Robinson+Cole

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Also admitted in Massachusetts

July 24, 2015

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

Re: **Notice of Exempt Modification – Facility Modification**
2715 Mountain Road, Suffield, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) antennas at the 160-foot level of the existing 190.5 foot tower at 2715 Mountain Road in Suffield, Connecticut (the "Property"). The tower is owned by Crown Castle. The Council approved Cellco's use of this tower in 2008. Cellco now intends to replace six (6) of its existing antennas with three (3) model SBNHH-1DS65B, 700/2100 MHz antennas and three (3) model SBNHH-1DS65B, 1900 MHz antennas, all at the same 160-foot level on the tower. Cellco also intends to replace three (3) existing remote radio heads ("RRHs") with three (3) newer model RRHs and install six (6) additional RRHs and two (2) HYBRIFLEX™ antenna cables. Included in Attachment 1 are specifications for Cellco's replacement antennas, RRHs and HYBRIFLEX™ cable.

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 Edward McAnaney, First Selectman of the Town of Suffield. The Town of Suffield is the owner of the Property.

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 at the 160-foot level on the 190.5 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* Structural Analysis Report included in Attachment 3).

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

Sincerely,

Kenneth C. Baldwin

Enclosures
Copy to:
Edward McAnaney, Suffield First Selectman
Tim Parks

ATTACHMENT 1

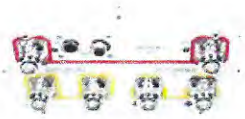
Product Specifications

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.

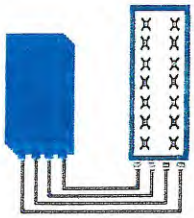
Its compactness and slim design makes the Alcatel-Lucent B13 RRH4x30-4R easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the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

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.)

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

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

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

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

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

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

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

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

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

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

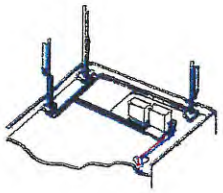
The Alcatel-Lucent RRH2x60-AWS is a very cost-effective solution to deploy LTE MIMO.

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

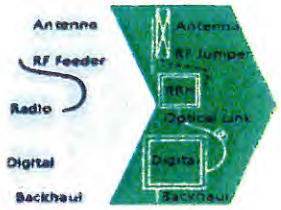
The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment. However, many of these sites can host an Alcatel-Lucent RRH2x60-AWS installation, providing more flexible site selection and improved network quality along with greatly reduced installation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

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

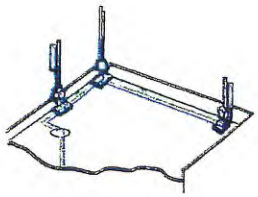
Installation can easily be done by a single person as the Alcatel-Lucent RRH2x60-AWS is compact and weighs about 20 kg, eliminating the need for a crane to hoist the BTS cabinet to the rooftop. A site can be in operation in less than one day.



Macro



RRH for space-constrained cell sites



Distributed

- RRH2x60-AWS 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
- MIMO LTE operation with only one single unit per sector
- Improved uplink coverage with built-in 4-way receive diversity capability
- RRH can be mounted close to the antenna, eliminating nearly all losses in RF cables and thus reducing power consumption by 50% compared to conventional solutions
- Distributed configurations provide easily deployable and cost-effective solutions, near zero footprint and silent solutions, with minimum impact on the neighborhood, which ease the deployment
- RETA and TMA support without additional hardware thanks to the AISG v2.0 port and the integrated Bias-Tees. Bias-Tees support AISG DC supply and signaling.

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

Dimensions and weights

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

Electrical Data

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

RF Characteristics

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

Connectivity

- Two CPRI optical ports for 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.

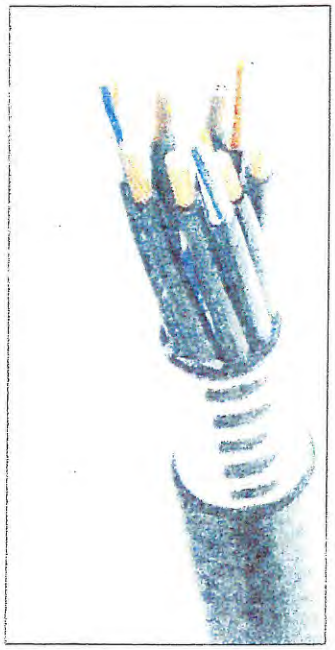


Figure 1: HYBRIFLEX Series

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-99-658 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)

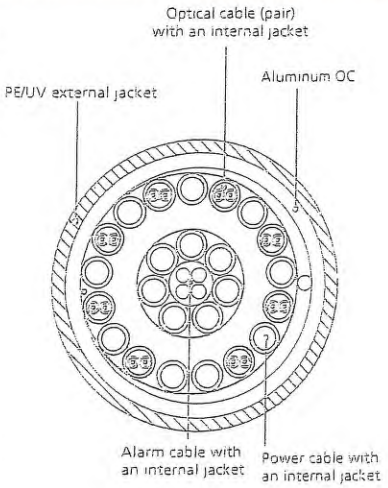


Figure 2: Construction Detail

* This data is provisional and subject to change

ATTACHMENT 2

	General	Power	Density					
Site Name: Suffield W								
Tower Height: 190.5Ft.								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*AT&T UMTS	2	565	170	0.0141	880	0.5867	2.40%	
*AT&T UMTS	2	875	170	0.0218	1900	1.0000	2.18%	
*AT&T GSM	1	283	170	0.0035	880	0.5867	0.60%	
*AT&T GSM	4	525	170	0.0261	1900	1.0000	2.61%	
*AT&T LTE	1	1615	170	0.0201	734	0.4893	4.11%	
*Nextel	9	100	192	0.0088	851	0.5673	1.55%	
*T-Mobile	6	1102	182	0.0718	1900	1.2667	5.67%	
*T-Mobile	1	865	182	0.0094	700	0.4667	2.01%	
Verizon PCS	**11**	**399**	**160**	**0.0616**	**1970**	**1.0000**	**6.16%**	
Verizon Cellular	**9**	**380**	**160**	**0.0480**	**869**	**0.5793**	**8.29%**	
Verizon AWS	**1**	**3500**	**160**	**0.0492**	**2145**	**1.0000**	**4.92%**	
Verizon 700	**1**	**2100**	**160**	**0.0295**	**746**	**0.4973**	**5.93%**	
								46.42%
* Source: Siting Council								

ATTACHMENT 3

June 19, 2015

Sean Dempsey
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277
(704) 405-6565

B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630
btwo@btgrp.com

Subject:	**Structural Analysis Report**	
Carrier Designation:	***Verizon Wireless* Co-Locate**	
	Carrier Site Number:	N/A
	Carrier Site Name:	N/A
Crown Castle Designation:	**Crown Castle BU Number:**	801485
	Crown Castle Site Name:	CT Suffield 1 CAC 801485
	Crown Castle JDE Job Number:	337400
	Crown Castle Work Order Number:	1077289
	Crown Castle Application Number:	300074 Rev. 2
Engineering Firm Designation:	**B+T Group Project Number:**	84855.006.01
Site Data:	**2715 Mountain Rd., Suffield, Hartford County, CT** **Latitude *42° 0' 41.8"*, Longitude *-72° 43' 43.6"*** **190.5 Foot - Monopole Tower**	

Dear Sean Dempsey,

B+T 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 798096, in accordance with application 300074, revision 2.

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

LC7: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table 1 and Table 2 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 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 *B+T 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.

Respectfully submitted by:
B+T Engineering, Inc.

Tapan Pandey, E.I.T.
Project Engineer

Chad E. Tuttle, P.E.
President
COA: PEC.0001564 Expires: 02/10/2016

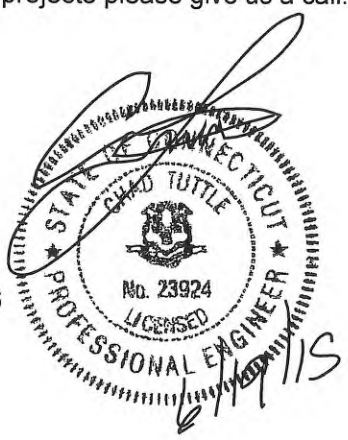


TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 190.5 ft. Monopole tower designed by FWT Inc. in May of 2000. The tower was originally designed for a wind speed of 80 mph per TIA/EIA-222-F. This tower has been modified by B+T Group in July of 2012 and those modifications were incorporated in this analysis.

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
160.0	160.0	3	Alcatel Lucent	RRH2X60-AWS	1	1-5/8	--
		3	Alcatel Lucent	RRH2X60-PCS			
		3	Alcatel Lucent	RRH2x60-700			
		6	Commscope	SBNHH-1D65B			
		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
191.0	192.0	12	Decibel	DB844H90-XY	12	1-5/8	3
	191.0	1	--	Platform Mount [LP 712-1]	--	--	1
180.0	182.0	3	Commscope	ATBT-BOTTOM-24V	6	1-5/8	2
		3	Commscope	LNX-6515DS-VTM			
		6	Decibel	PCS 1900 TMA DUAL DUP	6	1-5/8	1
		3	Ems Wireless	RR90-17-02DP			
	180.0	1	--	T-Arm Mount [TA 701-3]			
168.0	171.0	3	Ericsson	RRUS-11	2 1 12	3/4 3/8 1-5/8	1
		2	Powerwave Tech	LGP21401			
		1	Raycap	DC6-48-60-18-8F			
	170.0	1	Kmw Comm	AM-X-CD-14-65-00T-RET			
		6	Powerwave Tech	7770.00			
		4	Powerwave Tech	LGP21401			
		6	Powerwave Tech	LGP21901			
		2	Powerwave Tech	P65-17-XLH-RR			
	168.0	1	--	Platform Mount [LP 303-1]			
160.0	160.0	**6**	**Antel**	**LPA-171080-12CF-EDIN-2**	**6**	**1-5/8**	**4**
		1	Antel	BXA-70063-6CF-2	13	1-5/8	1
		2	Antel	BXA-70063-6CF-EDIN-0			
		4	Antel	LPA-80063-6CF-EDIN			
		2	Antel	LPA-80063-6CF-EDIN-5			
		1	Rfs Celwave	DB-T1-6Z-8AB-0Z			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
		1	--	Platform Mount [LP 601-1]			

Notes:
1) Existing Equipment
2) Reserved Equipment
3) Abandoned Equipment Considered In This Analysis
4) **Equipment To Be Removed**

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)
192	192	1	Generic	12' LPS Mount w/service grating	--	--
		12	Swedcom	ALP-9011-E-DIN		
182	182	1	Generic	12' LPS Mount w/service grating	--	--
		12	Swedcom	ALP-9212-N		
172	172	1	Generic	12' LPS Mount w/service grating	--	--
		12	Swedcom	ALP-9212-N		
162	162	1	Generic	12' LPS Mount w/service grating	--	--
		12	Swedcom	ALP-9212-N		
152	152	1	Generic	12' LPS Mount w/service grating	--	--
		12	Swedcom	ALP-9212-N		
142	142	1	Generic	12' LPS Mount w/service grating	--	--
		12	Swedcom	ALP-9212-N		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Online Application	Verizon Wireless Co-Locate, Revision # 2	300074	CCI Sites
Tower Manufacturer Drawing	FWT Inc., Job No. 21281000	942443	CCI Sites
Tower Modification Drawing	B+T Group, Project No. 84855.001 Date: 07/17/2012	3268394	CCI Sites
Post Modification Inspection	TEP, Project No. 127143 Date: 03/29/2013	3770639	CCI Sites
Foundation Drawing	FWT Inc. Job No. 21281000	1118796	CCI Sites
Geotech Report	Clough, Harbour & Associates LLP, Project No. 8961.07.06	2240855	CCI Sites
Antenna Configuration	Crown CAD Package	Date: 06/16/2015	CCI Sites

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) Mount areas and weights are assumed based on photographs provided.

