

December 17, 2015

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

Re: **Notice of Exempt Modification – Facility Modification
400 Reily Mountain Road, Coventry, Connecticut**

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless (“Cellco”) currently maintains fifteen (15) wireless telecommunications antennas at the 126-foot level of the existing 152-foot tower at 400 Reily Mountain Road in Coventry, Connecticut (the “Property”). The tower is owned by Crown Castle (“Crown”). The Council approved Cellco’s use of the tower in 2005. Cellco now intends to modify its facility by replacing six (6) of its existing antennas with three (3) model SBNHH-1D65B, 700 MHz antennas and three (3) model SBNHH-1D65B, 1900/2100 MHz antennas, all at the same 126-foot level on the tower. Cellco also intends to install nine (9) remote radio heads (“RRHs”) and two (2) HYBRIFLEX™ fiber optic antenna cables. Included in Attachment 1 are specifications for Cellco’s replacement antennas, RRHs and HYBRIFLEX™ cables.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to John Elsesser, Town Manager for the Town of Coventry. A copy of this letter is also being sent to James and Concetta Wallbeoff, Trustees, the owners of the Property and Crown, the tower owner.

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

1. The proposed modifications will not result in an increase in the height of the existing tower. Cellco’s replacement antennas and RRHs will be located at the 126-foot level on the 152-foot tower.


14366122-v1

Melanie A. Bachman
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2. The proposed modifications will not involve any change to ground-mounted equipment and, therefore, will not require the extension of the site boundary.
3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and/or local criteria.
4. The operation of the modified facility will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. A cumulative General Power Density table for Cellco's modified facility is included behind Attachment 2.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The tower and its foundation 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:

John Elsesser, Coventry Town Manager
James and Concetta Wallbeoff, Trustees
Crown
Tim Parks

ATTACHMENT 1



SBNHH-1D65B

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

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

Electrical Specifications

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

Electrical Specifications, BASTA*

Frequency Band, MHz	698–806	806–896	1695–1880	1850–1990	1920–2200	2300–2360
Gain by all Beam Tilts, average, dBi	14.5	14.3	17.4	17.9	18.2	18.3
Gain by all Beam Tilts Tolerance, dB	±0.5	±0.8	±0.4	±0.3	±0.5	±0.3
Gain by Beam Tilt, average, dBi	0° 14.6	0° 14.5	0° 17.4	0° 17.8	0° 18.1	0° 18.2
	7° 14.6	7° 14.4	3° 17.5	3° 17.9	3° 18.3	3° 18.4
	14° 14.2	14° 13.6	7° 17.4	7° 17.9	7° 18.2	7° 18.4
Beamwidth, Horizontal Tolerance, degrees	±2.2	±3.4	±2	±4.6	±5.7	±4.3
Beamwidth, Vertical Tolerance, degrees	±0.8	±1	±0.3	±0.2	±0.3	±0.2
USLS, beampeak to 20° above beampeak, dB	16	14	16	16	16	15
Front-to-Back Total Power at 180° ± 30°, dB	25	26	27	26	26	26
CPR at Boresight, dB	22	23	21	20	20	22
CPR at Sector, dB	13	11	16	12	11	4

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

General Specifications

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

SBNHH-1D65B

POWERED BY



Mechanical Specifications

Color	Light gray
Lightning Protection	dc Ground
Radiator Material	Aluminum Low loss circuit board
Radome Material	Fiberglass, UV resistant
Reflector Material	Aluminum
RF Connector Interface	7-16 DIN Female
RF Connector Location	Bottom
RF Connector Quantity, total	6
Wind Loading, maximum	617.7 N @ 150 km/h 138.9 lbf @ 150 km/h
Wind Speed, maximum	241 km/h 150 mph

Dimensions

Depth	180.0 mm 7.1 in
Length	1851.0 mm 72.9 in
Width	301.0 mm 11.9 in
Net Weight	18.4 kg 40.6 lb

Remote Electrical Tilt (RET) Information

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

Packed Dimensions

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

Regulatory Compliance/Certifications

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



Included Products

Product Specifications

COMMSCOPE®

SBNHH-1D65B

POWERED BY



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.

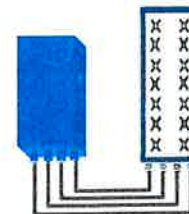
Its compactness and slim design makes the Alcatel-Lucent B13 RRH4x30-4R easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the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

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

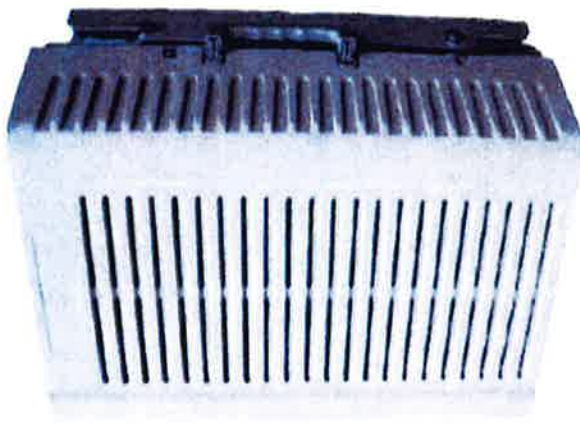
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PCS RF MODULES

RRH1900 2X60 - HW CHARACTERISTICS

LA6.0.1/13.3

RRH2x60	
RF Output Power	2x60W
Instantaneous Bandwidth	20MHz
Transmitter	2 TX
Receiver	2 Branch RX – LA6.0.1 4 Branch RX – LR13.3
Features	AISG 2.0 for RET/TMA Internal Smart Bias-T
Power	-48VDC
CPRI Ports	2 CPRI Rate 3 Ports
External Alarms	4 External User Alarms
Monitor Ports	TX
Environmental	GR487 Compliance
RF Connectors	7/16 DIN (top mounted)



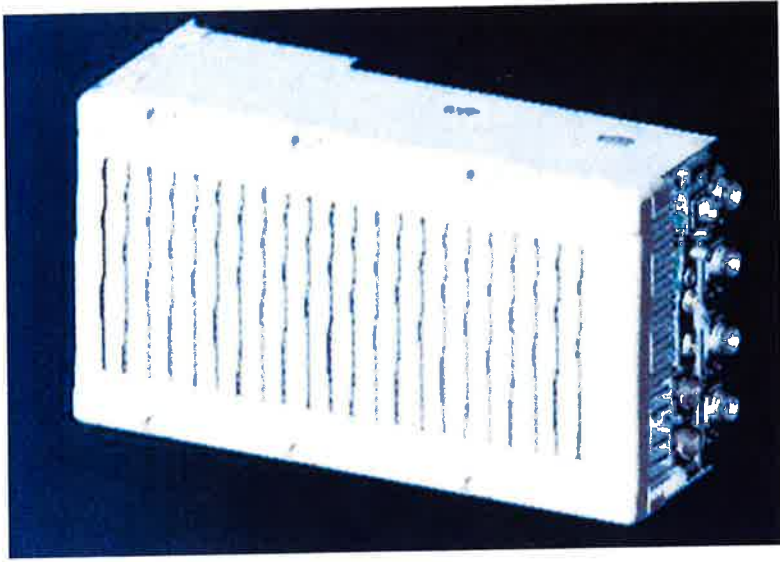
** Not a Verizon Wireless deployed product

ALCATEL-LUCENT – CONFIDENTIAL – SOLELY FOR AUTHORIZED PERSONS HAVING A NEED TO KNOW – PROPRIETARY – USE PURSUANT TO COMPANY INSTRUCTION

NEW PCS RF MODULES FOR VZW RRH2X60 - HW CHARACTERISTICS

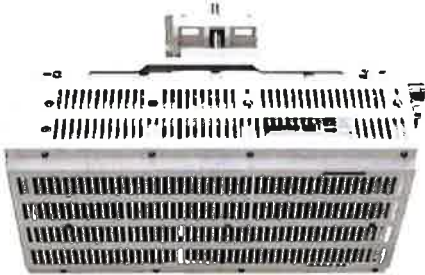
LR14.3

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.)

B66A RRH 4X45 - PHYSICAL CHARACTERISTICS- TARGET 15.1



B4 RRH4x45-4R (AWS-Extension Band)	
Frequency Band	LR15.1 – B4 / LR16.1 B66 (AWS 1 and 3 only)
RF Output Power	2x90W/4x45W (SW configurable)
Operational range	2110-2180 MHz, DL/ 1710-1780 MHz UL
Instantaneous Bandwidth	70MHz
Configuration (HW readiness)	LTE: 2T2R, 2T4R, 4T4R
Carrier Bandwidths	5, 10, 15 and 20 MHz
Interfaces	2x CPRI Rate 7 Ports Antenna Connectors 4.3-10
AISG Support	AISG 2.0 for RET Internal Smart Bias T
Monitor Ports	NA (Spec An to replace ports)
Environmental	GR487 Compliance / GR3178 Compliance (with exceptions)
Mounting options	Pole/Wall
Connectors location	All bottom
External Alarms	4
Annual Return Rate (Target)	<2%
Operating Temperature	-40 C to +55 C (without solar load)

- Commercial Product Will include B66 support of AWS 1 and 3.
- Lower AWS 3 UL Not in 3GPP Band 66 Definition

Physical Dimensions – Not to Exceed		
	W/O Solar Shield	With Solar Shield
Dimensions HxWxD	H = 26in W = 11.4in D = 5.9in (H=660mm) (W=290mm) (D=150mm)	H = 26.6in W = 12in D = 6.8in (H=675mm) (W=304mm) (D=173mm)
Volume	29l	35.5l
Weight		64lbs / 29kg





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.

