Robinson+Cole

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Also admitted in Massachusetts

September 1, 2015

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

Re: **Notice of Exempt Modification – Facility Modification**
36 Prospect Street, Newington, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains fifteen (15) antennas at the 106-foot level of the existing 136-foot tower at 36 Prospect Street in Newington, Connecticut (the "Property"). The tower is owned by Crown Castle ("Crown"). The Council approved Cellco's use of this tower in 2001. Cellco now intends to replace nine (9) of its existing antennas with three (3) model SBNHH-1D65B, 700 MHz antennas; three (3) model SBNHH-1D65B, 1900 MHz antennas; and three (3) model SBNHH-1D65B, 2100 MHz antennas, all at the same level on the tower. Cellco also intends to replace three (3) existing remote radio heads ("RRHs"), and install six (6) additional 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 Newington's Mayor Stephen Woods. A copy of this letter is also being sent to Global Signal Acquisitions IV LLC, the owner of the Property, and Crown, the tower owner.

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

1. The proposed modifications will not result in an increase in the height of the existing tower. Cellco's replacement antennas and RRH's will be located on its existing platform at the 106-foot level on the tower.

2. The proposed modifications will not involve any change to ground-mounted equipment and, therefore, will not require the extension of the site boundary.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.

4. The operation of the replacement antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. A cumulative worst-case General Power Density table for Cellco's modified facility is included in Attachment 2.

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

6. The tower and its foundation can support Cellco's proposed modifications. (*See* Tower Analysis Report included in Attachment 3).

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

Sincerely,

Kenneth C. Baldwin

Enclosures
Copy to:
Stephen Woods, Newington Mayor
Global Signal Acquisitions IV LLC
Crown Castle
Tim Parks

ATTACHMENT 1

Product Specifications

COMMSCOPE®

POWERED BY ANDREW.

SBNHH-1D65B

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

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

Electrical Specifications

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

Electrical Specifications, BASTA*

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

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

General Specifications

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

Product Specifications

SBNHH-1D65B

Mechanical Specifications

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

Dimensions

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

Remote Electrical Tilt (RET) Information

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

Regulatory Compliance/Certifications

Agency	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 scissor top bracket set and one bottom bracket set.

* Footnotes

Performance Note	Severe environmental conditions may degrade optimum performance

ALCATEL-LUCENT B13 RRH4X30-4R

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

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

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

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

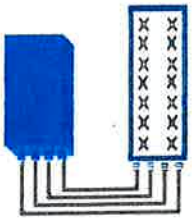
Its compactness and slim design makes the Alcatel-Lucent B13 RRH4x30-4R easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the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

FEATURES

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

BENEFITS

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



4x30W with 4T4R
or
2x60W with 2T4R

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

Alcatel·Lucent

TECHNICAL SPECIFICATIONS

Features & performance	
Number of TX/RX paths	4 duplexed (either 4T4R or 2T4R by SW)
Frequency band	U700 (C) (3GPP bands 13): DL: 746 - 756 MHz / UL: 777 - 787 MHz
Instantaneous bandwidth - #carriers	10MHz – 1 LTE carrier (in 10MHz occupied bandwidth)
LTE carrier bandwidth	10 MHz
RF output power	2x60W or 4x30W (by SW)
Noise figure – RX Diversity scheme	2 dB typ. (<2.5 dB max) – 2 or 4 way Rx diversity
Sizes (HxWxD) in mm (in.) 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)

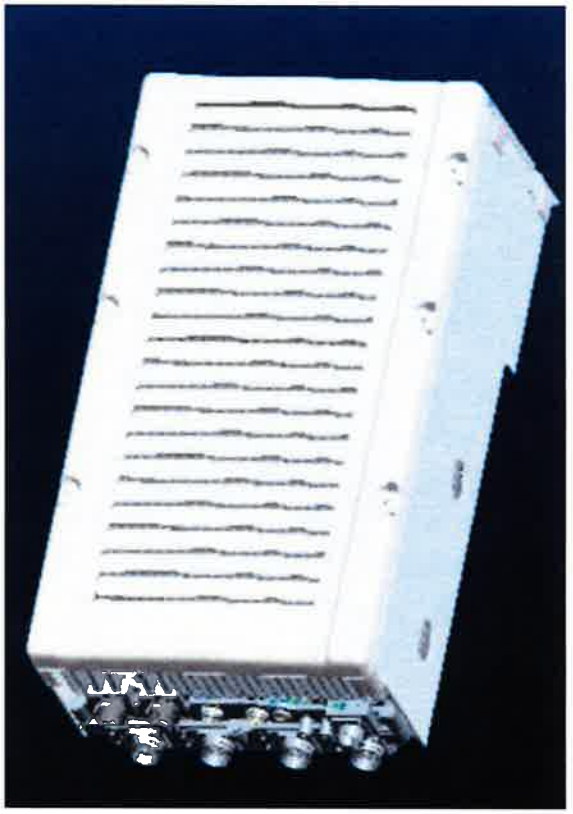
** Not a Verizon Wireless deployed product

Alcatel·Lucent

NEW PCS RF MODULES FOR VZW
RRH2X60 - HW CHARACTERISTICS

LR14.3

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



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

ALCATEL-LUCENT
WIRELESS PRODUCT DATASHEET
RRH2X60-AWS FOR BAND 4 APPLICATIONS

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

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

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

SUPERIOR RF PERFORMANCE

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

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

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

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

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

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

OPTIMIZED TCO

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

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

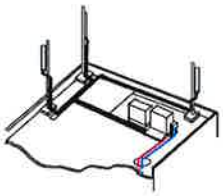
EASY INSTALLATION

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

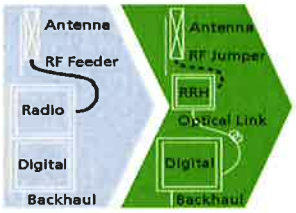
The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment. However, many of these sites can host an Alcatel-Lucent RRH2x60-AWS installation, providing more flexible site selection and improved network quality along with greatly reduced installation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

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

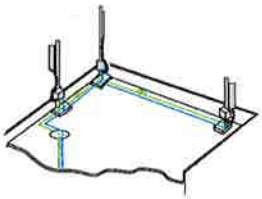
Installation can easily be done by a single person as the Alcatel–Lucent RRH2x60-AWS is compact and weighs about 20 kg, eliminating the need for a crane to hoist the BTS cabinet to the rooftop. A site can be in operation in less than one day.



Macro



RRH for space-constrained cell sites



Distributed

FEATURES

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

BENEFITS

- MIMO LTE operation with only one single unit per sector
- Improved uplink coverage with built-in 4-way receive diversity capability
- RRH can be mounted close to the antenna, eliminating nearly all losses in RF cables and thus reducing power consumption by 50% compared to conventional solutions
- Distributed configurations provide easily deployable and cost-effective solutions, near zero footprint and silent solutions, with minimum impact on the neighborhood, which ease the deployment
- RETA and TMA support without additional hardware thanks to the AISG v2.0 port and the integrated Bias-Tees. Bias-Tees support AISG DC supply and signaling.

TECHNICAL SPECIFICATIONS

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

Dimensions and weights

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

Electrical Data

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

RF Characteristics

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

Connectivity

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

Environmental specifications

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

Safety and Regulatory Data

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

Alcatel·Lucent

AT THE SPEED OF IDEAS™

Product Data Sheet HB158-1-08U8-S8J18

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

Product Description

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

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

Figure 1: HYBRIFLEX Series

Features/Benefits

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

Technical Specifications

Outer Conductor Armor	Corrugated Aluminum	[mm (in)]	46.5 (1.83)
Jacket	Polyethylene, PE	[mm (in)]	50.3 (1.98)
UV-Protection	Individual and External Jacket		Yes
Weight, Approximate		[kg/m (lb/ft)]	1.9 (1.30)
Minimum Bending Radius, Single Bending		[mm (in)]	200 (8)
Minimum Bending Radius, Repeated Bending		[mm (in)]	500 (20)
Recommended/Maximum Clamp Spacing		[m (ft)]	1.0 / 1.2 (3.25 / 4.0)
DC-Resistance Outer Conductor Armor		[Ω/km (Ω/1000ft)]	068 (0.205)
DC-Resistance Power Cable, 8.4mm²(8AWG)		[Ω/km (Ω/1000ft)]	2.1 (0.307)
Version			Single-mode OM3
Quantity, Fiber Count			16 (8 pairs)
Core/Clad		[µm]	50/125
Primary Coating (Acrylate)		[µm]	245
Buffer Diameter, Nominal		[µm]	900
Secondary Protection, Jacket, Nominal		[mm (in)]	2.0 (0.08)
Minimum Bending Radius		[mm (in)]	104 (4.1)
Insertion Loss @ wavelength 850nm		dB/km	3.0
Insertion Loss @ wavelength 1310nm		dB/km	1.0
Standards (Meets or exceeds)			UL94-V0, UL1666 RoHS Compliant
Size (Power)		[mm² (AWG)]	8.4 (8)
Quantity, Wire Count (Power)			16 (8 pairs)
Size (Alarm)		[mm² (AWG)]	0.8 (18)
Quantity, Wire Count (Alarm)			4 (2 pairs)
Type			UV protected
Strands			19
Primary Jacket Diameter, Nominal		[mm (in)]	6.8 (0.27)
Standards (Meets or exceeds)			NFPA 130, ICEA S-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)