This analysis may be affected if any assumptions are not valid or have been made in error. B+T Group 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	190.5 - 143.17	Pole	TP27.778x14.75x0.25	1	-8.898	1094.891	95.2	Pass
L2	143.17 - 93.753	Pole	TP40.88x26.292x0.375	2	-18.410	2415.569	91.9	Pass
L3	93.753 - 46.083	Pole	TP53.251x38.663x0.375	3	-23.667	2691.300	96.6	Pass
L4	46.083 - 0	Pole	TP65.185x50.597x0.375	4	-48.009	3748.329	99.8	Pass
							Summary	
						Pole (L4)	99.8	Pass
						RATING =	**99.8**	**Pass**

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	Base	83.0	Pass
1	Base Plate	Base	47.2	Pass
1	Base Foundation (Structural)	Base	81.7	Pass
1	Base Foundation (Soil Interaction)	Base	59.2	Pass

Structure Rating (max from all components) =	99.8%

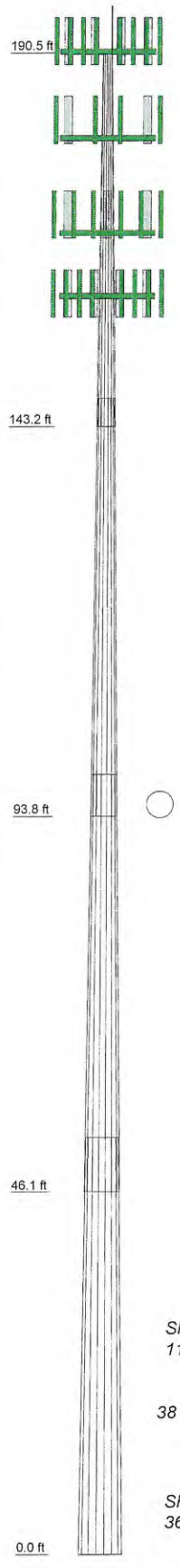
Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

4.1) Recommendations

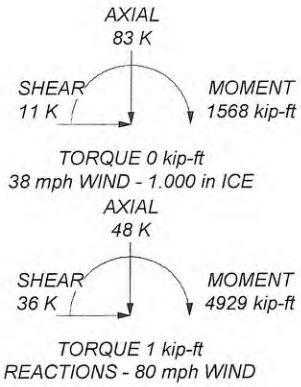
The tower and its foundation have sufficient capacity to carry the existing, reserved, and proposed loads. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT



Section	1	2	3	4	5	6	7
Length (ft)	47.330	53.000	53.000	53.000			2.7
Number of Sides	18	18	18	18			
Thickness (in)	0.250	0.375	0.375	0.375			
Socket Length (ft)	3.583	5.330	6.917				
Top Dia (in)	14.750	26.292	38.663	50.597			
Bot Dia (in)	27.778	40.880	53.251	65.185			
Grade	A572-65						
Weight (K)	31.9	7.1	9.8	12.3			



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(4) DB844H90-XY w/ Mount Pipe (AB)	191	(2) LGP21401 (E)	168
(4) DB844H90-XY w/ Mount Pipe (AB)	191	RRUS-11 (E)	168
(4) DB844H90-XY w/ Mount Pipe (AB)	191	RRUS-11 (E)	168
Platform Mount [LP 712-1] (E)	191	RRUS-11 (E)	168
Lightning Rod 5/8" x 6' (E)	190.5	DC6-48-60-18-8F (E)	168
RR90-17-02DP w/ Mount Pipe (E)	180	Platform Mount [LP 303-1] (E)	168
RR90-17-02DP w/ Mount Pipe (E)	180	BXA-70063-6CF-EDIN-0 w/ Mount Pipe (E)	160
RR90-17-02DP w/ Mount Pipe (E)	180		
(2) PCS 1900 TMA DUAL DUP (E)	180	BXA-70063-6CF-EDIN-0 w/ Mount Pipe (E)	160
(2) PCS 1900 TMA DUAL DUP (E)	180		
(2) PCS 1900 TMA DUAL DUP (E)	180	BXA-70063-6CF-2 w/ Mount Pipe (E)	160
LNX-6515DS-VTM w/ Mount Pipe (R)	180	(2) LPA-80063-6CF-EDIN w/ Mount Pipe (E)	160
LNX-6515DS-VTM w/ Mount Pipe (R)	180		
LNX-6515DS-VTM w/ Mount Pipe (R)	180	(2) LPA-80063-6CF-EDIN w/ Mount Pipe (E)	160
ATBT-BOTTOM-24V (R)	180		
ATBT-BOTTOM-24V (R)	180	(2) LPA-80063-6CF-EDIN-5 w/ Mount Pipe (E)	160
ATBT-BOTTOM-24V (R)	180		
6' x 2" Mount Pipe (E)	180	DB-T1-6Z-8AB-0Z (E)	160
6' x 2" Mount Pipe (E)	180	(2) SBNHH-1D65B w/ Mount Pipe (P)	160
6' x 2" Mount Pipe (E)	180	(2) SBNHH-1D65B w/ Mount Pipe (P)	160
T-Arm Mount [TA 701-3] (E)	180	(2) SBNHH-1D65B w/ Mount Pipe (P)	160
(2) 7770.00 w/ Mount Pipe (E)	168	DB-T1-6Z-8AB-0Z (P)	160
(2) 7770.00 w/ Mount Pipe (E)	168	RRH2X60-PCS (P)	160
(2) 7770.00 w/ Mount Pipe (E)	168	RRH2X60-PCS (P)	160
P65-17-XLH-RR w/ Mount Pipe (E)	168	RRH2X60-PCS (P)	160
P65-17-XLH-RR w/ Mount Pipe (E)	168	RRH2x60-700 (P)	160
AM-X-CD-14-65-00T-RET w/ Mount Pipe (E)	168	RRH2x60-700 (P)	160
		RRH2x60-700 (P)	160
(2) LGP21901 (E)	168	RRH2X60-AWS (P)	160
(2) LGP21901 (E)	168	RRH2X60-AWS (P)	160
(2) LGP21901 (E)	168	RRH2X60-AWS (P)	160
(2) LGP21401 (E)	168	Platform Mount [LP 601-1] (E)	160
(2) LGP21401 (E)	168		

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 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 99.8%

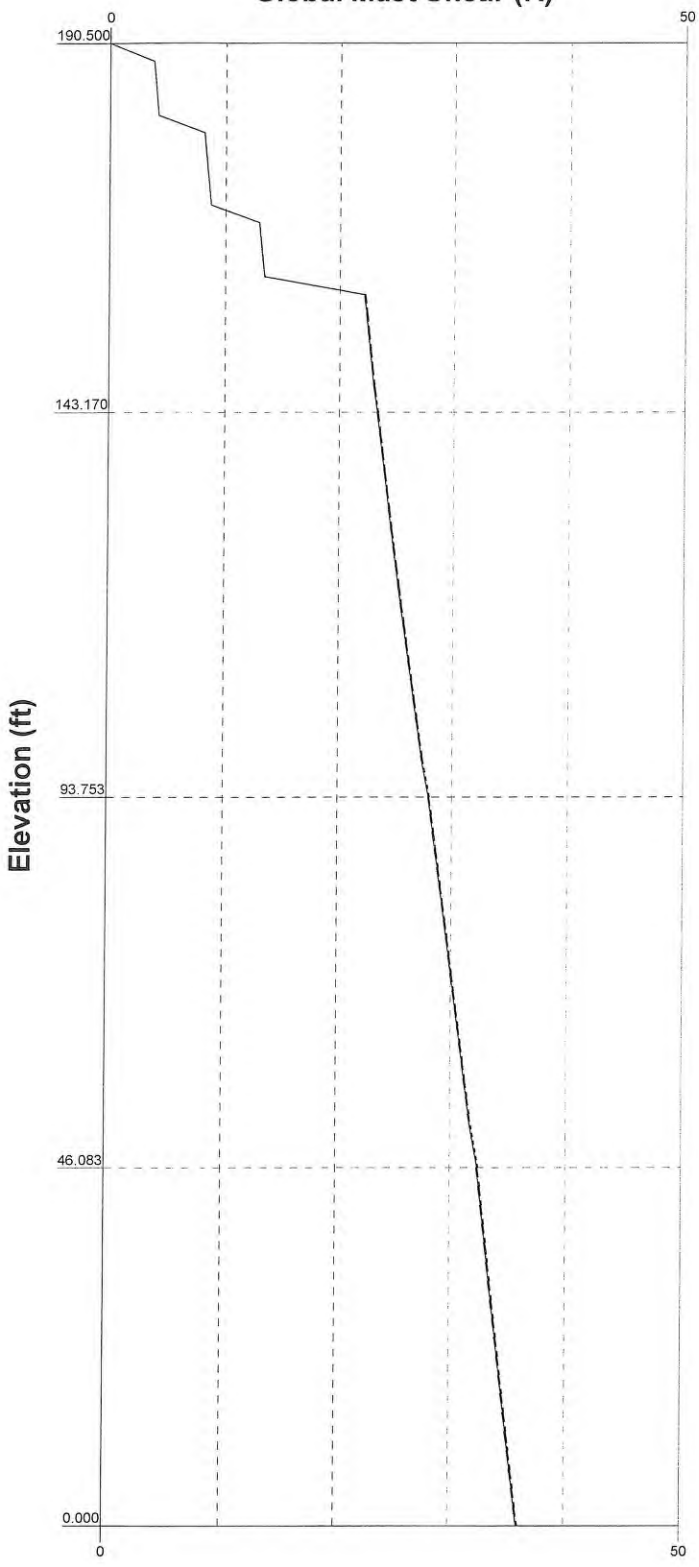
B+T Group
1717 S Boulder Ave, Suite 300
Tulsa, OK 74119
Phone: (918) 587-4630
FAX: (918) 295-0265