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



Figure 1: HYBRIFLEX Series

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, 8.4mm ² (8AWG)		[Ω/km (Ω/1000ft)]	2.1 (0.307)
Version			Single-mode OM3
Quantity, Fiber Count			16 (8 pairs)
Core/Clad		[μm]	50/125
Primary Coating (Acrylate)		[μm]	245
Buffer Diameter, Nominal		[μm]	900
Secondary Protection, Jacket, Nominal		[mm (in)]	2.0 (0.08)
Minimum Bending Radius		[mm (in)]	104 (4.1)
Insertion Loss @ wavelength 850nm		dB/km	3.0
Insertion Loss @ wavelength 1310nm		dB/km	1.0
Standards (Meets or exceeds)			UL94-V0, UL1666 RoHS Compliant
Size (Power)		[mm (AWG)]	8.4 (8)
Quantity, Wire Count (Power)			16 (8 pairs)
Size (Alarm)		[mm (AWG)]	0.8 (18)
Quantity, Wire Count (Alarm)			4 (2 pairs)
Type			UV protected
Strands			19
Primary Jacket Diameter, Nominal		[mm (in)]	6.8 (0.27)
Standards (Meets or exceeds)			NFPA 130, ICEA S-95-658 UL Type XHHW-2, UL 44 UL-LS Limited Smoke, UL VW-1 IEEE-383 (1974), IEEE1202/FT4 RoHS Compliant
Installation Temperature		[°C (°F)]	-40 to +65 (-40 to 149)
Operation Temperature		[°C (°F)]	-40 to +65 (-40 to 149)

* This data is provisional and subject to change

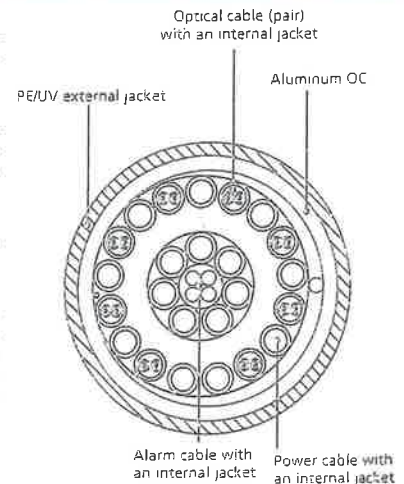


Figure 2: Construction Detail

All information contained in the present datasheet is subject to confirmation at time of ordering.

ATTACHMENT 2

Site Name: Coventry N Tower Height: 152'		General	Power	Density	CALC. POWER DENS	FREQ.	MAX. PERMISS. EXP.	FRACTION MPE	Total
CARRIER	# OF CHAN.	WATTS ERP	HEIGHT						
*AT&T UMTS	2	565	120	0.0313	880	0.5867	0.53%		
*AT&T UMTS	2	875	120	0.0484	1900	1.0000	0.48%		
*AT&T GSM	1	283	120	0.0078	880	0.5867	0.13%		
*AT&T GSM	4	525	120	0.0581	1900	1.0000	0.58%		
*AT&T LTE	1	1615	120	0.0447	734	0.4893	0.91%		
*Pocket (now MetroPCS)	3	631	107	0.0667	2130	1.0000	0.67%		
*Sprint	11	384	147	0.0764	1962.5	1.0000	0.76%		
*T-Mobile	6	1102	136	0.1407	1900	1.0000	1.41%		
*T-Mobile	1	865	136	0.0184	700	0.4667	0.39%		
Verizon	11	194	126	0.0483	1970	1.0000	4.83%		
Verizon	9	378	126	0.0770	869	0.5793	13.30%		
Verizon	1	2302	126	0.0521	2145	1.0000	5.21%		
Verizon	1	850	126	0.0193	746	0.4973	3.87%		
									33.1%
* Source: Siting Council									

ATTACHMENT 3



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

December 03, 2015

Rebecca Klein
 Crown Castle
 525 Alderman Lane
 Fort Mill, SC 29715
 (704) 405-6525

Subject: Structural Analysis Report

Carrier Designation: Verizon Wireless Co-locate
Carrier Site Number: 118000
Carrier Site Name: Coventry North CT

Crown Castle Designation: Crown Castle BU Number: 876385
 Crown Castle Site Name: N. Coventry / Wallbeoff
 Crown Castle JDE Job Number: 356356
 Crown Castle Work Order Number: 1162024
 Crown Castle Application Number: 320997 Rev. 5

Engineering Firm Designation: B+T Group Project Number: 100172.004.01

Site Data: Reilly Mtn. Rd., Coventry, Tolland County, CT
 Latitude 41° 47' 56.21", Longitude -72° 19' 55.88"
 152 Foot - Monopole Tower

Dear Rebecca Klein,

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 851831, in accordance with application 320997, revision 5.

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 85 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.

Krista M. Murphy, E.I.T.
 Project Engineer

Chad E. Tuttle, P.E.
 Engineer of Record
 COA: PEC.0001564 Expires: 02/10/2016

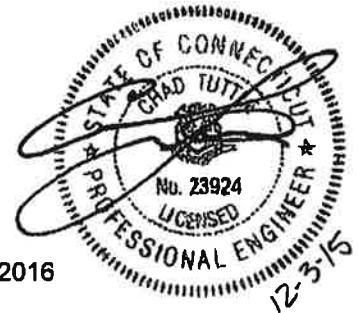


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1) INTRODUCTION

This tower is a 152 ft. Monopole tower designed by Engineered Endeavors, Inc. in September of 2000. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 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
124.0	126.0	3	Alcatel Lucent	RRH2X60-PCS	2	1-5/8	--
		3	Alcatel Lucent	RRH2x60-700			
		3	Alcatel Lucent	RRH4X45-AWS4 B66			
		6	Andrew	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
150.0	152.0	6	Decibel	DB980F90T2E-M	6	1-5/8	1
	150.0	1	--	Platform Mount [LP 601-1]			
133.0	136.0	3	Commscope	ATBT-BOTTOM-24V	6	1-5/8	2
		3	Commscope	LNx-6515DS-VTM			
		3	EMS Wireless	RR90-17-02DP			
		3	Ericsson	KRY 112 71/2			
	133.0	1	--	Platform Mount [LP 304-1]			
124.0	126.0	3	Antel	BXA-70063/6CF-2	18	1-5/8	1
		3	Antel	LPA-171080-12CF-EDIN-2			
		3	Antel	LPA-171080-12CF-EDIN-2			
		6	Antel	LPA-80080/6CF			
	124.0	1	--	Platform Mount [LP 304-1]			
116.0	120.0	3	Ericsson	RRUS-11	12	1-1/4	1
		2	KMW Comm.	AM-X-CD-16-65-00T-RET			
		6	Powerwave Tech	7770.00			
		6	Powerwave Tech	LGP21401			
		6	Powerwave Tech	LGP21903			
		1	Powerwave Tech	P65-17-XLH-RR			
		1	Raycap	DC6-48-60-18-8F			
	116.0	1	--	Platform Mount [LP 712-1]			
107.0	107.0	3	Kathrein	742 213	6	1-5/8	1
74.0	75.0	1	Lucent	KS24019-L112A	1	1/2	1
	74.0	1	--	Side Arm Mount [SO 701-1]			

Notes:

- 1) Existing Equipment
- 2) Reserved Equipment
- 3) Equipment To Be Removed; Not Considered In This Analysis

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
150	150	12	Dapa	48000	--	--
		1	Generic	LP Platform		
140	140	12	Dapa	48000	--	--
		1	Generic	LP Platform		
130	130	12	Dapa	48000	--	--
		1	Generic	LP Platform		
120	120	12	Dapa	48000	--	--
		1	Generic	LP Platform		
110	110	12	Dapa	48000	--	--
		1	Generic	LP Platform		
100	100	12	Dapa	48000	--	--
		1	Generic	LP Platform		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Online Application	Verizon Wireless Co-Locate, Rev# 5	320997	CCI Sites
Tower Manufacturer Drawing	EEl, Job No. 7831	1614566	CCI Sites
Foundation Drawing	EEl, Project No. 7831	1441268	CCI Sites
Geotech Report	Goodkind & O'Dea Inc., Date: 08/17/2000	1531969	CCI Sites
Antenna Configuration	Crown CAD Package	Date: 12/03/2015	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	152 - 137.42	Pole	TP37.31x33.03x0.313	1	-2.442	334.034	2.8	Pass
L2	137.42 - 91.09	Pole	TP50.15x35.167x0.375	2	-18.558	979.451	27.2	Pass
L3	91.09 - 44.79	Pole	TP62.86x47.413x0.438	3	-33.548	2199.237	38.2	Pass
L4	44.79 - 0	Pole	TP75x59.537x0.5	4	-58.123	3950.972	41.1	Pass
							Summary	
						Pole (L4)	41.1	Pass
						RATING =	41.1	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	Base	37.6	Pass
1	Base Plate	Base	54.9	Pass
1	Base Foundation (Structural)	Base	60.8	Pass
1	Base Foundation (Soil Interaction)	Base	43.1	Pass