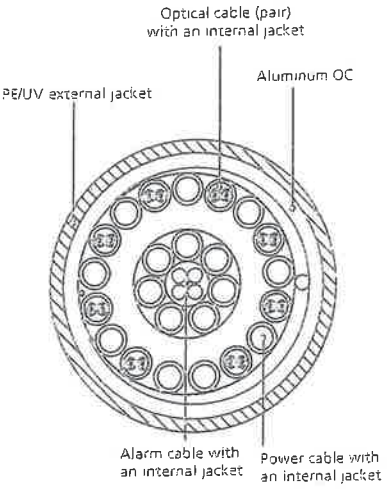


Figure 2: Construction Detail

* This data is provisional and subject to change

ATTACHMENT 2

	General	Power	Density					
Site Name: Newington								
Tower Height: 136Ft.								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*Sprint CDMA/LTE	3	693	121	0.0511	1900	1.0000	5.11%	
*Sprint CDMA/LTE	1	390	121	0.0096	850	0.5667	1.69%	
*Sprint CDMA/LTE	2	693	121	0.0340	2500	1.0000	3.40%	
*Town	no RF numbers for town							
Verizon PCS	**11**	**453**	**106**	**0.1595**	**1970**	**1.0000**	**15.95%**	
Verizon Cellular	**9**	**412**	**106**	**0.1187**	**869**	**0.5793**	**20.48%**	
Verizon AWS	**1**	**3500**	**106**	**0.1120**	**2145**	**1.0000**	**11.20%**	
Verizon 700	**1**	**2100**	**106**	**0.0672**	**746**	**0.4973**	**13.51%**	
								71.34%
* Source: Siting Council								

ATTACHMENT 3

Date: **June 25, 2015**

Veronica Harris
Crown Castle
1200 McArthur Blvd
Mahwah, NJ 07430
(201) 236-9094

SSOE Group
320 Seven Springs Way, Ste. 350
Brentwood, TN 37027
(615) 661-7585
ecasey@ssoe.com

Subject:	**Structural Analysis Report**	
Carrier Designation:	***Verizon Wireless* Co-Locate**	
	Carrier Site Number:	119730
	Carrier Site Name:	Newington CT
Crown Castle Designation:	**Crown Castle BU Number:**	876332
	Crown Castle Site Name:	36 Prospect Street
	Crown Castle JDE Job Number:	338365
	Crown Castle Work Order Number:	1079957
	Crown Castle Application Number:	300822 Rev. 0
Engineering Firm Designation:	**SSOE Project Number:**	015-00428-00 BC 0854
Site Data:	**36 Prospect Street, Newington, CT 06109, Hartford County**	
	Latitude *41° 41' 23.66"*, Longitude *-72° 42' 18.85"*	
	136 Foot - Summit Monopole Tower	

Dear Ms. Veronica Harris,

SSOE Group is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 800060, in accordance with application 300822, 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:

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

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

We at *SSOE Group* 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: Emily V. Casey

Respectfully submitted by:

6/25/15

Barry W. Burgess, P.E.
Section Manager

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1) INTRODUCTION

The existing 136' monopole consists of six major sections. From 0' to 120' the tower has twelve sides and is evenly tapered, measuring 47.98" (flat-flat) at the base to 22.00" (flat-flat) at the top. From 120' to 136' the tower consists of a 10' and a 6' pipe section measuring 8" and 3" in diameter, respectively. The structure is galvanized and has no tower lighting.

The tower was originally designed to 120' for Sprint Spectrum by Summit Manufacturing of West Hazleton, Pennsylvania for a 90 mph wind speed with 0.5" radial ice in accordance with ANSI/EIA-TIA-222-F.

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 and the 2005 Connecticut Building Code using a fastest mile wind speed of 80 mph with no ice, 38 mph with 1.0" 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
106.0	106.0	3	Alcatel Lucent	RRH2X60-AWS	2	1-5/8	1
		3	Alcatel Lucent	RRH2X60-PCS			
		3	Alcatel Lucent	RRH2x60-700			
		9	Andrew	SBNHH-1D65B w/ Mount Pipe			

Notes:
1) See Appendix B for the proposed coax layout.

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
120.0	121.0	3	Alcatel Lucent	TD-RRH8x20-25	3 1	1-1/4 1-5/8	
		3	RFS Celwave	APXVSPP18-C-A20 w/ Mount Pipe			
		3	RFS Celwave	APXVTM14-C-120 w/ Mount Pipe			
	120.0	1		Platform Mount [LP 712-1]			
116.0	118.0	3	Alcatel Lucent	PCS 1900MHz 4x45W-65MHz			
	116.0	1		Side Arm Mount [SO 102-3]			
	114.0	3	Alcatel Lucent	800MHz 2X50W RRH W/FILTER			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
106.0	106.0	3	Alcatel Lucent	RRH2X40-AWS	1	1-1/4	1
		3	Amphenol	BXA-171063-12CF-EDIN-X w/ Mount Pipe			
		2	Andrew	LNX-6514DS-T4M w/ Mount Pipe			
		3	Antel	BXA-185063/8CF w/ Mount Pipe			
		6	RFS Celwave	FD9R6004/2C-3L			
		1	Kathrein	800 10735 K w/ Mount Pipe			
		1	RFS Celwave	DB-T1-6Z-8AB-0Z	3 12	1/2 1-1/4	
		6	Decibel	DB846F65ZAXY w/ Mount Pipe			
		1		Platform Mount [LP 713-1]			
65.0	66.0	1	Lucent	KS24019-L112A	1	1/2	
	65.0	1		Side Arm Mount [SO 701-1]			

Notes:
1) 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)
120.0	120.0	12	Decibel	DB980 H90	-	-
		1		14' LP Platform		
105.0	105.0	12	Allgon	ALP9212N	-	-
		1		14' LP Platform		
95.0	95.0	12	Allgon	ALP9212	-	-
		1		14' LP Platform		
80.0	80.0	2	Celwave	PD10017	-	-
		2		6' Stiff Arm		
50.0	50.0	1	Generic	GPS & Mount	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Manufacturer Drawings	Paul J. Ford Job #: A29297-211, dated 4/17/97	Doc ID #: 1440581	Crown DMZ
Foundation Design	Paul J. Ford Job #: A29297-211, dated 4/17/97	Doc ID #: 1615432	Crown DMZ
Geotechnical Report	Dr. Clarence Welti, P.E., dated 9/15/96	Doc ID #: 1529724	Crown DMZ
Previous Analysis	Crown Castle Project #: 540287, dated 10/26/12	Doc ID #: 3357538	Crown DMZ

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) The tower and foundation were constructed in accordance with their original design and maintained per the manufacturer's specifications, are in good condition, and the tower is twist free and plumb.
2) All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
3) All equipment model numbers, quantities, and centerline elevations are as provided in the CCI CAD package, dated 6/21/15 with any adjustments as noted below.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	136 - 129.5	Pole	TP3x3x0.216	1	-0.04	52.88	8.6	Pass
L2	129.5 - 129	Pole	TP8x3x0.216	2	-0.04	52.88	8.6	Pass
L3	129 - 120.5	Pole	TP8x8x0.322	3	-0.26	217.42	4.8	Pass
L4	120.5 - 120	Pole	TP22x8x0.322	4	-0.27	217.42	4.8	Pass
L5	120 - 87.5	Pole	TP29.476x22x0.1875	5	-7.22	738.14	66.1	Pass
L6	87.5 - 58.75	Pole	TP35.715x28.2384x0.25	6	-10.59	1263.78	81.8	Pass
L7	58.75 - 32.25	Pole	TP41.311x34.1798x0.375	7	-15.56	2493.91	59.7	Pass
L8	32.25 - 0	Pole	TP47.98x39.3533x0.4375	8	-25.08	3481.85	60.0	Pass
							Summary	
						Pole (L6)	81.8	Pass
						Rating =	**81.8**	**Pass**

Table 6 - Tower Component Stresses vs. Capacity – LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods		54.1%	Pass
1	Base Plate		58.1%	Pass
1	Foundation (Original Design Reactions)		80.6%	Pass

Structure Rating (max from all components) =	81.8%

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

4.1) Recommendations

The existing tower and its foundations are sufficient for the proposed loads and do not require modifications.