Job: 84855.006.01 - CT SUFFIELD 1 CAC 801485, CT (BU# 801		
Project:		
Client: Crown Castle	Drawn by: T. Pandey	App'd:
Code: TIA/EIA-222-F	Date: 06/18/15	Scale: NTS
Path: S:\Projects\Crown Castle\840084855_801485_CT Suffield 1 CAC\Engineering\tnx Tower\84855_006_01_CT SUFFIELD 1 CAC 801485_CT.eri		Dwg No. E-1

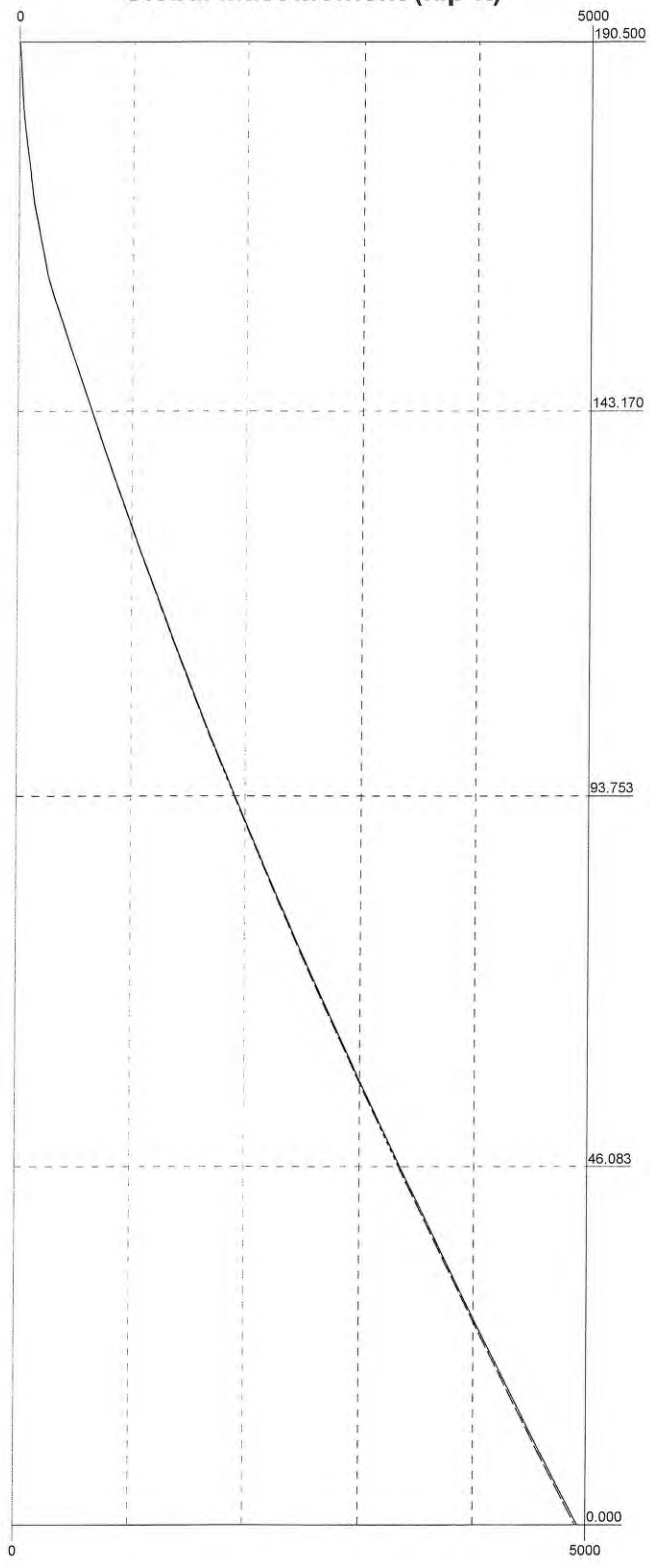
Vx Vz

Mx Mz

Global Mast Shear (K)



Global Mast Moment (kip-ft)



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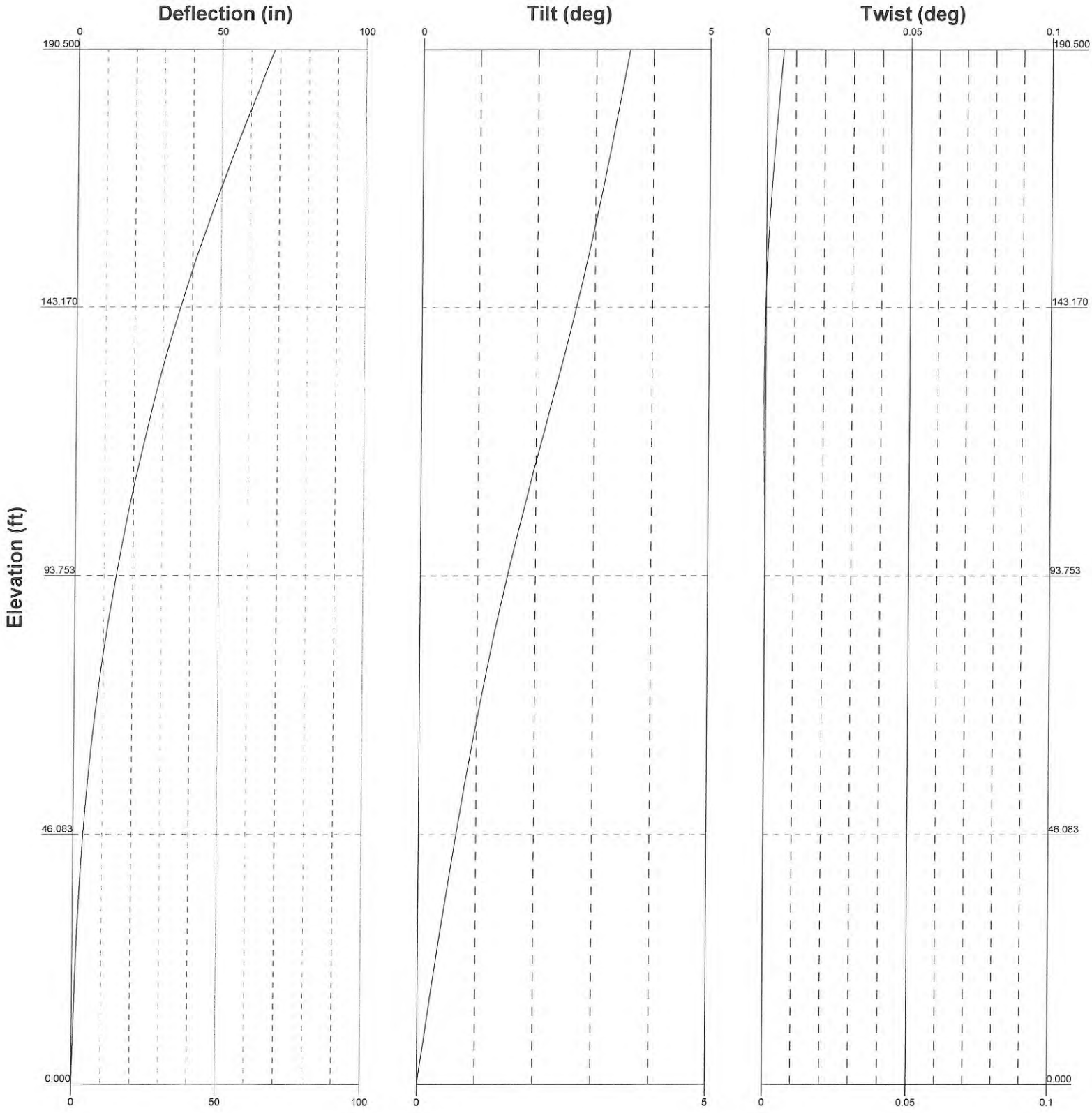
Project:		
Client: Crown Castle	Drawn by: T. Pandey	App'd:
Code: TIA/EIA-222-F	Date: 06/18/15	Scale: NTS
Path: S:\Projects\Crown Castle\84000\84855_801485_CT_Suffield 1 CAC\Engineering\tnxTower\84855_006_01_CT SUFFIELD 1 CAC 801485_CT.eri		Dwg No. E-4