Structure Rating (max from all components) =	60.8%
---	--------------

Notes:

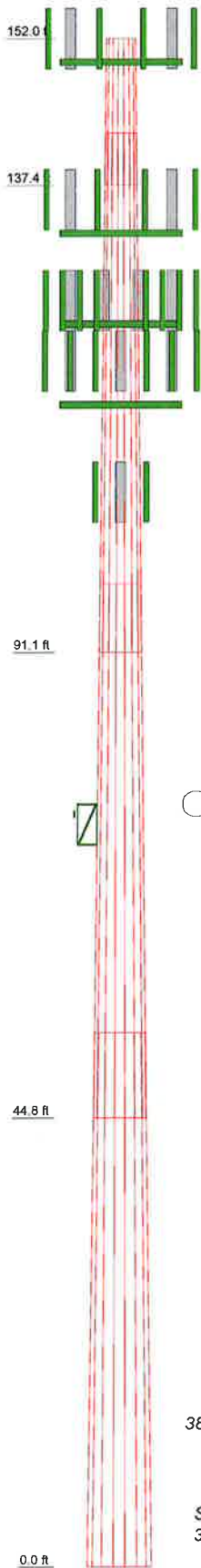
- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

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
Length (ft)	14.580	51.500	53.130	53.210
Number of Sides	18	18	18	18
Thickness (in)	0.313	0.375	0.438	0.500
Socket Length (ft)	5.170	6.630	8.420	9.537
Top Dia (in)	33.030	35.167	47.413	59.000
Bot Dia (in)	37.310	50.150	62.860	75.000
Grade		A572-65		
Weight (K)	1.7	8.8	13.7	19.2



DESIGNED APPURTENANCE LOADING

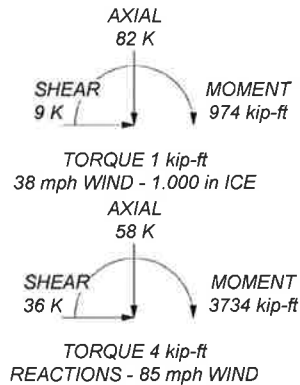
TYPE	ELEVATION	TYPE	ELEVATION
(2) DB980F90T2E-M w/ Mount Pipe (E)	150	RRH4X45-AWS4 B66 (P)	124
(2) DB980F90T2E-M w/ Mount Pipe (E)	150	RRH4X45-AWS4 B66 (P)	124
(2) DB980F90T2E-M w/ Mount Pipe (E)	150	RRH2X60-PCS (P)	124
8' x 2" Pipe Mount (E-Empty)	150	RRH2X60-PCS (P)	124
8' x 2" Pipe Mount (E-Empty)	150	(2) LPA-80080/6CF w/ Mount Pipe (E)	124
8' x 2" Pipe Mount (E-Empty)	150	(2) LPA-80080/6CF w/ Mount Pipe (E)	124
Platform Mount [LP 601-1] (E)	150	(2) LPA-80080/6CF w/ Mount Pipe (E)	124
LNx-6515DS-VTM w/ Mount Pipe (R)	133	6' x 2" Mount Pipe (E)	124
LNx-6515DS-VTM w/ Mount Pipe (R)	133	6' x 2" Mount Pipe (E)	124
LNx-6515DS-VTM w/ Mount Pipe (R)	133	6' x 2" Mount Pipe (E)	124
ATBT-BOTTOM-24V (R)	133	Platform Mount [LP 304-1] (E-Per Photo)	124
ATBT-BOTTOM-24V (R)	133	AM-X-CD-16-65-00T-RET w/ Mount Pipe (E)	116
ATBT-BOTTOM-24V (R)	133	AM-X-CD-16-65-00T-RET w/ Mount Pipe (E)	116
RR90-17-02DP w/ Mount Pipe (E)	133	P65-17-XLH-RR w/ Mount Pipe (E)	116
RR90-17-02DP w/ Mount Pipe (E)	133	(2) 7770.00 w/ Mount Pipe (E)	116
RR90-17-02DP w/ Mount Pipe (E)	133	(2) 7770.00 w/ Mount Pipe (E)	116
KRY 112 71/2 (E)	133	(2) 7770.00 w/ Mount Pipe (E)	116
KRY 112 71/2 (E)	133	RRUS-11 (E)	116
KRY 112 71/2 (E)	133	RRUS-11 (E)	116
6' x 2" Mount Pipe (E-For TME)	133	RRUS-11 (E)	116
6' x 2" Mount Pipe (E-For TME)	133	(2) LGP21903 (E)	116
6' x 2" Mount Pipe (E-For TME)	133	(2) LGP21903 (E)	116
Platform Mount [LP 304-1] (E-Per Photo)	133	(2) LGP21903 (E)	116
LPA-171080-12CF-EDIN-2 w/ Mount Pipe (E)	124	(2) LGP21903 (E)	116
LPA-171080-12CF-EDIN-2 w/ Mount Pipe (E)	124	DC6-48-60-18-8F (E-Per Photo)	116
LPA-171080-12CF-EDIN-2 w/ Mount Pipe (E)	124	(2) LGP21401 (E)	116
(2) SBNHH-1D65B w/ Mount Pipe (P)	124	(2) LGP21401 (E)	116
(2) SBNHH-1D65B w/ Mount Pipe (P)	124	(2) LGP21401 (E)	116
(2) SBNHH-1D65B w/ Mount Pipe (P)	124	(2) LGP21401 (E)	116
RRH2x60-700 (P)	124	4' x 2" Pipe Mount (E-For TME)	116
RRH2x60-700 (P)	124	4' x 2" Pipe Mount (E-For TME)	116
RRH2x60-700 (P)	124	4' x 2" Pipe Mount (E-For TME)	116
RRH2x60-700 (P)	124	Platform Mount [LP 712-1] (E)	116
DB-T1-6Z-8AB-0Z (P)	124	742 213 w/ Mount Pipe (E)	107
RRH4X45-AWS4 B66 (P)	124	742 213 w/ Mount Pipe (E)	107
		742 213 w/ Mount Pipe (E)	107
		KS24019-L112A (E)	74
		Side Arm Mount [SO 701-1] (E)	74

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Tolland County, Connecticut.
2. Tower designed for a 85 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: 41.1%



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 FAX: (918) 295-0265

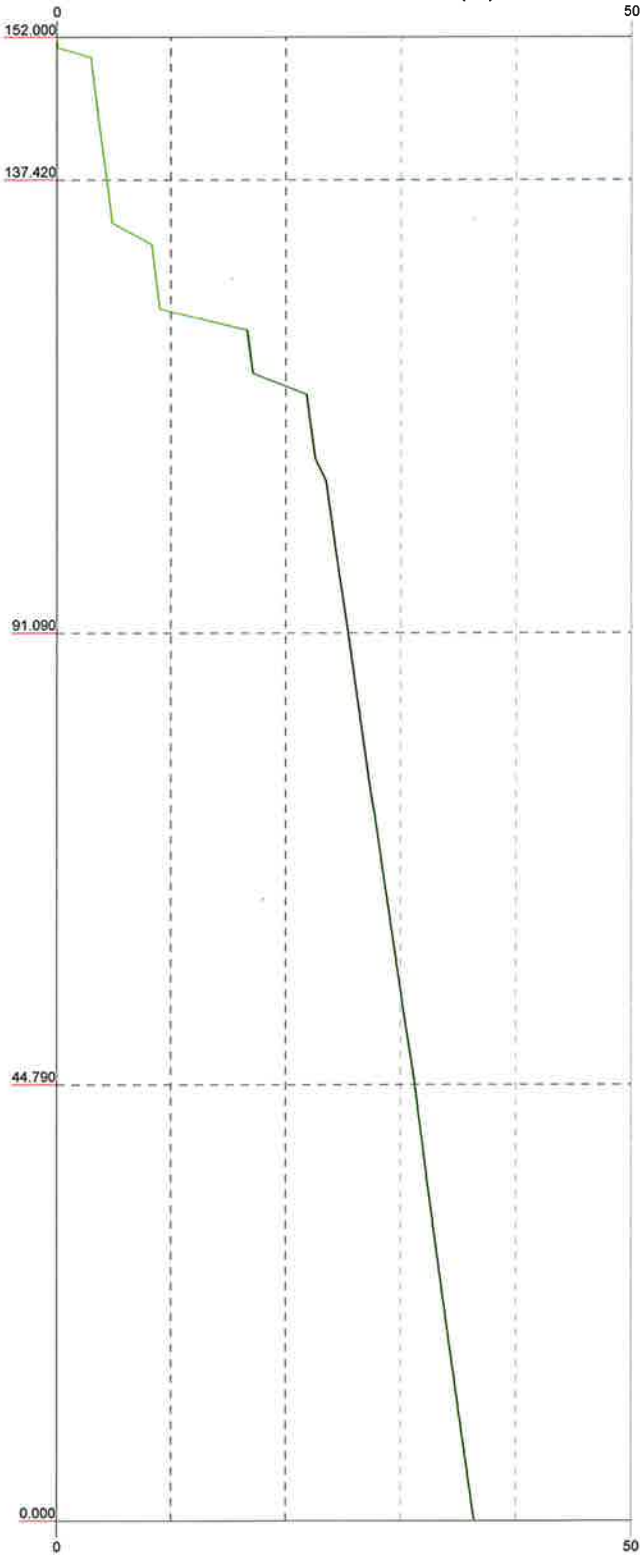
Job: **100172.004.01 - N. COVENTRY WALLBEOFF, CT (BU# 876)**

