Robinson+Cole

KENNETH C. BALDWIN

280 Trumbull Street
Hartford, CT 06103-3597
Main (860) 275-8200
Fax (860) 275-8299
kbaldwin@rc.com
Direct (860) 275-8345

Also admitted in Massachusetts

September 2, 2015

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

Re: **Notice of Exempt Modification – Facility Modification**
40 Bulls Bridge Road, Kent, 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 180-foot tower at 40 Bulls Bridge Road in Kent, Connecticut (the "Property"). The tower is owned by Crown Castle ("Crown"). The Council approved Cellco's use of this tower in 2006. Cellco now intends to replace six (6) of its existing antennas with three (3) model SBNHH-1D65B, 700/2100 MHz antennas and three (3) model SBNHH-1D65B, 1900 MHz antennas, all at the same level on the tower. Cellco also intends to install nine (9) new RRHs and two (2) HYBRIFLEX™ fiber optic antenna cables. Included in Attachment 1 are specifications for Cellco's replacement antennas, RRHs and HYBRIFLEX™ cables.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Bruce K. Adams, First Selectman for the Town of Kent. A copy of this letter is also being sent to South Kent School Corporation, 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 160-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* 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:
Bruce K. Adams, Kent First Selectman
South Kent School Corporation
Jason Rouse, Crown Castle
Tim Parks

ATTACHMENT 1

Product Specifications

COMMSCOPE®

POWERED BY ANDREW.

SBNHH-1D65B

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

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

Electrical Specifications

Frequency Band, MHz	698–806	806–896	1695–1880	1850–1990	1920–2200	2300–2360
Gain, dBi	14.9	14.7	17.7	18.2	18.6	18.6
Beamwidth, Horizontal, degrees	68	66	69	66	63	58
Beamwidth, Vertical, degrees	12.1	10.7	5.6	5.2	5.0	4.5
Beam Tilt, degrees	0–14	0–14	0–7	0–7	0–7	0–7
USLS, dB	14	13	15	15	15	13
Front-to-Back Ratio at 180°, dB	27	29	28	28	28	27
CPR at Boresight, dB	20	23	20	20	17	21
CPR at Sector, dB	14	10	12	10	9	1
Isolation, dB	25	25	25	25	25	25
Isolation, Intersystem, dB	30	30	30	30	30	30
VSWR | Return Loss, dB	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153	-153	-153	-153
Input Power per Port, maximum, watts	350	350	350	350	350	300
Polarization	±45°	±45°	±45°	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm

Electrical Specifications, BASTA*

Frequency Band, MHz	698–806	806–896	1695–1880	1850–1990	1920–2200	2300–2360
Gain by all Beam Tilts, average, dBi	14.5	14.3	17.4	17.9	18.2	18.3
Gain by all Beam Tilts Tolerance, dB	±0.5	±0.8	±0.4	±0.3	±0.5	±0.3
Gain by Beam Tilt, average, dBi	0 ° | 14.6	0 ° | 14.5	0 ° | 17.4	0 ° | 17.8	0 ° | 18.1	0 ° | 18.2
	7 ° | 14.6	7 ° | 14.4	3 ° | 17.5	3 ° | 17.9	3 ° | 18.3	3 ° | 18.4
	14 ° | 14.2	14 ° | 13.6	7 ° | 17.4	7 ° | 17.9	7 ° | 18.2	7 ° | 18.4
Beamwidth, Horizontal Tolerance, degrees	±2.2	±3.4	±2	±4.6	±5.7	±4.3
Beamwidth, Vertical Tolerance, degrees	±0.8	±1	±0.3	±0.2	±0.3	±0.2
USLS, 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®

Packed Dimensions

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

Regulatory Compliance/Certifications

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

Included Products

Product Specifications

SBNHH-1D65B

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

* Footnotes

Performance Note	Severe environmental conditions may degrade optimum performance

ALCATEL-LUCENT B13 RRH4X30-4R

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

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

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

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

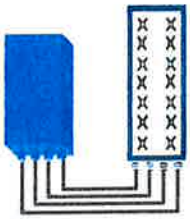
Its compactness and slim design makes the Alcatel-Lucent B13 RRH4x30-4R easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the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

FEATURES

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

BENEFITS

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



4x30W with 4T4R
or
2x60W with 2T4R

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

Alcatel·Lucent

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

PCS RF MODULES

RRH1900 2X60 - HW CHARACTERISTICS

LA6.0.1/13.3

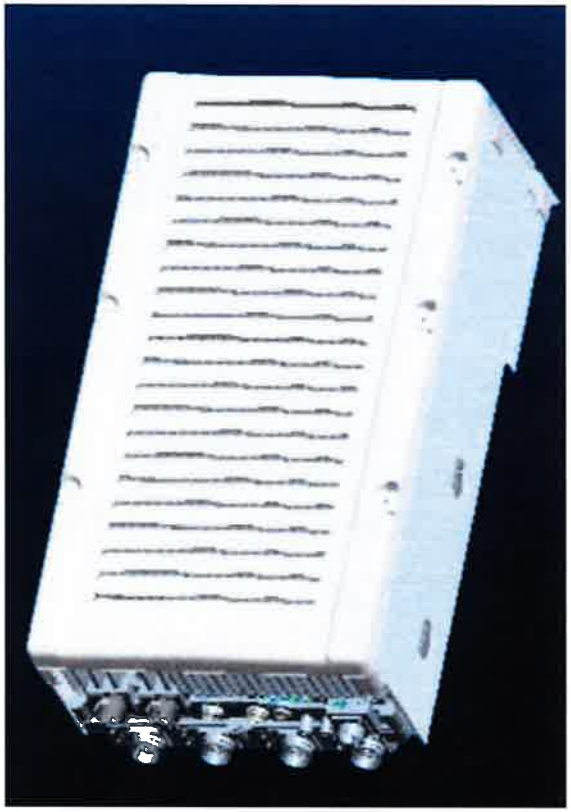
		RRH2x60
RF Output Power		2x60W
Instantaneous Bandwidth		20MHz
Transmitter		2 TX
Receiver	1900 HW version 1900A HW version	2 Branch RX – LA6.0.1 4 Branch RX – LR13.3
Features		AISG 2.0 for RET/TMA
		Internal Smart Bias-T
Power		-48VDC
CPRI Ports		2 CPRI Rate 3 Ports
External Alarms		4 External User Alarms
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

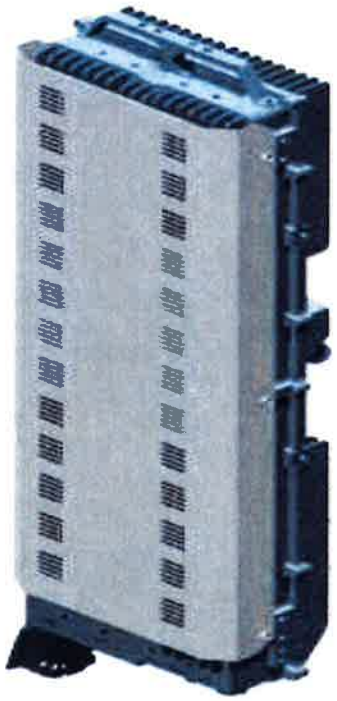
	RRH2x60
RF Output Power	2x60W (4x30W HW Ready)
Instantaneous Bandwidth	60MHz
Target Reliability (Annual Return Rate)	<2%
Receiver	4 Branch Rx
Features	AISG 2.0 for RET/TMA
Power	-48VDC
	Internal Smart Bias-T
CPRI Ports	2 CPRI Rate 5 Ports
External Alarms	4 External User Alarms
Monitor Ports	TX, RX
Environmental	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.)

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.

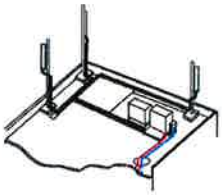
EASY INSTALLATION

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.

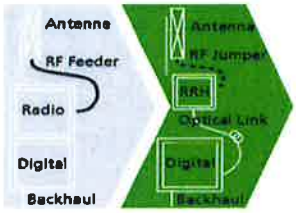
The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment. However, many of these sites can host an Alcatel-Lucent RRH2x60-AWS installation, providing more flexible site selection and improved network quality along with greatly reduced installation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

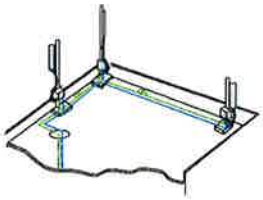
Installation can easily be done by a single person as the Alcatel–Lucent RRH2x60-AWS is compact and weighs about 20 kg, eliminating the need for a crane to hoist the BTS cabinet to the rooftop. A site can be in operation in less than one day.