TIA/EIA-222-F - Service - 50 mph

Maximum Values



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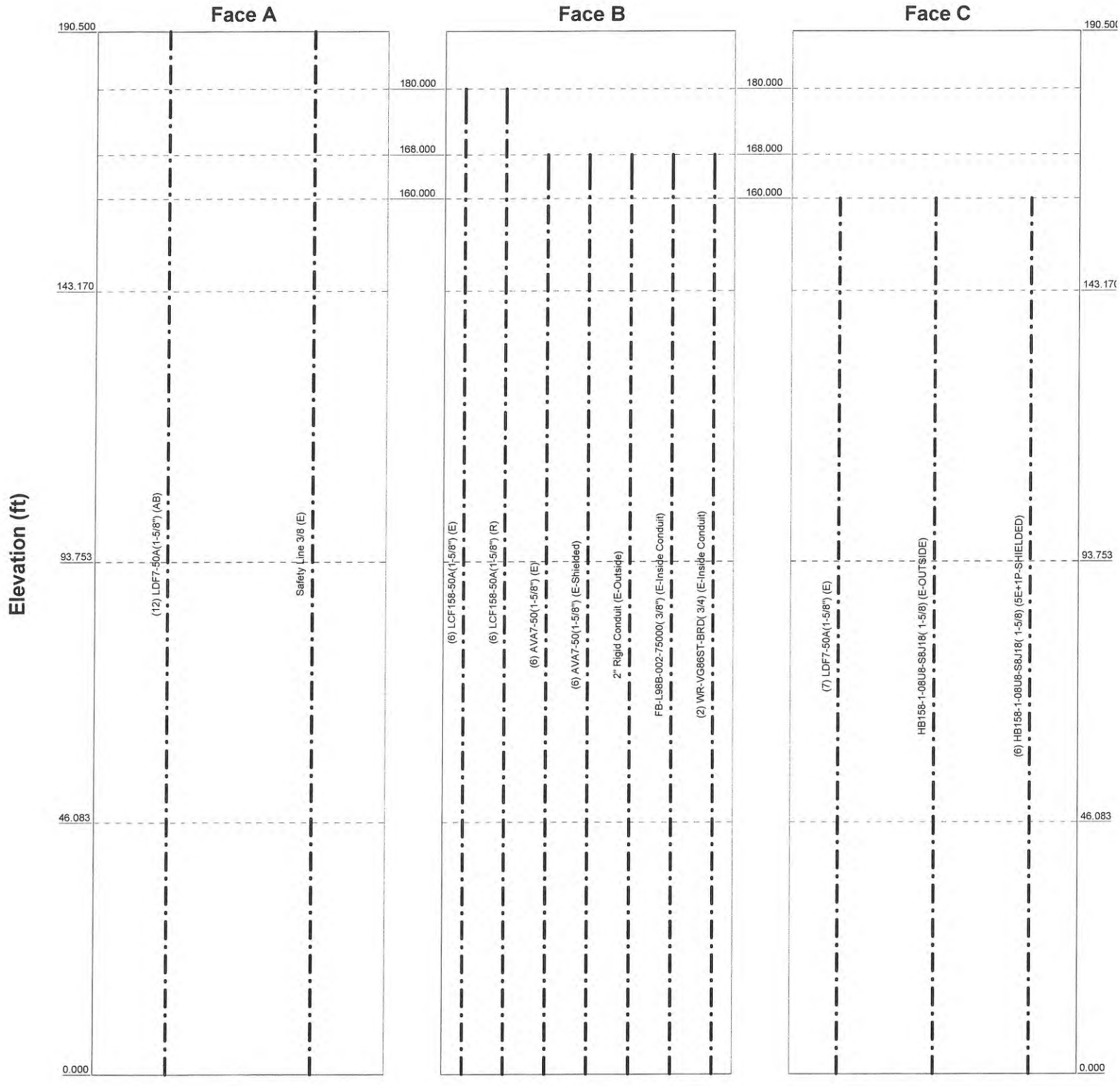
Job: 84855.006.01 - CT SUFFIELD 1 CAC 801485, CT (BU# 801			
Project:			
Client: Crown Castle	Drawn by: T. Pandey	App'd:	
Code: TIA/EIA-222-F	Date: 06/18/15	Scale: NTS	
Path: S:\Projects\Crown Castle\84000\84855_801485_CT Suffield 1 CAC\Engineering\tnTower\84855_006_01_CT SUFFIELD 1 CAC 801485_CT.eri		Dwg No. E-5	

0' - 190'6"

Round | Flat | App In Face | App Out Face | Truss Leg



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Project:			
Client: Crown Castle	Drawn by: T. Pandey	App'd:	
Code: TIA/EIA-222-F	Date: 06/18/15	Scale: NTS	
Path: S:\Projects\Crown Castle\840084855_801485_CT Suffield 1 CAC\Engineering\tnxTower\84855_006_01_CT SUFFIELD 1 CAC 801485_CT.eri		Dwg No. E-7	

Tower Input Data

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

Tower is located in Hartford County, Connecticut.
Basic wind speed of 80 mph.
Nominal ice thickness of 1.000 in.
Ice thickness is considered to increase with height.
Ice density of 56.000 pcf.
A wind speed of 38 mph is used in combination with ice.
Temperature drop of 50.000 °F.
Deflections calculated using a wind speed of 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.333.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	*Elevation*	*Section Length*	*Splice Length*	*Number of Sides*	*Top Diameter*	*Bottom Diameter*	*Wall Thickness*	*Bend Radius*	*Pole Grade*
	ft	*ft*	*ft*		*in*	*in*	*in*	*in*	
L1	190.500-143.170	47.330	3.583	18	14.750	27.778	0.250	1.000	A572-65 (65 ksi)
L2	143.170-93.753	53.000	5.330	18	26.292	40.880	0.375	1.500	A572-65 (65 ksi)
L3	93.753-46.083	53.000	6.917	18	38.663	53.251	0.375	1.500	A572-65 (65 ksi)
L4	46.083-0.000	53.000		18	50.597	65.185	0.375	1.500	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	14.978	11.506	305.625	5.148	7.493	40.788	611.651	5.754	2.156	8.624
	28.207	21.843	2091.262	9.772	14.111	148.198	4185.275	10.924	4.449	17.796
L2	27.699	30.847	2617.684	9.200	13.356	195.990	5238.811	15.427	3.967	10.58
	41.511	48.211	9993.130	14.379	20.767	481.201	19999.410	24.110	6.535	17.426
L3	40.749	45.572	8440.358	13.592	19.641	429.737	16891.822	22.790	6.145	16.386
	54.072	62.936	22230.612	18.771	27.052	821.788	44490.476	31.474	8.712	23.232
L4	53.311	59.777	19048.496	17.829	25.703	741.090	38122.057	29.894	8.245	21.987
	66.191	77.140	40935.651	23.008	33.114	1236.205	81925.167	38.577	10.813	28.833

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 190.500-143.170				1	1	1		
L2 143.170-93.753				1	1	1		
L3 93.753-46.083				1	1	1		
L4 46.083-0.000				1	1	1		

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
AB										

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 klf
LDF7-50A(1-5/8") (AB)	A	No	Inside Pole	190.500 - 0.000	12	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
AB								
LCF158-50A(1-5/8") (E)	B	No	Inside Pole	180.000 - 0.000	6	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
LCF158-50A(1-5/8") (R)	B	No	Inside Pole	180.000 - 0.000	6	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
AB								
AVA7-50(1-5/8") (E)	B	No	Inside Pole	168.000 - 0.000	6	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
AVA7-50(1-5/8") (E-Shielded)	B	No	CaAa (Out Of Face)	168.000 - 0.000	6	No Ice	0.000	0.001
						1/2" Ice	0.000	0.002
						1" Ice	0.000	0.004
						2" Ice	0.000	0.010
						4" Ice	0.000	0.030
2" Rigid Conduit (E-Outside)	B	No	CaAa (Out Of Face)	168.000 - 0.000	1	No Ice	0.200	0.003
						1/2" Ice	0.300	0.004
						1" Ice	0.400	0.006
						2" Ice	0.600	0.013
						4" Ice	1.000	0.032
FB-L98B-002-75000(3/8") (E-Inside Conduit)	B	No	CaAa (Out Of Face)	168.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
WR-VG86ST-BRD(3/4) (E-Inside Conduit)	B	No	CaAa (Out Of Face)	168.000 - 0.000	2	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.003
						2" Ice	0.000	0.007
						4" Ice	0.000	0.024
AB								
LDF7-50A(1-5/8") (E)	C	No	Inside Pole	160.000 - 0.000	7	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
HB158-1-08U8-S8J18(1-5/8) (E-OUTSIDE)	C	No	CaAa (Out Of Face)	160.000 - 0.000	1	No Ice	0.198	0.001
						1/2" Ice	0.298	0.003
						1" Ice	0.398	0.005
						2" Ice	0.598	0.011
						4" Ice	0.998	0.031
HB158-1-08U8-S8J18(1-5/8) (5E+1P-SHIELDED)	C	No	CaAa (Out Of Face)	160.000 - 0.000	6	No Ice	0.000	0.001
						1/2" Ice	0.000	0.003
						1" Ice	0.000	0.005
						2" Ice	0.000	0.011
						4" Ice	0.000	0.031
AB								
Safety Line 3/8 (E)	A	No	CaAa (Out Of Face)	190.500 - 0.000	1	No Ice	0.037	0.000
						1/2" Ice	0.137	0.001
						1" Ice	0.238	0.001
						2" Ice	0.437	0.002
						4" Ice	0.838	0.004
AB								

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

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	190.500-143.170	A	0.000	0.000	0.000	1.775	0.476
		B	0.000	0.000	0.000	4.966	0.662
		C	0.000	0.000	0.000	3.332	0.250
L2	143.170-93.753	A	0.000	0.000	0.000	1.853	0.497
		B	0.000	0.000	0.000	9.883	1.089
		C	0.000	0.000	0.000	9.785	0.733
L3	93.753-46.083	A	0.000	0.000	0.000	1.788	0.480
		B	0.000	0.000	0.000	9.534	1.051
		C	0.000	0.000	0.000	9.439	0.707
L4	46.083-0.000	A	0.000	0.000	0.000	1.728	0.464
		B	0.000	0.000	0.000	9.217	1.016
		C	0.000	0.000	0.000	9.124	0.684

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	190.500-143.170	A	1.213	0.000	0.000	0.000	13.255	0.537
		B		0.000	0.000	0.000	10.988	1.682
		C		0.000	0.000	0.000	7.414	0.831
L2	143.170-93.753	A	1.164	0.000	0.000	0.000	13.839	0.561
		B		0.000	0.000	0.000	21.869	3.119
		C		0.000	0.000	0.000	21.771	2.441
L3	93.753-46.083	A	1.093	0.000	0.000	0.000	12.887	0.538
		B		0.000	0.000	0.000	20.634	2.888
		C		0.000	0.000	0.000	20.539	2.256
L4	46.083-0.000	A	1.000	0.000	0.000	0.000	11.804	0.517
		B		0.000	0.000	0.000	19.293	2.622
		C		0.000	0.000	0.000	19.201	2.041

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	190.500-143.170	0.042	0.087	0.068	-0.054
L2	143.170-93.753	0.002	0.210	0.002	0.164
L3	93.753-46.083	0.002	0.218	0.002	0.181
L4	46.083-0.000	0.002	0.222	0.002	0.192

Discrete Tower Loads

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
Lightning Rod 5/8" x 6'	B	From Leg	0.000	0.000	190.500	No Ice	0.375	0.375	0.033