5) DISCLAIMER OF WARRANTIES

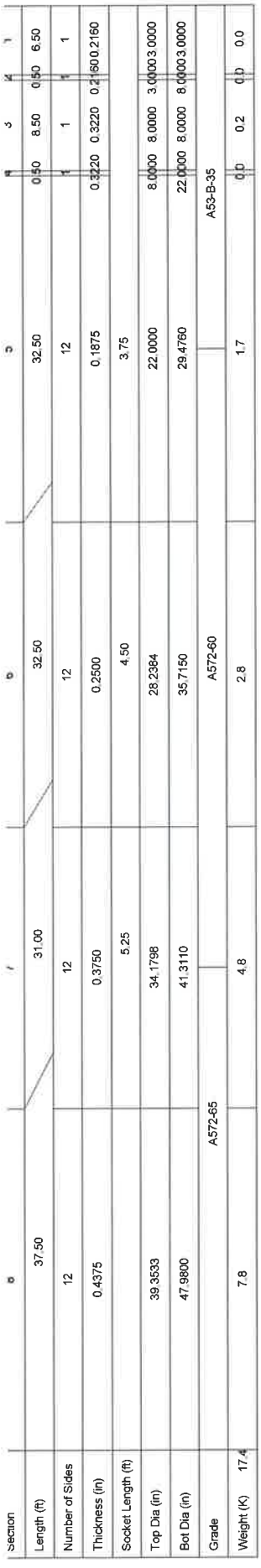
SSOE Group has not performed a site visit to the tower to verify member sizes or antenna/coax loading. SSOE Group shall be contacted immediately if the existing conditions are not as represented on the tower elevation contained in this report in order to evaluate the significance of the discrepancy. SSOE Group has not performed a condition assessment of the tower foundation. This report does not replace a full tower inspection

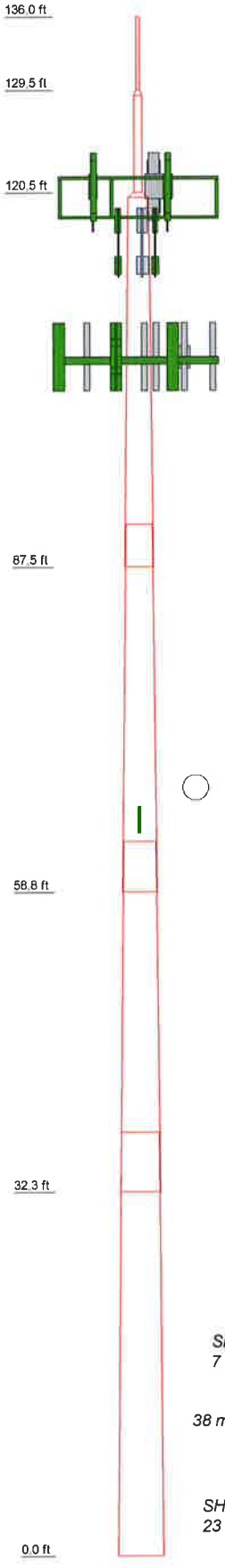
The engineering services rendered by SSOE Group in connection with this structural analysis are limited to an analysis of the tower structure and theoretical capacity of its main structural members. Miscellaneous items such as antenna mounts, etc., have not been designed or detailed as part of our work. We recommend that material of suitable size and strength be purchased from a reputable tower manufacturer.

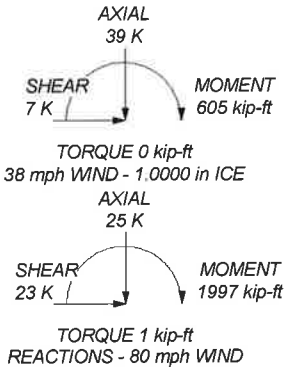
SSOE Group makes no warranties, expressed and/or implied, in connection with this report and disclaims any liability arising from material, fabrication, and erection of this tower. SSOE Group will not be responsible whatsoever for, or on account of, consequential or incidental damages sustained by any person, firm, or organization as a result of any data contained in this report. The maximum liability of SSOE Group pursuant to this report will be limited to the total fee received for preparation of this report.
preparation of this report.

APPENDIX A

TNXTOWER OUTPUT







DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Platform Mount [LP 712-1]	120	Platform Mount [LP 713-1]	106
APXVSPP18-C-A20 w/ Mount Pipe	120	(2) DB846F65ZAXY w/ Mount Pipe	106
APXVSPP18-C-A20 w/ Mount Pipe	120	(3) SBNHH-1D65B w/ Mount Pipe	106
APXVSPP18-C-A20 w/ Mount Pipe	120	RRH2X60-AWS	106
TD-RRH8x20-25	120	RRH2x60-700	106
TD-RRH8x20-25	120	RRH2X60-PCS	106
TD-RRH8x20-25	120	(2) DB846F65ZAXY w/ Mount Pipe	106
APXVTM14-C-120 w/ Mount Pipe	120	(3) SBNHH-1D65B w/ Mount Pipe	106
APXVTM14-C-120 w/ Mount Pipe	120	DB-T1-6Z-8AB-0Z	106
APXVTM14-C-120 w/ Mount Pipe	120	RRH2X60-AWS	106
(3) 2" x 6' Mount Pipe	120	RRH2x60-700	106
(3) 2" x 6' Mount Pipe	120	RRH2X60-PCS	106
(3) 2" x 6' Mount Pipe	120	(2) DB846F65ZAXY w/ Mount Pipe	106
Side Arm Mount [SO 102-3]	116	(3) SBNHH-1D65B w/ Mount Pipe	106
PCS 1900MHz 4x45W-65MHz	116	RRH2X60-AWS	106
PCS 1900MHz 4x45W-65MHz	116	RRH2x60-700	106
PCS 1900MHz 4x45W-65MHz	116	RRH2X60-PCS	106
800MHz 2X50W RRH W/FILTER	116	2" x 6' Mount Pipe	106
800MHz 2X50W RRH W/FILTER	116	2" x 6' Mount Pipe	106
800MHz 2X50W RRH W/FILTER	116	2" x 6' Mount Pipe	106
2" x 6' Mount Pipe	116	Side Arm Mount [SO 701-1]	65
2" x 6' Mount Pipe	116	KS24019-L112A	65
2" x 6' Mount Pipe	116	2" x 2' Mount Pipe	65

MATERIAL STRENGTH

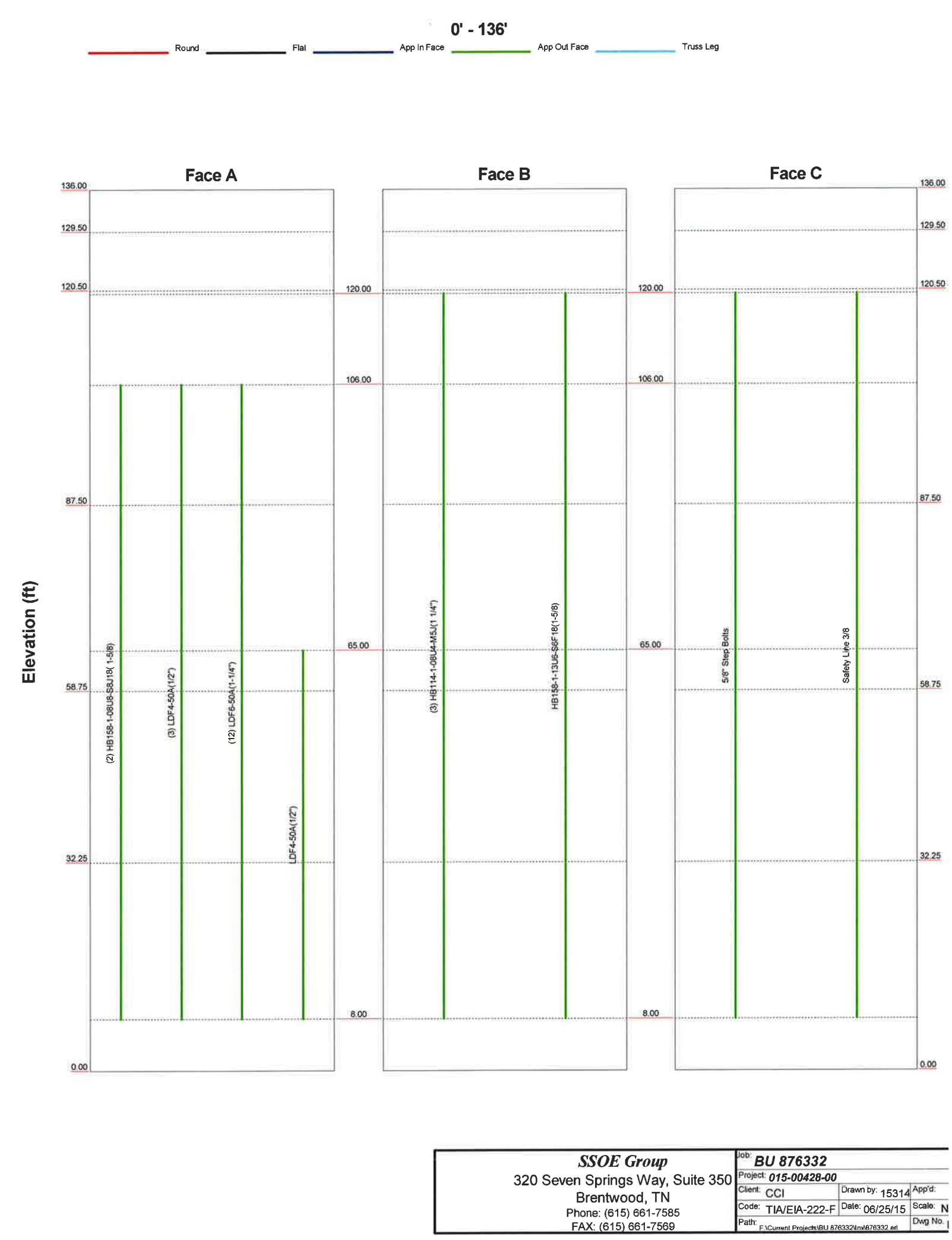
GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-35	35 ksi	63 ksi	A572-65	65 ksi	80 ksi
A572-60	60 ksi	75 ksi			

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 81.8%

SSOE Group
320 Seven Springs Way, Suite 350
Brentwood, TN
Phone: (615) 661-7585
FAX: (615) 661-7569

Job: BU 876332			
Project: 015-00428-00			
Client: CCI	Drawn by: 15314	App'd:	
Code: TIA/EIA-222-F	Date: 06/25/15	Scale: N	
Path: F:\Current Projects\BU 876332\mx\876332.eri		Dwg No.	



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Path: F:\Current Projects\BU 876332\mv\876332.eri		Dwg No.	