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 CELLFLEX³ 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)

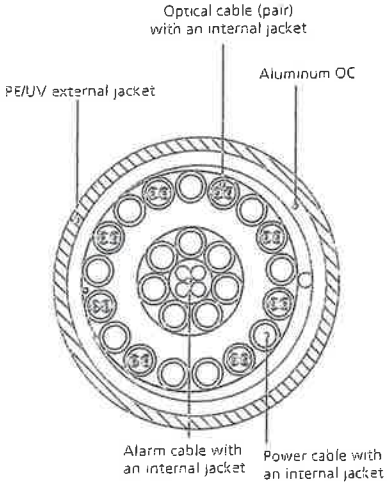


Figure 2: Construction Detail

* This data is provisional and subject to change

ATTACHMENT 2

	General	Power	Density					
Site Name: Kent S								
Tower Height: 180Ft.								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*AT&T UMTS	2	565	180	0.0125	880	0.5867	2.14%	
*AT&T UMTS	2	875	180	0.0194	1900	1.0000	1.94%	
*AT&T GSM	1	283	180	0.0031	880	0.5867	0.54%	
*AT&T GSM	4	525	180	0.0233	1900	1.0000	2.33%	
*AT&T LTE	1	1313	180	0.0146	734	0.4893	2.98%	
*Nextel	24	100	110	0.0713	851	0.5673	12.57%	
*CT State Police			150	0.0174	866	0.5773	3.01%	
*CT State Police			80	0.3728		1.0000	37.28%	
*WMNR			114	0.0052		0.2000	2.59%	
*Sprint CDMA/LTE	2	693	124	0.0324	1900	1.0000	3.24%	
*Sprint CDMA/LTE	1	390	124	0.0091	850	0.5667	1.61%	
*Sprint CDMA/LTE	2	693	124	0.0324	2500	1.0000	3.24%	
Verizon PCS	**7**	**399**	**160**	**0.0392**	**1970**	**1.0000**	**3.92%**	
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%**	
								96.52%
* Source: Siting Council								

ATTACHMENT 3

Date: **July 7, 2015**

GPD Engineering and Architecture
Professional Corporation
520 South Main Street, Suite 2531
Akron, OH 44311
(614) 859-1607
dpalkovic@gpdgroup.com

Jason Rouse
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
(704) 405-6605

Subject:	**Structural Analysis Report**	
Carrier Designation:	***Verizon Wireless* Co-Locate** **Carrier Site Name:**	 Kent South
Crown Castle Designation:	**Crown Castle BU Number:** **Crown Castle Site Name:** **Crown Castle JDE Job Number:** **Crown Castle Work Order Number:** **Crown Castle Application Number:**	841293 KENT-BULLS BRIDGE ROAD 337244 1086578 300053 Rev. 1
Engineering Firm Designation:	**GPD Group Project Number:**	2015777.841293.01
Site Data:	**136 BULLS BRIDGE ROAD, SOUTH KENT, Litchfield County, CT 06785** **Latitude *41° 40' 53.85"*, Longitude *-73° 29' 11.80"*** **180 Foot – Modified EEI Monopole Tower**	

Dear Jason Rouse,

GPD 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 800959, in accordance with application 300053, Revision 1.

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

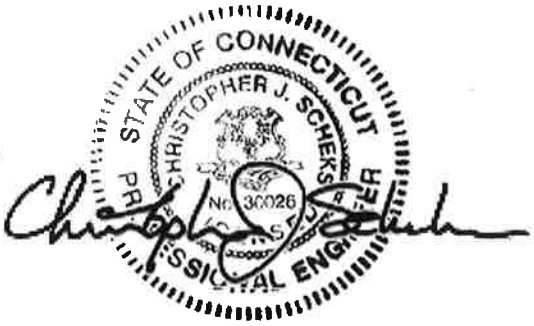
LC5: Existing + Proposed Equipment **Sufficient Capacity***
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

***The structure has sufficient capacity once the loading changes described in the Recommendations section of this report are completed.**

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 an 80 mph fastest mile.

We at *GPD* 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:



Christopher J. Scheks, P.E.
Connecticut #: 0030026

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 180-ft Monopole tower originally designed by Engineered Endeavors Inc. in December of 2000 for a wind speed of 80 mph per TIA/EIA-222-F.

The tower has been modified per reinforcement drawings prepared by GPD (Project #: 2012882.39, dated 12/13/2012). Reinforcement consists of installing new anchor rods and brackets to the existing tower.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F with a wind speed of an 80 mph fastest mile with no ice, and a wind speed of 28 mph fastest mile with 0.75" of radial ice.

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	6	Commscope	SBNHH-1D65B	2	1-5/8	1
		3	Alcatel Lucent	RRH2X60-PCS			
		3	Alcatel Lucent	RRH2x60-700			
		3	Alcatel Lucent	RRH2X60-AWS			
		1	RFS	DB-T1-6Z-8AB-0Z			

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
180.0	185.0	3	Decibel	ASP-952	15 2 1	1-5/8 7/8 1/2	
	182.0	6	Powerwave	7770.00			
		2	KMW	AM-X-CD-16-65-00T-RET			
		1	KMW	AM-X-CD-14-65-00T-RET			
		6	Powerwave	LGP21401			
		6	Powerwave	LGP13519			
		6	Ericsson	RRUS 11			
		1	Raycap	DC6-48-60-18-8F			
	180.0	1		Platform Mount [LP 601-1]			
170.0	170.0	1		Platform Mount [LP 601-1]	-	-	1
160.0	160.0	6	Antel	LPA-185080/12CFx2	-	-	1
		6	Antel	LPA-80080-6CF-EDIN	12	1-5/8	
		1		Platform Mount [LP 601-1]			
128.0	134.0	2	Decibel	DB809DK-Y	4	1-5/8	
		1	Decibel	DB809K-Y			
	128.0	2	TX RX Systems	422-86A-99575-18BW			
		1	TX RX Systems	431-86A-01-T			
		1		Side Arm Mount [SO 702-3]			
124.0	124.0	3	RFS	APXVSPP18-C-A20	3	1-1/4	
		3	Alcatel Lucent	1900MHz RRH			
		3	Alcatel Lucent	800MHZ RRH			
		1		Platform Mount [LP 601-1]			
115.0	115.0	1	Shively Labs	6813	1	7/8	
		1		Platform Mount [LP 601-1]			
100.0	100.0	1	Weather Bug	Anemometer	1	1/2	
		1		Pipe Mount [PM 601-1]			
80.0	80.0	1		Side Arm Mount [SO 702-1]	1	EW63	
	75.0	1	Amphenol	BCD-80609-EDIN-3-INVERT			
63.0	63.0	1	GPS	GPS_A	1	1/2	
		1		Side Arm Mount [SO 309-1]			

Notes:
1) 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)
180.0	180.0	12		7120.16		
		1		Low Profile Platform		
170.0	170.0	12		7120.16		
		1		Low Profile Platform		
160.0	160.0	12		7120.16		
		1		Low Profile Platform		
130.0	140.5	2		21' Omni		
	130.0	2		Side Arm		
124.5	124.5	9		7120.16		
		1		Low Profile Platform		
114.5	114.5	6		7120.16		
		1		Low Profile Platform		
104.5	104.5	12		7120.16		
		1		Low Profile Platform		
80.0	80.0	2		6' HP MW		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-TOWER MANUFACTURER DRAWINGS	Engineered Endeavors, Inc. Job #: 7846 Dated: 09/21/2001	4456613	CCISITES
4-GEOTECHNICAL REPORTS	GPD Project #: 2012801.85 Dated: 11/13/2012	4456627	CCISITES
4-TOWER REINFORCEMENT DESIGN	GPD Project #: 2012882.39 Dated: 12/13/2012	4456597	CCISITES
4-POST-MODIFICATION INSPECTION	GPD Project #: 2013707.52 Dated: 08/28/2013	4456621	CCISITES
4-TOWER FOUNDATION MAPPING REPORT	FDH Engineering, Inc. Project #: 1403061500 Dated: 04/01/2014	4797649	CCISITES

3.1) Analysis Method

tnxTower (version 6.1.4.1), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.

This analysis may be affected if any assumptions are not valid or have been made in error. GPD 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)	Ø*P_allow (K)	% Capacity	Pass / Fail
L1	180 - 133.24	Pole	TP25.5375x15x0.25	1	-6.15	1008.82	91.3	Pass
L2	133.24 - 87.6432	Pole	TP35.1887x24.2053x0.375	2	-16.72	2086.64	96.3	Pass
L3	87.6432 - 43.0729	Pole	TP44.3577x33.3472x0.4375	3	-27.67	3073.50	94.5	Pass
L4	43.0729 - 0	Pole	TP53x42.1374x0.5	4	-31.90	3628.24	86.8	Pass
							Summary	
						Pole (L2)	96.3	Pass
						RATING =	**96.3**	**Pass**

Table 6 - Tower Component Stresses vs. Capacity – LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	91.9	Pass
1	Base Plate	0	83.6	Pass
1	Base Foundation	0	52.0	Pass
1	Base Foundation Soil Interaction	0	93.2	Pass

Structure Rating (max from all components) =	**96.3**

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

4.1) Recommendations

The tower and foundation have sufficient capacity to carry the existing and proposed loading. In order for the results of this analysis to be considered valid the loading modification listed below must be completed.

Loading Changes:

1.) Removal of empty platform at the 170' elevation.

No structural modifications are required at this time, provided that the above listed changes are implemented.

5) DISCLAIMER OF WARRANTIES

GPD has not performed a site visit to the tower to verify the member sizes or antenna/coax loading. If the existing conditions are not as represented on the tower elevation contained in this report, we should be contacted immediately to evaluate the significance of the discrepancy. This is not a condition assessment of the tower or foundation. This report does not replace a full tower inspection. The tower and foundations are assumed to have been properly fabricated, erected, maintained, in good condition, twist free, and plumb.