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(E)			0.000			1/2" Ice	0.989	0.989	0.037
			3.000			1" Ice	1.619	1.619	0.045
						2" Ice	2.464	2.464	0.074
						4" Ice	4.076	4.076	0.184
AB									
(4) DB844H90-XY w/ Mount Pipe	A	From Leg	4.000	0.000	191.000	No Ice	3.104	5.154	0.028
(AB)			0.000			1/2" Ice	3.476	5.833	0.068
			1.000			1" Ice	3.879	6.523	0.113
						2" Ice	4.761	7.959	0.224
						4" Ice	6.660	11.092	0.552
(4) DB844H90-XY w/ Mount Pipe	B	From Leg	4.000	0.000	191.000	No Ice	3.104	5.154	0.028
(AB)			0.000			1/2" Ice	3.476	5.833	0.068
			1.000			1" Ice	3.879	6.523	0.113
						2" Ice	4.761	7.959	0.224
						4" Ice	6.660	11.092	0.552
(4) DB844H90-XY w/ Mount Pipe	C	From Leg	4.000	0.000	191.000	No Ice	3.104	5.154	0.028
(AB)			0.000			1/2" Ice	3.476	5.833	0.068
			1.000			1" Ice	3.879	6.523	0.113
						2" Ice	4.761	7.959	0.224
						4" Ice	6.660	11.092	0.552
Platform Mount [LP 712-1]	C	None		0.000	191.000	No Ice	24.530	24.530	1.335
(E)						1/2" Ice	29.940	29.940	1.646
						1" Ice	35.350	35.350	1.956
						2" Ice	46.170	46.170	2.577
						4" Ice	67.810	67.810	3.820
AB									
RR90-17-02DP w/ Mount Pipe	A	From Leg	4.000	0.000	180.000	No Ice	4.593	3.319	0.034
(E)			0.000			1/2" Ice	5.088	4.089	0.072
			2.000			1" Ice	5.578	4.784	0.115
						2" Ice	6.588	6.225	0.224
						4" Ice	8.731	9.308	0.557
RR90-17-02DP w/ Mount Pipe	B	From Leg	4.000	0.000	180.000	No Ice	4.593	3.319	0.034
(E)			0.000			1/2" Ice	5.088	4.089	0.072
			2.000			1" Ice	5.578	4.784	0.115
						2" Ice	6.588	6.225	0.224
						4" Ice	8.731	9.308	0.557
RR90-17-02DP w/ Mount Pipe	C	From Leg	4.000	0.000	180.000	No Ice	4.593	3.319	0.034
(E)			0.000			1/2" Ice	5.088	4.089	0.072
			2.000			1" Ice	5.578	4.784	0.115
						2" Ice	6.588	6.225	0.224
						4" Ice	8.731	9.308	0.557
(2) PCS 1900 TMA DUAL DUP	A	From Leg	4.000	0.000	180.000	No Ice	0.628	0.617	0.018
(E)			0.000			1/2" Ice	0.744	0.732	0.023
			2.000			1" Ice	0.869	0.856	0.031
						2" Ice	1.145	1.131	0.052
						4" Ice	1.799	1.783	0.122
(2) PCS 1900 TMA DUAL DUP	B	From Leg	4.000	0.000	180.000	No Ice	0.628	0.617	0.018
(E)			0.000			1/2" Ice	0.744	0.732	0.023
			2.000			1" Ice	0.869	0.856	0.031
						2" Ice	1.145	1.131	0.052
						4" Ice	1.799	1.783	0.122
(2) PCS 1900 TMA DUAL DUP	C	From Leg	4.000	0.000	180.000	No Ice	0.628	0.617	0.018
(E)			0.000			1/2" Ice	0.744	0.732	0.023
			2.000			1" Ice	0.869	0.856	0.031
						2" Ice	1.145	1.131	0.052
						4" Ice	1.799	1.783	0.122
LNX-6515DS-VTM w/	A	From Leg	4.000	0.000	180.000	No Ice	11.683	9.842	0.083

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Mount Pipe			0.000			1/2" Ice	12.404	11.366	0.173
(R)			2.000			1" Ice	13.135	12.914	0.273
						2" Ice	14.601	15.267	0.506
						4" Ice	17.875	20.139	1.151
LNX-6515DS-VTM w/	B	From Leg	4.000	0.000	180.000	No Ice	11.683	9.842	0.083
Mount Pipe			0.000			1/2" Ice	12.404	11.366	0.173
(R)			2.000			1" Ice	13.135	12.914	0.273
						2" Ice	14.601	15.267	0.506
						4" Ice	17.875	20.139	1.151
LNX-6515DS-VTM w/	C	From Leg	4.000	0.000	180.000	No Ice	11.683	9.842	0.083
Mount Pipe			0.000			1/2" Ice	12.404	11.366	0.173
(R)			2.000			1" Ice	13.135	12.914	0.273
						2" Ice	14.601	15.267	0.506
						4" Ice	17.875	20.139	1.151
ATBT-BOTTOM-24V	A	From Leg	4.000	0.000	180.000	No Ice	0.121	0.075	0.003
(R)			0.000			1/2" Ice	0.172	0.119	0.004
			2.000			1" Ice	0.232	0.172	0.006
						2" Ice	0.377	0.303	0.013
						4" Ice	0.771	0.668	0.045
ATBT-BOTTOM-24V	B	From Leg	4.000	0.000	180.000	No Ice	0.121	0.075	0.003
(R)			0.000			1/2" Ice	0.172	0.119	0.004
			2.000			1" Ice	0.232	0.172	0.006
						2" Ice	0.377	0.303	0.013
						4" Ice	0.771	0.668	0.045
ATBT-BOTTOM-24V	C	From Leg	4.000	0.000	180.000	No Ice	0.121	0.075	0.003
(R)			0.000			1/2" Ice	0.172	0.119	0.004
			2.000			1" Ice	0.232	0.172	0.006
						2" Ice	0.377	0.303	0.013
						4" Ice	0.771	0.668	0.045
6' x 2" Mount Pipe	A	From Leg	4.000	0.000	180.000	No Ice	1.425	1.425	0.022
(E)			0.000			1/2" Ice	1.925	1.925	0.033
			0.000			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
						4" Ice	4.702	4.702	0.231
6' x 2" Mount Pipe	B	From Leg	4.000	0.000	180.000	No Ice	1.425	1.425	0.022
(E)			0.000			1/2" Ice	1.925	1.925	0.033
			0.000			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
						4" Ice	4.702	4.702	0.231
6' x 2" Mount Pipe	C	From Leg	4.000	0.000	180.000	No Ice	1.425	1.425	0.022
(E)			0.000			1/2" Ice	1.925	1.925	0.033
			0.000			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
						4" Ice	4.702	4.702	0.231
T-Arm Mount [TA 701-3]	C	None		0.000	180.000	No Ice	27.950	27.950	1.092
(E)						1/2" Ice	37.260	37.260	1.407
						1" Ice	46.570	46.570	1.722
						2" Ice	65.190	65.190	2.352
						4" Ice	102.430	102.430	3.612
AB									
(2) 7770.00 w/ Mount Pipe	A	From Leg	4.000	0.000	168.000	No Ice	6.119	4.254	0.055
(E)			0.000			1/2" Ice	6.626	5.014	0.103
			2.000			1" Ice	7.128	5.711	0.157
						2" Ice	8.164	7.155	0.287
						4" Ice	10.360	10.412	0.665
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.000	0.000	168.000	No Ice	6.119	4.254	0.055
(E)			0.000			1/2" Ice	6.626	5.014	0.103

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			2.000			1" Ice	7.128	5.711	0.157
						2" Ice	8.164	7.155	0.287
						4" Ice	10.360	10.412	0.665
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.000	0.000	168.000	No Ice	6.119	4.254	0.055
(E)			0.000			1/2" Ice	6.626	5.014	0.103
			2.000			1" Ice	7.128	5.711	0.157
						2" Ice	8.164	7.155	0.287
						4" Ice	10.360	10.412	0.665
P65-17-XLH-RR w/ Mount Pipe	A	From Leg	4.000	0.000	168.000	No Ice	11.704	8.938	0.092
(E)			0.000			1/2" Ice	12.424	10.450	0.178
			2.000			1" Ice	13.153	11.986	0.273
						2" Ice	14.639	14.313	0.498
						4" Ice	17.906	19.144	1.126
P65-17-XLH-RR w/ Mount Pipe	B	From Leg	4.000	0.000	168.000	No Ice	11.704	8.938	0.092
(E)			0.000			1/2" Ice	12.424	10.450	0.178
			2.000			1" Ice	13.153	11.986	0.273
						2" Ice	14.639	14.313	0.498
						4" Ice	17.906	19.144	1.126
AM-X-CD-14-65-00T-RET w/ Mount Pipe	C	From Leg	4.000	0.000	168.000	No Ice	5.744	4.015	0.035
(E)			0.000			1/2" Ice	6.198	4.633	0.080
			2.000			1" Ice	6.661	5.276	0.131
						2" Ice	7.618	6.678	0.254
						4" Ice	9.668	9.744	0.610
(2) LGP21901	A	From Leg	4.000	0.000	168.000	No Ice	0.270	0.184	0.006
(E)			0.000			1/2" Ice	0.343	0.248	0.008
			2.000			1" Ice	0.425	0.322	0.011
						2" Ice	0.616	0.494	0.022
						4" Ice	1.101	0.943	0.066
(2) LGP21901	B	From Leg	4.000	0.000	168.000	No Ice	0.270	0.184	0.006
(E)			0.000			1/2" Ice	0.343	0.248	0.008
			2.000			1" Ice	0.425	0.322	0.011
						2" Ice	0.616	0.494	0.022
						4" Ice	1.101	0.943	0.066
(2) LGP21901	C	From Leg	4.000	0.000	168.000	No Ice	0.270	0.184	0.006
(E)			0.000			1/2" Ice	0.343	0.248	0.008
			2.000			1" Ice	0.425	0.322	0.011
						2" Ice	0.616	0.494	0.022
						4" Ice	1.101	0.943	0.066
(2) LGP21401	A	From Leg	4.000	0.000	168.000	No Ice	1.288	0.233	0.014
(E)			0.000			1/2" Ice	1.445	0.313	0.021
			2.000			1" Ice	1.611	0.403	0.030
						2" Ice	1.969	0.608	0.055
						4" Ice	2.788	1.121	0.135
(2) LGP21401	B	From Leg	4.000	0.000	168.000	No Ice	1.288	0.233	0.014
(E)			0.000			1/2" Ice	1.445	0.313	0.021
			3.000			1" Ice	1.611	0.403	0.030
						2" Ice	1.969	0.608	0.055
						4" Ice	2.788	1.121	0.135
(2) LGP21401	C	From Leg	4.000	0.000	168.000	No Ice	1.288	0.233	0.014
(E)			0.000			1/2" Ice	1.445	0.313	0.021
			2.000			1" Ice	1.611	0.403	0.030
						2" Ice	1.969	0.608	0.055
						4" Ice	2.788	1.121	0.135
RRUS-11	A	From Leg	4.000	0.000	168.000	No Ice	3.249	1.373	0.048
(E)			0.000			1/2" Ice	3.491	1.551	0.068
			3.000			1" Ice	3.741	1.738	0.092
						2" Ice	4.268	2.138	0.150