Tower Input Data

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

Tower is located in Hartford County, Connecticut.
Basic wind speed of 80 mph.
Nominal ice thickness of 1.0000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 38 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.333.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	136.00-129.50	6.50	0.00	Round	3.0000	3.0000	0.2160		A53-B-35 (35 ksi)
L2	129.50-129.00	0.50	0.00	Round	3.0000	8.0000	0.2160		A53-B-35 (35 ksi)
L3	129.00-120.50	8.50	0.00	Round	8.0000	8.0000	0.3220		A53-B-35 (35 ksi)
L4	120.50-120.00	0.50	0.00	Round	8.0000	22.0000	0.3220		A53-B-35 (35 ksi)
L5	120.00-87.50	32.50	3.75	12	22.0000	29.4760	0.1875	0.7500	A572-60 (60 ksi)
L6	87.50-58.75	32.50	4.50	12	28.2384	35.7150	0.2500	1.0000	A572-60 (60 ksi)
L7	58.75-32.25	31.00	5.25	12	34.1798	41.3110	0.3750	1.5000	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
L8	32.25-0.00	37.50		12	39.3533	47.9800	0.4375	1.7500	(65 ksi) 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	3.0000	1.8892	1.8413	0.9873	1.5000	1.2275	3.6826	0.9440	0.0000	0
	3.0000	1.8892	1.8413	0.9873	1.5000	1.2275	3.6826	0.9440	0.0000	0
L2	3.0000	1.8892	1.8413	0.9873	1.5000	1.2275	3.6826	0.9440	0.0000	0
	8.0000	5.2821	40.0365	2.7531	4.0000	10.0091	80.0731	2.6395	0.0000	0
L3	8.0000	7.7670	57.3355	2.7170	4.0000	14.3339	114.6709	3.8812	0.0000	0
	8.0000	7.7670	57.3355	2.7170	4.0000	14.3339	114.6709	3.8812	0.0000	0
L4	8.0000	7.7670	57.3355	2.7170	4.0000	14.3339	114.6709	3.8812	0.0000	0
	22.0000	21.9293	1288.4548	7.6652	11.0000	117.1323	2576.9097	10.9581	0.0000	0
L5	22.7761	13.1693	799.7595	7.8089	11.3960	70.1790	1620.5296	6.4815	5.3935	28.765
	30.5158	17.6829	1936.1299	10.4853	15.2686	126.8049	3923.1240	8.7030	7.3971	39.451
L6	30.1276	22.5306	2252.7622	10.0198	14.6275	154.0089	4564.7070	11.0889	6.8979	27.592
	36.9749	28.5493	4583.3363	12.6965	18.5004	247.7430	9287.0819	14.0511	8.9016	35.606
L7	36.4572	40.8193	5953.9787	12.1021	17.7051	336.2856	12064.3751	20.0900	8.1552	21.747
	42.7683	49.4302	10572.7826	14.6551	21.3991	494.0761	21423.3239	24.3281	10.0663	26.844
L8	41.9919	54.8226	10597.3562	13.9319	20.3850	519.8603	21473.1168	26.9820	9.3742	21.427
	49.6726	66.9755	19322.6161	17.0202	24.8536	777.4562	39152.8588	32.9633	11.6861	26.711

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 136.00-129.50				1	1	1		
L2 129.50-129.00				1	1	1		
L3 129.00-120.50				1	1	1		
L4 120.50-120.00				1	1	1		
L5 120.00-87.50				1	1	1		
L6 87.50-58.75				1	1	1		
L7 58.75-32.25				1	1	1		
L8 32.25-0.00				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
5/8" Step Bolts	C	No	CaAa (Out Of Face)	120.00 - 8.00	1	No Ice	0.04	1.00
						1/2" Ice	0.14	1.56
						1" Ice	0.24	2.73
						2" Ice	0.44	6.91
						4" Ice	0.84	22.58
Safety Line 3/8	C	No	CaAa (Out Of Face)	120.00 - 8.00	1	No Ice	0.04	0.22
						1/2" Ice	0.14	0.75
						1" Ice	0.24	1.28
						2" Ice	0.44	2.34
						4" Ice	0.84	4.46
HB158-1-08U8-S8J18(1-5/8)	A	No	Inside Pole	106.00 - 8.00	2	No Ice	0.00	1.30
						1/2" Ice	0.00	1.30
						1" Ice	0.00	1.30
						2" Ice	0.00	1.30
						4" Ice	0.00	1.30
LDF4-50A(1/2")	A	No	Inside Pole	106.00 - 8.00	3	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
LDF6-50A(1-1/4")	A	No	Inside Pole	106.00 - 8.00	12	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
LDF4-50A(1/2")	A	No	Inside Pole	65.00 - 8.00	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
HB114-1-08U4-M5J(1 1/4")	B	No	Inside Pole	120.00 - 8.00	3	No Ice	0.00	1.08
						1/2" Ice	0.00	1.08
						1" Ice	0.00	1.08
						2" Ice	0.00	1.08
						4" Ice	0.00	1.08
HB158-1-13U6-S6F18(1-5/8)	B	No	Inside Pole	120.00 - 8.00	1	No Ice	0.00	1.90
						1/2" Ice	0.00	1.90
						1" Ice	0.00	1.90
						2" Ice	0.00	1.90
						4" Ice	0.00	1.90

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	136.00-129.50	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	0.00
L2	129.50-129.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L3	129.00-120.50	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	0.00
L4	120.50-120.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C	0.000	0.000	0.000	0.000	0.00
L5	120.00-87.50	A	0.000	0.000	0.000	0.000	0.20
		B	0.000	0.000	0.000	0.000	0.17
		C	0.000	0.000	0.000	2.573	0.04
L6	87.50-58.75	A	0.000	0.000	0.000	0.000	0.32
		B	0.000	0.000	0.000	0.000	0.15
		C	0.000	0.000	0.000	2.276	0.04
L7	58.75-32.25	A	0.000	0.000	0.000	0.000	0.29
		B	0.000	0.000	0.000	0.000	0.14
		C	0.000	0.000	0.000	2.098	0.03
L8	32.25-0.00	A	0.000	0.000	0.000	0.000	0.27
		B	0.000	0.000	0.000	0.000	0.12
		C	0.000	0.000	0.000	1.920	0.03

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	136.00-129.50	A	1.182	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	0.00
L2	129.50-129.00	A	1.178	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	0.00
L3	129.00-120.50	A	1.173	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	0.00
L4	120.50-120.00	A	1.168	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	0.00
L5	120.00-87.50	A	1.147	0.000	0.000	0.000	0.000	0.20
		B		0.000	0.000	0.000	0.000	0.17
		C		0.000	0.000	0.000	17.478	0.16
L6	87.50-58.75	A	1.099	0.000	0.000	0.000	0.000	0.32
		B		0.000	0.000	0.000	0.000	0.15
		C		0.000	0.000	0.000	15.461	0.14
L7	58.75-32.25	A	1.038	0.000	0.000	0.000	0.000	0.29
		B		0.000	0.000	0.000	0.000	0.14
		C		0.000	0.000	0.000	13.751	0.12
L8	32.25-0.00	A	1.000	0.000	0.000	0.000	0.000	0.27
		B		0.000	0.000	0.000	0.000	0.12
		C		0.000	0.000	0.000	11.992	0.10

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	136.00-129.50	0.0000	0.0000	0.0000	0.0000
L2	129.50-129.00	0.0000	0.0000	0.0000	0.0000
L3	129.00-120.50	0.0000	0.0000	0.0000	0.0000
L4	120.50-120.00	0.0000	0.0000	0.0000	0.0000
L5	120.00-87.50	-0.0992	0.0573	-0.5214	0.3010

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L6	87.50-58.75	-0.0999	0.0577	-0.5501	0.3176
L7	58.75-32.25	-0.1003	0.0579	-0.5524	0.3189
L8	32.25-0.00	-0.0745	0.0430	-0.4121	0.2379

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
Platform Mount [LP 712-1]	C	None		0.0000	120.00	No Ice	24.53	24.53	1.34
						1/2" Ice	29.94	29.94	1.65
						1" Ice	35.35	35.35	1.96
						2" Ice	46.17	46.17	2.58
						4" Ice	67.81	67.81	3.82
APXVSPP18-C-A20 w/ Mount Pipe	A	From Centroid-Leg	3.76 1.37 1.00	20.0000	120.00	No Ice	8.26	6.71	0.08
						1/2" Ice	8.81	7.66	0.14
						1" Ice	9.36	8.49	0.22
						2" Ice	10.50	10.20	0.39
						4" Ice	12.88	13.98	0.87
APXVSPP18-C-A20 w/ Mount Pipe	B	From Centroid-Leg	3.76 1.37 1.00	0.0000	120.00	No Ice	8.26	6.71	0.08
						1/2" Ice	8.81	7.66	0.14
						1" Ice	9.36	8.49	0.22
						2" Ice	10.50	10.20	0.39
						4" Ice	12.88	13.98	0.87
APXVSPP18-C-A20 w/ Mount Pipe	C	From Centroid-Leg	3.76 1.37 1.00	-25.0000	120.00	No Ice	8.26	6.71	0.08
						1/2" Ice	8.81	7.66	0.14
						1" Ice	9.36	8.49	0.22
						2" Ice	10.50	10.20	0.39
						4" Ice	12.88	13.98	0.87
TD-RRH8x20-25	A	From Centroid-Leg	3.76 1.37 1.00	20.0000	120.00	No Ice	4.72	1.70	0.07
						1/2" Ice	5.01	1.92	0.10
						1" Ice	5.32	2.15	0.13
						2" Ice	5.95	2.62	0.20
						4" Ice	7.31	3.68	0.40
TD-RRH8x20-25	B	From Centroid-Leg	3.76 1.37 1.00	0.0000	120.00	No Ice	4.72	1.70	0.07
						1/2" Ice	5.01	1.92	0.10
						1" Ice	5.32	2.15	0.13
						2" Ice	5.95	2.62	0.20
						4" Ice	7.31	3.68	0.40
TD-RRH8x20-25	C	From Centroid-Leg	3.76 1.37 1.00	-25.0000	120.00	No Ice	4.72	1.70	0.07
						1/2" Ice	5.01	1.92	0.10
						1" Ice	5.32	2.15	0.13
						2" Ice	5.95	2.62	0.20
						4" Ice	7.31	3.68	0.40
APXVTM14-C-120 w/	A	From	3.76	20.0000	120.00	No Ice	7.13	4.96	0.08