The engineering services rendered by GPD in connection with this Structural Analysis are limited to a computer analysis of the tower structure and theoretical capacity of its main structural members. No allowance was made for any damaged, bent, missing, loose, or rusted members (above and below ground). No allowance was made for loose bolts or cracked welds.

This analysis is limited to the designated maximum wind and seismic conditions per the governing tower standards and code. Wind forces resulting in tower vibrations near the structure's resonant frequencies were not considered in this analysis and are outside the scope of this analysis. Lateral loading from any dynamic response was not evaluated under a time-domain based fatigue analysis.

GPD does not analyze the fabrication of the structure (including welding). It is not possible to have all the very detailed information needed to perform a thorough analysis of every structural sub-component and connection of an existing tower. GPD provides a limited scope of service in that we cannot verify the adequacy of every weld, plate connection detail, etc. The purpose of this report is to assess the capability of adding appurtenances usually accompanied by transmission lines to the structure.

It is the owner's responsibility to determine the amount of ice accumulation in excess of the code specified amount, if any, that should be considered in the structural analysis.

The attached sketches are a schematic representation of the analyzed tower. If any material is fabricated from these sketches, the contractor shall be responsible for field verifying the existing conditions, proper fit, and clearance in the field. Any mentions of structural modifications are reasonable estimates and should not be used as a precise construction document. Precise modification drawings are obtainable from GPD, but are beyond the scope of this report.

Miscellaneous items such as antenna mounts, etc., have not been designed or detailed as a part of our work. We recommend that material of adequate size and strength be purchased from a reputable tower manufacturer.

Towers are designed to carry gravity, wind, and ice loads. All members, legs, diagonals, struts, and redundant members provide structural stability to the tower with little redundancy. Absence or removal of a member can trigger catastrophic failure unless a substitute is provided before any removal. Legs carry axial loads and derive their strength from shorter unbraced lengths by the presence of redundant members and their connection to the diagonals with bolts or welds. If the bolts or welds are removed without providing any substitute to the frame, the leg is subjected to a higher unbraced length that immediately reduces its load carrying capacity. If a diagonal is also removed in addition to the connection, the unbraced length of the leg is greatly increased, jeopardizing its load carrying capacity. Failure of one leg can result in a tower collapse because there is no redundancy. Redundant members and diagonals are critical to the stability of the tower.

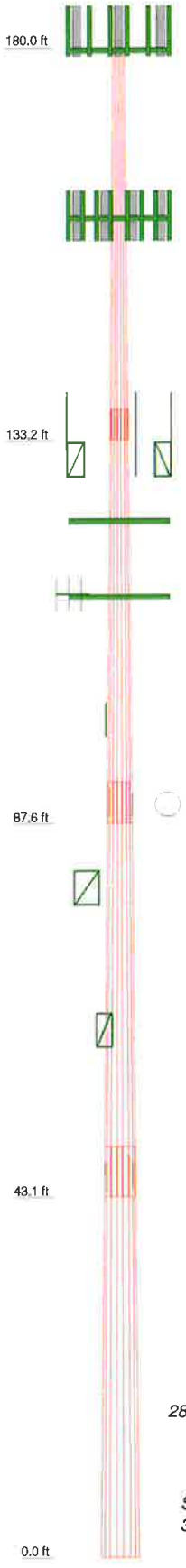
GPD makes no warranties, expressed and/or implied, in connection with this report and disclaims any liability arising from material, fabrication, and erection of this tower. GPD will not be responsible whatsoever for, or on account of, consequential or incidental damages sustained by any person, firm,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

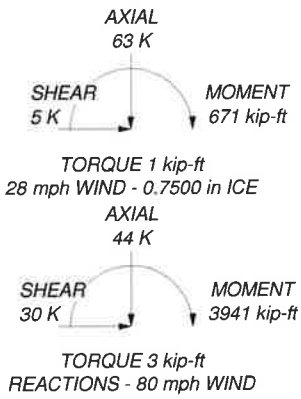
APPENDIX A

TNXTOWER OUTPUT

Section	1	2	3	4
Length (ft)	46.76	49.29	49.47	49.12
Number of Sides	18	18	18	18
Thickness (in)	0.2500	0.3750	0.4375	0.5000
Socket Length (ft)	3.69	4.90	6.04	
Top Dia (in)	15.0000	24.2053	33.3472	42.1374
Bot Dia (in)	25.5375	35.1887	44.3577	53.0000
Grade	A572-65			
Weight (K)	2.5	5.9	9.0	12.5

Total Weight (K) 29.8





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(2) 7770.00 w/ Mount Pipe	180	(2) LPA-80080-6CF-EDIN w/ Mount Pipe	160
(2) 7770.00 w/ Mount Pipe	180		
(2) 7770.00 w/ Mount Pipe	180	(2) LPA-80080-6CF-EDIN w/ Mount Pipe	160
AM-X-CD-16-65-00T-RET w/ Mount Pipe	180	(2) LPA-80080-6CF-EDIN w/ Mount Pipe	160
AM-X-CD-16-65-00T-RET w/ Mount Pipe	180	Platform Mount [LP 601-1]	160
AM-X-CD-14-65-00T-RET w/ Mount Pipe	180	DB809DK-Y	128
		DB809DK-Y	128
ASP-952	180	DB809K-Y	128
ASP-952	180	(2) 422-86A-99575-18BW	128
ASP-952	180	431-86A-01-T	128
(2) RRUS 11	180	Side Arm Mount [SO 702-3]	128
(2) RRUS 11	180	APXVSPP18-C-A20 w/ Mount Pipe	124
(2) RRUS 11	180	APXVSPP18-C-A20 w/ Mount Pipe	124
(2) LGP21401	180	APXVSPP18-C-A20 w/ Mount Pipe	124
(2) LGP21401	180	1900MHz RRH	124
(2) LGP21401	180	1900MHz RRH	124
(2) LGP13519	180	1900MHz RRH	124
(2) LGP13519	180	800MHZ RRH	124
(2) LGP13519	180	800MHZ RRH	124
DC6-48-60-18-8F	180	800MHZ RRH	124
Pipe Mount 6'x2.375"	180	Platform Mount [LP 601-1]	124
Pipe Mount 6'x2.375"	180	(2) Pipe Mount 6'x2.375"	124
Pipe Mount 6'x2.375"	180	(2) Pipe Mount 6'x2.375"	124
Platform Mount [LP 601-1]	180	(2) Pipe Mount 6'x2.375"	124
(2) SBNHH-1D65B w/ Mount Pipe	160	6813	115
(2) SBNHH-1D65B w/ Mount Pipe	160	8'x2 1/2" Pipe Mount	115
(2) SBNHH-1D65B w/ Mount Pipe	160	Pipe Mount 8'x2.375"	115
RRH2X60-AWS	160	(2) Pipe Mount 8'x2.375"	115
RRH2X60-AWS	160	(2) Pipe Mount 8'x2.375"	115
RRH2X60-AWS	160	(2) Side Arm Mount [SO 301-1]	115
RRH2x60-700	160	Platform Mount [LP 601-1]	115
RRH2x60-700	160	ANEMOMETER	100
RRH2x60-700	160	Pipe Mount [PM 601-1]	100
RRH2X60-PCS	160	BCD-80609-EDIN-3-INVERT	80
RRH2X60-PCS	160	Side Arm Mount [SO 702-1]	80
RRH2X60-PCS	160	GPS_A	63
DB-T1-6Z-8AB-0Z	160	Side Arm Mount [SO 309-1]	63