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice	5.426	3.042	0.310
RRUS-11	B	From Leg	4.000	0.000	168.000	No Ice	3.249	1.373	0.048
(E)			0.000			1/2" Ice	3.491	1.551	0.068
			3.000			1" Ice	3.741	1.738	0.092
						2" Ice	4.268	2.138	0.150
						4" Ice	5.426	3.042	0.310
RRUS-11	C	From Leg	4.000	0.000	168.000	No Ice	3.249	1.373	0.048
(E)			0.000			1/2" Ice	3.491	1.551	0.068
			3.000			1" Ice	3.741	1.738	0.092
						2" Ice	4.268	2.138	0.150
						4" Ice	5.426	3.042	0.310
DC6-48-60-18-8F	A	From Leg	4.000	0.000	168.000	No Ice	1.467	1.467	0.019
(E)			0.000			1/2" Ice	1.667	1.667	0.037
			3.000			1" Ice	1.878	1.878	0.057
						2" Ice	2.333	2.333	0.105
						4" Ice	3.378	3.378	0.239
Platform Mount [LP 303-1]	C	None		0.000	168.000	No Ice	14.660	14.660	1.250
(E)						1/2" Ice	18.870	18.870	1.481
						1" Ice	23.080	23.080	1.713
						2" Ice	31.500	31.500	2.175
						4" Ice	48.340	48.340	3.101
AB									
BXA-70063-6CF-EDIN-0 w/	A	From Leg	4.000	0.000	160.000	No Ice	7.969	5.801	0.042
Mount Pipe			0.000			1/2" Ice	8.609	6.953	0.103
(E)			0.000			1" Ice	9.216	7.819	0.171
						2" Ice	10.459	9.601	0.335
						4" Ice	13.066	13.366	0.804
BXA-70063-6CF-EDIN-0 w/	B	From Leg	4.000	0.000	160.000	No Ice	7.969	5.801	0.042
Mount Pipe			0.000			1/2" Ice	8.609	6.953	0.103
(E)			0.000			1" Ice	9.216	7.819	0.171
						2" Ice	10.459	9.601	0.335
						4" Ice	13.066	13.366	0.804
BXA-70063-6CF-2 w/ Mount	C	From Leg	4.000	0.000	160.000	No Ice	7.969	5.801	0.042
Pipe			0.000			1/2" Ice	8.609	6.953	0.103
(E)			0.000			1" Ice	9.216	7.819	0.171
						2" Ice	10.459	9.601	0.335
						4" Ice	13.066	13.366	0.804
(2) LPA-80063-6CF-EDIN	A	From Leg	4.000	0.000	160.000	No Ice	10.745	10.700	0.052
w/ Mount Pipe			0.000			1/2" Ice	11.412	11.967	0.145
(E)			0.000			1" Ice	12.045	12.948	0.247
						2" Ice	13.341	14.963	0.480
						4" Ice	16.054	19.208	1.095
(2) LPA-80063-6CF-EDIN	B	From Leg	4.000	0.000	160.000	No Ice	10.745	10.700	0.052
w/ Mount Pipe			0.000			1/2" Ice	11.412	11.967	0.145
(E)			0.000			1" Ice	12.045	12.948	0.247
						2" Ice	13.341	14.963	0.480
						4" Ice	16.054	19.208	1.095
(2) LPA-80063-6CF-EDIN-5	C	From Leg	4.000	0.000	160.000	No Ice	10.745	10.700	0.052
w/ Mount Pipe			0.000			1/2" Ice	11.412	11.967	0.145
(E)			0.000			1" Ice	12.045	12.948	0.247
						2" Ice	13.341	14.963	0.480
						4" Ice	16.054	19.208	1.095
DB-T1-6Z-8AB-0Z	C	From Leg	4.000	0.000	160.000	No Ice	5.600	2.333	0.044
(E)			0.000			1/2" Ice	5.915	2.558	0.080
			0.000			1" Ice	6.240	2.791	0.120
						2" Ice	6.914	3.284	0.213
						4" Ice	8.365	4.373	0.455

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(2) SBNHH-1D65B w/ Mount Pipe (P)	A	From Leg	4.000 0.000 0.000	0.000	160.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.637 9.293 9.917 11.190 13.855	7.071 8.260 9.170 11.006 15.043	0.066 0.135 0.212 0.394 0.903
(2) SBNHH-1D65B w/ Mount Pipe (P)	B	From Leg	4.000 0.000 0.000	0.000	160.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.637 9.293 9.917 11.190 13.855	7.071 8.260 9.170 11.006 15.043	0.066 0.135 0.212 0.394 0.903
(2) SBNHH-1D65B w/ Mount Pipe (P)	C	From Leg	4.000 0.000 0.000	0.000	160.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.637 9.293 9.917 11.190 13.855	7.071 8.260 9.170 11.006 15.043	0.066 0.135 0.212 0.394 0.903
DB-T1-6Z-8AB-0Z (P)	A	From Leg	4.000 0.000 0.000	0.000	160.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.600 5.915 6.240 6.914 8.365	2.333 2.558 2.791 3.284 4.373	0.044 0.080 0.120 0.213 0.455
RRH2X60-PCS (P)	A	From Leg	4.000 0.000 0.000	0.000	160.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.567 2.791 3.025 3.517 4.606	2.011 2.218 2.435 2.894 3.915	0.055 0.075 0.099 0.155 0.313
RRH2X60-PCS (P)	B	From Leg	4.000 0.000 0.000	0.000	160.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.567 2.791 3.025 3.517 4.606	2.011 2.218 2.435 2.894 3.915	0.055 0.075 0.099 0.155 0.313
RRH2X60-PCS (P)	C	From Leg	4.000 0.000 0.000	0.000	160.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.567 2.791 3.025 3.517 4.606	2.011 2.218 2.435 2.894 3.915	0.055 0.075 0.099 0.155 0.313
RRH2x60-700 (P)	A	From Leg	4.000 0.000 0.000	0.000	160.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.957 4.272 4.596 5.271 6.722	1.816 2.075 2.360 2.957 4.253	0.060 0.083 0.109 0.173 0.354
RRH2x60-700 (P)	B	From Leg	4.000 0.000 0.000	0.000	160.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.957 4.272 4.596 5.271 6.722	1.816 2.075 2.360 2.957 4.253	0.060 0.083 0.109 0.173 0.354
RRH2x60-700 (P)	C	From Leg	4.000 0.000 0.000	0.000	160.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.957 4.272 4.596 5.271 6.722	1.816 2.075 2.360 2.957 4.253	0.060 0.083 0.109 0.173 0.354
RRH2X60-AWS (P)	A	From Leg	4.000 0.000 0.000	0.000	160.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.957 4.272 4.596 5.271 6.722	1.816 2.075 2.360 2.957 4.253	0.060 0.083 0.109 0.173 0.354
RRH2X60-AWS (P)	B	From Leg	4.000 0.000	0.000	160.000	No Ice 1/2" Ice	3.957 4.272	1.816 2.075	0.060 0.083

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.000			1" Ice	4.596	2.360	0.109
						2" Ice	5.271	2.957	0.173
						4" Ice	6.722	4.253	0.354
RRH2X60-AWS	C	From Leg	4.000	0.000	160.000	No Ice	3.957	1.816	0.060
(P)			0.000			1/2" Ice	4.272	2.075	0.083
			0.000			1" Ice	4.596	2.360	0.109
						2" Ice	5.271	2.957	0.173
						4" Ice	6.722	4.253	0.354
Platform Mount [LP 601-1]	C	None		0.000	160.000	No Ice	28.470	28.470	1.122
(E)						1/2" Ice	33.590	33.590	1.514
						1" Ice	38.710	38.710	1.905
						2" Ice	48.950	48.950	2.689
						4" Ice	69.430	69.430	4.255
AB									

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

Comb. No.	Description
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	190.5 - 143.17	Pole	Max Tension	27	0.000	0.000	-0.000
			Max. Compression	14	-25.913	-0.553	0.047
			Max. Mx	5	-8.918	-560.764	0.428
			Max. My	2	-8.898	-0.421	562.322
			Max. Vy	5	22.982	-560.764	0.428
			Max. Vx	8	23.079	0.282	-562.000
			Max. Torque	7			1.209
L2	143.17 - 93.753	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-40.671	-0.967	-3.150
			Max. Mx	5	-18.426	-1757.039	1.989
			Max. My	8	-18.412	2.373	-1763.539
			Max. Vy	5	27.335	-1757.039	1.989
			Max. Vx	8	27.433	2.373	-1763.539
			Max. Torque	12			-1.159
L3	93.753 - 46.083	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-58.619	-1.406	-7.111
			Max. Mx	11	-30.660	3117.010	-5.600
			Max. My	8	-30.653	4.431	-3128.847
			Max. Vy	11	-31.614	3117.010	-5.600
			Max. Vx	8	31.711	4.431	-3128.847
			Max. Torque	12			-1.084
L4	46.083 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-82.786	-1.911	-12.143
			Max. Mx	11	-48.009	4909.069	-8.932
			Max. My	8	-48.009	6.776	-4926.980
			Max. Vy	11	-35.943	4909.069	-8.932
			Max. Vx	8	36.037	6.776	-4926.980
			Max. Torque	12			-1.005

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	21	82.786	0.016	-10.610
	Max. H_x	11	48.035	35.908	-0.042
	Max. H_z	2	48.035	-0.042	36.002
	Max. M_x	2	4922.508	-0.042	36.002
	Max. M_z	5	4908.878	-35.908	0.042
	Max. Torsion	6	0.930	-31.077	-17.965
	Min. Vert	1	48.035	0.000	0.000
	Min. H_x	5	48.035	-35.908	0.042
	Min. H_z	8	48.035	0.042	-36.002
	Min. M_x	8	-4926.980	0.042	-36.002
	Min. M_z	11	-4909.069	35.908	-0.042

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Min. Torsion	12	-0.930	31.077	17.965