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
Mount Pipe		Centroid-Leg	1.37 1.00			1/2" Ice 1" Ice 2" Ice 4" Ice	7.66 8.18 9.26 11.53	5.75 6.47 8.01 11.41	0.13 0.19 0.34 0.75
APXVTM14-C-120 w/ Mount Pipe	B	From Centroid-Leg	3.76 1.37 1.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.13 7.66 8.18 9.26 11.53	4.96 5.75 6.47 8.01 11.41	0.08 0.13 0.19 0.34 0.75
APXVTM14-C-120 w/ Mount Pipe	C	From Centroid-Leg	3.76 1.37 1.00	-25.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.13 7.66 8.18 9.26 11.53	4.96 5.75 6.47 8.01 11.41	0.08 0.13 0.19 0.34 0.75
(3) 2" x 6' Mount Pipe	A	From Centroid-Leg	3.76 1.37 0.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.20 1.80 2.17 2.93 4.57	1.20 1.80 2.17 2.93 4.57	0.03 0.04 0.05 0.09 0.23
(3) 2" x 6' Mount Pipe	B	From Centroid-Leg	3.76 1.37 0.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.20 1.80 2.17 2.93 4.57	1.20 1.80 2.17 2.93 4.57	0.03 0.04 0.05 0.09 0.23
(3) 2" x 6' Mount Pipe	C	From Centroid-Leg	3.76 1.37 0.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.20 1.80 2.17 2.93 4.57	1.20 1.80 2.17 2.93 4.57	0.03 0.04 0.05 0.09 0.23
Side Arm Mount [SO 102-3]	C	None		0.0000	116.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 3.48 3.96 4.92 6.84	3.00 3.48 3.96 4.92 6.84	0.08 0.11 0.14 0.20 0.32
PCS 1900MHz 4x45W-65MHz	A	From Leg	0.94 0.34 2.00	20.0000	116.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.71 2.95 3.20 3.72 4.86	2.61 2.85 3.09 3.61 4.74	0.06 0.08 0.11 0.17 0.35
PCS 1900MHz 4x45W-65MHz	B	From Leg	0.94 0.34 2.00	15.0000	116.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.71 2.95 3.20 3.72 4.86	2.61 2.85 3.09 3.61 4.74	0.06 0.08 0.11 0.17 0.35
PCS 1900MHz 4x45W-65MHz	C	From Leg	0.94 0.34 2.00	-25.0000	116.00	No Ice 1/2" Ice	2.71 2.95 3.20	2.61 2.85 3.09	0.06 0.08 0.11

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
						1" Ice	3.72	3.61	0.17
						2" Ice	4.86	4.74	0.35
						4" Ice			
800MHz 2X50W RRH W/FILTER	A	From Leg	0.94 0.34 -2.00	20.0000	116.00	No Ice	2.40	2.25	0.06
						1/2" Ice	2.61	2.46	0.09
						1" Ice	2.83	2.68	0.11
						2" Ice	3.30	3.13	0.17
						4" Ice	4.34	4.15	0.34
800MHz 2X50W RRH W/FILTER	B	From Leg	0.94 0.34 -2.00	15.0000	116.00	No Ice	2.40	2.25	0.06
						1/2" Ice	2.61	2.46	0.09
						1" Ice	2.83	2.68	0.11
						2" Ice	3.30	3.13	0.17
						4" Ice	4.34	4.15	0.34
800MHz 2X50W RRH W/FILTER	C	From Leg	0.94 0.34 -2.00	-25.0000	116.00	No Ice	2.40	2.25	0.06
						1/2" Ice	2.61	2.46	0.09
						1" Ice	2.83	2.68	0.11
						2" Ice	3.30	3.13	0.17
						4" Ice	4.34	4.15	0.34
2" x 6' Mount Pipe	A	From Leg	0.94 0.34 0.00	0.0000	116.00	No Ice	1.20	1.20	0.03
						1/2" Ice	1.80	1.80	0.04
						1" Ice	2.17	2.17	0.05
						2" Ice	2.93	2.93	0.09
						4" Ice	4.57	4.57	0.23
2" x 6' Mount Pipe	B	From Leg	0.94 0.34 0.00	0.0000	116.00	No Ice	1.20	1.20	0.03
						1/2" Ice	1.80	1.80	0.04
						1" Ice	2.17	2.17	0.05
						2" Ice	2.93	2.93	0.09
						4" Ice	4.57	4.57	0.23
2" x 6' Mount Pipe	C	From Leg	0.94 0.34 0.00	0.0000	116.00	No Ice	1.20	1.20	0.03
						1/2" Ice	1.80	1.80	0.04
						1" Ice	2.17	2.17	0.05
						2" Ice	2.93	2.93	0.09
						4" Ice	4.57	4.57	0.23
Platform Mount [LP 713-1]	C	None		0.0000	106.00	No Ice	31.27	31.27	1.51
						1/2" Ice	39.68	39.68	1.93
						1" Ice	48.09	48.09	2.35
						2" Ice	64.91	64.91	3.19
						4" Ice	98.55	98.55	4.86
(2) DB846F65ZAXY w/ Mount Pipe	A	From Centroid-Face	3.46 2.00 0.00	30.0000	106.00	No Ice	7.27	7.82	0.05
						1/2" Ice	7.88	9.01	0.11
						1" Ice	8.48	9.91	0.19
						2" Ice	9.72	11.81	0.37
						4" Ice	12.33	15.98	0.87
(3) SBNHH-1D65B w/ Mount Pipe	A	From Centroid-Face	3.46 2.00 0.00	30.0000	106.00	No Ice	8.40	6.82	0.06
						1/2" Ice	8.95	7.78	0.13
						1" Ice	9.51	8.61	0.20
						2" Ice	10.66	10.33	0.38
						4" Ice	13.06	14.12	0.86