Project:	Client: Crown Castle	Drawn by: kmurphy	App'd:
Code: TIA/EIA-222-F	Date: 12/03/15	Scale: NTS	Dwg No: E-1
Path:			

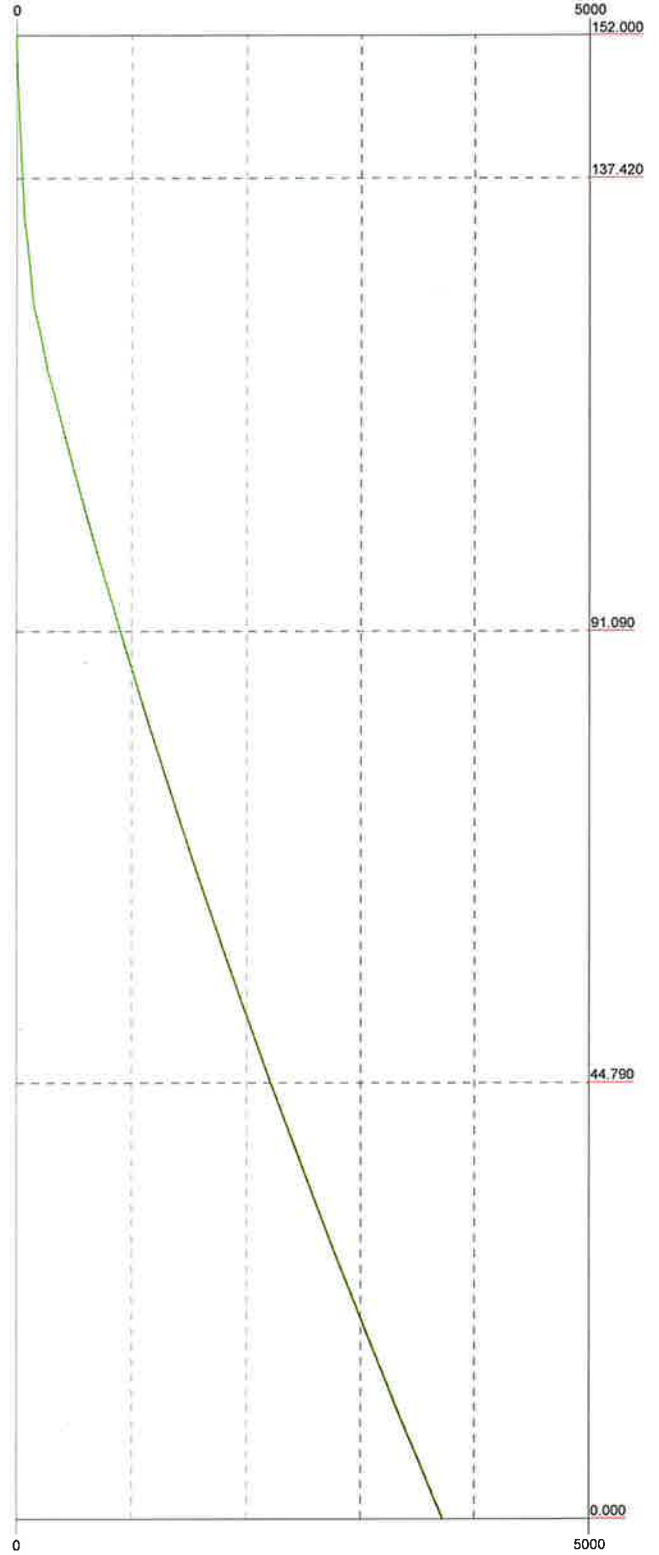
— Vx — Vz

— Mx — Mz

Global Mast Shear (K)



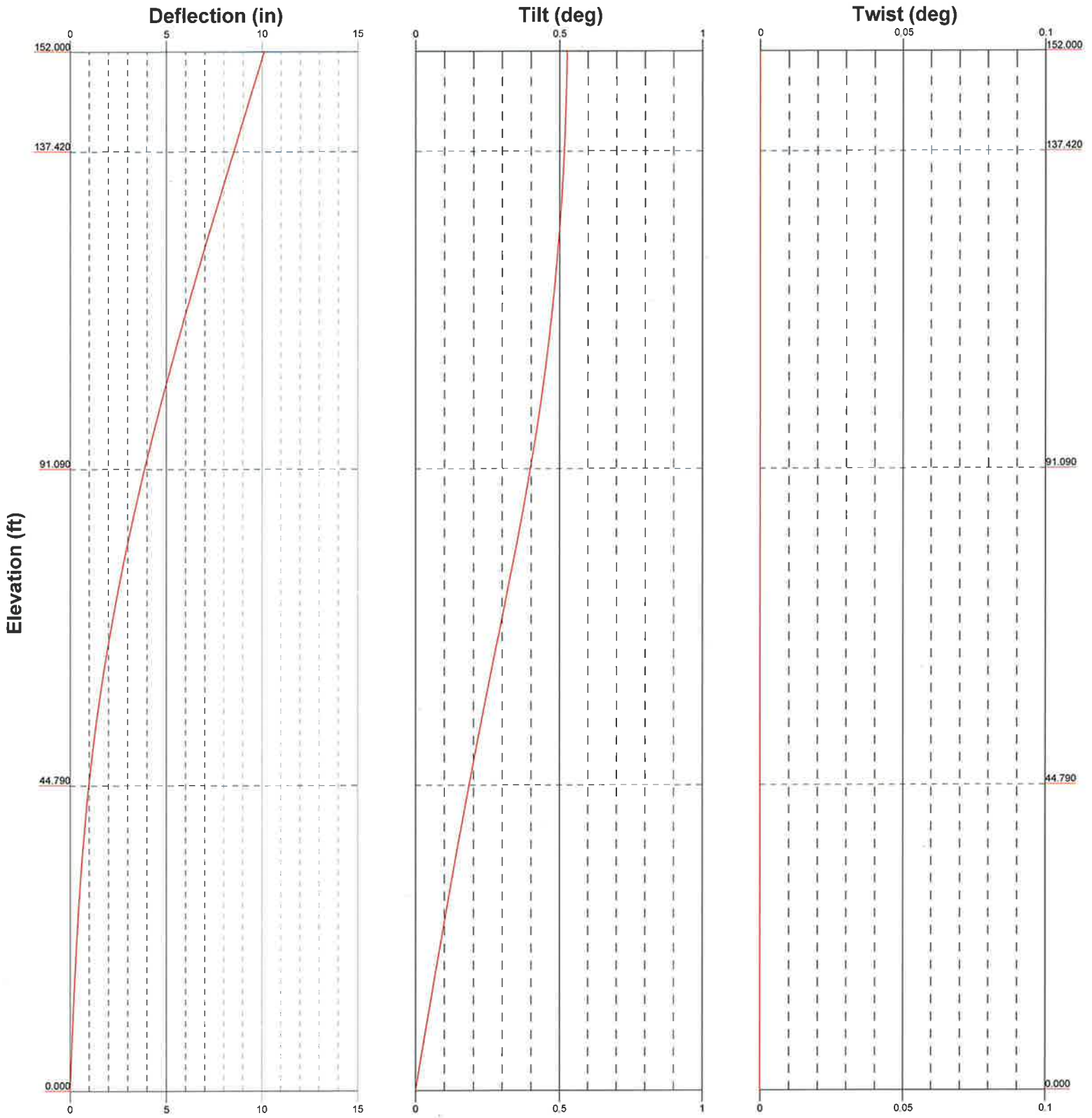
Global Mast Moment (kip-ft)



Elevation (ft)

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 FAX: (918) 295-0265

Job: 100172.004.01 - N. COVENTRY WALLBEOFF, CT (BU# 876)		
Project:	Client: Crown Castle	Drawn by: kmurphy
Code: TIA/EIA-222-F	Date: 12/03/15	App'd:
Path:	Scale: NTS	Dwg No: E-4



0' - 152'