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	48.035	0.000	0.000	2.176	0.098	0.000
Dead+Wind 0 deg - No Ice	48.035	0.042	-36.002	-4922.508	-6.569	0.491
Dead+Wind 30 deg - No Ice	48.035	17.990	-31.200	-4266.064	-2460.135	0.032
Dead+Wind 60 deg - No Ice	48.035	31.118	-18.037	-2465.931	-4254.517	-0.435
Dead+Wind 90 deg - No Ice	48.035	35.908	-0.042	-4.413	-4908.878	-0.787
Dead+Wind 120 deg - No Ice	48.035	31.077	17.965	2458.912	-4247.878	-0.930
Dead+Wind 150 deg - No Ice	48.035	17.918	31.158	4263.929	-2448.588	-0.824
Dead+Wind 180 deg - No Ice	48.035	-0.042	36.002	4926.980	6.776	-0.495
Dead+Wind 210 deg - No Ice	48.035	-17.990	31.200	4270.541	2460.318	-0.033
Dead+Wind 240 deg - No Ice	48.035	-31.118	18.037	2470.432	4254.692	0.438
Dead+Wind 270 deg - No Ice	48.035	-35.908	0.042	8.932	4909.069	0.791
Dead+Wind 300 deg - No Ice	48.035	-31.077	-17.965	-2454.398	4248.093	0.930
Dead+Wind 330 deg - No Ice	48.035	-17.918	-31.158	-4259.438	2448.812	0.820
Dead+Ice+Temp	82.786	0.000	0.000	12.143	-1.911	0.000
Dead+Wind 0 deg+Ice+Temp	82.786	0.016	-10.610	-1543.009	-4.714	0.183
Dead+Wind 30 deg+Ice+Temp	82.786	5.311	-9.196	-1336.014	-780.699	0.028
Dead+Wind 60 deg+Ice+Temp	82.786	9.183	-5.319	-767.727	-1348.015	-0.135
Dead+Wind 90 deg+Ice+Temp	82.786	10.595	-0.016	9.580	-1554.651	-0.261
Dead+Wind 120 deg+Ice+Temp	82.786	9.167	5.291	787.625	-1345.239	-0.318
Dead+Wind 150 deg+Ice+Temp	82.786	5.284	9.181	1357.933	-775.893	-0.289
Dead+Wind 180 deg+Ice+Temp	82.786	-0.016	10.610	1567.691	0.829	-0.183
Dead+Wind 210 deg+Ice+Temp	82.786	-5.311	9.196	1360.701	776.806	-0.028
Dead+Wind 240 deg+Ice+Temp	82.786	-9.183	5.319	792.423	1344.121	0.135
Dead+Wind 270 deg+Ice+Temp	82.786	-10.595	0.016	15.122	1550.765	0.262
Dead+Wind 300 deg+Ice+Temp	82.786	-9.167	-5.291	-762.928	1341.361	0.318
Dead+Wind 330 deg+Ice+Temp	82.786	-5.284	-9.181	-1333.245	772.016	0.289
Dead+Wind 0 deg - Service	48.035	0.016	-14.063	-1926.195	-2.517	0.197
Dead+Wind 30 deg - Service	48.035	7.027	-12.187	-1669.150	-963.289	0.013
Dead+Wind 60 deg - Service	48.035	12.156	-7.046	-964.243	-1665.924	-0.176
Dead+Wind 90 deg - Service	48.035	14.027	-0.016	-0.365	-1922.138	-0.317
Dead+Wind 120 deg - Service	48.035	12.139	7.018	964.214	-1663.312	-0.373
Dead+Wind 150 deg - Service	48.035	6.999	12.171	1671.030	-958.763	-0.330
Dead+Wind 180 deg - Service	48.035	-0.016	14.063	1930.682	2.707	-0.198
Dead+Wind 210 deg - Service	48.035	-7.027	12.187	1673.638	963.475	-0.013
Dead+Wind 240 deg - Service	48.035	-12.156	7.046	968.735	1666.109	0.176
Dead+Wind 270 deg - Service	48.035	-14.027	0.016	4.860	1922.326	0.317
Dead+Wind 300 deg - Service	48.035	-12.139	-7.018	-959.720	1663.503	0.373
Dead+Wind 330 deg - Service	48.035	-6.999	-12.171	-1666.540	958.956	0.329

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.000	-48.035	0.000	0.000	48.035	0.000	0.000%
2	0.042	-48.035	-36.002	-0.042	48.035	36.002	0.000%
3	17.990	-48.035	-31.200	-17.990	48.035	31.200	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
4	31.118	-48.035	-18.037	-31.118	48.035	18.037	0.000%
5	35.908	-48.035	-0.042	-35.908	48.035	0.042	0.000%
6	31.077	-48.035	17.965	-31.077	48.035	-17.965	0.000%
7	17.918	-48.035	31.158	-17.918	48.035	-31.158	0.000%
8	-0.042	-48.035	36.002	0.042	48.035	-36.002	0.000%
9	-17.990	-48.035	31.200	17.990	48.035	-31.200	0.000%
10	-31.118	-48.035	18.037	31.118	48.035	-18.037	0.000%
11	-35.908	-48.035	0.042	35.908	48.035	-0.042	0.000%
12	-31.077	-48.035	-17.965	31.077	48.035	17.965	0.000%
13	-17.918	-48.035	-31.158	17.918	48.035	31.158	0.000%
14	0.000	-82.786	0.000	-0.000	82.786	-0.000	0.000%
15	0.016	-82.786	-10.610	-0.016	82.786	10.610	0.000%
16	5.311	-82.786	-9.196	-5.311	82.786	9.196	0.000%
17	9.183	-82.786	-5.319	-9.183	82.786	5.319	0.000%
18	10.595	-82.786	-0.016	-10.595	82.786	0.016	0.000%
19	9.167	-82.786	5.291	-9.167	82.786	-5.291	0.000%
20	5.284	-82.786	9.180	-5.284	82.786	-9.181	0.000%
21	-0.016	-82.786	10.610	0.016	82.786	-10.610	0.000%
22	-5.311	-82.786	9.196	5.311	82.786	-9.196	0.000%
23	-9.183	-82.786	5.319	9.183	82.786	-5.319	0.000%
24	-10.595	-82.786	0.016	10.595	82.786	-0.016	0.000%
25	-9.167	-82.786	-5.291	9.167	82.786	5.291	0.000%
26	-5.284	-82.786	-9.180	5.284	82.786	9.181	0.000%
27	0.016	-48.035	-14.063	-0.016	48.035	14.063	0.000%
28	7.027	-48.035	-12.187	-7.027	48.035	12.187	0.000%
29	12.156	-48.035	-7.046	-12.156	48.035	7.046	0.000%
30	14.027	-48.035	-0.016	-14.027	48.035	0.016	0.000%
31	12.139	-48.035	7.018	-12.139	48.035	-7.018	0.000%
32	6.999	-48.035	12.171	-6.999	48.035	-12.171	0.000%
33	-0.016	-48.035	14.063	0.016	48.035	-14.063	0.000%
34	-7.027	-48.035	12.187	7.027	48.035	-12.187	0.000%
35	-12.156	-48.035	7.046	12.156	48.035	-7.046	0.000%
36	-14.027	-48.035	0.016	14.027	48.035	-0.016	0.000%
37	-12.139	-48.035	-7.018	12.139	48.035	7.018	0.000%
38	-6.999	-48.035	-12.171	6.999	48.035	12.171	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	0.00073945
3	Yes	6	0.00000001	0.00006165
4	Yes	6	0.00000001	0.00006213
5	Yes	4	0.00000001	0.00086173
6	Yes	6	0.00000001	0.00006068
7	Yes	6	0.00000001	0.00006234
8	Yes	4	0.00000001	0.00065611
9	Yes	6	0.00000001	0.00006175
10	Yes	6	0.00000001	0.00006126
11	Yes	4	0.00000001	0.00073393
12	Yes	6	0.00000001	0.00006241
13	Yes	6	0.00000001	0.00006076
14	Yes	4	0.00000001	0.00003317
15	Yes	5	0.00000001	0.00058390
16	Yes	5	0.00000001	0.00098165

17	Yes	5	0.00000001	0.00098137
18	Yes	5	0.00000001	0.00058730
19	Yes	5	0.00000001	0.00098408
20	Yes	5	0.00000001	0.00099505
21	Yes	5	0.00000001	0.00059049
22	Yes	5	0.00000001	0.00099044
23	Yes	5	0.00000001	0.00099006
24	Yes	5	0.00000001	0.00058531
25	Yes	5	0.00000001	0.00097396
26	Yes	5	0.00000001	0.00096386
27	Yes	4	0.00000001	0.00022454
28	Yes	5	0.00000001	0.00018396
29	Yes	5	0.00000001	0.00018587
30	Yes	4	0.00000001	0.00024556
31	Yes	5	0.00000001	0.00017920
32	Yes	5	0.00000001	0.00018669
33	Yes	4	0.00000001	0.00021891
34	Yes	5	0.00000001	0.00018459
35	Yes	5	0.00000001	0.00018230
36	Yes	4	0.00000001	0.00023566
37	Yes	5	0.00000001	0.00018642
38	Yes	5	0.00000001	0.00017932

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	190.5 - 143.17	68.145	33	3.588	0.005
L2	146.753 - 93.753	38.021	34	2.758	0.002
L3	99.083 - 46.083	16.011	34	1.641	0.001
L4	53 - 0	4.332	34	0.768	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
191.000	(4) DB844H90-XY w/ Mount Pipe	33	68.145	3.588	0.005	16458
190.500	Lightning Rod 5/8" x 6'	33	68.145	3.588	0.005	16458
180.000	RR90-17-02DP w/ Mount Pipe	33	60.452	3.403	0.004	7836
168.000	(2) 7770.00 w/ Mount Pipe	33	51.877	3.184	0.004	3655
160.000	BXA-70063-6CF-EDIN-0 w/ Mount Pipe	34	46.409	3.031	0.003	2695

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	190.5 - 143.17	173.224	8	9.129	0.013
L2	146.753 - 93.753	96.792	8	7.023	0.006
L3	99.083 - 46.083	40.805	8	4.183	0.002
L4	53 - 0	11.049	9	1.959	0.001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
191.000	(4) DB844H90-XY w/ Mount Pipe	8	173.224	9.129	0.013	6733
190.500	Lightning Rod 5/8" x 6'	8	173.224	9.129	0.013	6733
180.000	RR90-17-02DP w/ Mount Pipe	8	153.714	8.659	0.011	3204
168.000	(2) 7770.00 w/ Mount Pipe	8	131.965	8.104	0.009	1491
160.000	BXA-70063-6CF-EDIN-0 w/ Mount Pipe	8	118.090	7.716	0.008	1097