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			
RRH2X60-AWS	A	From Centroid-Face	3.46 2.00 0.00	30.0000	106.00	No Ice	3.96	1.82	0.06
						1/2" Ice	4.27	2.08	0.08
						1" Ice	4.60	2.36	0.11
						2" Ice	5.27	2.96	0.17
						4" Ice	6.72	4.25	0.35
RRH2x60-700	A	From Centroid-Face	3.46 2.00 0.00	30.0000	106.00	No Ice	3.96	1.82	0.06
						1/2" Ice	4.27	2.08	0.08
						1" Ice	4.60	2.36	0.11
						2" Ice	5.27	2.96	0.17
						4" Ice	6.72	4.25	0.35
RRH2X60-PCS	A	From Centroid-Face	3.46 2.00 0.00	30.0000	106.00	No Ice	2.57	2.01	0.06
						1/2" Ice	2.79	2.22	0.08
						1" Ice	3.02	2.43	0.10
						2" Ice	3.52	2.89	0.16
						4" Ice	4.61	3.92	0.31
(2) DB846F65ZAXY w/ Mount Pipe	B	From Centroid-Face	3.46 2.00 0.00	30.0000	106.00	No Ice	7.27	7.82	0.05
						1/2" Ice	7.88	9.01	0.11
						1" Ice	8.48	9.91	0.19
						2" Ice	9.72	11.81	0.37
						4" Ice	12.33	15.98	0.87
(3) SBNHH-1D65B w/ Mount Pipe	B	From Centroid-Face	3.46 2.00 0.00	30.0000	106.00	No Ice	8.40	6.82	0.06
						1/2" Ice	8.95	7.78	0.13
						1" Ice	9.51	8.61	0.20
						2" Ice	10.66	10.33	0.38
						4" Ice	13.06	14.12	0.86
DB-T1-6Z-8AB-0Z	B	From Centroid-Face	3.46 2.00 0.00	30.0000	106.00	No Ice	5.60	2.33	0.04
						1/2" Ice	5.92	2.56	0.08
						1" Ice	6.24	2.79	0.12
						2" Ice	6.91	3.28	0.21
						4" Ice	8.37	4.37	0.45
RRH2X60-AWS	B	From Centroid-Face	3.46 2.00 0.00	30.0000	106.00	No Ice	3.96	1.82	0.06
						1/2" Ice	4.27	2.08	0.08
						1" Ice	4.60	2.36	0.11
						2" Ice	5.27	2.96	0.17
						4" Ice	6.72	4.25	0.35
RRH2x60-700	B	From Centroid-Face	3.46 2.00 0.00	30.0000	106.00	No Ice	3.96	1.82	0.06
						1/2" Ice	4.27	2.08	0.08
						1" Ice	4.60	2.36	0.11
						2" Ice	5.27	2.96	0.17
						4" Ice	6.72	4.25	0.35
RRH2X60-PCS	B	From Centroid-Face	3.46 2.00 0.00	30.0000	106.00	No Ice	2.57	2.01	0.06
						1/2" Ice	2.79	2.22	0.08
						1" Ice	3.02	2.43	0.10
						2" Ice	3.52	2.89	0.16
						4" Ice	4.61	3.92	0.31
(2) DB846F65ZAXY w/	C	From	3.46	30.0000	106.00	No Ice	7.27	7.82	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
Mount Pipe		Centroid-Face	2.00 0.00			1/2" Ice	7.88 8.48	9.01 9.91	0.11 0.19
						1" Ice	9.72	11.81	0.37
						2" Ice	12.33	15.98	0.87
						4" Ice			
(3) SBNHH-1D65B w/ Mount Pipe	C	From Centroid-Face	3.46 2.00 0.00	30.0000	106.00	No Ice 1/2" Ice	8.40 8.95	6.82 7.78	0.06 0.13
						1" Ice	9.51	8.61	0.20
						2" Ice	10.66	10.33	0.38
						4" Ice	13.06	14.12	0.86
RRH2X60-AWS	C	From Centroid-Face	3.46 2.00 0.00	30.0000	106.00	No Ice 1/2" Ice	3.96 4.27	1.82 2.08	0.06 0.08
						1" Ice	4.60	2.36	0.11
						2" Ice	5.27	2.96	0.17
						4" Ice	6.72	4.25	0.35
RRH2x60-700	C	From Centroid-Face	3.46 2.00 0.00	30.0000	106.00	No Ice 1/2" Ice	3.96 4.27	1.82 2.08	0.06 0.08
						1" Ice	4.60	2.36	0.11
						2" Ice	5.27	2.96	0.17
						4" Ice	6.72	4.25	0.35
RRH2X60-PCS	C	From Centroid-Face	3.46 2.00 0.00	30.0000	106.00	No Ice 1/2" Ice	2.57 2.79	2.01 2.22	0.06 0.08
						1" Ice	3.02	2.43	0.10
						2" Ice	3.52	2.89	0.16
						4" Ice	4.61	3.92	0.31
2" x 6' Mount Pipe	A	From Centroid-Face	3.46 2.00 0.00	0.0000	106.00	No Ice 1/2" Ice	1.20 1.80	1.20 1.80	0.03 0.04
						1" Ice	2.17	2.17	0.05
						2" Ice	2.93	2.93	0.09
						4" Ice	4.57	4.57	0.23
2" x 6' Mount Pipe	B	From Centroid-Face	3.46 2.00 0.00	0.0000	106.00	No Ice 1/2" Ice	1.20 1.80	1.20 1.80	0.03 0.04
						1" Ice	2.17	2.17	0.05
						2" Ice	2.93	2.93	0.09
						4" Ice	4.57	4.57	0.23
2" x 6' Mount Pipe	C	From Centroid-Face	3.46 2.00 0.00	0.0000	106.00	No Ice 1/2" Ice	1.20 1.80	1.20 1.80	0.03 0.04
						1" Ice	2.17	2.17	0.05
						2" Ice	2.93	2.93	0.09
						4" Ice	4.57	4.57	0.23
Side Arm Mount [SO 701-1]	C	From Face	1.50 0.00 0.00	0.0000	65.00	No Ice 1/2" Ice	0.85 1.14	1.67 2.34	0.07 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
KS24019-L112A	C	From Face	3.00 0.00 1.00	0.0000	65.00	No Ice 1/2" Ice	0.16 0.22	0.16 0.22	0.01 0.01
						1" Ice	0.30	0.30	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
						1" Ice	0.48	0.48	0.02
						2" Ice	0.95	0.95	0.06
						4" Ice			
2" x 2' Mount Pipe	C	From Face	3.00 0.00 0.00	0.0000	65.00	No Ice	0.30	0.30	0.02
						1/2" Ice	0.43	0.43	0.02
						1" Ice	0.58	0.58	0.03
						2" Ice	0.93	0.93	0.04
						4" Ice	1.78	1.78	0.10

Load Combinations

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

Comb. No.	Description
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	136 - 129.5	Pole	Max Tension	11	0.00	0.00	0.00
			Max. Compression	14	-0.08	0.00	0.00
			Max. Mx	5	-0.04	-0.27	0.00
			Max. My	8	-0.04	0.00	-0.27
			Max. Vy	5	0.08	-0.27	0.00
			Max. Vx	8	0.08	0.00	-0.27
			Max. Torque	8			0.00
L2	129.5 - 129	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-0.09	0.00	0.00
			Max. Mx	5	-0.04	-0.31	0.00
			Max. My	8	-0.04	0.00	-0.31
			Max. Vy	5	0.09	-0.31	0.00
			Max. Vx	8	0.09	0.00	-0.31
			Max. Torque	8			0.00
L3	129 - 120.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-0.43	0.00	0.00
			Max. Mx	5	-0.26	-1.73	0.00
			Max. My	8	-0.26	0.00	-1.73
			Max. Vy	5	0.24	-1.73	0.00
			Max. Vx	8	0.24	0.00	-1.73
			Max. Torque	8			0.00
L4	120.5 - 120	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-0.47	0.00	0.00
			Max. Mx	5	-0.28	-1.85	0.00
			Max. My	8	-0.28	0.00	-1.86
			Max. Vy	5	0.26	-1.85	0.00
			Max. Vx	2	-0.26	-0.00	1.86
			Max. Torque	8			0.00
L5	120 - 87.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-16.15	-0.41	-0.07
			Max. Mx	5	-7.24	-273.33	3.00
			Max. My	8	-7.23	2.89	-276.57
			Max. Vy	5	14.23	-273.33	3.00
			Max. Vx	8	14.28	2.89	-276.57
			Max. Torque	8			-0.84
L6	87.5 - 58.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-20.91	-0.26	-0.62
			Max. Mx	5	-10.60	-708.95	5.56
			Max. My	8	-10.60	5.81	-713.94
			Max. Vy	5	16.99	-708.95	5.56
			Max. Vx	8	17.01	5.81	-713.94
			Max. Torque	8			-0.51
L7	58.75 - 32.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-27.29	-0.10	-0.71
			Max. Mx	5	-15.57	-1179.39	8.17
			Max. My	8	-15.56	8.49	-1185.04
			Max. Vy	5	19.54	-1179.39	8.17
			Max. Vx	8	19.56	8.49	-1185.04
			Max. Torque	7			-0.53
L8	32.25 - 0	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	-38.93	0.09	-0.82
			Max. Mx	11	-25.08	1981.60	-12.74
			Max. My	8	-25.08	12.33	-1988.15
			Max. Vy	11	-23.26	1981.60	-12.74
			Max. Vx	8	23.28	12.33	-1988.15
			Max. Torque	7			-0.56

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	22	38.93	3.38	-5.83
	Max. H_x	11	25.09	23.25	-0.10
	Max. H_z	2	25.09	-0.10	23.27
	Max. M_x	2	1987.34	-0.10	23.27
	Max. M_z	5	1981.58	-23.25	0.10
	Max. Torsion	13	0.55	11.54	20.11
	Min. Vert	1	25.09	0.00	0.00
	Min. H_x	5	25.09	-23.25	0.10
	Min. H_z	8	25.09	0.10	-23.27
	Min. M_x	8	-1988.15	0.10	-23.27
	Min. M_z	11	-1981.60	23.25	-0.10
	Min. Torsion	7	-0.56	-11.54	-20.11

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	25.09	0.00	0.00	0.40	0.01	0.00
Dead+Wind 0 deg - No Ice	25.09	0.10	-23.27	-1987.34	-12.32	-0.55
Dead+Wind 30 deg - No Ice	25.09	11.71	-20.20	-1727.19	-1001.45	-0.40
Dead+Wind 60 deg - No Ice	25.09	20.19	-11.72	-1004.14	-1722.25	-0.15
Dead+Wind 90 deg - No Ice	25.09	23.25	-0.10	-11.92	-1981.58	0.15
Dead+Wind 120 deg - No Ice	25.09	20.09	11.55	983.62	-1709.95	0.41
Dead+Wind 150 deg - No Ice	25.09	11.54	20.11	1715.70	-980.12	0.56
Dead+Wind 180 deg - No Ice	25.09	-0.10	23.27	1988.15	12.33	0.56
Dead+Wind 210 deg - No Ice	25.09	-11.71	20.20	1728.00	1001.46	0.40
Dead+Wind 240 deg - No Ice	25.09	-20.19	11.72	1004.96	1722.26	0.13
Dead+Wind 270 deg - No Ice	25.09	-23.25	0.10	12.74	1981.60	-0.16
Dead+Wind 300 deg - No Ice	25.09	-20.09	-11.55	-982.80	1709.96	-0.41
Dead+Wind 330 deg - No Ice	25.09	-11.54	-20.11	-1714.89	980.13	-0.55
Dead+Ice+Temp	38.93	0.00	0.00	0.82	0.09	0.00
Dead+Wind 0 deg+Ice+Temp	38.93	0.02	-6.72	-601.69	-2.30	-0.19
Dead+Wind 30 deg+Ice+Temp	38.93	3.38	-5.83	-522.16	-303.23	-0.09
Dead+Wind 60 deg+Ice+Temp	38.93	5.84	-3.38	-302.48	-522.89	0.04
Dead+Wind 90 deg+Ice+Temp	38.93	6.73	-0.02	-1.53	-602.42	0.15
Dead+Wind 120	38.93	5.82	3.34	300.06	-520.51	0.23

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
deg+Ice+Temp						
Dead+Wind 150 deg+Ice+Temp	38.93	3.35	5.81	521.48	-299.11	0.24
Dead+Wind 180 deg+Ice+Temp	38.93	-0.02	6.72	603.40	2.46	0.19
Dead+Wind 210 deg+Ice+Temp	38.93	-3.38	5.83	523.86	303.39	0.09
Dead+Wind 240 deg+Ice+Temp	38.93	-5.84	3.38	304.19	523.04	-0.04
Dead+Wind 270 deg+Ice+Temp	38.93	-6.73	0.02	3.23	602.57	-0.15
Dead+Wind 300 deg+Ice+Temp	38.93	-5.82	-3.34	-298.36	520.66	-0.23
Dead+Wind 330 deg+Ice+Temp	38.93	-3.35	-5.81	-519.77	299.26	-0.24
Dead+Wind 0 deg - Service	25.09	0.04	-9.13	-781.99	-4.81	-0.22
Dead+Wind 30 deg - Service	25.09	4.60	-7.93	-679.58	-394.16	-0.16
Dead+Wind 60 deg - Service	25.09	7.92	-4.60	-394.96	-677.89	-0.06
Dead+Wind 90 deg - Service	25.09	9.13	-0.04	-4.41	-779.98	0.06
Dead+Wind 120 deg - Service	25.09	7.88	4.53	387.43	-673.07	0.16
Dead+Wind 150 deg - Service	25.09	4.53	7.89	675.57	-385.81	0.22
Dead+Wind 180 deg - Service	25.09	-0.04	9.13	782.80	4.82	0.22
Dead+Wind 210 deg - Service	25.09	-4.60	7.93	680.39	394.17	0.16
Dead+Wind 240 deg - Service	25.09	-7.92	4.60	395.78	677.90	0.05
Dead+Wind 270 deg - Service	25.09	-9.13	0.04	5.23	779.99	-0.06
Dead+Wind 300 deg - Service	25.09	-7.88	-4.53	-386.62	673.08	-0.16
Dead+Wind 330 deg - Service	25.09	-4.53	-7.89	-674.76	385.83	-0.22

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-25.09	0.00	0.00	25.09	0.00	0.000%
2	0.10	-25.09	-23.27	-0.10	25.09	23.27	0.000%
3	11.71	-25.09	-20.20	-11.71	25.09	20.20	0.000%
4	20.19	-25.09	-11.72	-20.19	25.09	11.72	0.000%
5	23.25	-25.09	-0.10	-23.25	25.09	0.10	0.000%
6	20.09	-25.09	11.55	-20.09	25.09	-11.55	0.000%
7	11.54	-25.09	20.11	-11.54	25.09	-20.11	0.000%
8	-0.10	-25.09	23.27	0.10	25.09	-23.27	0.000%
9	-11.71	-25.09	20.20	11.71	25.09	-20.20	0.000%
10	-20.19	-25.09	11.72	20.19	25.09	-11.72	0.000%
11	-23.25	-25.09	0.10	23.25	25.09	-0.10	0.000%
12	-20.09	-25.09	-11.55	20.09	25.09	11.55	0.000%
13	-11.54	-25.09	-20.11	11.54	25.09	20.11	0.000%
14	0.00	-38.93	0.00	0.00	38.93	0.00	0.000%
15	0.02	-38.93	-6.72	-0.02	38.93	6.72	0.000%
16	3.38	-38.93	-5.83	-3.38	38.93	5.83	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
17	5.84	-38.93	-3.38	-5.84	38.93	3.38	0.000%
18	6.73	-38.93	-0.02	-6.73	38.93	0.02	0.000%
19	5.82	-38.93	3.34	-5.82	38.93	-3.34	0.000%
20	3.35	-38.93	5.81	-3.35	38.93	-5.81	0.000%
21	-0.02	-38.93	6.72	0.02	38.93	-6.72	0.000%
22	-3.38	-38.93	5.83	3.38	38.93	-5.83	0.000%
23	-5.84	-38.93	3.38	5.84	38.93	-3.38	0.000%
24	-6.73	-38.93	0.02	6.73	38.93	-0.02	0.000%
25	-5.82	-38.93	-3.34	5.82	38.93	3.34	0.000%
26	-3.35	-38.93	-5.81	3.35	38.93	5.81	0.000%
27	0.04	-25.09	-9.13	-0.04	25.09	9.13	0.000%
28	4.60	-25.09	-7.93	-4.60	25.09	7.93	0.000%
29	7.92	-25.09	-4.60	-7.92	25.09	4.60	0.000%
30	9.13	-25.09	-0.04	-9.13	25.09	0.04	0.000%
31	7.88	-25.09	4.53	-7.88	25.09	-4.53	0.000%
32	4.53	-25.09	7.89	-4.53	25.09	-7.89	0.000%
33	-0.04	-25.09	9.13	0.04	25.09	-9.13	0.000%
34	-4.60	-25.09	7.93	4.60	25.09	-7.93	0.000%
35	-7.92	-25.09	4.60	7.92	25.09	-4.60	0.000%
36	-9.13	-25.09	0.04	9.13	25.09	-0.04	0.000%
37	-7.88	-25.09	-4.53	7.88	25.09	4.53	0.000%
38	-4.53	-25.09	-7.89	4.53	25.09	7.89	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00035016
3	Yes	5	0.00000001	0.00012904
4	Yes	5	0.00000001	0.00013712
5	Yes	4	0.00000001	0.00015869
6	Yes	5	0.00000001	0.00013156
7	Yes	5	0.00000001	0.00012486
8	Yes	4	0.00000001	0.00055673
9	Yes	5	0.00000001	0.00013996
10	Yes	5	0.00000001	0.00013040
11	Yes	4	0.00000001	0.00008782
12	Yes	5	0.00000001	0.00012646
13	Yes	5	0.00000001	0.00013463
14	Yes	4	0.00000001	0.00000001
15	Yes	5	0.00000001	0.00010420
16	Yes	5	0.00000001	0.00012746
17	Yes	5	0.00000001	0.00012802
18	Yes	5	0.00000001	0.00010416
19	Yes	5	0.00000001	0.00012690
20	Yes	5	0.00000001	0.00012609
21	Yes	5	0.00000001	0.00010457
22	Yes	5	0.00000001	0.00012856
23	Yes	5	0.00000001	0.00012769
24	Yes	5	0.00000001	0.00010395
25	Yes	5	0.00000001	0.00012542
26	Yes	5	0.00000001	0.00012654
27	Yes	4	0.00000001	0.00010066
28	Yes	4	0.00000001	0.00053660
29	Yes	4	0.00000001	0.00060493

30	Yes	4	0.00000001	0.00003649
31	Yes	4	0.00000001	0.00056926
32	Yes	4	0.00000001	0.00051278
33	Yes	4	0.00000001	0.00011946
34	Yes	4	0.00000001	0.00062928
35	Yes	4	0.00000001	0.00054780
36	Yes	4	0.00000001	0.00003080
37	Yes	4	0.00000001	0.00052516
38	Yes	4	0.00000001	0.00059458

Compression Checks

Pole Design Data

Section No.	Elevation	Size	L	L_u	KI/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft		ft	ft		ksi	in^2	K	K	
L1	136 - 129.5 (1)	TP3x3x0.216	6.50	0.00	0.0	21.000	1.8892	-0.04	39.67	0.001
L2	129.5 - 129 (2)	TP8x3x0.216	0.50	0.00	0.0	21.000	1.8892	-0.04	39.67	0.001
L3	129 - 120.5 (3)	TP8x8x0.322	8.50	0.00	0.0	21.000	7.7670	-0.26	163.11	0.002
L4	120.5 - 120 (4)	TP22x8x0.322	0.50	0.00	0.0	21.000	7.7670	-0.27	163.11	0.002
L5	120 - 87.5 (5)	TP29.476x22x0.1875	32.50	0.00	0.0	32.266	17.1621	-7.22	553.75	0.013
L6	87.5 - 58.75 (6)	TP35.715x28.2384x0.25	32.50	0.00	0.0	34.207	27.7160	-10.59	948.07	0.011
L7	58.75 - 32.25 (7)	TP41.311x34.1798x0.375	31.00	0.00	0.0	39.000	47.9719	-15.56	1870.90	0.008
L8	32.25 - 0 (8)	TP47.98x39.3533x0.4375	37.50	0.00	0.0	39.000	66.9755	-25.08	2612.04	0.010

Pole Bending Design Data

Section No.	Elevation	Size	Actual M_x	Actual f_{bx}	Allow. F_{bx}	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y	Actual f_{by}	Allow. F_{by}	Ratio $\frac{f_{by}}{F_{by}}$
	ft		kip-ft	ksi	ksi		kip-ft	ksi	ksi	
L1	136 - 129.5 (1)	TP3x3x0.216	0.27	2.636	23.100	0.114	0.00	0.000	23.100	0.000
L2	129.5 - 129 (2)	TP8x3x0.216	0.27	2.635	23.100	0.114	0.00	0.000	23.100	0.000
L3	129 - 120.5 (3)	TP8x8x0.322	1.73	1.450	23.100	0.063	0.00	0.000	23.100	0.000
L4	120.5 - 120 (4)	TP22x8x0.322	1.73	1.449	23.100	0.063	0.00	0.000	23.100	0.000
L5	120 - 87.5 (5)	TP29.476x22x0.1875	278.37	27.972	32.266	0.867	0.00	0.000	32.266	0.000
L6	87.5 - 58.75 (6)	TP35.715x28.2384x0.25	717.77	36.897	34.207	1.079	0.00	0.000	34.207	0.000
L7	58.75 - 32.25 (7)	TP41.311x34.1798x0.375	1191.02	30.721	39.000	0.788	0.00	0.000	39.000	0.000
L8	32.25 - 0 (8)	TP47.98x39.3533x0.4375	1997.22	30.827	39.000	0.790	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	136 - 129.5 (1)	TP3x3x0.216	0.08	0.044	14.000	0.006	0.00	0.000	14.000	0.000
L2	129.5 - 129 (2)	TP8x3x0.216	0.09	0.049	14.000	0.007	0.00	0.000	14.000	0.000
L3	129 - 120.5 (3)	TP8x8x0.322	0.24	0.031	14.000	0.004	0.00	0.000	14.000	0.000
L4	120.5 - 120 (4)	TP22x8x0.322	0.26	0.033	14.000	0.005	0.00	0.000	14.000	0.000
L5	120 - 87.5 (5)	TP29.476x22x0.1875	14.36	0.836	24.000	0.071	0.48	0.023	24.000	0.001
L6	87.5 - 58.75 (6)	TP35.715x28.2384x0.25	17.09	0.617	24.000	0.052	0.37	0.009	24.000	0.000
L7	58.75 - 32.25 (7)	TP41.311x34.1798x0.375	19.64	0.409	26.000	0.032	0.38	0.005	26.000	0.000
L8	32.25 - 0 (8)	TP47.98x39.3533x0.4375	23.36	0.349	26.000	0.027	0.40	0.003	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	136 - 129.5 (1)	0.001	0.114	0.000	0.006	0.000	0.115 ✔	1.333	H1-3+VT ✔
L2	129.5 - 129 (2)	0.001	0.114	0.000	0.007	0.000	0.115 ✔	1.333	H1-3+VT ✔
L3	129 - 120.5 (3)	0.002	0.063	0.000	0.004	0.000	0.064 ✔	1.333	H1-3+VT ✔
L4	120.5 - 120 (4)	0.002	0.063	0.000	0.005	0.000	0.064 ✔	1.333	H1-3+VT ✔
L5	120 - 87.5 (5)	0.013	0.867	0.000	0.071	0.001	0.881 ✔	1.333	H1-3+VT ✔
L6	87.5 - 58.75 (6)	0.011	1.079	0.000	0.052	0.000	1.090 ✔	1.333	H1-3+VT ✔
L7	58.75 - 32.25 (7)	0.008	0.788	0.000	0.032	0.000	0.796 ✔	1.333	H1-3+VT ✔
L8	32.25 - 0 (8)	0.010	0.790	0.000	0.027	0.000	0.800 ✔	1.333	H1-3+VT ✔

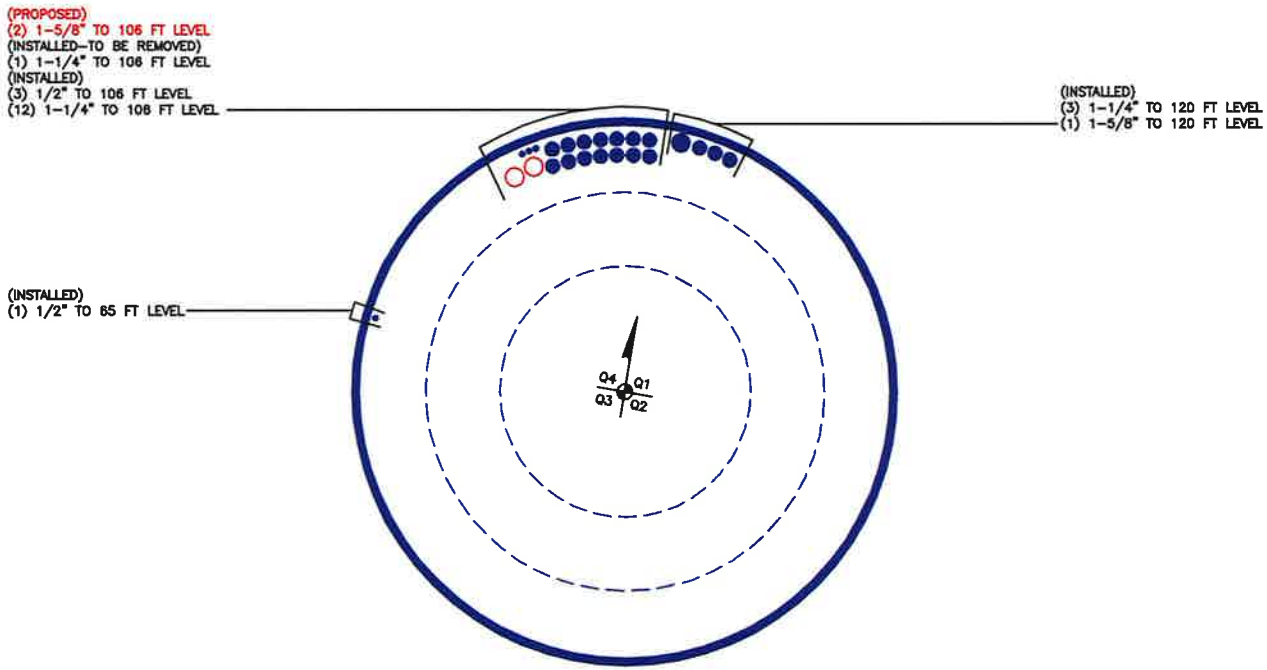
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	136 - 129.5	Pole	TP3x3x0.216	1	-0.04	52.88	8.6	Pass
L2	129.5 - 129	Pole	TP8x3x0.216	2	-0.04	52.88	8.6	Pass
L3	129 - 120.5	Pole	TP8x8x0.322	3	-0.26	217.42	4.8	Pass
L4	120.5 - 120	Pole	TP22x8x0.322	4	-0.27	217.42	4.8	Pass
L5	120 - 87.5	Pole	TP29.476x22x0.1875	5	-7.22	738.14	66.1	Pass
L6	87.5 - 58.75	Pole	TP35.715x28.2384x0.25	6	-10.59	1263.78	81.8	Pass
L7	58.75 - 32.25	Pole	TP41.311x34.1798x0.375	7	-15.56	2493.91	59.7	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L8	32.25 - 0	Pole	TP47.98x39.3533x0.4375	8	-25.08	3481.85	60.0	Pass
						Summary	ELC:	Existing/Proposed/Reserved
						Pole (L6)	81.8	Pass
						Rating =	81.8	Pass

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 876332 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

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

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

Site Data

BU#: *876332*
Site Name: *36 Prospect Street*
App #: *300822 Rev. 0*

Anchor Rod Data		
Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Yield, Fy:	75	ksi
Strength, Fu:	100	ksi
Bolt Circle:	56	in
Anchor Spacing:	6	in

Plate Data		
W=Side:	56	in
Thick:	3	in
Grade:	50	ksi
Clip Distance:	7	in

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

Pole Data		
Diam:	47.98	in
Thick:	0.4375	in
Grade:	65	ksi
# of Sides:	12	"0" IF Round

Stress Increase Factor		
ASD ASIF:	1.333	

Base Reactions		
TIA Revision:	F	
Unfactored Moment, M:	1997	ft-kips
Unfactored Axial, P:	25	kips
Unfactored Shear, V:	23	kips

Anchor Rod Results

TIA F --> Maximum Rod Tension	105.4 Kips
Allowable Tension:	195.0 Kips
Anchor Rod Stress Ratio:	54.1% **Pass**

Base Plate Results Flexural Check

Base Plate Stress:	29.1 ksi
Allowable PL Bending Stress:	50.0 ksi
Base Plate Stress Ratio:	58.1% **Pass**

PL Ref. Data	
Yield Line (in):	31.22
Max PL Length:	31.22

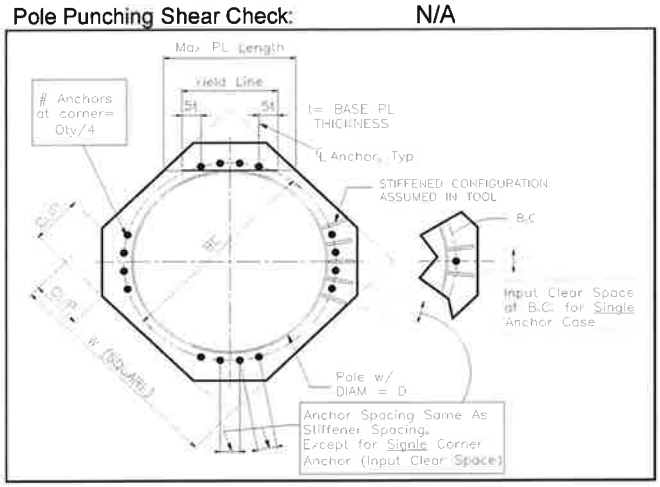
N/A - Unstiffened

Stiffener Results

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

Pole Results

Pole Punching Shear Check:	N/A



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

Original Design Reaction Comparison for Monopole
BU#:876332 - 36 Prospect Street
SSOE Project Number: 015-00428-00

Analysis Code	F
Foundation Type	Pad & Pier

Overall Capacity	80.6%	OK

Vector	Design Reactions	Actual Reactions	Capacity
Moment	3250.0 ft-kips	1997.0 ft-kips	61.4%
Compression	31.0 kips	25.0 kips	80.6%