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

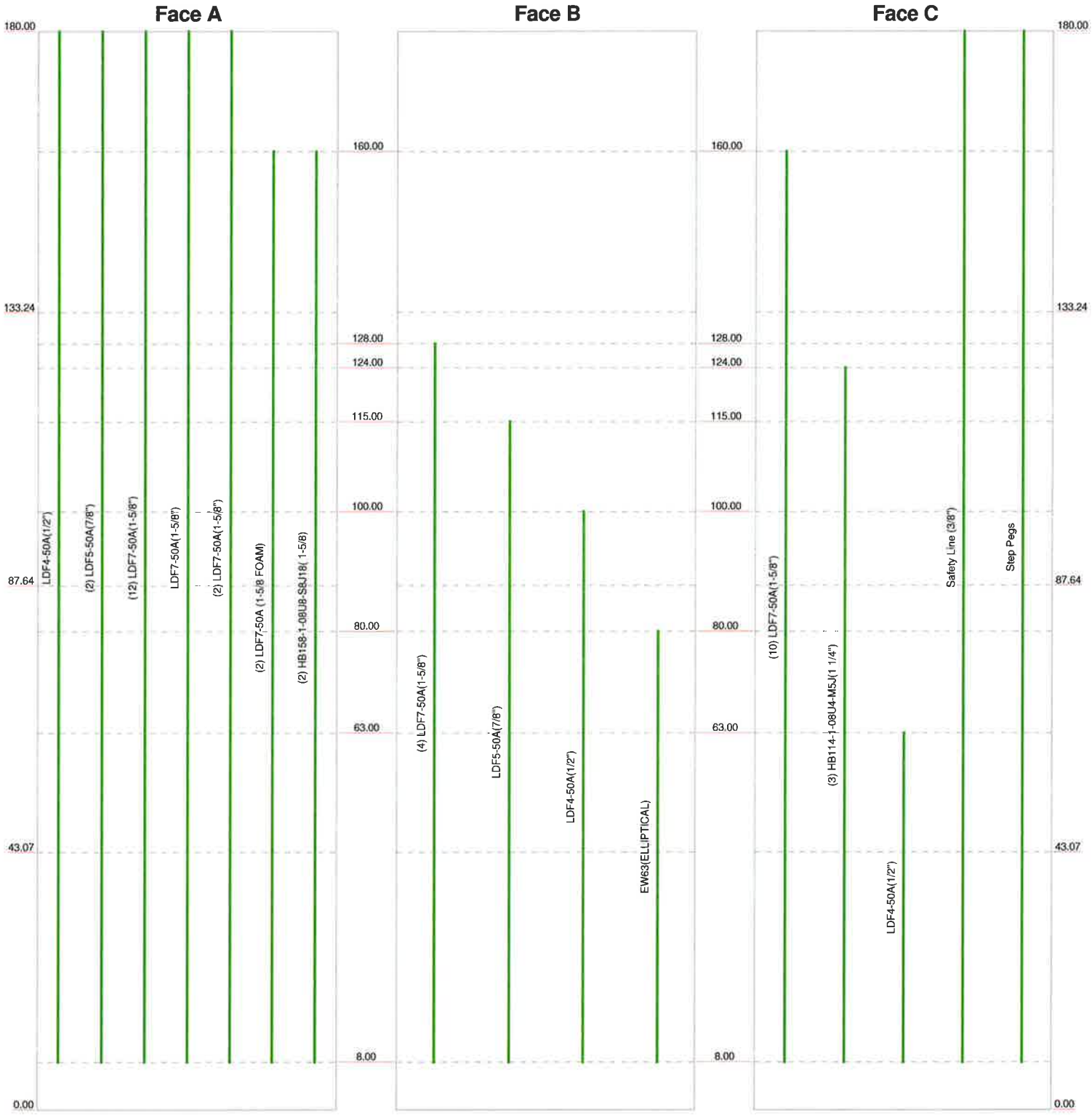
1. Tower is located in Litchfield County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 28 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 96.3%

GPD
520 S. Main St
Akron, OH 44311
GPD Phone: (330) 572 2100
FAX: (330) 572 2101

Job: KENT-BULLS BRIDGE ROAD - BU #: 8412
Project: 841293 - KENT-BULLS BRIDGE ROAD
Client: Crown Castle | Drawn by: B. Franczkowski | App'd:
Code: TIA/EIA-222-F | Date: 07/07/15 | Scale: NTS
Path: T:\Crown\841293\01 Mods\mr\20150618_APP300053_841293_LC7_20150618.eri | Dwg No. E-1

0' - 180'

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



GPD
520 S. Main St
Akron, OH 44311
Phone: (330) 572 2100
FAX: (330) 572 2101

Job:	KENT-BULLS BRIDGE ROAD - BU #: 8412		
Project:	841293 - KENT-BULLS BRIDGE ROAD		
Client: Crown Castle	Drawn by: B. Franczkowski	App'd:	
Code: TIA/EIA-222-F	Date: 07/07/15	Scale: NTS	
Path: T:\Crown\841293\01 Mods\tnx\20150618_APP300053_841293_LC7_20150618.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 Litchfield County, Connecticut.
Basic wind speed of 80 mph.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 28 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*	*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	180.00-133.24	46.76	3.69	18	15.0000	25.5375	0.2500	1.0000	A572-65 (65 ksi)
L2	133.24-87.64	49.29	4.90	18	24.2053	35.1887	0.3750	1.5000	A572-65 (65 ksi)
L3	87.64-43.07	49.47	6.04	18	33.3472	44.3577	0.4375	1.7500	A572-65 (65 ksi)
L4	43.07-0.00	49.12		18	42.1374	53.0000	0.5000	2.0000	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	15.2314	11.7041	321.7069	5.2363	7.6200	42.2188	643.8372	5.8532	2.2000	8.8
	25.9315	20.0656	1621.0711	8.9771	12.9731	124.9568	3244.2753	10.0347	4.0546	16.218
L2	25.4143	28.3641	2035.0104	8.4598	12.2963	165.4976	4072.6985	14.1847	3.6001	9.6
	35.7315	41.4370	6344.9205	12.3589	17.8759	354.9435	12698.1899	20.7224	5.5332	14.755
L3	34.9687	45.6992	6253.0569	11.6829	16.9404	369.1220	12514.3417	22.8539	5.0991	11.655
	45.0420	60.9887	14863.3039	15.5917	22.5337	659.6030	29746.1653	30.5001	7.0370	16.084
L4	44.1448	66.0785	14473.2124	14.7813	21.4058	676.1352	28965.4690	33.0455	6.5362	13.072
	53.8176	83.3175	29012.9766	18.6375	26.9240	1077.5879	58064.1291	41.6667	8.4480	16.896

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 180.00-133.24				1	1	1		
L2 133.24-87.64				1	1	1		
L3 87.64-43.07				1	1	1		
L4 43.07-0.00				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
LDF4-50A(1/2")	A	No	Inside Pole	180.00 - 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
LDF5-50A(7/8")	A	No	Inside Pole	180.00 - 8.00	2	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
						1" Ice	0.00	0.33
						2" Ice	0.00	0.33
						4" Ice	0.00	0.33
LDF7-50A(1-5/8")	A	No	Inside Pole	180.00 - 8.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
LDF7-50A(1-5/8")	C	No	Inside Pole	160.00 - 8.00	10	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
***								
LDF7-50A(1-5/8")	B	No	Inside Pole	128.00 - 8.00	4	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
***								
HB114-1-08U4-M5J(1	C	No	Inside Pole	124.00 - 8.00	3	No Ice	0.00	1.08

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
1/4")						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
***								
LDF5-50A(7/8")	B	No	Inside Pole	115.00 - 8.00	1	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
						1" Ice	0.00	0.33
						2" Ice	0.00	0.33
						4" Ice	0.00	0.33
***								
LDF4-50A(1/2")	B	No	Inside Pole	100.00 - 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
***								
EW63(ELLIPTICAL)	B	No	Inside Pole	80.00 - 8.00	1	No Ice	0.00	0.51
						1/2" Ice	0.00	0.51
						1" Ice	0.00	0.51
						2" Ice	0.00	0.51
						4" Ice	0.00	0.51
***								
LDF4-50A(1/2")	C	No	CaAa (Out Of Face)	63.00 - 8.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.84
						1" Ice	0.00	2.14
						2" Ice	0.00	6.58
						4" Ice	0.00	22.78
***								
Safety Line (3/8")	C	No	CaAa (Out Of Face)	180.00 - 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
Step Pegs	C	No	CaAa (Out Of Face)	180.00 - 8.00	1	No Ice	0.08	2.72
						1/2" Ice	0.18	3.51
						1" Ice	0.28	4.92
						2" Ice	0.48	9.56
						4" Ice	0.88	26.18
***								
LDF7-50A(1-5/8")	A	No	CaAa (Out Of Face)	180.00 - 8.00	1	No Ice	0.05	0.82
						1/2" Ice	0.06	2.33
						1" Ice	0.07	4.46
						2" Ice	0.09	10.54
						4" Ice	0.13	30.04
LDF7-50A(1-5/8")	A	No	CaAa (Out Of Face)	180.00 - 8.00	2	No Ice	0.00	0.82
						1/2" Ice	0.00	2.33
						1" Ice	0.00	4.46
						2" Ice	0.00	10.54
						4" Ice	0.00	30.04
LDF7-50A (1-5/8 FOAM)	A	No	CaAa (Out Of Face)	160.00 - 8.00	2	No Ice	0.00	0.82
						1/2" Ice	0.00	2.33
						1" Ice	0.00	4.46
						2" Ice	0.00	10.54
						4" Ice	0.00	30.04
HB158-1-08U8-S8J18(1-5/8)	A	No	CaAa (Out Of Face)	160.00 - 8.00	2	No Ice	0.00	1.30
						1/2" Ice	0.00	2.81
						1" Ice	0.00	4.94
						2" Ice	0.00	11.02
						4" Ice	0.00	30.52

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	180.00-133.24	A	0.000	0.000	0.000	2.338	0.73
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	5.494	0.36
L2	133.24-87.64	A	0.000	0.000	0.000	2.280	0.79
		B	0.000	0.000	0.000	0.000	0.14
		C	0.000	0.000	0.000	5.358	0.63
L3	87.64-43.07	A	0.000	0.000	0.000	2.229	0.77
		B	0.000	0.000	0.000	0.000	0.19
		C	0.000	0.000	0.000	5.237	0.64
L4	43.07-0.00	A	0.000	0.000	0.000	1.754	0.61
		B	0.000	0.000	0.000	0.000	0.15
		C	0.000	0.000	0.000	4.121	0.51

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	180.00-133.24	A	0.903	0.000	0.000	0.000	3.182	1.52
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	22.382	0.49
L2	133.24-87.64	A	0.866	0.000	0.000	0.000	3.103	1.82
		B		0.000	0.000	0.000	0.000	0.14
		C		0.000	0.000	0.000	21.825	0.76
L3	87.64-43.07	A	0.814	0.000	0.000	0.000	3.001	1.73
		B		0.000	0.000	0.000	0.000	0.19
		C		0.000	0.000	0.000	20.678	0.80
L4	43.07-0.00	A	0.750	0.000	0.000	0.000	2.324	1.31
		B		0.000	0.000	0.000	0.000	0.15
		C		0.000	0.000	0.000	15.534	0.65

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	180.00-133.24	-0.1389	0.0119	-0.4401	0.1818
L2	133.24-87.64	-0.1431	0.0123	-0.4866	0.2010
L3	87.64-43.07	-0.1452	0.0125	-0.4998	0.2048
L4	43.07-0.00	-0.1180	0.0101	-0.4045	0.1637

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
***									
(2) 7770.00 w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 2.00	0.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.22 6.77 7.30 8.38 10.69	4.35 5.20 5.92 7.41 10.76	0.06 0.11 0.16 0.29 0.68
(2) 7770.00 w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 2.00	0.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.22 6.77 7.30 8.38 10.69	4.35 5.20 5.92 7.41 10.76	0.06 0.11 0.16 0.29 0.68
(2) 7770.00 w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 2.00	0.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.22 6.77 7.30 8.38 10.69	4.35 5.20 5.92 7.41 10.76	0.06 0.11 0.16 0.29 0.68
AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 2.00	0.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.30 7.48 8.37 10.18 14.02	0.07 0.14 0.21 0.38 0.87
AM-X-CD-16-65-00T-RET w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 2.00	0.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.30 7.48 8.37 10.18 14.02	0.07 0.14 0.21 0.38 0.87
AM-X-CD-14-65-00T-RET w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 2.00	0.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.46 7.26 8.00 9.32 12.13	4.73 5.87 6.87 8.62 12.32	0.07 0.12 0.18 0.32 0.74
ASP-952	A	From Centroid-Leg	4.00 0.00 5.00	0.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.02 4.16 5.30 6.96 9.76	3.02 4.16 5.30 6.96 9.76	0.02 0.04 0.07 0.15 0.40
ASP-952	B	From Centroid-Leg	4.00 0.00 5.00	0.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.02 4.16 5.30 6.96 9.76	3.02 4.16 5.30 6.96 9.76	0.02 0.04 0.07 0.15 0.40
ASP-952	C	From Centroid-Leg	4.00 0.00 5.00	0.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.02 4.16 5.30 6.96 9.76	3.02 4.16 5.30 6.96 9.76	0.02 0.04 0.07 0.15 0.40
(2) RRUS 11	A	From Centroid-Leg	4.00 0.00 2.00	0.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.25 3.49 3.74 4.27 5.43	1.37 1.55 1.74 2.14 3.04	0.05 0.07 0.10 0.15 0.31
(2) RRUS 11	B	From Centroid-Leg	4.00 0.00 2.00	0.0000	180.00	No Ice 1/2" Ice 1" Ice	3.25 3.49 3.74	1.37 1.55 1.74	0.05 0.07 0.10

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	4.27	2.14	0.15
						4" Ice	5.43	3.04	0.31
(2) RRUS 11	C	From Centroid-Leg	4.00 0.00 2.00	0.0000	180.00	No Ice	3.25	1.37	0.05
						1/2" Ice	3.49	1.55	0.07
						1" Ice	3.74	1.74	0.10
						2" Ice	4.27	2.14	0.15
						4" Ice	5.43	3.04	0.31
(2) LGP21401	A	From Centroid-Leg	4.00 0.00 2.00	0.0000	180.00	No Ice	1.29	0.36	0.01
						1/2" Ice	1.45	0.48	0.02
						1" Ice	1.61	0.60	0.03
						2" Ice	1.97	0.87	0.05
						4" Ice	2.79	1.52	0.14
(2) LGP21401	B	From Centroid-Leg	4.00 0.00 2.00	0.0000	180.00	No Ice	1.29	0.36	0.01
						1/2" Ice	1.45	0.48	0.02
						1" Ice	1.61	0.60	0.03
						2" Ice	1.97	0.87	0.05
						4" Ice	2.79	1.52	0.14
(2) LGP21401	C	From Centroid-Leg	4.00 0.00 2.00	0.0000	180.00	No Ice	1.29	0.36	0.01
						1/2" Ice	1.45	0.48	0.02
						1" Ice	1.61	0.60	0.03
						2" Ice	1.97	0.87	0.05
						4" Ice	2.79	1.52	0.14
(2) LGP13519	A	From Centroid-Leg	4.00 0.00 2.00	0.0000	180.00	No Ice	0.34	0.21	0.01
						1/2" Ice	0.42	0.28	0.01
						1" Ice	0.51	0.36	0.01
						2" Ice	0.73	0.55	0.02
						4" Ice	1.25	1.03	0.07
(2) LGP13519	B	From Centroid-Leg	4.00 0.00 2.00	0.0000	180.00	No Ice	0.34	0.21	0.01
						1/2" Ice	0.42	0.28	0.01
						1" Ice	0.51	0.36	0.01
						2" Ice	0.73	0.55	0.02
						4" Ice	1.25	1.03	0.07
(2) LGP13519	C	From Centroid-Leg	4.00 0.00 2.00	0.0000	180.00	No Ice	0.34	0.21	0.01
						1/2" Ice	0.42	0.28	0.01
						1" Ice	0.51	0.36	0.01
						2" Ice	0.73	0.55	0.02
						4" Ice	1.25	1.03	0.07
DC6-48-60-18-8F	A	From Centroid-Leg	4.00 0.00 2.00	0.0000	180.00	No Ice	2.57	2.57	0.02
						1/2" Ice	2.80	2.80	0.04
						1" Ice	3.04	3.04	0.07
						2" Ice	3.54	3.54	0.13
						4" Ice	4.66	4.66	0.30
Pipe Mount 6'x2.375"	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	180.00	No Ice	1.43	1.43	0.03
						1/2" Ice	1.92	1.92	0.04
						1" Ice	2.29	2.29	0.05
						2" Ice	3.06	3.06	0.09
						4" Ice	4.70	4.70	0.23
Pipe Mount 6'x2.375"	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	180.00	No Ice	1.43	1.43	0.03
						1/2" Ice	1.92	1.92	0.04
						1" Ice	2.29	2.29	0.05
						2" Ice	3.06	3.06	0.09
						4" Ice	4.70	4.70	0.23
Pipe Mount 6'x2.375"	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	180.00	No Ice	1.43	1.43	0.03
						1/2" Ice	1.92	1.92	0.04
						1" Ice	2.29	2.29	0.05
						2" Ice	3.06	3.06	0.09
						4" Ice	4.70	4.70	0.23

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 601-1]	C	None		0.0000	180.00	No Ice	28.47	28.47	1.12
						1/2" Ice	33.59	33.59	1.51
						1" Ice	38.71	38.71	1.91
						2" Ice	48.95	48.95	2.69
						4" Ice	69.43	69.43	4.26
***									
***									
(2) SBNHH-1D65B w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	160.00	No Ice	8.77	7.24	0.09
						1/2" Ice	9.52	8.52	0.16
						1" Ice	10.25	9.66	0.24
						2" Ice	11.64	11.59	0.42
						4" Ice	14.54	15.85	0.95
(2) SBNHH-1D65B w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	160.00	No Ice	8.77	7.24	0.09
						1/2" Ice	9.52	8.52	0.16
						1" Ice	10.25	9.66	0.24
						2" Ice	11.64	11.59	0.42
						4" Ice	14.54	15.85	0.95
(2) SBNHH-1D65B w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	160.00	No Ice	8.77	7.24	0.09
						1/2" Ice	9.52	8.52	0.16
						1" Ice	10.25	9.66	0.24
						2" Ice	11.64	11.59	0.42
						4" Ice	14.54	15.85	0.95
RRH2X60-AWS	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	160.00	No Ice	2.19	1.43	0.04
						1/2" Ice	2.40	1.61	0.06
						1" Ice	2.61	1.80	0.08
						2" Ice	3.07	2.21	0.13
						4" Ice	4.09	3.13	0.26
RRH2X60-AWS	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	160.00	No Ice	2.19	1.43	0.04
						1/2" Ice	2.40	1.61	0.06
						1" Ice	2.61	1.80	0.08
						2" Ice	3.07	2.21	0.13
						4" Ice	4.09	3.13	0.26
RRH2X60-AWS	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	160.00	No Ice	2.19	1.43	0.04
						1/2" Ice	2.40	1.61	0.06
						1" Ice	2.61	1.80	0.08
						2" Ice	3.07	2.21	0.13
						4" Ice	4.09	3.13	0.26
RRH2x60-700	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	160.00	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-Leg	4.00 0.00 0.00	0.0000	160.00	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	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	160.00	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-Leg	4.00 0.00 0.00	0.0000	160.00	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

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
RRH2X60-PCS	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.57 2.79 3.02 3.52 4.61	2.01 2.22 2.43 2.89 3.92	0.06 0.08 0.10 0.16 0.31
RRH2X60-PCS	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.57 2.79 3.02 3.52 4.61	2.01 2.22 2.43 2.89 3.92	0.06 0.08 0.10 0.16 0.31
DB-T1-6Z-8AB-0Z	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.60 5.92 6.24 6.91 8.37	2.33 2.56 2.79 3.28 4.37	0.04 0.08 0.12 0.21 0.45
(2) LPA-80080-6CF-EDIN w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.56 5.10 5.61 6.65 8.83	10.74 12.00 12.98 14.99 19.23	0.05 0.11 0.19 0.36 0.86
(2) LPA-80080-6CF-EDIN w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.56 5.10 5.61 6.65 8.83	10.74 12.00 12.98 14.99 19.23	0.05 0.11 0.19 0.36 0.86
(2) LPA-80080-6CF-EDIN w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.56 5.10 5.61 6.65 8.83	10.74 12.00 12.98 14.99 19.23	0.05 0.11 0.19 0.36 0.86
Platform Mount [LP 601-1]	C	None		0.0000	160.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	28.47 33.59 38.71 48.95 69.43	28.47 33.59 38.71 48.95 69.43	1.12 1.51 1.91 2.69 4.26
****									
****									
DB809DK-Y	A	From Centroid-Leg	6.00 0.00 6.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.39 4.55 5.73 7.38 10.25	3.39 4.55 5.73 7.38 10.25	0.03 0.06 0.09 0.18 0.44
DB809DK-Y	B	From Centroid-Leg	6.00 0.00 6.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.39 4.55 5.73 7.38 10.25	3.39 4.55 5.73 7.38 10.25	0.03 0.06 0.09 0.18 0.44
DB809K-Y	C	From Centroid-Leg	6.00 0.00 6.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.85 4.03 5.21 7.17 10.06	2.85 4.03 5.21 7.17 10.06	0.03 0.05 0.08 0.16 0.42
(2) 422-86A-99575-18BW	B	From Leg	2.00 0.00 0.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.11 3.35 3.60 4.11 5.25	1.17 1.34 1.52 1.91 2.79	0.05 0.07 0.09 0.14 0.29

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
431-86A-01-T	C	From Leg	2.00 0.00 0.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.87 2.05 2.25 2.66 3.60	1.40 1.57 1.74 2.12 2.97	0.05 0.06 0.08 0.12 0.25
Side Arm Mount [SO 702-3]	C	None		0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.22 4.15 5.08 6.94 10.66	3.22 4.15 5.08 6.94 10.66	0.08 0.11 0.15 0.21 0.34
****									
APXVSPP18-C-A20 w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	124.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.26 8.81 9.36 10.50 12.88	6.71 7.66 8.49 10.20 13.98	0.08 0.14 0.22 0.39 0.87
APXVSPP18-C-A20 w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	124.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.26 8.81 9.36 10.50 12.88	6.71 7.66 8.49 10.20 13.98	0.08 0.14 0.22 0.39 0.87
APXVSPP18-C-A20 w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	124.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.26 8.81 9.36 10.50 12.88	6.71 7.66 8.49 10.20 13.98	0.08 0.14 0.22 0.39 0.87
1900MHz RRH	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	124.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.91 3.14 3.39 3.91 5.05	3.80 4.06 4.34 4.91 6.15	0.04 0.08 0.11 0.19 0.41
1900MHz RRH	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	124.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.91 3.14 3.39 3.91 5.05	3.80 4.06 4.34 4.91 6.15	0.04 0.08 0.11 0.19 0.41
1900MHz RRH	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	124.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.91 3.14 3.39 3.91 5.05	3.80 4.06 4.34 4.91 6.15	0.04 0.08 0.11 0.19 0.41
800MHZ RRH	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	124.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.49 2.71 2.93 3.41 4.46	2.07 2.27 2.48 2.93 3.93	0.05 0.07 0.10 0.16 0.32
800MHZ RRH	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	124.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.49 2.71 2.93 3.41 4.46	2.07 2.27 2.48 2.93 3.93	0.05 0.07 0.10 0.16 0.32
800MHZ RRH	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	124.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.49 2.71 2.93 3.41 4.46	2.07 2.27 2.48 2.93 3.93	0.05 0.07 0.10 0.16 0.32
Platform Mount [LP 601-1]	C	None		0.0000	124.00	No Ice	28.47	28.47	1.12

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
						1/2" Ice	33.59	33.59	1.51
						1" Ice	38.71	38.71	1.91
						2" Ice	48.95	48.95	2.69
						4" Ice	69.43	69.43	4.26
(2) Pipe Mount 6'x2.375"	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	124.00	No Ice	1.43	1.43	0.03
						1/2" Ice	1.92	1.92	0.04
						1" Ice	2.29	2.29	0.05
						2" Ice	3.06	3.06	0.09
						4" Ice	4.70	4.70	0.23
(2) Pipe Mount 6'x2.375"	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	124.00	No Ice	1.43	1.43	0.03
						1/2" Ice	1.92	1.92	0.04
						1" Ice	2.29	2.29	0.05
						2" Ice	3.06	3.06	0.09
						4" Ice	4.70	4.70	0.23
(2) Pipe Mount 6'x2.375"	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	124.00	No Ice	1.43	1.43	0.03
						1/2" Ice	1.92	1.92	0.04
						1" Ice	2.29	2.29	0.05
						2" Ice	3.06	3.06	0.09
						4" Ice	4.70	4.70	0.23
****									
6813	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	115.00	No Ice	8.40	8.40	0.10
						1/2" Ice	8.79	8.79	0.18
						1" Ice	9.20	9.20	0.26
						2" Ice	10.02	10.02	0.44
						4" Ice	11.79	11.79	0.89
8'x2 1/2" Pipe Mount	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	115.00	No Ice	2.30	2.30	0.04
						1/2" Ice	3.13	3.13	0.06
						1" Ice	3.62	3.62	0.08
						2" Ice	4.62	4.62	0.14
						4" Ice	6.73	6.73	0.33
Pipe Mount 8'x2.375"	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	115.00	No Ice	1.90	1.90	0.03
						1/2" Ice	2.73	2.73	0.05
						1" Ice	3.40	3.40	0.07
						2" Ice	4.40	4.40	0.12
						4" Ice	6.50	6.50	0.30
(2) Pipe Mount 8'x2.375"	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	115.00	No Ice	1.90	1.90	0.03
						1/2" Ice	2.73	2.73	0.05
						1" Ice	3.40	3.40	0.07
						2" Ice	4.40	4.40	0.12
						4" Ice	6.50	6.50	0.30
(2) Pipe Mount 8'x2.375"	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	115.00	No Ice	1.90	1.90	0.03
						1/2" Ice	2.73	2.73	0.05
						1" Ice	3.40	3.40	0.07
						2" Ice	4.40	4.40	0.12
						4" Ice	6.50	6.50	0.30
(2) Side Arm Mount [SO 301-1]	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	115.00	No Ice	1.00	0.90	0.02
						1/2" Ice	1.39	1.42	0.03
						1" Ice	1.78	1.94	0.04
						2" Ice	2.56	2.98	0.06
						4" Ice	4.12	5.06	0.10
Platform Mount [LP 601-1]	C	None		0.0000	115.00	No Ice	28.47	28.47	1.12
						1/2" Ice	33.59	33.59	1.51
						1" Ice	38.71	38.71	1.91
						2" Ice	48.95	48.95	2.69
						4" Ice	69.43	69.43	4.26
****									
ANEMOMETER	C	From	4.00	0.0000	100.00	No Ice	0.66	1.58	0.00

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
		Centroid-Leg	0.00 0.00			1/2" Ice 1" Ice 2" Ice 4" Ice	0.78 0.91 1.21 1.89	1.74 1.92 2.31 3.17	0.01 0.02 0.06 0.16
Pipe Mount [PM 601-1]	C	From Leg	0.50 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 3.74 4.48 5.96 8.92	0.90 1.12 1.34 1.78 2.66	0.07 0.08 0.09 0.12 0.18
***									
BCD-80609-EDIN-3-INVERT	C	From Centroid-Leg	6.00 0.00 -5.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.95 4.11 5.29 7.16 10.03	2.95 4.11 5.29 7.16 10.03	0.03 0.05 0.08 0.16 0.42
Side Arm Mount [SO 702-1]	C	From Leg	3.00 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.00 1.25 1.50 2.00 3.00	1.43 2.05 2.67 3.91 6.39	0.03 0.04 0.05 0.07 0.12
****									
GPS_A	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	63.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.30 0.37 0.46 0.65 1.15	0.30 0.37 0.46 0.65 1.15	0.00 0.00 0.01 0.02 0.08
Side Arm Mount [SO 309-1]	C	From Leg	0.50 0.00 0.00	0.0000	63.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.82 4.07 5.32 7.82 12.82	2.20 3.16 4.12 6.04 9.88	0.04 0.06 0.08 0.13 0.22
****									

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 60 deg - No Ice
5	Dead+Wind 90 deg - No Ice
6	Dead+Wind 120 deg - No Ice
7	Dead+Wind 150 deg - No Ice
8	Dead+Wind 180 deg - No Ice
9	Dead+Wind 210 deg - No Ice
10	Dead+Wind 240 deg - No Ice
11	Dead+Wind 270 deg - No Ice
12	Dead+Wind 300 deg - No Ice
13	Dead+Wind 330 deg - No Ice
14	Dead+Ice+Temp

Comb. No.	Description
15	Dead+Wind 0 deg+Ice+Temp
16	Dead+Wind 30 deg+Ice+Temp
17	Dead+Wind 60 deg+Ice+Temp
18	Dead+Wind 90 deg+Ice+Temp
19	Dead+Wind 120 deg+Ice+Temp
20	Dead+Wind 150 deg+Ice+Temp
21	Dead+Wind 180 deg+Ice+Temp
22	Dead+Wind 210 deg+Ice+Temp
23	Dead+Wind 240 deg+Ice+Temp
24	Dead+Wind 270 deg+Ice+Temp
25	Dead+Wind 300 deg+Ice+Temp
26	Dead+Wind 330 deg+Ice+Temp
27	Dead+Wind 0 deg - Service
28	Dead+Wind 30 deg - Service
29	Dead+Wind 60 deg - Service
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	180 - 133.24	68.294	36	3.8346	0.0041
L2	136.932 - 87.6432	37.124	36	2.8554	0.0042
L3	92.5417 - 43.0729	15.630	36	1.7197	0.0029
L4	49.1172 - 0	4.127	36	0.7878	0.0011

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180.00	(2) 7770.00 w/ Mount Pipe	36	68.294	3.8346	0.0041	14709
160.00	(2) SBNHH-1D65B w/ Mount Pipe	36	53.023	3.3949	0.0035	3675
128.00	DB809DK-Y	36	31.841	2.6307	0.0044	1836
124.00	APXVSPP18-C-A20 w/ Mount Pipe	36	29.648	2.5278	0.0043	1902
115.00	6813	36	25.077	2.2937	0.0041	2071
100.00	ANEMOMETER	36	18.483	1.9060	0.0033	2431
80.00	BCD-80609-EDIN-3-INVERT	36	11.409	1.4233	0.0023	2612
63.00	GPS_A	36	6.845	1.0568	0.0016	2548

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	180 - 133.24	173.381	11	9.7419	0.0108
L2	136.932 - 87.6432	94.432	11	7.2627	0.0105
L3	92.5417 - 43.0729	39.819	11	4.3799	0.0074
L4	49.1172 - 0	10.523	11	2.0086	0.0027

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180.00	(2) 7770.00 w/ Mount Pipe	11	173.381	9.7419	0.0108	6050
160.00	(2) SBNHH-1D65B w/ Mount Pipe	11	134.717	8.6291	0.0088	1508
128.00	DB809DK-Y	11	81.028	6.6929	0.0112	743
124.00	APXVSPP18-C-A20 w/ Mount Pipe	11	75.459	6.4318	0.0111	768
115.00	6813	11	63.846	5.8378	0.0103	832
100.00	ANEMOMETER	11	47.078	4.8532	0.0085	969
80.00	BCD-80609-EDIN-3-INVERT	11	29.073	3.6262	0.0059	1033
63.00	GPS_A	11	17.449	2.6935	0.0040	1004

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	180 - 133.24 (1)	TP25.5375x15x0.25	46.76	0.00	0.0	39.000	19.4053	-6.15	756.81	0.008
L2	133.24 - 87.6432 (2)	TP35.1887x24.2053x0.375	49.29	0.00	0.0	39.000	40.1378	-16.72	1565.37	0.011
L3	87.6432 - 43.0729 (3)	TP44.3577x33.3472x0.4375	49.47	0.00	0.0	39.000	59.1206	-27.67	2305.70	0.012
L4	43.0729 - 0 (4)	TP53x42.1374x0.5	49.12	0.00	0.0	39.000	69.7913	-31.90	2721.86	0.012

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	180 - 133.24 (1)	TP25.5375x15x0.25	458.90	47.135	39.000	1.209	0.00	0.000	39.000	0.000
L2	133.24 - 87.6432 (2)	TP35.1887x24.2053x0.375	1376.46	49.614	39.000	1.272	0.00	0.000	39.000	0.000
L3	87.6432 - 43.0729 (3)	TP44.3577x33.3472x0.4375	2511.26	48.635	39.000	1.247	0.00	0.000	39.000	0.000
L4	43.0729 - 0 (4)	TP53x42.1374x0.5	2808.11	44.648	39.000	1.145	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	180 - 133.24 (1)	TP25.5375x15x0.25	14.95	0.770	26.000	0.059	0.41	0.021	26.000	0.001
L2	133.24 - 87.6432 (2)	TP35.1887x24.2053x0.375	24.47	0.610	26.000	0.047	1.21	0.021	26.000	0.001
L3	87.6432 - 43.0729 (3)	TP44.3577x33.3472x0.4375	27.67	0.468	26.000	0.036	1.73	0.016	26.000	0.001
L4	43.0729 - 0 (4)	TP53x42.1374x0.5	28.53	0.409	26.000	0.031	1.73	0.013	26.000	0.001

Pole Interaction Design Data

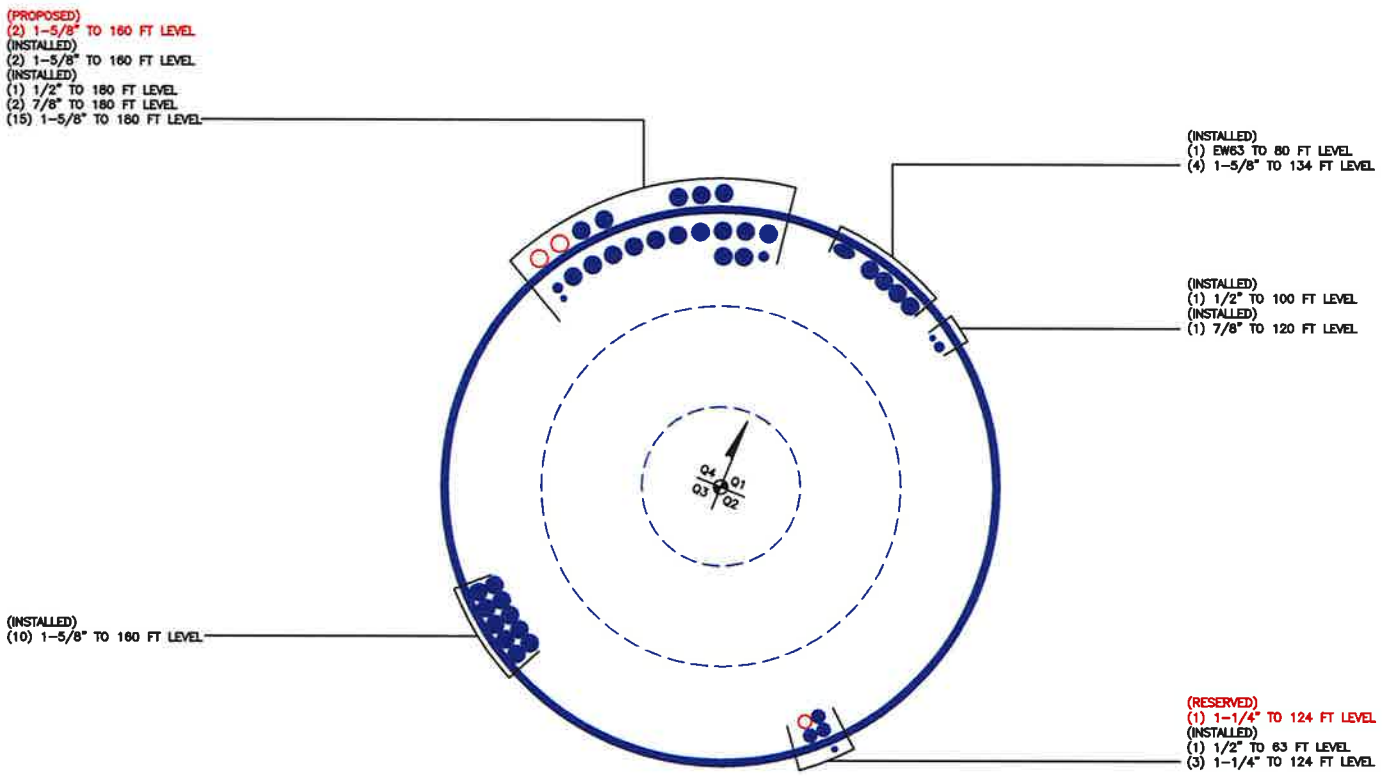
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	180 - 133.24 (1)	0.008	1.209	0.000	0.059	0.001	1.218 ✔	1.333	H1-3+VT ✔
L2	133.24 - 87.6432 (2)	0.011	1.272	0.000	0.047	0.001	1.283 ✔	1.333	H1-3+VT ✔
L3	87.6432 - 43.0729 (3)	0.012	1.247	0.000	0.036	0.001	1.259 ✔	1.333	H1-3+VT ✔
L4	43.0729 - 0 (4)	0.012	1.145	0.000	0.031	0.001	1.157 ✔	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	180 - 133.24	Pole	TP25.5375x15x0.25	1	-6.15	1008.82	91.3	Pass
L2	133.24 - 87.6432	Pole	TP35.1887x24.2053x0.375	2	-16.72	2086.64	96.3	Pass
L3	87.6432 - 43.0729	Pole	TP44.3577x33.3472x0.4375	3	-27.67	3073.50	94.5	Pass
L4	43.0729 - 0	Pole	TP53x42.1374x0.5	4	-31.90	3628.24	86.8	Pass
							Summary	
						Pole (L2)	96.3	Pass
						RATING =	**96.3**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 841293 TOWER ID: C_BASELEVEL

CROWN REGION ADDRESS

USA

05/02/14	NEW BUILD PER WORK ORDER # 707309	
22/02/14	UPDATED PER WORK ORDER # 715041	
04/03/14	APPLICATION ADDED PER WORK ORDER # 721184	KF
10/04/14	UPDATED PER WORK ORDER # 760020	KT
10/06/14	UPDATED PER WORK ORDER # 742844	CJH
16/06/14	UPDATED PER WORK ORDER # 799148	CJH
15/1/2015	UPDATED PER WORK ORDER 863004	TSB
16/6/2015	UPDATED PER WORK ORDER 1078888	CMP
25/6/2015	UPDATED PER WORK ORDER 1081774	TSB

DRAWN BY: SLS
CHECKED BY:
DRAWING DATE: 05-02-14

SITE NUMBER:
SITE NAME:

SITE NAME

KENT-BULLS BRIDGE ROAD

BUSINESS UNIT NUMBER

841293

SITE ADDRESS

136 BULLS BRIDGE ROAD
SOUTH KENT, CT 06785
LITCHFIELD COUNTY
USA

SHEET TITLE

BASE LEVEL

SHEET NUMBER

A1-0

BASE LEVEL DRAWING	1" = 1'-0"	1

PLOT DATE: 6/25/2015 FILE NAME: 841293 BASELEVEL.dwg

APPENDIX C

ADDITIONAL CALCULATIONS

Anchor Rod Interaction, TIA/EIA-222-F
KENT-BULLS BRIDGE ROAD - BU #: 841293
2015777.841293.01

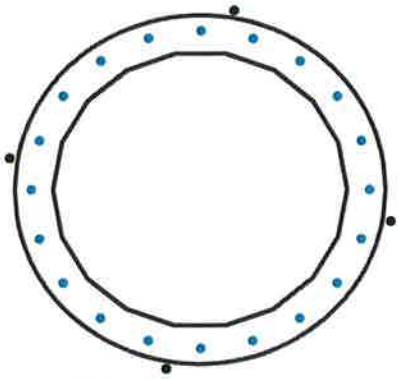
tnx Reactions		
Overturning Moment=	3941.00	k*ft
Axial Force =	44.00	k
Shear Force =	30.00	k

Existing Anchor Rods		
Number of Rods =	20	
Rod Circle =	62	in
Rod Diameter =	2.25	in
Est. Dist. b/w ea. Rod =	6	in
Plate Type =	Round	
Plate Diameter =	68	in

Pole		
Pole Diameter =	53	in
Number of Sides =	18	
Thickness =	0.5	in

First Added Anchor Rods		
Number of Rods =	4	
Rod Circle =	71.00	in
Rod Diameter =	1.75	in
Anchor Rod Grade =	F1554 GR 105	

Rod Number	Initial Angle
1	10
2	100
3	190
4	280



- Existing Anchor Rods
- First Added Anchor Rods
- Second Added Anchor Rods

Second Added Anchor Rods		
Number of Rods =		
Rod Circle =		in
Rod Diameter =		in
Anchor Rod Grade =		

First Added Anchor Rods		
Max Rod Tension =	91.16	k
Rnt/Ω=	99.22	k
Anchor Rod Capacity =	91.87%	OK

Reactions in Existing Rods		
Overturning Moment=	**3401.50**	k*ft
Axial Force =	**44.00**	k
Shear Force =	**30.00**	k
Centroid Offset =	**0.00**	in

GPD GROUP

Anchor Rod and Base Plate Stresses
KENT-BULLS BRIDGE ROAD - BU #: 841293
2015777.841293.01

Overturning Moment =	3401.50	k*ft
Axial Force =	44.00	k
Shear Force =	30.00	k

Acceptable Stress Ratio =	100.0%

Anchor Rods		
Number of Rods =	20	
Type =	Bolt	
Rod Ultimate Strength (Fu) =	100	ksi
ASIF =	1.333	
Rod Circle =	62	in
Rod Diameter =	2.25	in
Area =	3.98	in^2
Max Tension on Rod =	129.38	kips
Max Compression on Rod =	133.78	kips
Allow. Rod Force =	174.95	kips
Anchor Rod Capacity =	**74.0%**	**OK**

Base Plate		
Location =	External	
Plate Strength (F_y) =	60	ksi
Outside Diameter =	68	in
Plate Thickness =	2.25	in
wcalc =	32.17	in
wmax =	41.66	in
w =	32.17	in
S =	27.14	in^3
fb =	50.16	ksi
Fb =	60	ksi
BP Capacity =	**83.6%**	**OK**

Stiffeners		
Configuration =	None	

Pole		
Pole Diameter =	53	in
Number of Sides =	18	
Thickness =	0.5	in
Pole Yield Strength =	65	ksi

Site Number	841293
Site Name	KENT-BULLS BRIDGE ROAD

Caisson Analysis

Pier Properties		
Moment	3941	kip-ft
Shear	30	kip
Pier Diameter	7.5	ft
Height Above Grade	0.50	ft
Depth Below Grade	19.50	ft
Donut Diameter		ft
Donut Depth		ft

Analysis Properties		
TIA Code	F	
Soil Safety Factor	2.00	
Water Table Depth	10.0	ft
Ignored Soil Depth	0.0	ft
Cohesion Based on	PLS Caisson	
Max Soil Capacity	100%	

Soil Properties

Layer	Top of Soil Layer (ft)	Layer Thickness (ft)	Bottom of Soil Layer (ft)	Soil Unit Weight (pcf)	Cohesion (psf)	Friction Angle (degrees)
Soil.Layer	*Soil.Top*	*Soil.Thick*	*Soil.Bottom*	*Soil.Weight*	*Soil.Cohesion*	*Soil.Phi*
1	0.00	3	3.00	130		28
2	3.00	11	14.00	135		40
3	14.00	4	18.00	145		42
4	18.00	5	23.00	160		44
5						
6						
7						
8						
9						
10						

Critical Depths Below Grade		
Rotation Axis	13.95	ft
Zero Shear	3.62	ft

Results		
Soil Capacity	93.2%	OK
Max Pier Moment	4033	kip-ft

Moment At User Defined Depths Below Grade	
kip-ft	kip-ft
kip-ft	kip-ft

V1.0

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

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

Site Data

BU#: *841293*
Site Name: *KENT-BULLS BRIDGE ROAD*
App #:

Enter Load Factors Below:		
For M (WL)	1.3	<---- Enter Factor
For P (DL)	1.3	<---- Enter Factor

Pier Properties

Concrete:

Pier Diameter =	7.5	ft
Concrete Area =	6361.7	in^2

Reinforcement:

Clear Cover to **Tie**=	6.00	in
Horiz. **Tie** Bar Size=	5	
Vert. Cage Diameter =	6.28	ft
Vert. Cage Diameter =	75.34	in
Vertical Bar Size =	11	
Bar Diameter =	1.41	in
Bar Area =	1.56	in^2
Number of Bars =	42	
As Total=	65.52	in^2
A s/ Aconc, Rho:	0.0103	1.03%

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

(3)*(Sqrt(f'c)/Fy:	0.0027
200 / Fy:	0.0033

Minimum Rho Check:

Actual Req'd Min. Rho:	0.33%	Flexural
Provided Rho:	1.03%	OK

Ref. Shaft Max Axial Capacities, ϕ Max(Pn or Tn):		
Max Pu = (φ=0.65) Pn.		
Pn per ACI 318 (10-2)	10392.99	kips
at Mu=(ϕ=0.65)Mn=	6562.62	ft-kips
Max Tu, (φ=0.9) Tn =	3538.08	kips
at Mu=ϕ=(0.90)Mn=	0.00	ft-kips

Maximum Shaft Superimposed Forces

TIA Revision:	F	
Max. Service Shaft M:	4033	ft-kips (* Note)
Max. Service Shaft P:	44	kips
Max Axial Force Type:	Comp.	

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

Load Factor	Shaft Factored Loads		
1.30	Mu:	5242.9	ft-kips
1.30	Pu:	57.2	kips

Material Properties

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

ACI 318 Code

Select Analysis ACI Code=	2008	

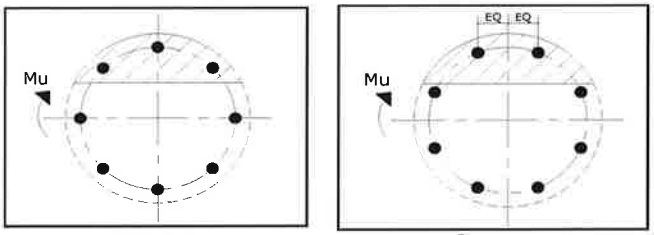
Seismic Properties

Seismic Design Category =	B	
Seismic Risk =	**Low**	

Solve (Run) <-- Press Upon Completing All Input

Results:

Governing Orientation Case: **1**



Case 1 Case 2

Dist. From Edge to Neutral Axis:	**19.71**	in
Extreme Steel Strain, ϵt:	**0.0096**	
	ϵt > 0.0050, Tension Controlled	
Reduction Factor,φ:	**0.900**	

Output Note: Negative Pu=Tension

For Axial Compression, φ Pn = Pu:	57.20	kips
Drilled Shaft Moment Capacity, φMn:	**10089.56**	ft-kips
Drilled Shaft Superimposed Mu:	**5242.90**	ft-kips

(Mu/φMn, Drilled Shaft Flexure CSR:	**52.0%**