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	190.5 - 143.17 (1)	TP27.778x14.75x0.25	47.330	0.000	0.0	39.000	21.061	-8.898	821.374	0.011
L2	143.17 - 93.753 (2)	TP40.88x26.292x0.375	53.000	0.000	0.0	39.000	46.465	-18.410	1812.130	0.010
L3	93.753 - 46.083 (3)	TP53.251x38.663x0.375	53.000	0.000	0.0	39.000	51.769	-23.667	2018.980	0.012
L4	46.083 - 0 (4)	TP65.185x50.597x0.375	53.000	0.000	0.0	36.453	77.140	-48.009	2811.950	0.017

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	190.5 - 143.17 (1)	TP27.778x14.75x0.25	562.322	48.996	39.000	1.256	0.000	0.000	39.000	0.000
L2	143.17 - 93.753 (2)	TP40.88x26.292x0.375	1764.000	47.375	39.000	1.215	0.000	0.000	39.000	0.000
L3	93.753 - 46.083 (3)	TP53.251x38.663x0.375	2301.450	49.744	39.000	1.275	0.000	0.000	39.000	0.000
L4	46.083 - 0 (4)	TP65.185x50.597x0.375	4928.558	47.842	36.453	1.312	0.000	0.000	36.453	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	190.5 - 143.17 (1)	TP27.778x14.75x0.25	23.079	1.096	26.000	0.084	0.494	0.021	26.000	0.001
L2	143.17 - 93.753 (2)	TP40.88x26.292x0.375	27.446	0.591	26.000	0.045	0.063	0.001	26.000	0.000
L3	93.753 - 46.083 (3)	TP53.251x38.663x0.375	29.488	0.570	26.000	0.043	0.043	0.000	26.000	0.000
L4	46.083 - 0 (4)	TP65.185x50.597x0.375	36.050	0.467	26.000	0.036	0.033	0.000	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	190.5 - 143.17 (1)	0.011	1.256	0.000	0.084	0.001	1.269 ✔	1.333	H1-3+VT ✔
L2	143.17 - 93.753 (2)	0.010	1.215	0.000	0.045	0.000	1.225 ✔	1.333	H1-3+VT ✔
L3	93.753 - 46.083 (3)	0.012	1.275	0.000	0.043	0.000	1.288 ✔	1.333	H1-3+VT ✔
L4	46.083 - 0 (4)	0.017	1.312	0.000	0.036	0.000	1.330 ✔	1.333	H1-3+VT ✔

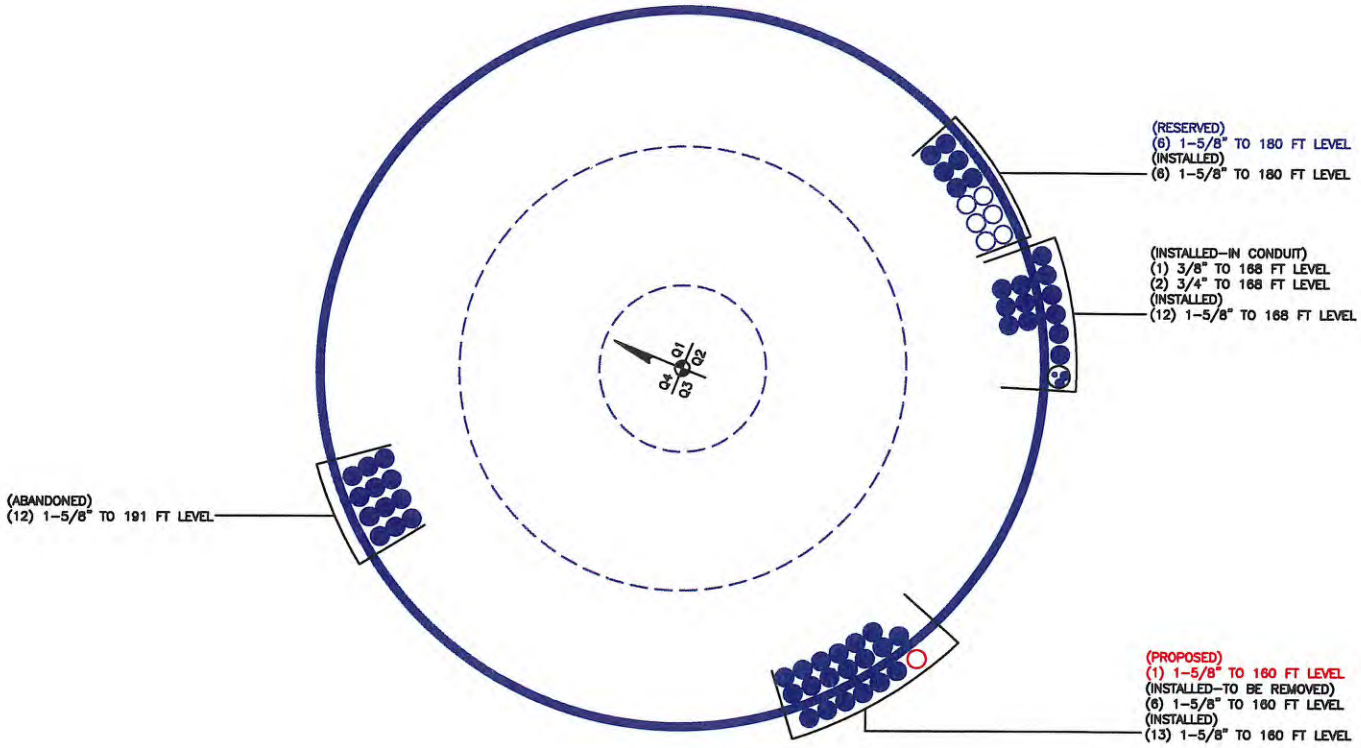
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	190.5 - 143.17	Pole	TP27.778x14.75x0.25	1	-8.898	1094.891	95.2	Pass
L2	143.17 - 93.753	Pole	TP40.88x26.292x0.375	2	-18.410	2415.569	91.9	Pass
L3	93.753 - 46.083	Pole	TP53.251x38.663x0.375	3	-23.667	2691.300	96.6	Pass
L4	46.083 - 0	Pole	TP65.185x50.597x0.375	4	-48.009	3748.329	99.8	Pass
							Summary	
						Pole (L4)	99.8	Pass
						RATING =	**99.8**	**Pass**

Program Version 6.1.4.1

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 801485

APPENDIX C

ADDITIONAL CALCULATIONS

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

TIA Rev F

Site Data

BU#: *801485*
Site Name: *CT SUFFIELD 1 CAC 8014*
App #: *300074 Revision # 2*
Pole Manufacturer: *Other*

Reactions		
Moment:	4929	ft-kips
Axial:	48	kips
Shear:	36	kips

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

Anchor Rod Data		
Qty:	20	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	72	in

Anchor Rod Results

		Rigid
Maximum Rod Tension:	161.9 Kips	Service, ASD
Allowable Tension:	195.0 Kips	Fty*ASIF
Anchor Rod Stress Ratio:	83.0% Pass	

Plate Data		
Diam:	78	in
Thick:	2.75	in
Grade:	60	ksi
Single-Rod B-eff:	10.34	in

Base Plate Results

	Flexural Check	Rigid
Base Plate Stress:	28.3 ksi	Service ASD
Allowable Plate Stress:	60.0 ksi	0.75*Fy*ASIF
Base Plate Stress Ratio:	47.2% Pass	Y.L. Length: 30.58

Stiffener Data (Welding at both sides)		
Config:	0	*
Weld Type:		
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

n/a

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

Pole Data		
Diam:	65.185	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	

* 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

PROJECT	**801485 - CT SUFFIELD 1 CAC 801485, CT**				
SUBJECT	**Foundation Analysis**				
DATE	**06/18/15**	PAGE	1	OF	1

B+T GRP
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630

Monopole Pad & Pier Foundation Analysis

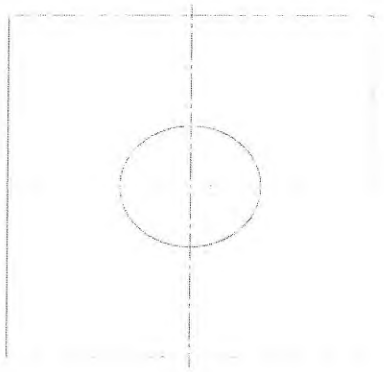
Rev. Type: F

Design Loads:

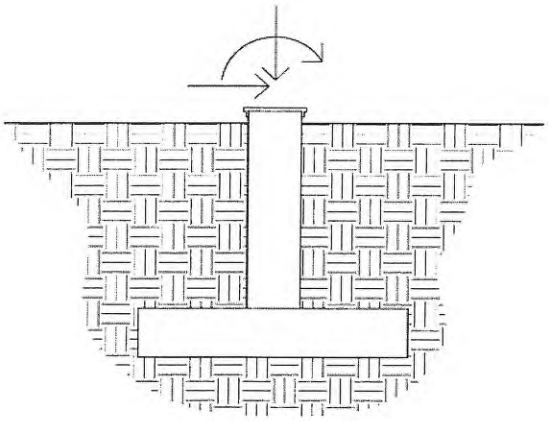
	Input unfactored loads	
Shear:	36.0	kips
Moment:	4,929.0	ft-kips
Tower Height:	190.5	ft
Tower Weight:	48.0	kips

Pad & Pier Dimensions / Properties:

Pole Diameter at Base:	65.18	in
Bearing Depth:	6.5	ft
Pad Width:	32.0	ft
Neglected Depth:	2.0	ft
Thickness:	5.0	ft
Pier Diameter:	8.0	ft
Pier Height Above Grade:	0.5	ft
BP Dist. Above Pier:	3.0	in
Clear Cover:	3.0	in
Pier Rebar Size:	9	
Pier Rebar Quanity:	43	
Pad Rebar Size:	9	
Pad Rebar Quanity:	34	
Pier Tie Size:	5	
Tie Quanity:	9	
Rebar Yield Strength:	60000	psi
Concrete Strength:	3000	psi
Concrete Unit Weight:	0.15	kcf



Elevation Overview



Soil Data:

	Allowable Values	
Soil Unit Weight:	0.120	kcf
Ult. Bearing Capacity:	6.000	ksf
Angle of Friction:	30.000	deg
Cohesion:	0.000	ksf
Passive Pressure:	0.000	ksf
Base Friction:	0.300	

Summary of Results

Req'd Pier Diam.	OK
Overturning	59.2%
Shear Capacity	23.6%
Bearing	46.9%
Pad Shear - 1-way	29.4%
Pad Shear - 2-way	3.0%
Pad Moment Capacity	26.8%
Pier Moment Capacity	81.7%

** Notes: