	54.71	44.5%	57.5%									58.1%
108.58 - 103.58	2481	3508	5989	23.12	32.25	55.37	48.7%	62.8%									63.5%
103.58 - 98.58	2698	3698	6395	23.77	32.25	56.02	52.6%	67.9%									68.7%
98.58 - 93.58	2926	3892	6818	24.42	32.25	56.67	56.4%	72.7%									73.6%
93.58 - 89.28	3132	4064	7196	24.98	32.25	57.23	59.6%	77.2%									77.7%
89.28 - 83.7	4045	3246	7292	31.58	25.00	56.58	65.6%		87.5%								
83.7 - 83.17	4079	3263	7342	31.66	25.00	56.66	65.9%		87.4%								
83.17 - 82.92	4095	4589	8684	31.71	43.00	74.71	56.3%		73.5%					67.2%			
82.92 - 77.92	4418	4814	9232	32.52	43.00	75.52	59.1%		77.2%					70.6%			
77.92 - 73.42	4722	5022	9744	33.25	43.00	76.25	61.6%		80.3%					73.6%			
73.42 - 73.17	4754	10095	14850	33.29	68.00	101.29	41.5%		55.0%	55.2%				54.5%			
73.17 - 72.92	4755	9647	14402	33.33	68.00	101.33	41.6%		55.5%	55.0%				54.6%			
72.92 - 72.67	4772	8619	13391	33.37	61.00	94.37	44.9%			58.9%				58.4%		61.4%	
72.67 - 67.67	5129	9023	14152	34.18	61.00	95.18	47.0%			61.5%				61.1%		64.2%	
67.67 - 64.42	5370	9291	14661	34.71	61.00	95.71	48.3%			63.2%				62.8%		65.9%	
64.42 - 64.17	5388	6944	12332	34.75	43.00	77.75	57.2%			75.6%				75.1%			
64.17 - 59.17	5775	7257	13032	35.56	43.00	78.56	59.4%			78.4%				77.9%			
59.17 - 54.17	6180	7577	13757	36.38	43.00	79.38	61.5%			81.1%				80.6%			
54.17 - 49.2	6600	7902	14502	37.18	43.00	80.18	63.5%			84.2%				83.2%			
49.2 - 42.78	8160	7904	16064	45.06	54.00	99.06	63.8%				80.1%		70.3%				
42.78 - 37.78	8702	8232	16934	46.03	54.00	100.03	65.5%				80.5%		71.0%				
37.78 - 32.78	9267	8567	17835	47.01	54.00	101.01	67.1%				82.4%		72.8%				
32.78 - 28.25	9800	8877	18677	47.89	54.00	101.89	68.4%				84.1%		74.3%				
28.25 - 28	9856	17700	27556	47.94	84.00	131.94	47.5%				59.6%	60.3%	56.6%				
28 - 27.83	9846	16775	26622	47.97	84.00	131.97	47.9%				60.8%	59.2%	56.6%				
27.83 - 27.58	9875	14291	24167	48.02	72.00	120.02	52.7%					64.6%	61.7%		71.7%		
27.58 - 22.58	10490	14853	25343	49.00	72.00	121.00	54.0%					66.1%	63.2%		73.4%		
22.58 - 19.33	10903	15224	26127	49.64	72.00	121.64	54.8%					67.0%	64.1%		74.4%		
19.33 - 19.08	10935	12184	23118	49.68	54.00	103.68	61.8%					76.9%	73.4%				
19.08 - 14.08	11592	12647	24239	50.66	54.00	104.66	63.0%					78.4%	74.9%				
14.08 - 9.08	12276	13118	25394	51.64	54.00	105.64	64.2%					79.8%	76.3%				
9.08 - 4.08	12985	13599	26584	52.61	54.00	106.61	65.3%					81.1%	77.6%				
4.08 - 0	13584	13997	27581	53.41	54.00	107.41	66.2%					83.8%	79.9%				

Note: Section capacity checked in 5 degree increments.

Stiffened or Unstiffened, Ungrouted, Circular Base Plate - Any Rod Material

TIA Rev F

Site Data

BU#: *842859*
Site Name: *BRISTOL CENTER*
App #: *307095*

Pole Manufacturer:	*Other*

Reactions		
Moment:	3397	ft-kips
Axial:	58	kips
Shear:	29	kips

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

Anchor Rod Data		
Qty:	24	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	54	in

Plate Data		
Diam:	60	in
Thick:	2	in
Grade:	60	ksi
Single-Rod B-eff:	5.98	in

Stiffener Data (Welding at both sides)		
Config:	1	*
Weld Type:	Both	
Groove Depth:	0.375	in **
Groove Angle:	45	degrees
Fillet H. Weld:	0.375	in
Fillet V. Weld:	0.3125	in
Width:	7	in
Height:	15	in
Thick:	0.75	in
Notch:	0.75	in
Grade:	65	ksi
Weld str.:	80	ksi

Pole Data		
Diam:	45.25	in
Thick:	0.375	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Anchor Rod Results

		Stiffened
Maximum Rod Tension:	123.4 Kips	Service, ASD
Allowable Tension:	195.0 Kips	Fty*ASIF
Anchor Rod Stress Ratio:	63.3% Pass	

Base Plate Results

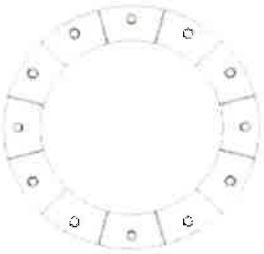
	Flexural Check	Stiffened
Base Plate Stress:	31.3 ksi	Service, ASD
Allowable Plate Stress:	60.0 ksi	0.75*Fy*ASIF
Base Plate Stress Ratio:	52.2% Pass	Y.L. Length: N/A, Roark

Stiffener Results

Horizontal Weld :	45.9% Pass
Vertical Weld:	59.6% Pass
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	19.6% Pass
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	45.0% Pass
Plate Comp. (AISC Bracket):	57.6% Pass

Pole Results

Pole Punching Shear Check:	19.2% Pass



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

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

CCI Foundation Tool Suite - Monopole Pier - Beta Release

CCI Foundation Tool Suite - v1.0 Date: 9/17/2015

BU:	842859
Site Name:	BRISTOL CENTER
App Number:	307095
Work Order:	1117732

Monopole Drilled Pier

Input

Criteria

TIA Revision:	F
ACI 318 Revision:	2002
Seismic Category:	B

Forces

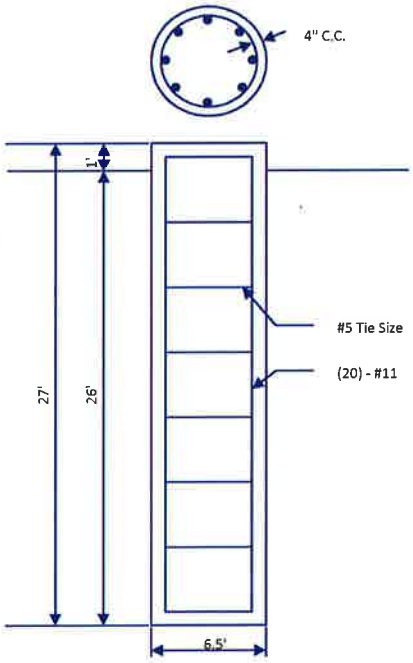
Compression	75.4 kips
Shear	37.7 kips
Moment	4416.1 k-ft
Swelling Force	0 kips

Foundation Dimensions

Pier Diameter:	6.5 ft
Ext. above grade:	1 ft
Depth below grade:	26 ft

Material Properties

Number of Rebar:	20
Rebar Size:	11
Tie Size	5
Rebar tensile strength:	60 ksi
Concrete Strength:	4000 psi
Ultimate Concrete Strain	0.003 in/in
Clear Cover to Ties:	4 in



Soil Profile: 842859.1117732 SOIL PROFILE

Layer	Thickness (ft)	From (ft)	To (ft)	Unit Weight (pcf)	Cohesion (psf)	Friction Angle (deg)	Ultimate Uplift Skin Friction (ksf)	Ultimate Comp. Skin Friction (ksf)	Ultimate Bearing Capacity (ksf)	SPT 'N' Counts
1	3.3	0	3.3	105	0	0	0	0	0	
2	0.7	3.3	4	105	0	29	0	0	0	
3	2	4	6	110	0	30			0	
4	2	6	8	115	0	31			0	
5	4	8	12	120	0	33			0	
6	8	12	20	115	0	31			0	
7	5	20	25	125	0	35			0	
8	1	25	26	130	0	37			13.5	

Analysis Results

Soil Lateral Capacity

Depth to Zero Shear:	6.05 ft
Max Moment, Mu:	3547.22 k-ft
Soil Safety Factor:	3.06
Safety Factor Req'd:	2
RATING:	65.4%

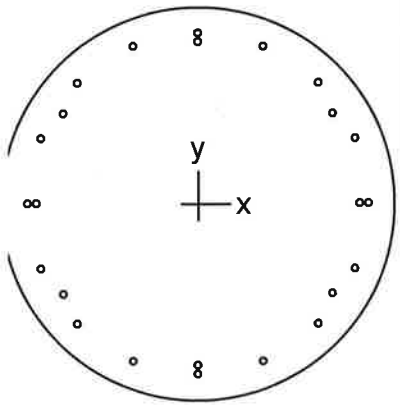
Soil Axial Capacity

Skin Friction (k):	149.32 kips
End Bearing (k):	223.99 kips
Comp. Capacity (k), ϕCn:	373.31 kips
Comp. (k), Cu:	75.40 kips
RATING:	20.2%

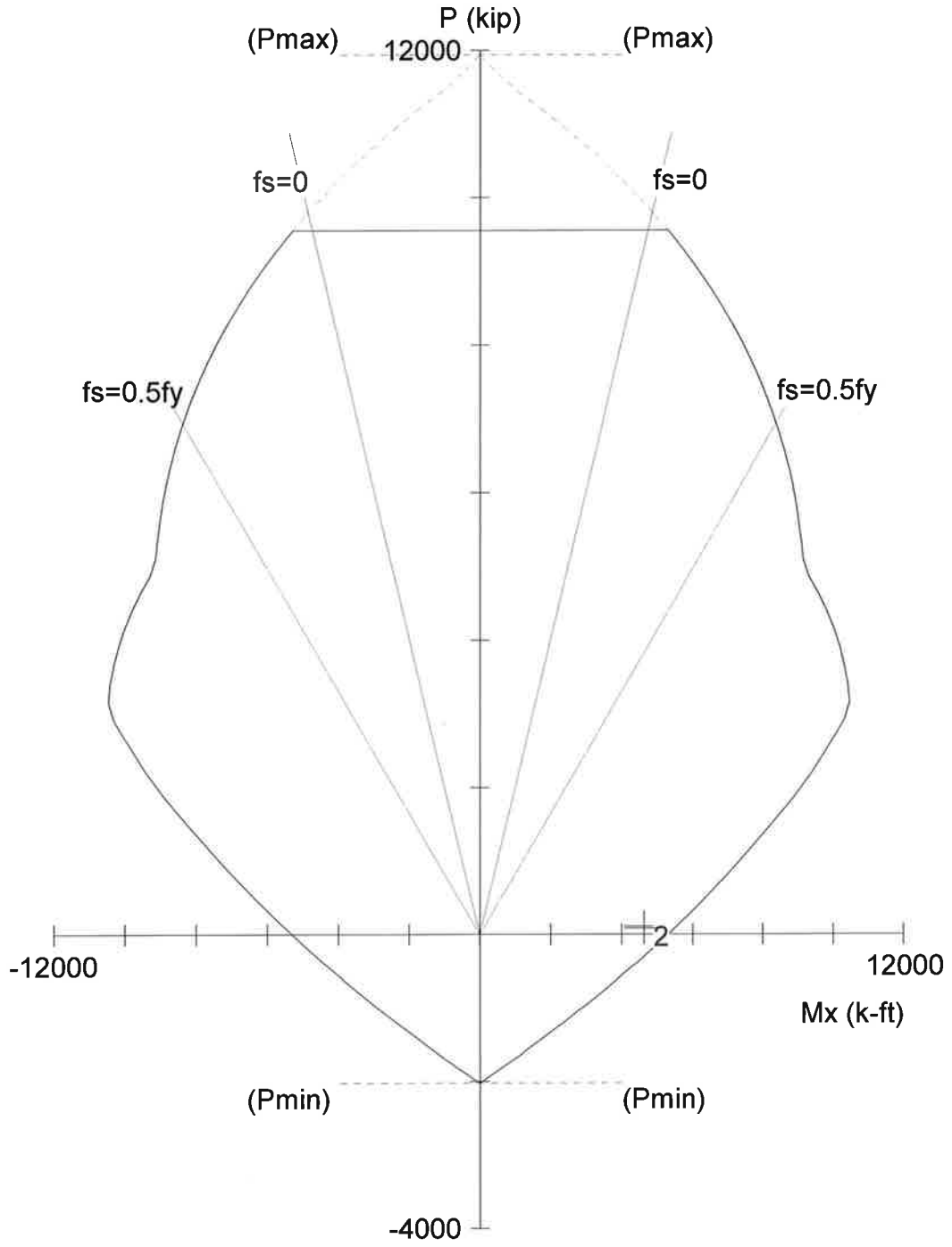
Concrete/Steel Check

Mu (from soil analysis)	4611.39 k-ft

Foundation Soil Rating: 65.4%



78 in diam.



Code: ACI 318-02

Units: English

Run axis: About X-axis

Run option: Investigation

Slenderness: Not considered

Column type: Structural

Bars: ASTM A615

Date: 09/17/15

Time: 12:56:22

spColumn v4.81. Licensed to: Black & Veatch. License ID: 62342-1042289-4-29254-26826

File: C:\Users\sie76967\Documents\Projects\Crown Castle\842859\FDN\842859.1117732 foundation steel analysis.col

Project: BU842859 WO1117732

Column:

Engineer: Andrew

f'c = 4 ksi	fy = 60 ksi	Ag = 4778.36 in^2	24 #11 bars
Ec = 3605 ksi	Es = 29000 ksi	As = 37.44 in^2	rho = 0.78%
fc = 3.4 ksi		Xo = 0.00 in	Ix = 1.81697e+006 in^4
e_u = 0.003 in/in		Yo = 0.00 in	Iy = 1.81697e+006 in^4
Beta1 = 0.85		Min clear spacing = 0.29 in	Clear cover = 4.60 in

Confinement: Tied

phi(a) = 0.8, phi(b) = 0.9, phi(c) = 0.65

(Rev 1)

General Information:
==========
File Name: C:\Users\sie76967\Documents\Projects\Crow...\842859.1117732 foundation steel analysis.col
Project: BU842859 WO1117732
Column: Engineer: Andrew
Code: ACI 318-02 Units: English

Run Option: Investigation Slenderness: Not considered
Run Axis: X-axis Column Type: Structural

Material Properties:
==========
f'c = 4 ksi fy = 60 ksi
Ec = 3605 ksi Es = 29000 ksi
Ultimate strain = 0.003 in/in
Beta1 = 0.85

Section:
==========
Circular: Diameter = 78 in

Gross section area, Ag = 4778.36 in^2
Ix = 1.81697e+006 in^4 Iy = 1.81697e+006 in^4
rx = 19.5 in ry = 19.5 in
Xo = 0 in Yo = 0 in

Reinforcement:
==========
Bar Set: ASTM A615

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

Confinement: Tied; #5 ties with #10 bars, #5 with larger bars.
phi(a) = 0.8, phi(b) = 0.9, phi(c) = 0.65

Pattern: Irregular
Total steel area: As = 37.44 in^2 at rho = 0.78% (Note: rho < 1.0%)
Minimum clear spacing = 0.29 in

Area in^2	X (in)	Y (in)	Area in^2	X (in)	Y (in)	Area in^2	X (in)	Y (in)
1.56	0.0	33.7	1.56	-33.7	0.0	1.56	31.1	12.9
1.56	23.8	-23.8	1.56	-12.9	-31.1	1.56	-12.9	31.1
1.56	-26.6	-17.8	1.56	0.0	-32.0	1.56	12.9	31.1
1.56	33.7	0.0	1.56	12.9	-31.1	1.56	-23.8	-23.8
1.56	-31.1	12.9	1.56	26.6	17.8	1.56	-26.6	17.8
1.56	32.0	0.0	1.56	23.8	23.8	1.56	31.1	-12.9
1.56	0.0	-33.7	1.56	-31.1	-12.9	1.56	-23.8	23.8
1.56	26.6	-17.8	1.56	0.0	32.0	1.56	-32.0	0.0

Factored Loads and Moments with Corresponding Capacities:
==========

No.	Pu kip	Mux k-ft	PhiMnx k-ft	PhiMn/Mu	NA depth in	Dt depth in	eps_t	Phi
1	110.00	4611.39	5541.47	1.202	13.86	72.70	0.01274	0.900
2	82.50	4611.39	5481.62	1.189	13.73	72.70	0.01289	0.900

*** End of output ***

STRESS RATIO = 1/1.189 = 84.1%

APPENDIX D

REQUIRED MODIFICATION DRAWINGS

MONOPOLE REINFORCEMENT DRAWINGS

SITE NAME: BRISTOL CENTER
BU NUMBER: 842859

SITE ADDRESS:
371 TERRYVILLE AVENUE
BRISTOL, CT 06010
HARTFORD COUNTY, USA

ATTENTION ALL CONTRACTORS

ANYTIME YOU ACCESS A CROWN SITE FOR ANY REASON YOU ARE TO CALL THE CROWN NOC UPON ARRIVAL AND DEPARTURE, DAILY AT 800-788-7011.

CODE COMPLIANCE

THIS REINFORCEMENT DESIGN IS BASED ON THE REQUIREMENTS OF TIA/EIA-222-F STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS USING A FASTEST MILE WIND SPEED OF 80 MPH WITH NO ICE, 37.6 MPH WITH 1.00 INCH ICE THICKNESS AND 50 MPH UNDER SERVICE LOADS.

TOWER INFORMATION

TOWER MANUFACTURER / DWG#:	EEI / DWG #GS54864
TOWER HEIGHT / TYPE:	168.5 FT MONOPOLE TOWER
TOWER LOCATION: DATUM: NAD 1983	LATITUDE 41° 40' 47.71" LONGITUDE -72° 57' 45.18"
STRUCTURAL DESIGN DRAWING:	B&V / WO #1159456
STRUCTURAL ANALYSIS REPORT:	AW SOLUTIONS / WO #1106751
APPLICATION ID:	307095 REV #2

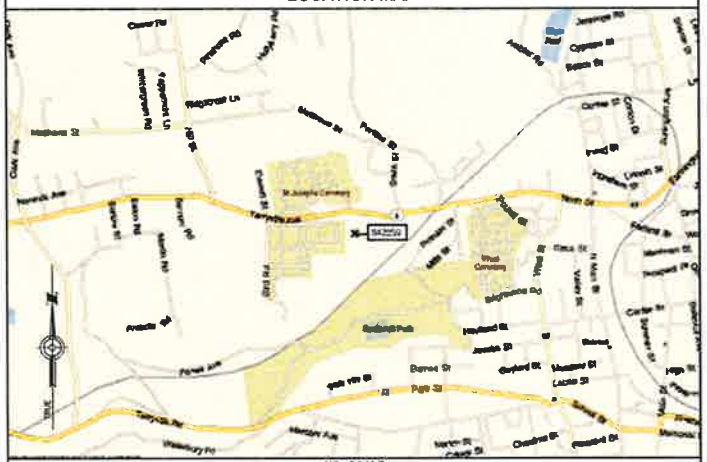
PROJECT CONTACTS

CROWN PROJECT MANAGER
DAN VADNEY
(518) 373-3510
DAN.VADNEY@CROWNCASTLE.COM

CROWN CONSTRUCTION MANAGER
JASON D'AMICO
(860) 209-0104
JASON.D'AMICO.VENDOR@CROWNCASTLE.COM

BLACK & VEATCH CONTACTS
CROWNCASTLERFI@BV.COM
PATRICK DAVIS
(913) 458-6984
ERIC S. BRANDSTADTER, P.E.
(913) 458-7360

LOCATION MAP



NO SCALE

DRIVING DIRECTIONS

FROM I-84 WEST TAKE EXIT 33 FOR CONNECTICUT 72 W TOWARD BRISTOL 0.3 MI KEEP LEFT AT THE FORK AND MERGE ONTO CT-72 W 4.1 MI TURN RIGHT ONTO CT-72 0.4 MI TAKE THE 3RD RIGHT ONTO RIVERSIDE AVE 1.0 MI TURN RIGHT ONTO N MAIN ST 0.7 MI TURN LEFT ONTO NORTH ST DESTINATION WILL BE ON THE LEFT.

DRAWING INDEX

SHEET NO:	SHEET TITLE
TM-1	TITLE PAGE
TM-2	MODIFICATION INSPECTION CHECKLIST
TM-3	NOTES
TM-4	NEXGEN2 BOLT SPECIFICATIONS & TIGHTENING PROCEDURE
TM-5	FIDRGBOLT BOLT SPECIFICATIONS & TIGHTENING PROCEDURE
TM-6	TOWER ELEVATION
TM-7	COAX FEEDLINE PLAN & SPLICE DETAIL
TM-8	TOWER SECTIONS
TM-9	TOWER SECTIONS
TM-10	CUSTOM FLAT PLATE DETAILS
TM-11	CUSTOM FLAT PLATE DETAILS
TM-12	BASE PLATE STIFFENERS
TM-13	TRANSITION STIFFENER PLATES
TM-14	TOWER FOUNDATION

DO NOT SCALE DRAWINGS

CONTRACTOR SHALL VERIFY ALL PLANS & EXISTING DIMENSIONS & CONDITIONS ON THE JOB SITE & SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME

PREPARED FOR:

CROWN CASTLE

BLACK & VEATCH
10950 GRANDVIEW DRIVE
OVERLAND PARK, KS 66210
(913) 458-2000

PROJECT NO:	182896
DRAWN BY:	TYW
CHECKED BY:	AHS

REV	DATE	DESCRIPTION
0	12/15/15	ISSUED FOR CONSTRUCTION

STATE OF CONNECTICUT
PING JIANG
J0767
PROFESSIONAL ENGINEER

12/16/2015

BU #842859
WO #1159456
BRISTOL CENTER
371 TERRYVILLE AVENUE
BRISTOL, CT 06010
HARTFORD COUNTY, USA

SHEET TITLE
TITLE PAGE

SHEET NUMBER
TM-1

MODIFICATION INSPECTION NOTES

GENERAL

1. THE MODIFICATION INSPECTION IS A VISUAL INSPECTION OF TOWER MODIFICATIONS AND A REVIEW OF CONSTRUCTION INSPECTIONS AND OTHER REPORTS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS, AS DESIGNED BY THE ENGINEER OF RECORD.
2. THE MODIFICATION INSPECTION IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION ITSELF, NOR DOES THE MODIFICATION INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTENT RESIDES WITH THE ENGINEER OF RECORD AT ALL TIMES.
3. ALL MI'S SHALL BE CONDUCTED BY A CROWN ENGINEERING SERVICE VENDOR (AESV) THAT IS APPROVED TO PERFORM ELEVATED WORK FOR CROWN. SEE CROWN ENG-BUL-10173, "APPROVED MI VENDORS".
4. TO ENSURE THAT THE REQUIREMENTS OF THE MODIFICATION INSPECTION ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MODIFICATION INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS PO OR PAYMENT IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN COMMUNICATION WITH THE OTHER PARTY. CONTACT LISTED ON TITLE SHEET SHALL BE CONTACTED IF SPECIFIC INSPECTOR CONTACT INFORMATION IS NOT KNOWN.
5. ALL REQUEST FOR INFORMATION (RFI'S) SHALL BE MADE AVAILABLE TO THE MODIFICATION INSPECTOR BY GC.
6. REFER TO CROWN ENG-SOW-10007, "MODIFICATION INSPECTION SOW", FOR FURTHER DETAILS AND REQUIREMENTS.

MODIFICATION INSPECTOR

1. THE MODIFICATION INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PURCHASE ORDER (PO) OR PAYMENT FOR THE MODIFICATION INSPECTION TO:
   - REVIEW THE REQUIREMENTS OF THE MODIFICATION INSPECTION CHECKLIST.
   - WORK WITH GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS.
   - DISCUSS ANY SITE SPECIFIC INSPECTIONS OR CONCERNS.
2. THE MODIFICATION INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL GENERAL CONTRACTOR (GC) INSPECTION AND TEST REPORTS, REVIEWING THE DOCUMENTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING THE IN-FIELD INSPECTIONS, AND SUBMITTING THE MODIFICATION INSPECTION REPORT TO CROWN.

GENERAL CONTRACTOR

1. THE GC IS REQUIRED TO CONTACT THE MODIFICATION INSPECTOR AS SOON AS RECEIVING A PO OR PAYMENT FOR THE MODIFICATION INSTALLATION OR TURNKEY PROJECT TO:
   - REVIEW THE REQUIREMENTS OF THE MODIFICATION INSPECTION CHECKLIST.
   - WORK WITH MODIFICATION INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE MODIFICATION INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS.
   - BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS.
2. THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MODIFICATION INSPECTION CHECKLIST AND CROWN ENG-SOW-10007.

RECOMMENDATIONS

1. THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING A MODIFICATION INSPECTION REPORT:
   - IT IS SUGGESTED THAT THE GC PROVIDE MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLY 10 BUSINESS DAYS, TO THE MODIFICATION INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MODIFICATION INSPECTION TO BE CONDUCTED.
   - THE GC AND MODIFICATION INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
   - WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MODIFICATION INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS.
   - IT MAY BE BENEFICIAL TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW FOUNDATION AND MODIFICATION INSPECTION(S) TO COMMENCE IN ONE SITE VISIT.
   - WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MODIFICATION INSPECTOR ON-SITE DURING THE MODIFICATION INSPECTION TO HAVE ANY DEFICIENCIES CORRECTED DURING THE INITIAL MODIFICATION INSPECTION. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MODIFICATION INSPECTION CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MODIFICATION INSPECTOR IS ON SITE.

CANCELLATION OR DELAY IN SCHEDULED MODIFICATION INSPECTION

1. IF THE GC AND MODIFICATION INSPECTOR AGREE TO A DATE ON WHICH THE MODIFICATION INSPECTION WILL BE CONDUCTED, AND EITHER PARTY CANCELS OR DELAYS, THE TOWER OWNER SHALL NOT BE RESPONSIBLE FOR COSTS, FEES, LOSS OF DEPOSITS AND/OR OTHER PENALTIES RELATED TO THE CANCELLATION OR DELAY INCURRED BY EITHER PARTY FOR ANY TIME (E.G. TRAVEL AND LODGING, COSTS OF KEEPING EQUIPMENT ON-SITE, ETC). EXCEPTIONS MAY BE MADE IN THE EVENT THAT THE DELAY/CANCELLATION IS CAUSED BY WEATHER OR OTHER CONDITIONS THAT MAY COMPROMISE THE SAFETY OF THE PARTIES INVOLVED.

CORRECTION OF FAILING MODIFICATION INSPECTION

1. IF THE MODIFICATION INSTALLATION SHOULD FAIL THE MODIFICATION INSPECTION ("FAILED MODIFICATION INSPECTION"), THE GC SHALL WORK WITH MODIFICATION INSPECTOR TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:
   - CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENTAL MODIFICATION INSPECTION.
   - OR, WITH TOWER OWNER'S APPROVAL, THE GC MAY WORK WITH ENGINEER OF RECORD TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION.

VERIFICATION INSPECTIONS

1. TOWER OWNER RESERVES THE RIGHT TO CONDUCT A VERIFICATION INSPECTION TO VERIFY THE ACCURACY AND COMPLETENESS OF PREVIOUSLY COMPLETED MODIFICATION INSPECTION(S) ON TOWER MODIFICATION PROJECTS.
2. ALL VERIFICATION INSPECTIONS SHALL BE HELD TO THE SAME SPECIFICATIONS AND REQUIREMENTS IN THE CONTRACT DOCUMENTS AND IN ACCORDANCE WITH CROWN ENG-SOW-10007.
3. VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT FIRM AFTER A MODIFICATION PROJECT IS COMPLETED, AS MARKED BY THE DATE OF AN ACCEPTED "PASSING MODIFICATION INSPECTION" OR "PASS AS NOTED MODIFICATION INSPECTION" REPORT FOR THE ORIGINAL PROJECT.

REQUIRED PHOTOS

1. BETWEEN THE GC AND THE MODIFICATION INSPECTOR, THE FOLLOWING PHOTOGRAPHS ARE TO BE TAKEN AND INCLUDED IN THE MODIFICATION INSPECTION REPORT:
   - PRE-CONSTRUCTION GENERAL SITE CONDITIONS.
   - PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION.
     - ** RAW MATERIALS
     - ** PHOTOS OF CRITICAL DETAILS
     - ** FOUNDATION MODIFICATIONS
     - ** REBAR PLACEMENT
     - ** FOUNDATION DEPTH VERIFICATION
     - ** SOIL COMPACTION PROCESS
     - ** COLD GALVANIZED VERIFICATION
     - ** GUY WIRE GROUNDING SYSTEM VERIFICATION
     - ** POST INSTALL ANCHOR DRILL HOLE DIAMETER AND DEPTH
     - ** WELD PREPARATION
     - ** WELD INSTALLATION PRIOR TO SURFACE COATING
     - ** BOLT INSTALLATION AND TORQUE
     - ** FINAL INSTALLED CONDITION
     - ** SURFACE COATING REPAIR
   - POST CONSTRUCTION PHOTOGRAPHS.
     - ** FINAL IN FIELD CONDITION
   - ANY OTHER PHOTOS DEEMED RELEVANT TO SHOW COMPLETE DETAILS OF MODIFICATION.

   THIS IS NOT A COMPLETE LIST OF REQUIRED PHOTOS PLEASE REFER TO CROWN ENG-SOW-10007.
2. PHOTOS OF ABOVE GROUND MODIFICATIONS TAKEN FROM GROUND LEVEL SHALL BE CONSIDERED INADEQUATE.

MODIFICATION INSPECTION CHECKLIST

BEFORE CONSTRUCTION		DURING CONSTRUCTION		AFTER CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED	REPORT ITEM	CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED	REPORT ITEM	CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED	REPORT ITEM
X	MODIFICATION INSPECTION CHECKLIST DRAWING	X	CONSTRUCTION INSPECTION	X	MODIFICATION INSPECTOR REDLINE OR RECORD DRAWING(S)
X	FABRICATOR QUALITY MANAGEMENT DOCUMENTATION	X	FOUNDATION INSPECTION/REBAR INSPECTION	–	POST INSTALLED ANCHOR ROD PULL-OUT TESTING (OR ALTERNATE MANUFACTURER'S APPROVED METHOD)
X	FABRICATOR CERTIFIED WELD INSPECTION	–	CONCRETE COMPRESSIVE STRENGTH AND SLUMP TESTS (7 DAY AND 28 DAY CYLINDER BREAKS – REPORT REQUIRED)	–	HELICAL PILE PULL-OUT TESTING (OR ALTERNATE MANUFACTURER'S APPROVED METHOD)
X	MATERIAL TEST REPORTS	–	POST INSTALLED ANCHOR ROD VERIFICATION	–	HOLLOW BAR ANCHOR PULL-OUT TESTING (OR ALTERNATE MANUFACTURER'S APPROVED METHOD)
–	FABRICATION NDE INSPECTION	X	BASE PLATE GROUT VERIFICATION	X	PHOTOGRAPHS
X	PACKING SLIPS	X	THIRD PARTY CERTIFIED WELD INSPECTION (NDE REPORT REQUIRED)	ADDITIONAL TESTING AND INSPECTIONS:	
X	NDE REPORT OF MONOPOLE BASE PLATE PER ENG-SOW-10033	–	EARTHWORK: LIFT PLACEMENT AND DENSITY (REPORT REQUIRED)		
ADDITIONAL TESTING AND INSPECTIONS:		X	ON-SITE COLD GALVANIZED VERIFICATION		
		–	GUY WIRE TENSION REPORT		
		X	GC AS-BUILT DOCUMENTS		
		ADDITIONAL TESTING AND INSPECTIONS:			

NOTE: NDE DENOTES NON-DESTRUCTIVE EXAMINATION

NOTE: X DENOTES A DOCUMENT REQUIRED FOR THE MODIFICATION INSPECTION REPORT
– DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE MODIFICATION INSPECTION REPORT

PREPARED FOR:

CROWN CASTLE

BLACK & VEATCH

10950 GRANDVIEW DRIVE
OVERLAND PARK, KS 66210
(913) 458-2000

PROJECT NO:	182896
DRAWN BY:	TYW
CHECKED BY:	AHS

REV	DATE	DESCRIPTION
0	12/15/15	ISSUED FOR CONSTRUCTION

STATE OF CONNECTICUT
PING JIANG
30767
LICENSED PROFESSIONAL ENGINEER

12/16/2015

BU #842859
WO #1159456
BRISTOL CENTER
371 TERRYVILLE AVENUE
BRISTOL, CT 06010
HARTFORD COUNTY, USA

SHEET TITLE
MODIFICATION INSPECTION CHECKLIST

SHEET NUMBER
TM-2

GENERAL NOTES

1. ALL WORK PRESENTED ON THESE DRAWINGS MUST BE COMPLETED BY THE CONTRACTOR UNLESS NOTED OTHERWISE. THE CONTRACTOR MUST BE EXPERIENCED IN THE PERFORMANCE OF WORK SIMILAR TO THAT DESCRIBED HEREIN. BY ACCEPTANCE OF THIS ASSIGNMENT, THE CONTRACTOR IS ATTESTING THAT HE DOES HAVE SUFFICIENT EXPERIENCE AND ABILITY, THAT HE IS KNOWLEDGEABLE OF THE WORK TO BE PERFORMED, THAT HE IS PROPERLY LICENSED, AND THAT HE IS PROPERLY REGISTERED TO DO THIS WORK IN THE STATE AND/OR COUNTY IN WHICH IT IS TO BE PERFORMED.
2. THE GENERAL NOTES AND TYPICAL DETAILS ARE APPLICABLE TO ALL PARTS OF THE STRUCTURE AND SHALL BE READ IN CONJUNCTION WITH THE STRUCTURAL DRAWINGS AND PROJECT SPECIFICATIONS.
3. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING APPROVALS FROM ALL AUTHORITIES HAVING JURISDICTION FOR THIS PROJECT AND SHALL NOTIFY THE APPLICABLE JURISDICTIONAL (STATE, COUNTY, OR CITY) ENGINEER 24 HOURS PRIOR TO THE BEGINNING OF CONSTRUCTION.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ABIDING BY ALL CONDITIONS AND REQUIREMENTS OF THE PERMITS.
5. ERECT GUARDS AND BARRIERS PER APPLICABLE LABOR AND CONSTRUCTION SAFETY REGULATIONS.
6. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS, POSSIBLE INTERFERENCES, AND DIMENSIONS BEFORE PROCEEDING WITH THE WORK. REPORT ANY AND ALL DISCREPANCIES TO THE ENGINEER OF RECORD (EOR) AND FIELD PERSONNEL IMMEDIATELY. ANY AND ALL FIELD CHANGES SHALL BE APPROVED AND DOCUMENTED BY THE EOR PRIOR TO FIELD IMPLEMENTATION.
7. ALL MATERIALS AND WORKMANSHIP SHALL BE WARRANTED FOR TWO (2) YEARS FROM THE DATE OF COMPLETED CONSTRUCTION.
8. USE ONLY THE LATEST ISSUES OF ANY APPLICABLE CODES, STANDARDS, OR REGULATIONS MENTIONED IN THE FOLLOWING NOTES AND SPECIFICATIONS, UNO.
9. ALL WORKMANSHIP SHALL BE IN ACCORDANCE WITH ANSI, ASTM, ACI, TIA, AND AISC STANDARDS AS REFERENCED IN THE APPLICABLE CODE.
10. STRUCTURAL ELEMENTS SHOWN ON THESE DRAWINGS ARE DESIGNED IN ACCORDANCE WITH APPLICABLE BUILDING CODES/STANDARDS. ALL CONSTRUCTION, EXCEPT WHERE NOTED OTHERWISE, SHALL COMPLY WITH THOSE CODES/STANDARDS.
11. ALL MATERIALS AND EQUIPMENT FURNISHED SHALL BE NEW AND OF GOOD QUALITY, FREE FROM FAULTS AND DEFECTS, AND IN CONFORMANCE WITH THE DRAWINGS. ANY AND ALL SUBSTITUTIONS MUST BE DULY APPROVED AND AUTHORIZED IN WRITING BY THE OWNER AND ENGINEER OF RECORD PRIOR TO FABRICATION AND INSTALLATION. THE CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF THE MATERIALS AND EQUIPMENT BEING SUBSTITUTED.
12. ALL MANUFACTURER'S HARDWARE ASSEMBLY INSTRUCTIONS SHALL BE FOLLOWED EXACTLY AND SHALL SUPERSEDE ANY CONFLICTING NOTES ENCLOSED HEREIN.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK. THE CONTRACTOR IS ALSO RESPONSIBLE FOR ENSURING THAT ALL CONSTRUCTION PROCEDURES MEET THE REQUIREMENTS OF OSHA, THE OWNER, AND ALL OTHER APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY REGULATIONS. CONSTRUCTION SHALL BE PERFORMED ONLY IN "GOOD WEATHER". "GOOD WEATHER" MEANS LITTLE OR NO WIND AND RAIN AND MINIMUM TEMPERATURE OF 50 DEGREES F. CONTACT ENGINEER FOR ADDITIONAL INSTRUCTIONS IF "GOOD WEATHER" CANNOT BE ACHIEVED.
14. ACCESS TO THE PROPOSED WORK SITE MAY BE RESTRICTED. THE CONTRACTOR SHALL COORDINATE INTENDED CONSTRUCTION ACTIVITY, INCLUDING WORK SCHEDULE AND MATERIAL ACCESS, WITH THE RESIDENT LEASING AGENT.
15. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO SAFEGUARD ALL EXISTING STRUCTURES OR BURIED SERVICES AFFECTED BY THIS CONSTRUCTION. CONTRACTOR IS ALSO RESPONSIBLE FOR TEMPORARILY RELOCATING ANY LINES OR STRUTS AS NECESSARY TO COMPLETE THE REQUIRED WORK.
16. STRUCTURAL DESIGN IS FOR THE COMPLETE CONDITION ONLY. THE CONTRACTOR MUST BE COGNIZANT THAT THE REMOVAL OF ANY STRUCTURAL COMPONENT OF AN EXISTING TOWER HAS THE POTENTIAL TO CAUSE THE PARTIAL OR COMPLETE COLLAPSE OF THE STRUCTURE. ALL NECESSARY PRECAUTIONS MUST BE TAKEN TO ENSURE STRUCTURAL INTEGRITY, INCLUDING, BUT NOT LIMITED TO, ENGINEERING ASSESSMENT OF CONSTRUCTION STRESSES WITH INSTALLATION MAXIMUM WIND SPEED AND/OR TEMPORARY BRACING AND SHORING.
17. DO NOT SCALE DRAWINGS.
18. FOR THIS ANALYSIS AND MODIFICATION, THE TOWER HAS BEEN ASSUMED TO BE IN GOOD CONDITION WITHOUT ANY DEFECTS. IF THE CONTRACTOR DISCOVERS ANY INDICATION OF AN EXISTING STRUCTURAL DEFECT, CONTACT THE ENGINEER OF RECORD IMMEDIATELY.
19. MODIFICATION WORK SHALL BE COMPLETED IN CALM WIND CONDITIONS / OR APPROPRIATE WIND SPEED FOR THE TYPE OF MODIFICATION WORK TO BE INSTALLED.
20. THE CLIMBING FACILITIES, SAFETY CLIMB AND ALL PARTS THEREOF SHALL NOT BE IMPEDED, MODIFIED OR ALTERED WITHOUT THE EXPRESS APPROVAL OF THE ENGINEER OF RECORD.
21. CONTRACTOR TO VERIFY REQUIRED STEEL PLATE LENGTHS FROM BOTTOM OF SECTION TO BOTTOM OF NEXT SECTION.
22. THESE DRAWINGS DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION METHODS, MEANS, TECHNIQUES, SEQUENCES AND PROCEDURES.
23. ALL CHANGES/ALTERNATES/REVISIONS TO THESE DRAWINGS SHALL BE DOCUMENTED BY REQUEST FOR INFORMATION (RFI) FORM APPROVED BY ENGINEER OF RECORD. FINAL WORK AUTHORIZATION AND ALL CHANGE ORDERS SHALL BE APPROVED BY CLIENT AND/OR CLIENT REPRESENTATIVE PRIOR TO PROCEEDING WITH ANY WORK THAT DEVIATES FROM THE ORIGINAL DESIGN, SCOPE, PRICE AND/OR SCHEDULE.
24. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN AND SHALL MEET ANSI/TIA-1019 (LATEST EDITION), OSHA, AND GENERAL INDUSTRY STANDARDS. ALL RIGGING PLANS SHALL ADHERE TO ANSI/TIA-1019 (LATEST EDITION) INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION.
25. IN THE EVENT OF AN EMERGENCY, CONTRACTOR SHALL CONTACT BLACK & VEATCH AND CROWN CASTLE PERSONNEL TO REPORT ANY EVENT OR EMERGENCY INCIDENT AT ANY CROWN CASTLE TOWER SITE PER THE CONTACT INFORMATION PROVIDED ON SHEET TM-1.

STRUCTURAL STEEL NOTES

1. DESIGN, FABRICATION, ERECTION, ALTERATION AND MAINTENANCE SHALL CONFORM TO THE FOLLOWING, UNLESS NOTED OTHERWISE (UNO).
   A. TIA-222: STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS
   B. TIA-1019-A: INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS
   C. AISC: MANUAL OF STEEL CONSTRUCTION
2. ALL STRUCTURAL ELEMENTS SHALL CONFORM TO THE FOLLOWING REQUIREMENTS, UNO.
   A. STRUCTURAL STEEL: ASTM A572 GRADE 65 (Fy = 65KSI).
   B. ALL BOLTS, ASTM A325 TYPE 1 GALVANIZED HIGH STRENGTH BOLTS.
   C. ALL NUTS, ASTM A563 CARBON AND ALLOY STEEL NUTS.
   D. ALL WASHERS, ASTM F436 HARDENED STEEL WASHERS.
3. ALL HOLES SHALL BE CUT WITH A GRINDER OR DRILLED. HOLES SHALL NOT BE FLAME CUT THRU STEEL UNLESS APPROVED BY THE ENGINEER OF RECORD.
4. ALL FASTENERS SHALL NOT BE REUSED.
5. A NUT LOCKING DEVICE SHALL BE INSTALLED ON ALL PROPOSED AND/OR REPLACED ASTM A325 BOLTS.
6. ALL PROPOSED AND/OR REPLACED BOLTS SHALL BE OF SUFFICIENT LENGTH SUCH THAT THE END OF THE BOLT BE AT LEAST FLUSH WITH THE FACE OF THE NUT. IT IS NOT PERMITTED FOR THE BOLT END TO BE BELOW THE FACE OF THE NUT AFTER TIGHTENING IS COMPLETED.
7. HOT-DIP GALVANIZE ALL ITEMS, UNO.
   GALVANIZE PER ASTM A123, ASTM A153/A153M OR ASTM A653 G90, AS APPLICABLE.
8. FOR A LIST OF CROWN APPROVED COLD GALVANIZING COMPOUNDS, REFER TO CROWN ENG-BUL-10149, "TOWER PROTECTIVE COATINGS BULLETIN".
9. AFTER FINAL INSPECTION, ALL EXPOSED STRUCTURAL STEEL AS THE RESULT OF THIS SCOPE OF WORK INCLUDING WELDS, FIELD DRILLED HOLES, AND SHAFT INTERIORS (WHERE ACCESSIBLE), SHALL BE CLEANED AND COLD GALVANIZING APPLIED BY BRUSH IN ACCORDANCE WITH CROWN ENG-BUL-10149, "TOWER PROTECTIVE COATINGS BULLETIN". PHOTO DOCUMENTATION IS REQUIRED TO BE SUBMITTED TO THE MI INSPECTOR.

WELDING NOTES

1. ALL WELDING SHALL BE IN ACCORDANCE WITH THE AWS D1.1/D1.1M, "STRUCTURAL WELDING CODE-STEEL".
2. ALL WELDING SHALL BE PERFORMED BY AWS CERTIFIED WELDERS.
3. ALL ARC WELDING ON CROWN STRUCTURES SHALL BE DONE IN ACCORDANCE WITH THE CROWN ENG-PLN-10015, "CUTTING AND WELDING SAFETY PLAN" AND AWS D1.1 (LATEST EDITION). THIS SHALL INCLUDE A CERTIFIED WELDING INSPECTOR (CWI) FOR ACCEPTANCE OR REJECTION OF ALL WELDING OPERATIONS, PRE-DURING-POST, USING THE ACCEPTANCE CRITERIA OF AWS D1.1. THE CWI SHALL WORK WITH THE GC ON THE LEVEL OF INTERACTION NEEDED TO CONDUCT THE WELDING INSPECTION. THE CERTIFIED WELDING INSPECTION IS THE RESPONSIBILITY OF THE GC.
4. FOR ALL WELDING, USE E80XX ELECTRODES FOR SMAW PROCESS AND E8XT-XX ELECTRODES FOR FCAW PROCESS, UNO.
5. SURFACES TO BE WELDED SHALL BE FREE FROM SCALE, SLAG, RUST, MOISTURE, GREASE OR ANY OTHER FOREIGN MATERIAL THAT WOULD PREVENT PROPER WELDING. GRIND THE SURFACE ADJACENT TO THE WELD FOR A DISTANCE OF 2" MINIMUM ALL AROUND. ENSURE BOTH AREAS ARE 100% FREE OF ALL GALVANIZING.
6. REPAIR THE GALVANIZED COATING. ALL AREAS AFFECTED BY THE FIELD DRILLING, FIELD GRINDING AND FIELD WELDING, BOTH INSIDE AND OUTSIDE THE MONOPOLE, SHALL BE REPAIRED PER CROWN DOCUMENT ENG-STD-10149. PRODUCTS TO BE APPLIED IN STRICT ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. AREAS THAT HAVE BEEN TOUCHED UP SHOULD BE INSPECTED AS PART OF THE ROUTINE MAINTENANCE OS THE STRUCTURE. NO SPRAY PAINT IS ALLOWED. AFTER ZINC-RICH PAINT IS DRY, OVERCOAT WITH OWNER'S PAINT SPECIFICATIONS, APPLIED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
7. DO NOT WELD IF THE TEMPERATURE OF THE STEEL IN THE VICINITY OF THE WELD AREA IS BELOW 0° F. WHEN THE TEMPERATURE IS BETWEEN 0° F AND 32° F, PREHEAT AND MAINTAIN THE STEEL IN THE VICINITY OF THE WELD AREA AT 70° F DURING THE WELDING PROCESS.
8. DO NOT WELD ON WET OR FROST-COVERED SURFACES & PROVIDE ADEQUATE PROTECTION FROM HIGH WINDS.
9. FULL PENETRATION WELDS IN THE VICINITY OF THE BASE OF THE TOWER ARE REQUIRED TO BE 100% NDE INSPECTED BY UT IN ACCORDANCE WITH AWS D1.1.
10. PARTIAL PENETRATION AND FILLET WELDS IN THE VICINITY OF THE BASE OF THE TOWER ARE REQUIRED TO BE 50% NDE INSPECTED BY MP IN ACCORDANCE WITH AWS D1.1.
11. MOVE ALL COAX AND OTHER FLAMMABLE MATERIALS FROM ANY AREA THAT MAY BE HEATED DURING CONSTRUCTION.
12. CONTRACTOR SHALL MAKE PROPER PRECAUTIONS AND PROCEDURES TO PROTECT THE STRUCTURE FROM CATCHING FIRE DURING ALL WELDING OPERATIONS. THE FOLLOWING FIRE SAFETY PREVENTION PROTOCOL IS THE MINIMUM REQUIREMENTS DURING WELDING OPERATIONS. ALSO REFERENCE CROWN DOCUMENT ENG-BUL-10172 FOR ADDITIONAL WELDING REQUIREMENTS.
    - 500 GALLON WATER TANK WITH PUMP TO BE ON SITE AT ALL TIMES.
    - 2 FIRE EXTINGUISHERS ON SITE AT ALL TIMES.
    - 2 MAN FIRE WATCH ON ANY ADJACENT STRUCTURES, FIELDS AND POLE.
    - INTERMITTENT COOLING OF WELDED SURFACE TO REDUCE HEAT IN STRUCTURE.

NEW ANCHOR ROD TARGET TENSION LOADING [1]

CROWN PART #	ROD DIAMETER (IN)	LENGTH (IN)	MATERIAL	HOLE DIAMETER (IN)	EMBEDMENT DEPTH (IN)	TARGET TENSION LOAD (KIPS)	NOTES
CCI-AR-0175	1.75	120	A193 GR B7	2	60	111	2, 3
CCI-AR-0225	2.25	132	A193 GR B7	2.5	72	190	2, 3

NOTES

1. TARGET TENSION LOAD PER SECTION 1.4.6 OF CROWN DOCUMENT ENG-PRC-10119 REVISION C: PULL-OUT TESTING POST-INSTALLED ANCHOR RODS, FOR SPECIFICATIONS.
2. CONTRACTOR MAY SUBSTITUTE F1554-105 FOR A193 GR B7.
3. MATERIAL IS TO BE ALL-THREADED ROD.

DETAIL DRAWINGS SHALL GOVERN OVER ANY VARIANCE FROM THIS SHEET

PREPARED FOR:

CROWN CASTLE

BLACK & VEATCH

10950 GRANDVIEW DRIVE
OVERLAND PARK, KS 66210
(913) 458-2000

PROJECT NO:	182896
DRAWN BY:	TYW
CHECKED BY:	AHS

REV	DATE	DESCRIPTION
0	12/15/15	ISSUED FOR CONSTRUCTION

STATE OF CONNECTICUT
PING JIANG
30767
LICENSED PROFESSIONAL ENGINEER
12/16/2015

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

BU #842859
WO #1159456
BRISTOL CENTER
371 TERRYVILLE AVENUE
BRISTOL, CT 06010
HARTFORD COUNTY, USA

SHEET TITLE

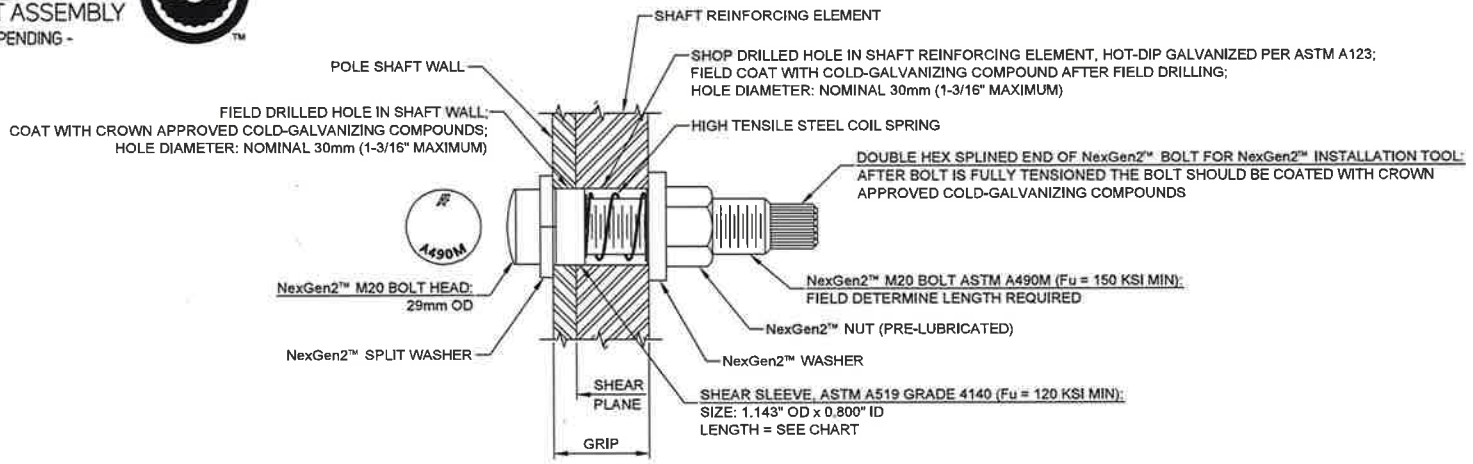
NOTES

SHEET NUMBER

TM-3

NEXGEN2 NG2
BLIND BOLT ASSEMBLY
- PATENT PENDING -

INTERIOR OF POLE SHAFT | EXTERIOR OF POLE SHAFT



TYPICAL NG2 BOLT DETAIL

PART NUMBER	BOLT LENGTH	SLEEVE LENGTH	MIN GRIP RANGE	MAX GRIP RANGE
M20x36	M20x95	11/16"	15/16"	1-7/16"
M20x48	M20x95	1-3/16"	1-7/16"	1-7/8"
M20x57	M20x95	1-5/8"	1-7/8"	2-1/4"
M20x68	M20x135	2"	2-1/4"	2-11/16"
M20x96	M20x135	2-7/16"	2-11/16"	3-3/4"
M20x127	M20x165	3"	3-3/4"	5"
M20x212	M20x250	4"	5"	8-5/16"

MANUFACTURER:
ALLFASTENERS
15401 COMMERCE PARK DRIVE, BROOKPARK, OHIO, USA 44142
PHONE: 440-232-6060
WEBSITE: WWW.ALLFASTENERS.COM

NOTE: ALL SHOP AND FIELD DRILLED HOLES SHALL BE NOMINAL 30mm DIAMETER. THE MAXIMUM HOLE DIAMETER PERMITTED IS 1-3/16".

NOTE: NexGen2™ COMPLETE ASSEMBLY SHALL BE MAGNI 565 COATED PER ASTM F2833 AS APPROPRIATE.

NOTE: INSTALL PER MANUFACTURER'S INSTRUCTIONS.

PREPARED FOR:
CROWN CASTLE

BLACK & VEATCH
10950 GRANDVIEW DRIVE
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(913) 458-2000

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STATE OF CONNECTICUT
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30767
PROFESSIONAL ENGINEER
12/16/2015

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HARTFORD COUNTY, USA

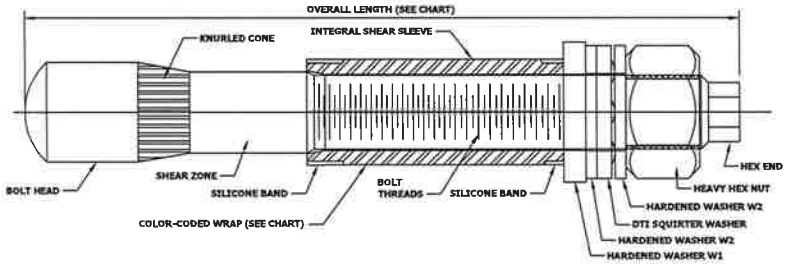
SHEET TITLE
NEXGEN2 BOLT SPECS & TIGHTENING PROCEDURE

SHEET NUMBER
TM-4

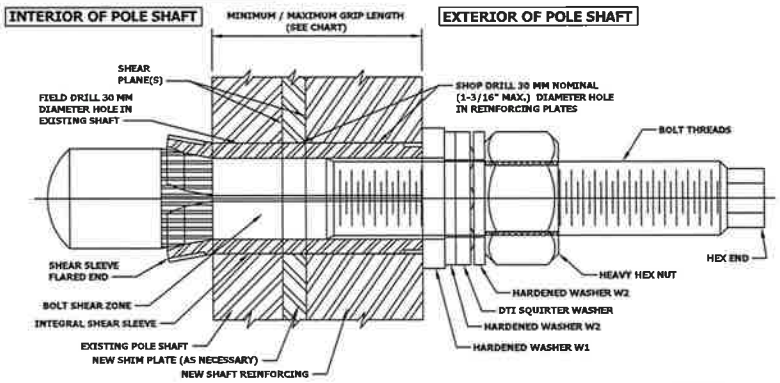
FORGBolt™ NOTE SHEET: A325/PC8.8 LANDSCAPE VERSION DATE 01/29/2015; Rev. 1.0 04/23/2015

NOTES: 1. **ALL STRUCTURAL BOLTS SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.**

2. **ALL STRUCTURAL BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.**



PRE-INSTALLED FORGBolt™ ASSEMBLY DETAIL 1



INSTALLED FORGBolt™ ASSEMBLY DETAIL 2

BOLT HOLE NOTES:

1. **ALL SHOP-DRILLED HOLES SHALL BE NOMINAL 30 MM DIAMETER. THE MAXIMUM SHOP-DRILLED HOLE DIAMETER PERMITTED IS 1-3/16".**
2. **ALL FIELD-DRILLED HOLES SHALL BE NOMINAL 30 MM DIAMETER. THE MAXIMUM FIELD-DRILLED HOLE DIAMETER PERMITTED IS 30 MM.**

DISTRIBUTOR CONTACT:
PRECISION TOWER PRODUCTS
PHONE: **888-926-4857**
EMAIL: info@precisiontowerproducts.com
WEB: www.precisiontowerproducts.com

CONTAINS PROPRIETARY INFORMATION PATENT PENDING

FORGBolt™		AISC Group A Material: ASTM A325 and PC8.8 (Tensile Stress, Fu = 120 ksi minimum)					
GROUP A		FORGBolt™ Size (mm)	Overall Length (inches)	Estimated Weight Each (lbs)	Grip Range (inch)	Comment	Color Code
FORGBolt™ A325 - PC8.8	1	**135**	5.31	1.3	3/8" to 1"	--	**RED**
	2	**160**	6.30	1.6	3/4" to 1-1/2"	--	**GREEN**
	3	**195**	7.68	1.9	1-1/4" to 2-1/4"	--	**BLUE**
	4	**260**	10.24	2.6	2" to 3-1/2"	Splice Bolt	**YELLOW**
	5	**365**	14.37	3.6	3-1/2" to 5-1/2"	Flange Jump Bolt	**ORANGE**
	6	**440**	17.32	4.3	5-1/2" to 8-1/2"	Flange Jump Bolt	**BLACK**
DTI Note		Each Group A (A325/PC8.8) FORGBolt™ assembly shall have a 'Squirter' DTI that is compatible with a M20-PC8.8 bolt.					

FORGBolt™ Installation

Follow all Manufacturer/Distributer Recommendations for Installation, Tightening, and Inspection.

1. FIELD DRILL HOLES TO 30 MM DIAMETER.
2. SELECT CORRECT BOLT SIZE FOR INSTALLATION GRIP (REFER TO PLANS).
3. INSERT BOLT ASSEMBLY THROUGH HOLES IN SHAFT REINFORCING PLATES AND SEAT THE HARDENED WASHER W1 FLUSH AGAINST OUTSIDE OF PLATE.
4. HAND TIGHTEN NUT TO FINGER TIGHT.
5. TIGHTEN NUT TO PRETENSIONED CONDITION AND UNTIL DTI SHOWS PROPER INDICATION.
6. PROPERLY DOCUMENT AND INSPECT BOLT TIGHTENING PER PLAN REQUIREMENTS.

PREPARED FOR:

CROWN CASTLE

BLACK & VEATCH
10950 GRANDVIEW DRIVE
OVERLAND PARK, KS 66210
(913) 458-2000

PROJECT NO:	182896
DRAWN BY:	TYW
CHECKED BY:	AHS

REV	DATE	DESCRIPTION
0	12/13/13	ISSUED FOR CONSTRUCTION

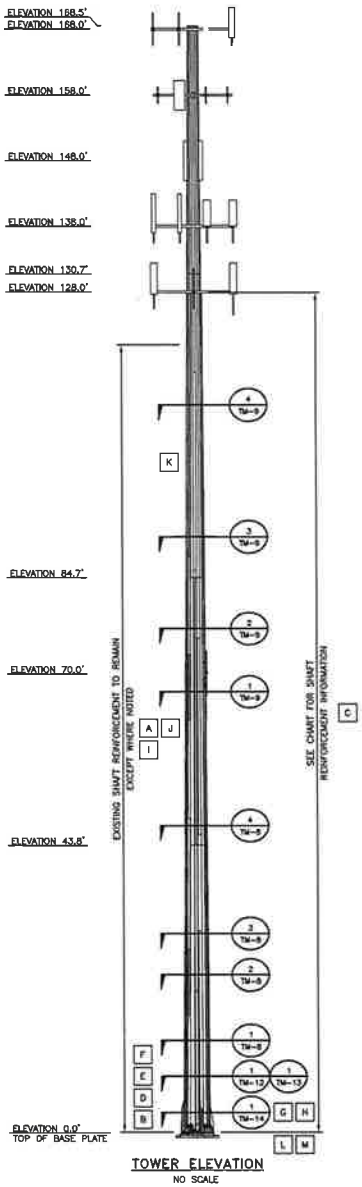
STATE OF CONNECTICUT · PING JIANG · 30767 · PROFESSIONAL ENGINEER

12/16/2015

BU #842859
WO #1159456
BRISTOL CENTER
371 TERRYVILLE AVENUE
BRISTOL, CT 06010
HARTFORD COUNTY, USA

SHEET TITLE
FORGBOLT BOLT SPECS & TIGHTENING PROCEDURE

SHEET NUMBER
TM-5



TOWER ELEVATION

NO SCALE

POLE MODIFICATION SCHEDULE

CALLOUT	ELEVATION (FT)	MODIFICATION	REFERENCE SHEET
A	0.0 – 84.8	REMOVE EXISTING FLAT PLATE REINFORCEMENT ON FLATS 1, 7, 10, & 16	TM-8 & TM-9
B	0.0	REMOVE (20) EXISTING 1/2" THICK BASE PLATE STIFFENER PLATES	TM-12 & TM-13
C	1.3 – 127.9	INSTALL NEW FLAT PLATE REINFORCEMENT	TM-8, TM-9, TM-10, & TM-11
D	0.0	INSTALL (16) NEW 3/4" THICK BASE PLATE STIFFENER PLATES	TM-12
E	0.0	INSTALL (4) NEW 1 1/4" THICK TRANSITION STIFFENER PLATES	TM-13
F	0.0	INSTALL (4) NEW #11 A615 GR 75 HOT DIP GALVANIZED ALL-THREAD BAR 228" EMBEDMENT	TM-14
G	0.0	REMOVE AND REPLACE EXISTING BASE PLATE GROUT	TM-12 & TM-13
H	0.0	REPAIR EXISTING TRANSITION STIFFENER HORIZONTAL WELD	TM-13
I	0.75 – 115.8	SURFACE CORROSION WAS FOUND ON EXISTING STEP PEG BRACKETS AND TOWER MODIFICATIONS; CLEAN AREAS OF SURFACE CORROSION AND APPLY CROWN APPROVED BRUSH-ON GALVANIZING PRODUCT	-
J	0.75 – 115.8	65% OF EXISTING AJAX BOLTS ON PREVIOUS TOWER SHAFT MODIFICATIONS WERE FOUND TO BE LOSE OR SPINNING; TIGHTEN ALL AJAX BOLTS PER THE "TURN OF THE NUT" METHOD	-
K	115.7	AN EMPTY BOLT HOLE WAS OBSERVED IN THE TOWER AT THE 115'-8" ELEVATION; FILL HOLE WITH NEW BOLT	-
L	0.0	REMOVE ALL TRASH AND DEBRIS FROM INSIDE THE TOWER	-
M	0.0	REMOVE ANY SURFACE CORROSION INSIDE BASE OF MONOPOLE WITH A WIRE BRUSH AND APPLY CROWN APPROVED BRUSH-ON GALVANIZING PRODUCT	-

CONTRACTOR SHALL FIELD VERIFY AND MEASURE DIMENSIONS OF THE SITE STRUCTURE BEFORE FABRICATION OF MATERIALS FOR ALL TOWER MODIFICATION INSTALLATIONS.

CCI FLAT PLATE (65 KSI) REINFORCEMENT SCHEDULE

BOTTOM ELEVATION	TOP ELEVATION	PART NUMBER	FLATS / DEGREES (°)	TERMINATION BOLTS (BOTTOM)	TERMINATION BOLTS (TOP)	MAX INTERMEDIATE BOLT SPACING	BOLT QUANTITY PER PLATE	STEEL WEIGHT PER PLATE (BLACK)	TOTAL BOLT QUANTITY	TOTAL STEEL WEIGHT (BLACK)
1'-3"	21'-8"	CFP-060100203	1, 7, 10, 16	8	8	1'-0"	31	413.0	124	1652.0
21'-8"	43'-9"	CFP-060100222	1, 7, 10, 16	8	8	1'-0"	35	452.0	140	1808.0
43'-9"	64'-3"	CFP-045100205	1, 7, 10, 16	6	6	1'-0"	30	312.0	120	1248.0
64'-3"	84'-8"	CFP-045100204	1, 7, 10, 16	6	6	1'-0"	30	311.0	120	1244.0
17'-10"	27'-10"	CCI-SFP-04510010	3, 8, 14, 18	6	6	1'-8"	16	153.0	64	612.0
62'-11"	72'-11"	CCI-SFP-04510010	3, 8, 14, 18	6	6	1'-8"	16	153.0	64	612.0
87'-11"	107'-11"	CCI-SFP-04510020	3, 8, 14	6	6	1'-8"	22	306.0	66	918.0
107'-11"	127'-11"	CCI-SFP-04510020	3, 8, 14	6	6	1'-8"	22	306.0	66	918.0
								TOTAL	868*	9012.0

* NOTE: TOTAL BOLT COUNT INCLUDES EXTRA BOLTS FOR NEW SPLICES BETWEEN NEW AND EXISTING PLATE REINFORCEMENT. PRELIMINARY BOLT QUANTITIES ARE ALSO INCLUDED FOR CUSTOM FLAT PLATES (CFP). CONTRACTOR TO FIELD VERIFY ACTUAL QUANTITY OF BOLTS REQUIRED.

NOTES FOR CROWN REINFORCING (65 KSI) MATERIAL

1. DO NOT WELD WITHOUT APPROVAL FROM THE EOR.
2. SHIMS FOR MONOPOLE REINFORCEMENT MEMBER SHALL BE REQUIRED WHERE GAPS BETWEEN THE POLE SHAFT AND REINFORCING MEMBER EXIST AT FASTENER LOCATIONS. FOR INTERMEDIATE CONNECTIONS, THE MINIMUM SHIM LENGTH AND WIDTH SHALL BE THE WIDTH OF THE REINFORCING MEMBER. FOR TERMINATION CONNECTIONS, A CONTINUOUS SHIM PLATE (PREFERRED) OR EQUIVALENT INDIVIDUAL SHIM PLATES THE WIDTH OF THE REINFORCING MEMBER MAY BE USED. SHIM THICKNESS SHALL BE NO LESS THAN 1/16". STACKING OF SHIMS IS PERMITTED. TIGHTENING BOLTS TO COLD BEND THE STEEL PLATES IN LIEU OF SHIMS IS STRICTLY PROHIBITED AND WILL BE CAUSE FOR REJECTION.
3. ALL FLAT PLATE REINFORCEMENT IS TO BE INSTALLED CENTERED ON ITS DESIGNATED FLAT, UNO.
4. SEE CMRP 65 KSI PARTS CATALOG 2nd EDITION AND SHEET TM-10 & TM-11 FOR PART DETAILS.
5. TOWER SHAFT REINFORCEMENTS MAY BE INSTALLED WITH ALLFASTENERS NEXGEN2 BLIND BOLT ASSEMBLY, AS DETAILED ON SHEET TM-4, OR FORGBOLTS, AS DETAILED ON SHEET TM-5.
6. THE FOLLOWING ELEVATION TOLERANCES ARE ACCEPTABLE. ANY FURTHER DEVIATIONS REQUIRE EOR REVIEW AND APPROVAL.
   - FOR PROPOSED FLAT PLATE REINFORCEMENTS THAT ARE TO START WITHIN 5'-0" FROM THE TOP OF THE BASE PLATE, A ± 1" VERTICAL TOLERANCE FROM THE "BOTTOM ELEVATION" LISTED IN THE TABLE ABOVE IS ACCEPTABLE.
   - FOR ALL OTHER PROPOSED FLAT PLATE REINFORCEMENT ELEVATIONS LISTED ABOVE, A ± 3" VERTICAL TOLERANCE IS ACCEPTABLE.

PREPARED FOR:

CROWN CASTLE

BLACK & VEATCH

10950 GRANDVIEW DRIVE
OVERLAND PARK, KS 66210
(913) 458-2000

PROJECT NO:	182895
DRAWN BY:	TYW
CHECKED BY:	AHS

REV	DATE	DESCRIPTION
0	12/15/15	ISSUED FOR CONSTRUCTION

STATE OF CONNECTICUT
PING JIANG
30767
LICENSED PROFESSIONAL ENGINEER
12/16/2015

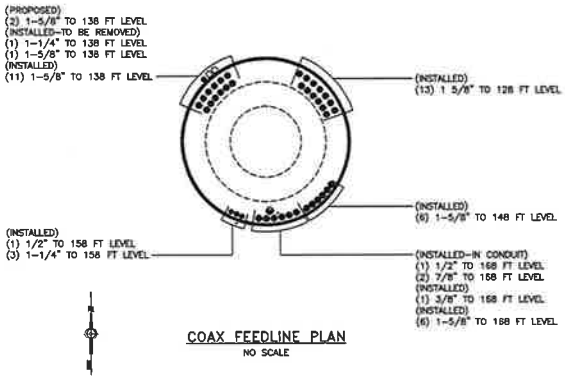
BU #842859
WO #1159456
BRISTOL CENTER
371 TERRYVILLE AVENUE
BRISTOL, CT 06010
HARTFORD COUNTY, USA

SHEET TITLE

TOWER ELEVATION

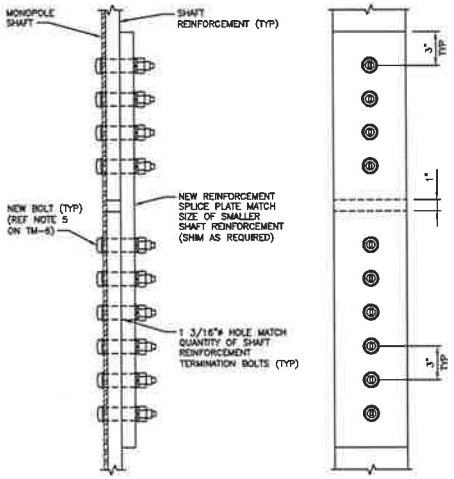
SHEET NUMBER

TM-6



COAX FEEDLINE PLAN
NO SCALE

EXISTING FEEDLINE PLAN SHOWN ON THIS DRAWING IS BASED ON CURRENT BEST KNOWLEDGE OF THE EXISTING CONDITION. IF THE EXISTING FEEDLINE LAYOUT IS NOT AS SHOWN ON THIS DRAWING CONTRACTOR SHALL NOTIFY ENGINEER.



REINFORCED SPLICE PLATE DETAIL
NO SCALE

PREPARED FOR:

CROWN CASTLE

BLACK & VEATCH
10950 GRANDVIEW DRIVE
OVERLAND PARK, KS 66210
(913) 458-2000

PROJECT NO:	182896
DRAWN BY:	TYW
CHECKED BY:	AHS

REV	DATE	DESCRIPTION
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BRISTOL CENTER
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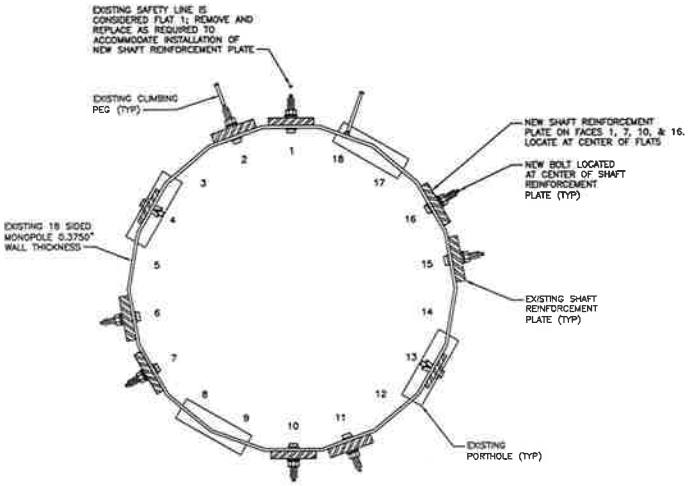
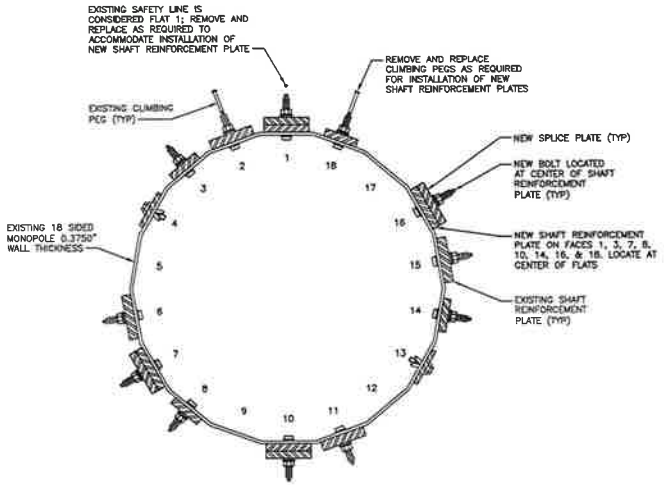
SHEET TITLE
COAX FEEDLINE PLAN & SPLICE DETAIL

SHEET NUMBER
TM-7



SECTION 1
NO SCALE



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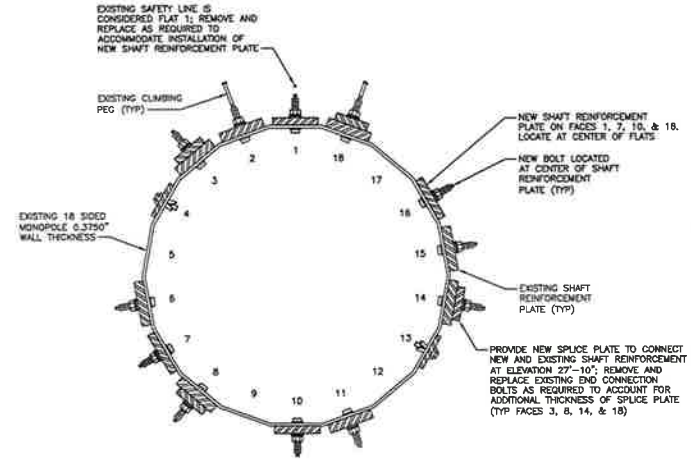

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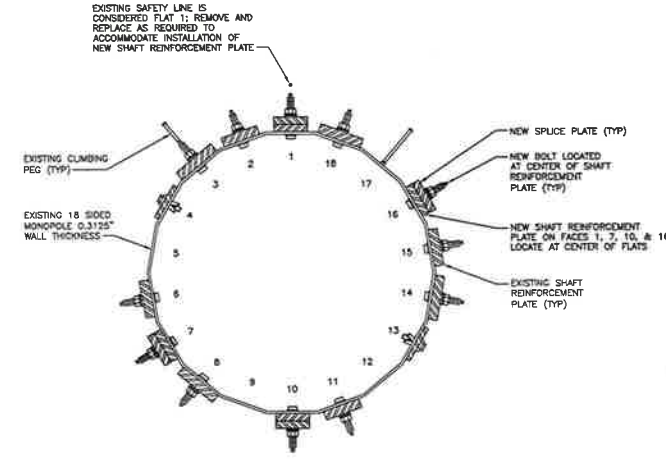


SECTION 4
NO SCALE

PREPARED FOR:

CROWN CASTLE

BLACK & VEATCH

10950 GRANDVIEW DRIVE
OVERLAND PARK, KS 66210
(913) 458-2000

PROJECT NO:	182896
DRAWN BY:	TYW
CHECKED BY:	AHS

REV	DATE	DESCRIPTION
0	12/15/15	ISSUED FOR CONSTRUCTION

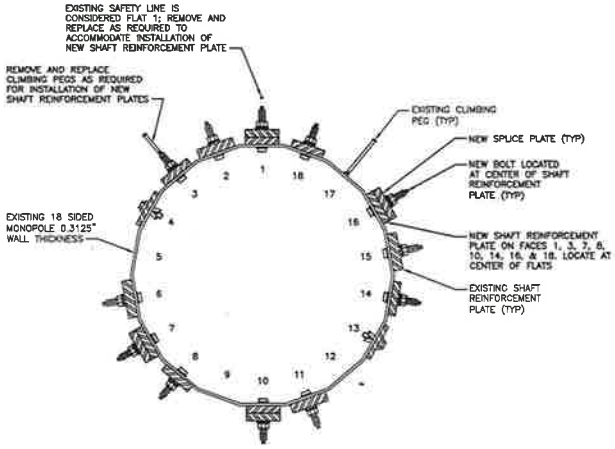
STATE OF CONNECTICUT
PING JIANG
J0767
PROFESSIONAL ENGINEER
12/16/2015

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

BU #842859
WO #1159456
BRISTOL CENTER
371 TERRYVILLE AVENUE
BRISTOL, CT 06010
HARTFORD COUNTY, USA

SHEET TITLE
TOWER SECTIONS

SHEET NUMBER
TM-8



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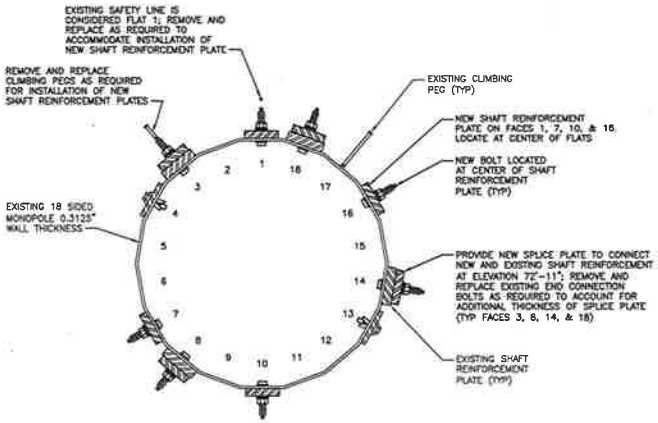
NO SCALE



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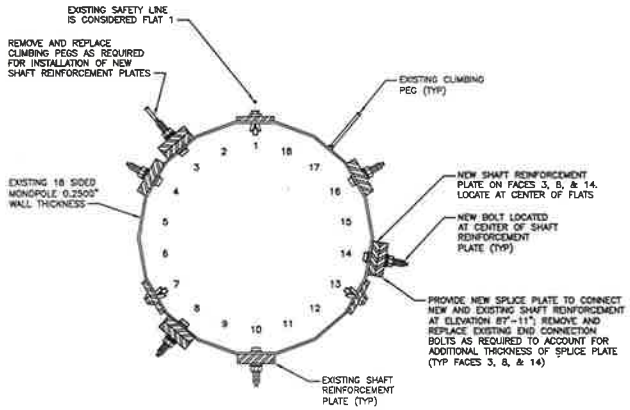
NO SCALE



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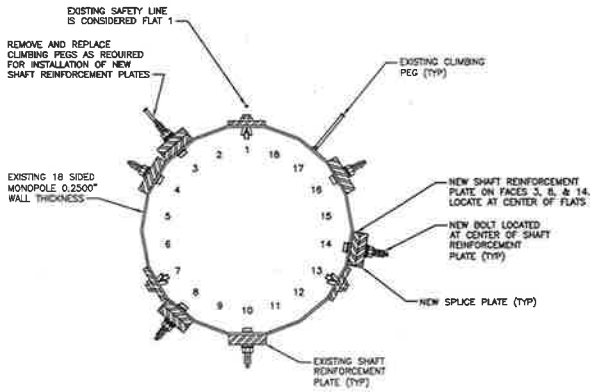
NO SCALE



SECTION 4
NO SCALE

PREPARED FOR:

CROWN CASTLE

BLACK & VEATCH

10950 GRANDVIEW DRIVE
OVERLAND PARK, KS 66210
(913) 458-2000

PROJECT NO:	182896
DRAWN BY:	TYW
CHECKED BY:	AHS

REV	DATE	DESCRIPTION
0	12/15/15	ISSUED FOR CONSTRUCTION

STATE OF CONNECTICUT
PING JIANG
30767
LICENSED PROFESSIONAL ENGINEER

12/16/2015

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BU #842859
WO #1159456
BRISTOL CENTER
371 TERRYVILLE AVENUE
BRISTOL, CT 06010
HARTFORD COUNTY, USA

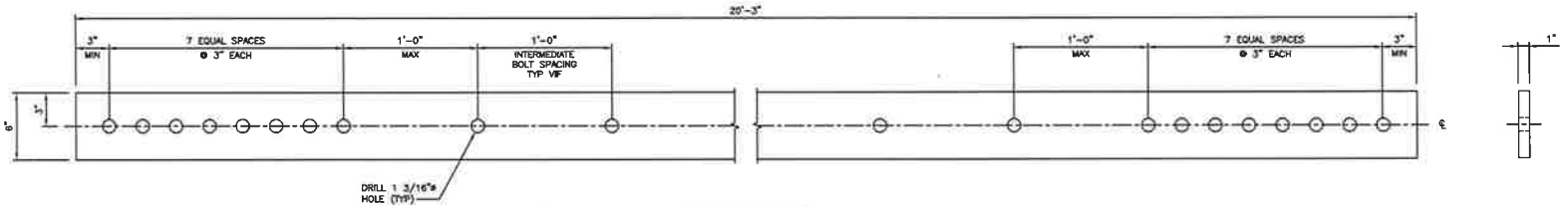
SHEET TITLE
TOWER SECTIONS

SHEET NUMBER
TM-9

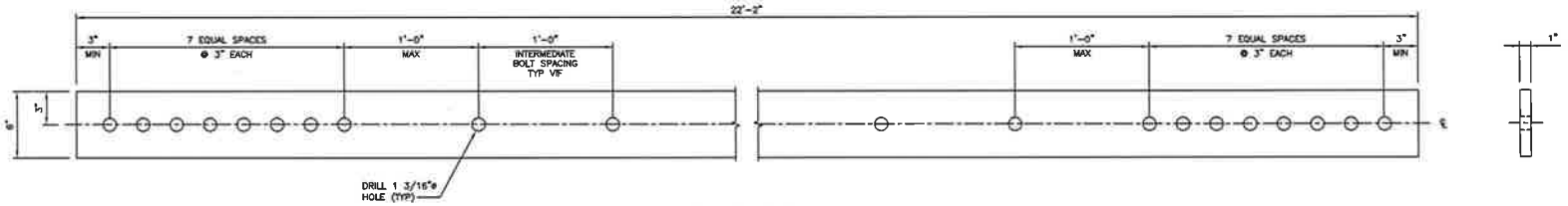
AFTER REMOVING EXISTING REINFORCEMENT ON FLATS 1, 7, 10, 16 CONTRACTOR TO MATCH EXISTING BOLT HOLES ON TOWER WITH HOLES IN NEW FLAT PLATE REINFORCEMENT. HOLE LOCATIONS SHOWN HERE ARE PRELIMINARY AND BASED ON CURRENT KNOWLEDGE OF EXISTING REINFORCEMENTS. CONTRACTOR SHALL FIELD VERIFY LOCATIONS OF EXISTING HOLES PRIOR TO FABRICATION. REAM OUT EXISTING HOLES IN TOWER SHAFT AS REQUIRED TO ALLOW FOR NEW BOLT INSTALLATION. ALL BOLTS TO BE A MINIMUM 3" FROM ADJACENT BOLTS OR BOLT HOLES.

NOTES

1. ALL HOLES ARE TO BE DRILLED, DO NOT BURN OR PUNCH.
2. TOLERANCES: FRACTIONS ± 1/16"
   ANGLES ± 1/2 DEGREE
   DECIMALS ± .010"
3. THE 65 KSI MATERIAL SHALL CONFORM TO THE FOLLOWING.
   A. MATERIAL SHALL BE ASTM A572 HAVING A MINIMUM TENSILE STRENGTH (Fu) OF 80 KSI AND A MINIMUM YIELD STRENGTH (Fy) OF 65 KSI.
   B. THE FINISH SHALL BE HOT-DIPPED GALVANIZED PER ASTM A123.



#CFP-060100203
CUSTOM FLAT PLATE
(4) PL 1"x6"x20'-3" (A572-65)
NO SCALE



#CFP-060100222
CUSTOM FLAT PLATE
(4) PL 1"x6"x22'-2" (A572-65)
NO SCALE

PREPARED FOR:

CROWN CASTLE

BLACK & VEATCH

10950 GRANDVIEW DRIVE
OVERLAND PARK, KS 66210
(913) 458-2000

PROJECT NO:	182896
DRAWN BY:	TYW
CHECKED BY:	AHS

BDV	DATE	DESCRIPTION
0	12/15/15	ISSUED FOR CONSTRUCTION

STATE OF CONNECTICUT
PING JIANG
30767
LICENSED PROFESSIONAL ENGINEER
12/16/2015

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BU #842859
WO #1159456
BRISTOL CENTER
371 TERRYVILLE AVENUE
BRISTOL, CT 06010
HARTFORD COUNTY, USA

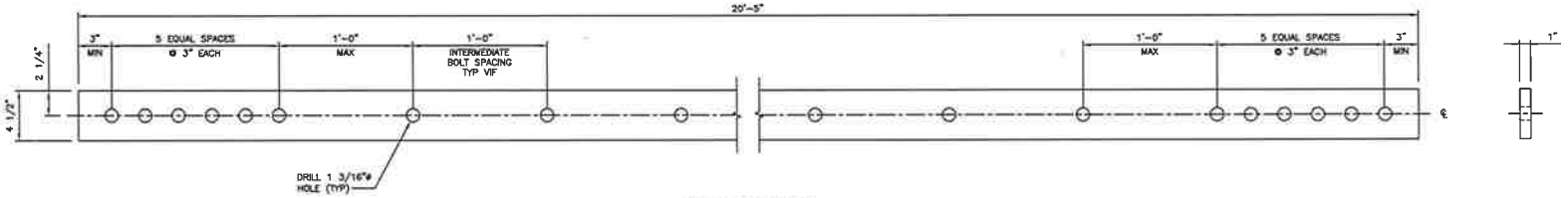
SHEET TITLE
CUSTOM FLAT PLATE DETAILS

SHEET NUMBER
TM-10

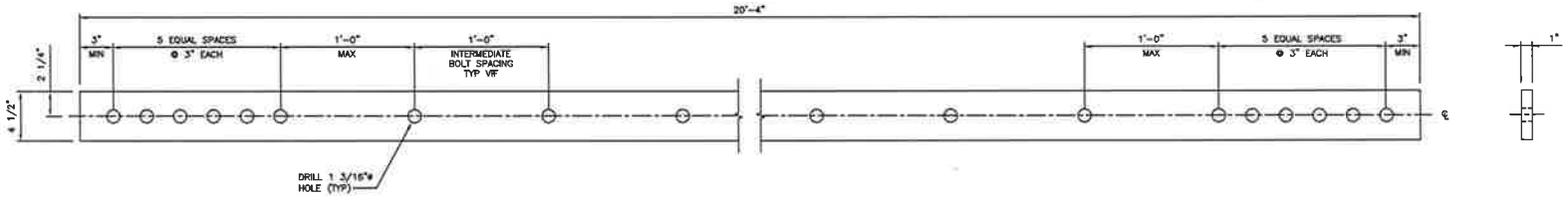
AFTER REMOVING EXISTING REINFORCEMENT ON FLATS 1, 7, 10, 16 CONTRACTOR TO MATCH EXISTING BOLT HOLES ON TOWER WITH HOLES IN NEW FLAT PLATE REINFORCEMENT. HOLE LOCATIONS SHOWN HERE ARE PRELIMINARY AND BASED ON CURRENT KNOWLEDGE OF EXISTING REINFORCEMENTS. CONTRACTOR SHALL FIELD VERIFY LOCATIONS OF EXISTING HOLES PRIOR TO FABRICATION. REAM OUT EXISTING HOLES IN TOWER SHAFT AS REQUIRED TO ALLOW FOR NEW BOLT INSTALLATION. ALL BOLTS TO BE A MINIMUM 3" FROM ADJACENT BOLTS OR BOLT HOLES.

NOTES

1. ALL HOLES ARE TO BE DRILLED. DO NOT BURN OR PUNCH.
2. TOLERANCES: FRACTIONS ± 1/16"
   ANGLES ± 1/2 DEGREE
   DECIMALS ± .010"
3. THE 65 KSI MATERIAL SHALL CONFORM TO THE FOLLOWING.
   A. MATERIAL SHALL BE ASTM A572 HAVING A MINIMUM TENSILE STRENGTH (Fu) OF 80 KSI AND A MINIMUM YIELD STRENGTH (Fy) OF 65 KSI.
   B. THE FINISH SHALL BE HOT-DIPPED GALVANIZED PER ASTM A123.



#CFP-045100205
CUSTOM FLAT PLATE
(4) PL 1"x4 1/2"x20'-5" (A572-65)
NO SCALE



#CFP-045100204
CUSTOM FLAT PLATE
(4) PL 1"x4 1/2"x20'-4" (A572-65)
NO SCALE

PREPARED FOR:

CROWN CASTLE

BLACK & VEATCH

10950 GRANDVIEW DRIVE
OVERLAND PARK, KS 66210
(913) 458-2000

PROJECT NO:	182896
DRAWN BY:	TYW
CHECKED BY:	AHS

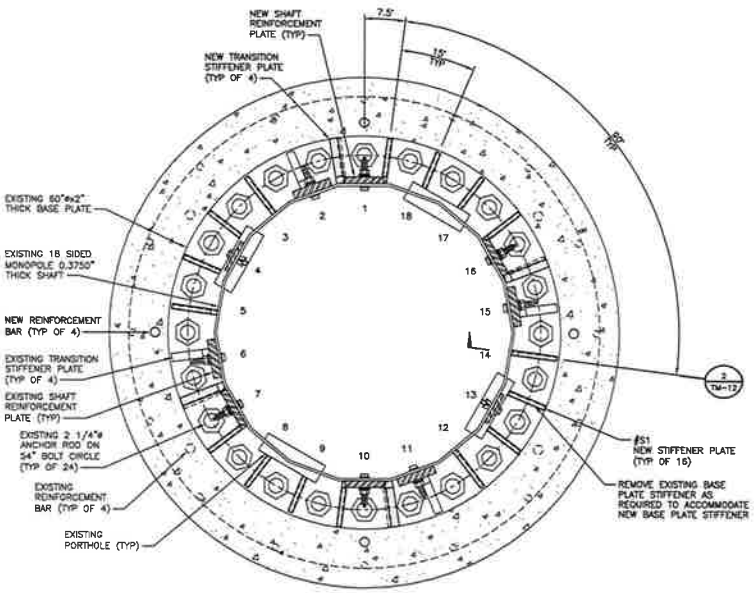
REV	DATE	DESCRIPTION
0	12/15/15	ISSUED FOR CONSTRUCTION

STATE OF CONNECTICUT
PING JIANG
30767
REGISTERED
PROFESSIONAL ENGINEER
12/16/2015

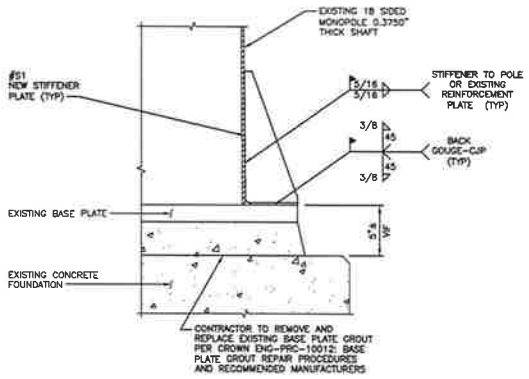
BU #842859
WO #1159456
BRISTOL CENTER
371 TERRYVILLE AVENUE
BRISTOL, CT 06010
HARTFORD COUNTY, USA

SHEET TITLE
CUSTOM FLAT PLATE DETAILS

SHEET NUMBER
TM-11



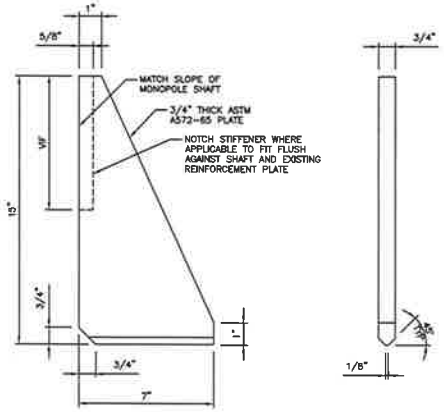
SECTION 1
BASE PLATE STIFFENER PLAN
NO SCALE



SECTION 2
NO SCALE

NOTES

1. FIELD LOCATE STIFFENER PLATES EVENLY SPACED ABOUT SHAFT AS SHOWN AND AS REQUIRED TO AVOID EXISTING INTERFERENCES.
2. ALL NEW PLATES SHALL BE HOT-DIPPED GALVANIZED.



#S1
STIFFENER PLATE
NO SCALE

PREPARED FOR:
CROWN CASTLE

BLACK & VEATCH
10950 GRANDVIEW DRIVE
OVERLAND PARK, KS 66210
(913) 458-2000

PROJECT NO:	182896
DRAWN BY:	TYW
CHECKED BY:	AHS

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STATE OF CONNECTICUT
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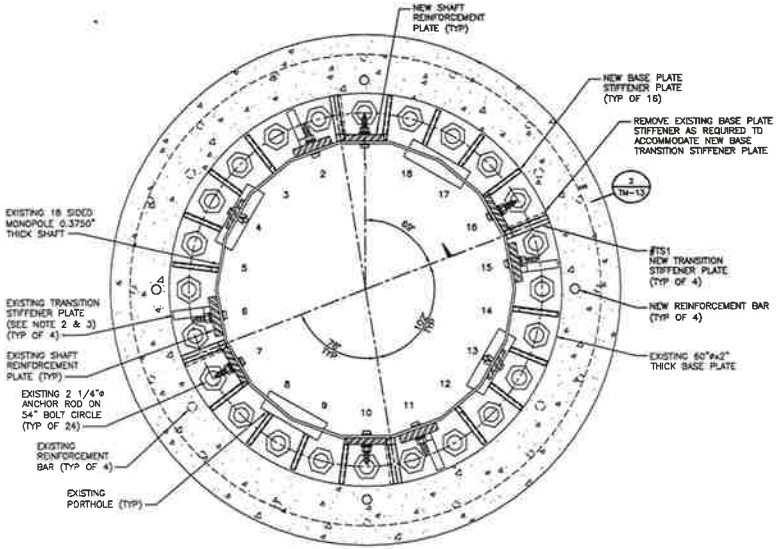
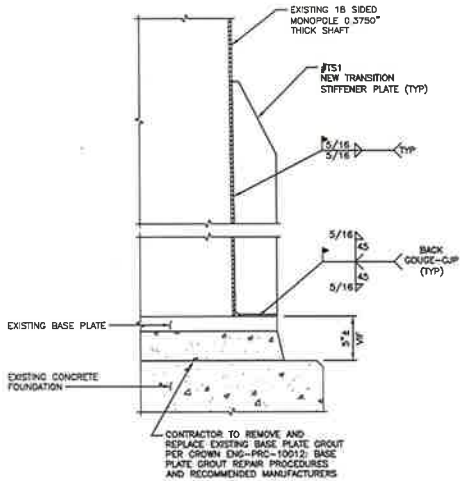
BU #842859
WO #1159456
BRISTOL CENTER
371 TERRYVILLE AVENUE
BRISTOL, CT 06010
HARTFORD COUNTY, USA

SHEET TITLE
BASE PLATE STIFFENERS

SHEET NUMBER
TM-12



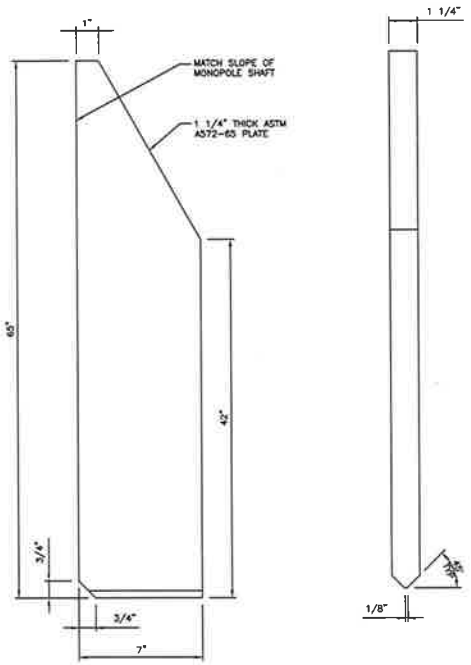
SECTION 1
TRANSITION STIFFENER PLATE PLAN
NO SCALE



SECTION 2
NO SCALE

NOTES

1. ALL NEW PLATES SHALL BE HOT-DIPPED GALVANIZED.
2. UNDERCUT GREATER THAN 1/16" WAS OBSERVED ON EXISTING TRANSITION STIFFENER HORIZONTAL WELD. UNACCEPTABLE PORTIONS OF WELD SHALL BE REMOVED WITHOUT SUBSTANTIAL REMOVAL OF THE BASE METAL. THE SURFACES SHALL BE CLEANED THOROUGHLY BEFORE WELDING. WELD METAL SHALL BE DEPOSITED TO COMPENSATE FOR DEFICIENCY IN SIZE.
3. CLEAN AREAS OF SURFACE CORROSION ON EXISTING TRANSITION STIFFENERS WITH A STEEL BRUSH AND APPLY 2 COATS OF A CROWN APPROVED BRUSH-ON GALVANIZED PRODUCT.



#TS1
TRANSITION STIFFENER PLATE
NO SCALE

PREPARED FOR:

CROWN CASTLE

BLACK & VEATCH

10950 GRANDVIEW DRIVE
OVERLAND PARK, KS 66210
(913) 458-2000

PROJECT NO:	182896
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REV	DATE	DESCRIPTION
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STATE OF CONNECTICUT
PING JIXING
30767
LICENSED PROFESSIONAL ENGINEER
12/16/2015

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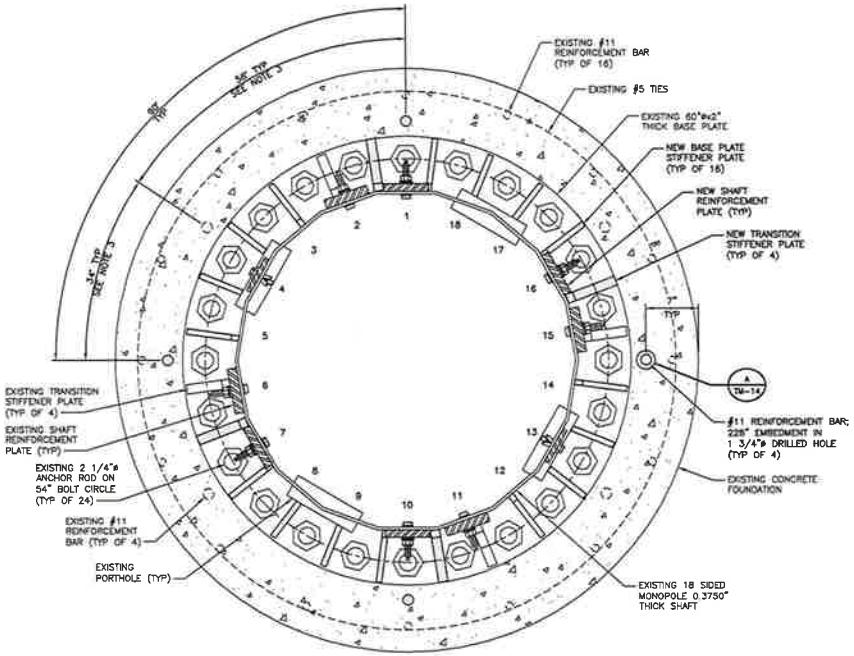
BU #842859
WO #1159456
BRISTOL CENTER
371 TERRYVILLE AVENUE
BRISTOL, CT 06010
HARTFORD COUNTY, USA

SHEET TITLE
TRANSITION STIFFENER PLATES

SHEET NUMBER
TM-13

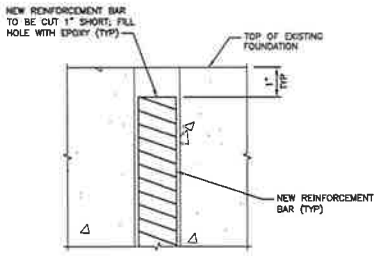
NOTES

1. REINFORCING STEEL SHALL BE A615 GR 75 HOT DIP GALVANIZED AL-THREAD BAR WILLIAMS R61 (OR EQUIVALENT).
2. NEW REINFORCEMENT BARS TO BE DRILLED AND EPOXIED INTO FOUNDATION USING HILTI HIT-RE 500-SD EPOXY PER MANUFACTURER'S SPECIFICATIONS.
3. CONTRACTOR TO FIELD VERIFY LOCATION OF EXISTING #11 REINFORCEMENT BAR AND INSTALL NEW #11 REINFORCEMENT BAR ACCORDINGLY.



*** CONTRACTOR TO X-RAY FOUNDATION TO VERIFY LOCATION OF EXISTING REINFORCEMENT. IF EXISTING REINFORCEMENT VARIES FROM THAT SHOWN, NOTIFY ENGINEER.**
*** PLACE NEW REINFORCEMENT SO AS NOT TO INTERFERE WITH EXISTING REINFORCEMENT.**

SECTION 1
FOUNDATION MODIFICATION PLAN
NO SCALE



DETAIL A
NO SCALE

PREPARED FOR:

CROWN CASTLE

BLACK & VEATCH
10950 GRANDVIEW DRIVE
OVERLAND PARK, KS 66210
(913) 458-2000

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WO #1159456
BRISTOL CENTER
371 TERRYVILLE AVENUE
BRISTOL, CT 06010
HARTFORD COUNTY, USA

SHEET TITLE
TOWER FOUNDATION

SHEET NUMBER
TM-14