Round

Flat

App In Face

App Out Face

Truss Leg

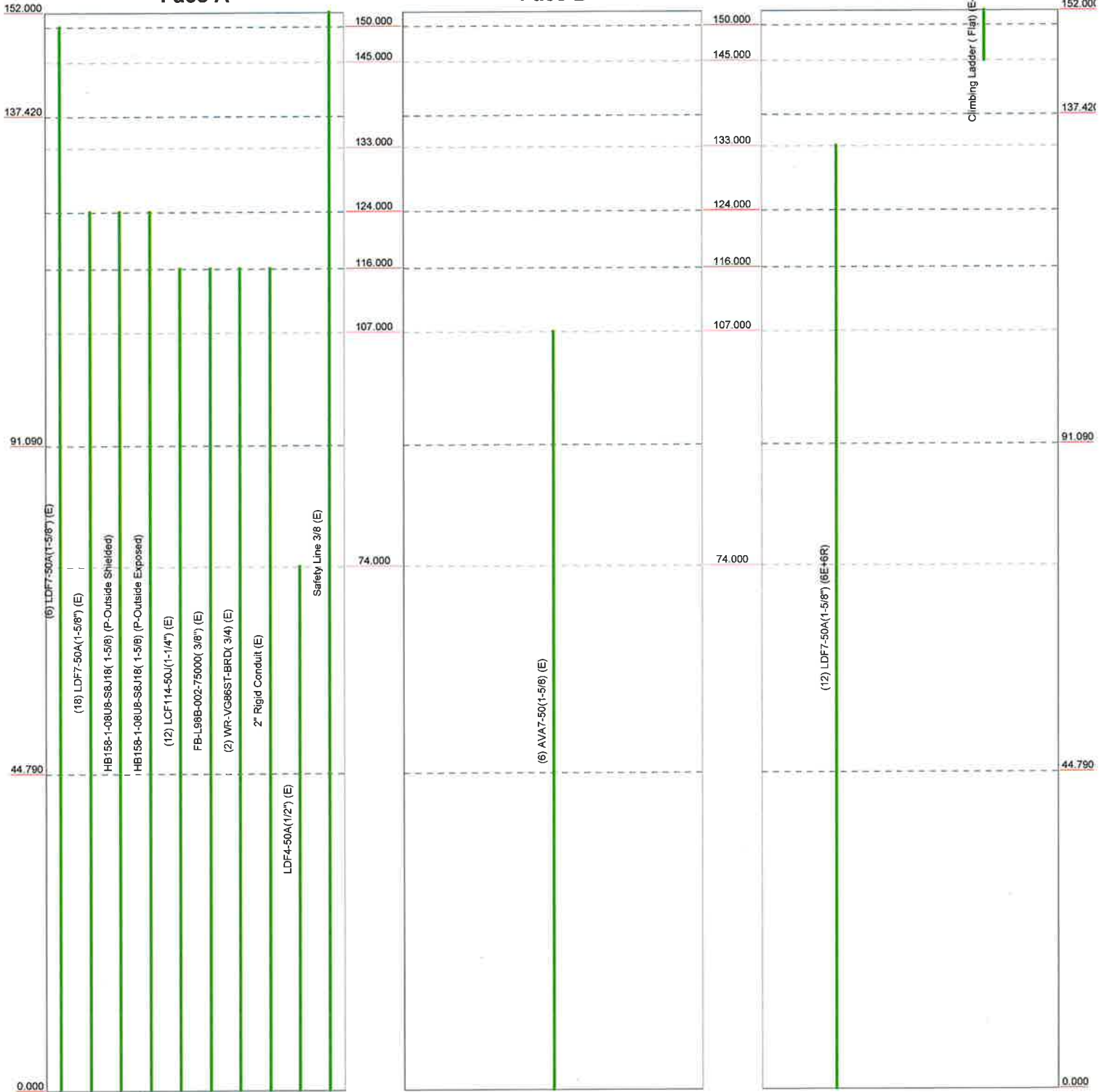
Face A

Face B

Face C

Climbing Ladder (Flg) (E-Per Photo)

Elevation (ft)



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	Project:	Client: Crown Castle	Drawn by: kmurphy	App'd:
	Code: TIA/EIA-222-F	Date: 12/03/15	Scale: NTS	
	Path:		Dwg No: E-7	

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	Project	Date 16:22:18 12/03/15
	Client Crown Castle	Designed by kmurphy

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 Tolland County, Connecticut.

Basic wind speed of 85 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

- | | | |
|--|---|---|
| <ul style="list-style-type: none"> Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification √ Use Code Stress Ratios √ Use Code Safety Factors - Guys √ Escalate Ice Always Use Max Kz Use Special Wind Profile Include Bolts In Member Capacity Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) Add IBC .6D+W Combination | <ul style="list-style-type: none"> Distribute Leg Loads As Uniform Assume Legs Pinned √ Assume Rigid Index Plate √ Use Clear Spans For Wind Area Use Clear Spans For KL/r Retension Guys To Initial Tension Bypass Mast Stability Checks √ Use Azimuth Dish Coefficients √ Project Wind Area of Appurt. Autocalc Torque Arm Areas SR Members Have Cut Ends Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Use TIA-222-G Tension Splice Capacity Exemption | <ul style="list-style-type: none"> Treat Feedline Bundles As Cylinder Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation √ Consider Feedline Torque Include Angle Block Shear Check <li style="text-align: center;">Poles √ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets |
|--|---|---|

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	152.000-137.420	14.580	5.170	18	33.030	37.310	0.313	1.250	A572-65 (65 ksi)
L2	137.420-91.090	51.500	6.830	18	35.167	50.150	0.375	1.500	A572-65 (65 ksi)
L3	91.090-44.790	53.130	8.420	18	47.413	62.860	0.438	1.750	A572-65 (65 ksi)
L4	44.790-0.000	53.210		18	59.537	75.000	0.500	2.000	A572-65 (65 ksi)

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	Client Crown Castle	Designed by kmurphy

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	I/O in ²	w in	w/t
L1	33.540	32.452	4388.688	11.615	16.779	261.555	8783.151	16.229	5.263	16.842
	37.886	36.697	6346.168	13.134	18.953	334.829	12700.685	18.352	6.017	19.253
L2	37.237	41.412	6333.245	12.351	17.865	354.506	12674.823	20.710	5.529	14.745
	50.924	59.245	18544.257	17.670	25.476	727.905	37112.916	29.628	8.166	21.777
L3	50.161	65.231	18185.953	16.676	24.086	755.049	36395.835	32.622	7.575	17.314
	63.830	86.681	42672.286	22.160	31.933	1336.312	85400.720	43.349	10.293	23.528
L4	62.940	93.692	41255.942	20.958	30.245	1364.068	82566.170	46.855	9.599	19.197
	76.157	118.232	82905.472	26.448	38.100	2175.997	165920.033	59.127	12.320	24.64

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A _f	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals
ft	ft ²	in					in	in
L1 152.000-137.4				1	1	1		
20 L2 137.420-91.09				1	1	1		
0 L3 91.090-44.790				1	1	1		
L4 44.790-0.000				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement	Face Offset	Lateral Offset (Frac FW)	#	C _A A _A	Weight	
				ft	in			ft ² /ft	klf	
LDF7-50A(1-5/8") (E)	A	No	Inside Pole	150.000 - 0.000	0.000	0	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
AB LDF7-50A(1-5/8") (6E+6R)	C	No	Inside Pole	133.000 - 0.000	0.000	0	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 LDF7-50A(1-5/8") (E)	A	No	Inside Pole	124.000 - 0.000	0.000	0	18	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
HB158-1-08U 8-S8J18(1-5/8) (P-Outside Shielded)	A	No	CaAa (Out Of Face)	124.000 - 0.000	0.000	0	1	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
HB158-1-08U 8-S8J18(A	No	CaAa (Out Of Face)	124.000 - 0.000	0.000	0	1	No Ice	0.198	0.001
								1/2" Ice	0.298	0.003

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	Client Crown Castle	Designed by kmurphy

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#		C _{AA}	Weight
									ft ² /ft	klf
1-5/8)								1" Ice	0.398	0.005
(P-Outside Exposed)								2" Ice	0.598	0.011
AB								4" Ice	0.998	0.031
LCF114-50J(1 -1/4") (E)	A	No	Inside Pole	116.000 - 0.000	0.000	0	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
FB-L98B-002-75000(3/8") (E)	A	No	Inside Pole	116.000 - 0.000	0.000	0	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)	A	No	Inside Pole	116.000 - 0.000	0.000	0	2	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
2" Rigid Conduit (E)	A	No	Inside Pole	116.000 - 0.000	0.000	0	1	No Ice	0.000	0.003
								1/2" Ice	0.000	0.003
								1" Ice	0.000	0.003
								2" Ice	0.000	0.003
								4" Ice	0.000	0.003
AB										
AVA7-50(1-5/8) (E)	B	No	Inside Pole	107.000 - 0.000	0.000	0	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
AB										
LDF4-50A(1/2") (E)	A	No	Inside Pole	74.000 - 0.000	0.000	0	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
AB										
Safety Line 3/8 (E)	A	No	CaAa (Out Of Face)	152.000 - 0.000	0.000	0	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										
Climbing Ladder (Flat) (E-Per Photo)	C	No	CaAa (Out Of Face)	152.000 - 145.000	36.000	0	1	No Ice	0.584	0.005
								1/2" Ice	1.030	0.007
								1" Ice	1.476	0.010
								2" Ice	2.368	0.020
								4" Ice	4.151	0.049
AB										

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	152.000-137.420	A	0.000	0.000	0.000	0.547	0.065
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	4.091	0.034

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	Project	Date 16:22:18 12/03/15
	Client Crown Castle	Designed by kmurphy

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
L2	137.420-91.090	A	0.000	0.000	0.000	8.254	1.119
		B	0.000	0.000	0.000	0.000	0.067
		C	0.000	0.000	0.000	0.000	0.412
L3	91.090-44.790	A	0.000	0.000	0.000	10.904	1.622
		B	0.000	0.000	0.000	0.000	0.194
		C	0.000	0.000	0.000	0.000	0.456
L4	44.790-0.000	A	0.000	0.000	0.000	10.548	1.572
		B	0.000	0.000	0.000	0.000	0.188
		C	0.000	0.000	0.000	0.000	0.441

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	152.000-137.420	A	1.194	0.000	0.000	0.000	4.028	0.084
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	11.543	0.085
L2	137.420-91.090	A	1.160	0.000	0.000	0.000	27.175	1.495
		B		0.000	0.000	0.000	0.000	0.067
		C		0.000	0.000	0.000	0.000	0.412
L3	91.090-44.790	A	1.090	0.000	0.000	0.000	32.380	2.106
		B		0.000	0.000	0.000	0.000	0.194
		C		0.000	0.000	0.000	0.000	0.456
L4	44.790-0.000	A	1.000	0.000	0.000	0.000	30.073	1.998
		B		0.000	0.000	0.000	0.000	0.188
		C		0.000	0.000	0.000	0.000	0.441

Feed Line Center of Pressure

Section	Elevation ft	CP _X in	CP _Z in	CP _X Ice in	CP _Z Ice in
L1	152.000-137.420	-0.318	0.133	-0.695	0.112
L2	137.420-91.090	0.000	-0.264	0.000	-0.740
L3	91.090-44.790	0.000	-0.336	0.000	-0.881
L4	44.790-0.000	0.000	-0.339	0.000	-0.876

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) DB980F90T2E-M w/ Mount Pipe (E)	A	From Leg	4.000	0.000	150.000	No Ice	3.987	3.717	0.031
			0.000			1/2" Ice	4.450	4.579	0.068
			2.000			1" Ice	4.897	5.318	0.110
						2" Ice	5.819	6.846	0.218
						4" Ice	7.982	10.101	0.552

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
(R)			0.000 3.000			1/2" Ice 0.172 1" Ice 0.232 2" Ice 0.377 4" Ice 0.771	0.119 0.172 0.303 0.668	0.004 0.006 0.013 0.045
RR90-17-02DP w/ Mount Pipe (E)	A	From Leg	4.000 0.000 3.000	0.000	133.000	No Ice 4.593 1/2" Ice 5.088 1" Ice 5.578 2" Ice 6.588 4" Ice 8.731	3.319 4.089 4.784 6.225 9.308	0.034 0.072 0.115 0.224 0.557
RR90-17-02DP w/ Mount Pipe (E)	B	From Leg	4.000 0.000 3.000	0.000	133.000	No Ice 4.593 1/2" Ice 5.088 1" Ice 5.578 2" Ice 6.588 4" Ice 8.731	3.319 4.089 4.784 6.225 9.308	0.034 0.072 0.115 0.224 0.557
RR90-17-02DP w/ Mount Pipe (E)	C	From Leg	4.000 0.000 3.000	0.000	133.000	No Ice 4.593 1/2" Ice 5.088 1" Ice 5.578 2" Ice 6.588 4" Ice 8.731	3.319 4.089 4.784 6.225 9.308	0.034 0.072 0.115 0.224 0.557
KRY 112 71/2 (E)	A	From Leg	4.000 0.000 3.000	0.000	133.000	No Ice 0.681 1/2" Ice 0.802 1" Ice 0.932 2" Ice 1.219 4" Ice 1.896	0.510 0.623 0.744 1.013 1.653	0.013 0.019 0.026 0.046 0.114
KRY 112 71/2 (E)	B	From Leg	4.000 0.000 3.000	0.000	133.000	No Ice 0.681 1/2" Ice 0.802 1" Ice 0.932 2" Ice 1.219 4" Ice 1.896	0.510 0.623 0.744 1.013 1.653	0.013 0.019 0.026 0.046 0.114
KRY 112 71/2 (E)	C	From Leg	4.000 0.000 3.000	0.000	133.000	No Ice 0.681 1/2" Ice 0.802 1" Ice 0.932 2" Ice 1.219 4" Ice 1.896	0.510 0.623 0.744 1.013 1.653	0.013 0.019 0.026 0.046 0.114
6' x 2" Mount Pipe (E-For TME)	A	From Leg	4.000 0.000 1.000	0.000	133.000	No Ice 1.425 1/2" Ice 1.925 1" Ice 2.294 2" Ice 3.060 4" Ice 4.702	1.425 1.925 2.294 3.060 4.702	0.022 0.033 0.048 0.090 0.231
6' x 2" Mount Pipe (E-For TME)	B	From Leg	4.000 0.000 1.000	0.000	133.000	No Ice 1.425 1/2" Ice 1.925 1" Ice 2.294 2" Ice 3.060 4" Ice 4.702	1.425 1.925 2.294 3.060 4.702	0.022 0.033 0.048 0.090 0.231
6' x 2" Mount Pipe (E-For TME)	C	From Leg	4.000 0.000 1.000	0.000	133.000	No Ice 1.425 1/2" Ice 1.925 1" Ice 2.294 2" Ice 3.060 4" Ice 4.702	1.425 1.925 2.294 3.060 4.702	0.022 0.033 0.048 0.090 0.231
Platform Mount [LP 304-1] (E-Per Photo)	C	None		0.000	133.000	No Ice 17.460 1/2" Ice 22.440 1" Ice 27.420 2" Ice 37.380 4" Ice 57.300	17.460 22.440 27.420 37.380 57.300	1.349 1.625 1.900 2.451 3.554
AB								
LPA-171080-12CF-EDIN-2 w/ Mount Pipe	A	From Leg	4.000 0.000	0.000	124.000	No Ice 3.956 1/2" Ice 4.508	7.095 8.302	0.037 0.086

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	Project	Date 16:22:18 12/03/15
	Client Crown Castle	Designed by kmurphy

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
			Horz ft	Lateral Vert ft					
(E)			2.000						
LPA-171080-12CF-EDIN-2 w/ Mount Pipe (E)	A	From Leg	4.000	0.000	124.000	1" Ice 5.029 2" Ice 6.087 4" Ice 8.308 No Ice 3.956 1/2" Ice 4.508 1" Ice 5.029 2" Ice 6.087 4" Ice 8.308 No Ice 3.956 1/2" Ice 4.508 1" Ice 5.029 2" Ice 6.087 4" Ice 8.308	9.242 11.104 15.144 7.095 8.302 9.242 11.104 15.144 7.095 8.302 9.242 11.104 15.144	0.143 0.282 0.702 0.037 0.086 0.143 0.282 0.702 0.037 0.086 0.143 0.282 0.702	
LPA-171080-12CF-EDIN-2 w/ Mount Pipe (E)	B	From Leg	4.000	0.000	124.000	No Ice 8.637 1/2" Ice 9.293 1" Ice 9.917 2" Ice 11.190 4" Ice 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)	A	From Leg	4.000	0.000	124.000	No Ice 8.637 1/2" Ice 9.293 1" Ice 9.917 2" Ice 11.190 4" Ice 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	124.000	No Ice 8.637 1/2" Ice 9.293 1" Ice 9.917 2" Ice 11.190 4" Ice 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	124.000	No Ice 8.637 1/2" Ice 9.293 1" Ice 9.917 2" Ice 11.190 4" Ice 13.855	7.071 8.260 9.170 11.006 15.043	0.066 0.135 0.212 0.394 0.903	
RRH2x60-700 (P)	A	From Leg	4.000	0.000	124.000	No Ice 3.957 1/2" Ice 4.272 1" Ice 4.596 2" Ice 5.271 4" Ice 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	124.000	No Ice 3.957 1/2" Ice 4.272 1" Ice 4.596 2" Ice 5.271 4" Ice 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	124.000	No Ice 3.957 1/2" Ice 4.272 1" Ice 4.596 2" Ice 5.271 4" Ice 6.722	1.816 2.075 2.360 2.957 4.253	0.060 0.083 0.109 0.173 0.354	
DB-T1-6Z-8AB-0Z (P)	A	From Leg	4.000	0.000	124.000	No Ice 5.600 1/2" Ice 5.915 1" Ice 6.240 2" Ice 6.914 4" Ice 8.365	2.333 2.558 2.791 3.284 4.373	0.044 0.080 0.120 0.213 0.455	
RRH4X45-AWS4 B66 (P)	A	From Leg	4.000	0.000	124.000	No Ice 3.103 1/2" Ice 3.358 1" Ice 3.621 2" Ice 4.173 4" Ice 5.381	1.759 1.979 2.209 2.694 3.767	0.064 0.084 0.108 0.165 0.326	
RRH4X45-AWS4 B66 (P)	B	From Leg	4.000	0.000	124.000	No Ice 3.103 1/2" Ice 3.358 1" Ice 3.621 2" Ice 4.173	1.759 1.979 2.209 2.694	0.064 0.084 0.108 0.165	

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	Client Crown Castle	Designed by kmurphy

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Lateral					
RRH4X45-AWS4 B66 (P)	C	From Leg	4.000	0.000	124.000	4" Ice	5.381	3.767	0.326
			0.000	0.000		No Ice	3.103	1.759	0.064
			2.000	0.000		1/2" Ice	3.358	1.979	0.084
				0.000		1" Ice	3.621	2.209	0.108
				0.000		2" Ice	4.173	2.694	0.165
RRH2X60-PCS (P)	A	From Leg	4.000	0.000	124.000	4" Ice	5.381	3.767	0.326
			0.000	0.000		No Ice	2.567	2.011	0.055
			2.000	0.000		1/2" Ice	2.791	2.218	0.075
				0.000		1" Ice	3.025	2.435	0.099
				0.000		2" Ice	3.517	2.894	0.155
RRH2X60-PCS (P)	B	From Leg	4.000	0.000	124.000	4" Ice	4.606	3.915	0.313
			0.000	0.000		No Ice	2.567	2.011	0.055
			2.000	0.000		1/2" Ice	2.791	2.218	0.075
				0.000		1" Ice	3.025	2.435	0.099
				0.000		2" Ice	3.517	2.894	0.155
RRH2X60-PCS (P)	C	From Leg	4.000	0.000	124.000	4" Ice	4.606	3.915	0.313
			0.000	0.000		No Ice	2.567	2.011	0.055
			2.000	0.000		1/2" Ice	2.791	2.218	0.075
				0.000		1" Ice	3.025	2.435	0.099
				0.000		2" Ice	3.517	2.894	0.155
(2) LPA-80080/6CF w/ Mount Pipe (E)	A	From Leg	4.000	0.000	124.000	4" Ice	4.606	3.915	0.313
			0.000	0.000		No Ice	4.564	10.728	0.046
			2.000	0.000		1/2" Ice	5.105	11.990	0.113
				0.000		1" Ice	5.612	12.968	0.187
				0.000		2" Ice	6.651	14.980	0.363
(2) LPA-80080/6CF w/ Mount Pipe (E)	B	From Leg	4.000	0.000	124.000	4" Ice	8.834	19.217	0.857
			0.000	0.000		No Ice	4.564	10.728	0.046
			2.000	0.000		1/2" Ice	5.105	11.990	0.113
				0.000		1" Ice	5.612	12.968	0.187
				0.000		2" Ice	6.651	14.980	0.363
(2) LPA-80080/6CF w/ Mount Pipe (E)	C	From Leg	4.000	0.000	124.000	4" Ice	8.834	19.217	0.857
			0.000	0.000		No Ice	4.564	10.728	0.046
			2.000	0.000		1/2" Ice	5.105	11.990	0.113
				0.000		1" Ice	5.612	12.968	0.187
				0.000		2" Ice	6.651	14.980	0.363
6' x 2" Mount Pipe (E)	A	From Leg	4.000	0.000	124.000	4" Ice	8.834	19.217	0.857
			0.000	0.000		No Ice	1.425	1.425	0.022
			0.000	0.000		1/2" Ice	1.925	1.925	0.033
				0.000		1" Ice	2.294	2.294	0.048
				0.000		2" Ice	3.060	3.060	0.090
6' x 2" Mount Pipe (E)	B	From Leg	4.000	0.000	124.000	4" Ice	4.702	4.702	0.231
			0.000	0.000		No Ice	1.425	1.425	0.022
			0.000	0.000		1/2" Ice	1.925	1.925	0.033
				0.000		1" Ice	2.294	2.294	0.048
				0.000		2" Ice	3.060	3.060	0.090
6' x 2" Mount Pipe (E)	C	From Leg	4.000	0.000	124.000	4" Ice	4.702	4.702	0.231
			0.000	0.000		No Ice	1.425	1.425	0.022
			0.000	0.000		1/2" Ice	1.925	1.925	0.033
				0.000		1" Ice	2.294	2.294	0.048
				0.000		2" Ice	3.060	3.060	0.090
Platform Mount [LP 304-1] (E-Per Photo)	C	None		0.000	124.000	4" Ice	4.702	4.702	0.231
				0.000		No Ice	17.460	17.460	1.349
				0.000		1/2" Ice	22.440	22.440	1.625
				0.000		1" Ice	27.420	27.420	1.900
				0.000		2" Ice	37.380	37.380	2.451
	0.000	4" Ice	57.300	57.300	3.554				

AB

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment °	Placement ft	C _{AA}		Weight K	
			Horz Lateral ft	Vert ft			Front ft ²	Side ft ²		
AM-X-CD-16-65-00T-RET w/ Mount Pipe (E)	A	From Leg	4.000	0.000	0.000	116.000	No Ice	8.498	6.304	0.074
			0.000				1/2" Ice	9.149	7.479	0.139
			4.000				1" Ice	9.767	8.368	0.212
							2" Ice	11.031	10.179	0.385
							4" Ice	13.679	14.024	0.874
AM-X-CD-16-65-00T-RET w/ Mount Pipe (E)	B	From Leg	4.000	0.000	0.000	116.000	No Ice	8.498	6.304	0.074
			0.000				1/2" Ice	9.149	7.479	0.139
			4.000				1" Ice	9.767	8.368	0.212
							2" Ice	11.031	10.179	0.385
							4" Ice	13.679	14.024	0.874
P65-17-XLH-RR w/ Mount Pipe (E)	C	From Leg	4.000	0.000	0.000	116.000	No Ice	11.704	8.938	0.092
			0.000				1/2" Ice	12.424	10.450	0.178
			4.000				1" Ice	13.153	11.986	0.273
							2" Ice	14.639	14.313	0.498
							4" Ice	17.906	19.144	1.126
(2) 7770.00 w/ Mount Pipe (E)	A	From Leg	4.000	0.000	0.000	116.000	No Ice	6.119	4.254	0.055
			0.000				1/2" Ice	6.626	5.014	0.103
			4.000				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 (E)	B	From Leg	4.000	0.000	0.000	116.000	No Ice	6.119	4.254	0.055
			0.000				1/2" Ice	6.626	5.014	0.103
			4.000				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 (E)	C	From Leg	4.000	0.000	0.000	116.000	No Ice	6.119	4.254	0.055
			0.000				1/2" Ice	6.626	5.014	0.103
			4.000				1" Ice	7.128	5.711	0.157
							2" Ice	8.164	7.155	0.287
							4" Ice	10.360	10.412	0.665
RRUS-11 (E)	A	From Leg	4.000	0.000	0.000	116.000	No Ice	3.249	1.373	0.048
			0.000				1/2" Ice	3.491	1.551	0.068
			4.000				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 (E)	B	From Leg	4.000	0.000	0.000	116.000	No Ice	3.249	1.373	0.048
			0.000				1/2" Ice	3.491	1.551	0.068
			4.000				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 (E)	C	From Leg	4.000	0.000	0.000	116.000	No Ice	3.249	1.373	0.048
			0.000				1/2" Ice	3.491	1.551	0.068
			4.000				1" Ice	3.741	1.738	0.092
							2" Ice	4.268	2.138	0.150
							4" Ice	5.426	3.042	0.310
(2) LGP21903 (E)	A	From Leg	4.000	0.000	0.000	116.000	No Ice	0.270	0.184	0.011
			0.000				1/2" Ice	0.343	0.248	0.013
			4.000				1" Ice	0.425	0.322	0.017
							2" Ice	0.616	0.494	0.028
							4" Ice	1.101	0.943	0.072
(2) LGP21903 (E)	B	From Leg	4.000	0.000	0.000	116.000	No Ice	0.270	0.184	0.011
			0.000				1/2" Ice	0.343	0.248	0.013
			4.000				1" Ice	0.425	0.322	0.017
							2" Ice	0.616	0.494	0.028
							4" Ice	1.101	0.943	0.072
(2) LGP21903 (E)	C	From Leg	4.000	0.000	0.000	116.000	No Ice	0.270	0.184	0.011
			0.000				1/2" Ice	0.343	0.248	0.013

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	Project	Date 16:22:18 12/03/15
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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			ft ft ft	°	ft	ft ²	ft ²	K
			4.000			1" Ice 0.425	0.322	0.017
						2" Ice 0.616	0.494	0.028
						4" Ice 1.101	0.943	0.072
DC6-48-60-18-8F (E-Per Photo)	A	From Leg	2.000	0.000	116.000	No Ice 1.467	1.467	0.019
			0.000			1/2" Ice 1.667	1.667	0.037
			4.000			1" Ice 1.878	1.878	0.057
						2" Ice 2.333	2.333	0.105
						4" Ice 3.378	3.378	0.239
(2) LGP21401 (E)	A	From Leg	4.000	0.000	116.000	No Ice 1.288	0.233	0.014
			0.000			1/2" Ice 1.445	0.313	0.021
			4.000			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 (E)	B	From Leg	4.000	0.000	116.000	No Ice 1.288	0.233	0.014
			0.000			1/2" Ice 1.445	0.313	0.021
			4.000			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 (E)	C	From Leg	4.000	0.000	116.000	No Ice 1.288	0.233	0.014
			0.000			1/2" Ice 1.445	0.313	0.021
			4.000			1" Ice 1.611	0.403	0.030
						2" Ice 1.969	0.608	0.055
						4" Ice 2.788	1.121	0.135
4' x 2" Pipe Mount (E-For TME)	A	From Leg	4.000	0.000	116.000	No Ice 0.785	0.785	0.029
			0.000			1/2" Ice 1.028	1.028	0.035
			4.000			1" Ice 1.281	1.281	0.044
						2" Ice 1.814	1.814	0.072
						4" Ice 3.111	3.111	0.167
4' x 2" Pipe Mount (E-For TME)	B	From Leg	4.000	0.000	116.000	No Ice 0.785	0.785	0.029
			0.000			1/2" Ice 1.028	1.028	0.035
			4.000			1" Ice 1.281	1.281	0.044
						2" Ice 1.814	1.814	0.072
						4" Ice 3.111	3.111	0.167
4' x 2" Pipe Mount (E-For TME)	C	From Leg	4.000	0.000	116.000	No Ice 0.785	0.785	0.029
			0.000			1/2" Ice 1.028	1.028	0.035
			4.000			1" Ice 1.281	1.281	0.044
						2" Ice 1.814	1.814	0.072
						4" Ice 3.111	3.111	0.167
Platform Mount [LP 712-1] (E)	C	None		0.000	116.000	No Ice 24.530	24.530	1.335
						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								
742 213 w/ Mount Pipe (E)	A	From Leg	1.000	0.000	107.000	No Ice 5.373	4.620	0.049
			0.000			1/2" Ice 5.950	6.000	0.094
			0.000			1" Ice 6.501	6.982	0.146
						2" Ice 7.611	8.852	0.277
						4" Ice 9.933	12.794	0.683
742 213 w/ Mount Pipe (E)	B	From Leg	1.000	0.000	107.000	No Ice 5.373	4.620	0.049
			0.000			1/2" Ice 5.950	6.000	0.094
			0.000			1" Ice 6.501	6.982	0.146
						2" Ice 7.611	8.852	0.277
						4" Ice 9.933	12.794	0.683
742 213 w/ Mount Pipe (E)	C	From Leg	1.000	0.000	107.000	No Ice 5.373	4.620	0.049
			0.000			1/2" Ice 5.950	6.000	0.094
			0.000			1" Ice 6.501	6.982	0.146

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
						2" Ice 7.611	8.852	0.277
						4" Ice 9.933	12.794	0.683
AB								
KS24019-L112A (E)	C	From Leg	3.000 0.000 1.000	0.000	74.000	No Ice 0.156 1/2" Ice 0.225 1" Ice 0.302 2" Ice 0.484 4" Ice 0.951	0.156 0.225 0.302 0.484 0.951	0.005 0.007 0.009 0.018 0.056
Side Arm Mount [SO 701-1] (E)	C	From Leg	1.500 0.000 0.000	0.000	74.000	No Ice 0.850 1/2" Ice 1.140 1" Ice 1.430 2" Ice 2.010 4" Ice 3.170	1.670 2.340 3.010 4.350 7.030	0.065 0.079 0.093 0.121 0.177
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

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Comb. No.	Description
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	152 - 137.42	Pole	Max Tension	18	0.000	0.000	-0.000
			Max. Compression	14	-4.770	0.067	-0.018
			Max. Mx	11	-2.442	27.677	-0.010
			Max. My	8	-2.443	0.026	-27.662
			Max. Vy	11	-3.805	27.677	-0.010
			Max. Vx	2	-3.805	0.024	27.637
			Max. Torque	13			0.028
L2	137.42 - 91.09	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-33.214	-0.367	2.968
			Max. Mx	5	-18.560	-733.269	2.722
			Max. My	2	-18.563	-2.067	731.772
			Max. Vy	11	-24.588	733.168	-1.336
			Max. Vx	2	-24.508	-2.067	731.772
			Max. Torque	6			3.741
L3	91.09 - 44.79	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-52.390	-0.009	4.067
			Max. Mx	11	-33.549	1957.495	-4.201
			Max. My	2	-33.551	-4.887	1952.762
			Max. Vy	11	-30.157	1957.495	-4.201
			Max. Vx	2	-30.093	-4.887	1952.762
			Max. Torque	6			3.471
L4	44.79 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-82.351	-0.009	5.907
			Max. Mx	11	-58.123	3728.582	-6.978
			Max. My	2	-58.123	-8.087	3720.888
			Max. Vy	11	-36.404	3728.582	-6.978
			Max. Vx	2	-36.342	-8.087	3720.888
			Max. Torque	5			3.569

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	82.351	0.000	0.000
	Max. H _x	11	58.133	36.389	-0.060
	Max. H _z	2	58.133	-0.060	36.326
	Max. M _x	2	3720.888	-0.060	36.326
	Max. M _z	5	3728.209	-36.389	0.060
	Max. Torsion	5	3.569	-36.389	0.060
	Min. Vert	29	58.133	-10.915	6.303
	Min. H _x	5	58.133	-36.389	0.060
	Min. H _z	8	58.133	0.060	-36.326
	Min. M _x	8	-3718.293	0.060	-36.326
	Min. M _z	11	-3728.582	36.389	-0.060
	Min. Torsion	11	-3.569	36.389	-0.060

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Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
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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	58.133	0.000	0.000	-1.277	0.184	0.000
Dead+Wind 0 deg - No Ice	58.133	0.060	-36.326	-3720.888	-8.087	0.723
Dead+Wind 30 deg - No Ice	58.133	18.246	-31.489	-3226.692	-1871.177	-1.158
Dead+Wind 60 deg - No Ice	58.133	31.544	-18.215	-1868.255	-3232.835	-2.729
Dead+Wind 90 deg - No Ice	58.133	36.389	-0.060	-9.570	-3728.209	-3.569
Dead+Wind 120 deg - No Ice	58.133	31.484	18.112	1851.334	-3224.563	-3.452
Dead+Wind 150 deg - No Ice	58.133	18.143	31.430	3215.827	-1856.846	-2.410
Dead+Wind 180 deg - No Ice	58.133	-0.060	36.326	3718.293	8.461	-0.722
Dead+Wind 210 deg - No Ice	58.133	-18.246	31.489	3224.097	1871.549	1.159
Dead+Wind 240 deg - No Ice	58.133	-31.544	18.215	1865.662	3233.207	2.729
Dead+Wind 270 deg - No Ice	58.133	-36.389	0.060	6.978	3728.582	3.569
Dead+Wind 300 deg - No Ice	58.133	-31.484	-18.112	-1853.926	3224.938	3.452
Dead+Wind 330 deg - No Ice	58.133	-18.143	-31.430	-3218.421	1857.222	2.410
Dead+Ice+Temp	82.351	0.000	0.000	-5.907	-0.009	0.000
Dead+Wind 0 deg+Ice+Temp	82.351	0.010	-9.107	-972.566	-1.643	0.146
Dead+Wind 30 deg+Ice+Temp	82.351	4.573	-7.892	-843.894	-486.118	-0.405
Dead+Wind 60 deg+Ice+Temp	82.351	7.910	-4.563	-490.728	-840.342	-0.848
Dead+Wind 90 deg+Ice+Temp	82.351	9.127	-0.010	-7.697	-969.400	-1.063
Dead+Wind 120 deg+Ice+Temp	82.351	7.899	4.545	475.771	-838.712	-0.993
Dead+Wind 150 deg+Ice+Temp	82.351	4.555	7.882	830.130	-483.296	-0.657
Dead+Wind 180 deg+Ice+Temp	82.351	-0.010	9.107	960.431	1.616	-0.145
Dead+Wind 210 deg+Ice+Temp	82.351	-4.573	7.892	831.759	486.091	0.406
Dead+Wind 240 deg+Ice+Temp	82.351	-7.910	4.563	478.593	840.315	0.848
Dead+Wind 270 deg+Ice+Temp	82.351	-9.127	0.010	-4.438	969.373	1.063
Dead+Wind 300 deg+Ice+Temp	82.351	-7.899	-4.545	-487.905	838.685	0.993
Dead+Wind 330 deg+Ice+Temp	82.351	-4.555	-7.882	-842.265	483.269	0.657
Dead+Wind 0 deg - Service	58.133	0.021	-12.570	-1288.472	-2.677	0.250
Dead+Wind 30 deg - Service	58.133	6.314	-10.896	-1117.455	-647.404	-0.401
Dead+Wind 60 deg - Service	58.133	10.915	-6.303	-647.365	-1118.609	-0.945
Dead+Wind 90 deg - Service	58.133	12.591	-0.021	-4.161	-1290.035	-1.236
Dead+Wind 120 deg - Service	58.133	10.894	6.267	639.809	-1115.746	-1.195
Dead+Wind 150 deg - Service	58.133	6.278	10.875	1111.995	-642.444	-0.835
Dead+Wind 180 deg - Service	58.133	-0.021	12.570	1285.875	3.050	-0.250
Dead+Wind 210 deg - Service	58.133	-6.314	10.896	1114.858	647.777	0.401
Dead+Wind 240 deg - Service	58.133	-10.915	6.303	644.768	1118.983	0.945
Dead+Wind 270 deg - Service	58.133	-12.591	0.021	1.565	1290.408	1.236
Dead+Wind 300 deg - Service	58.133	-10.894	-6.267	-642.405	1116.120	1.195
Dead+Wind 330 deg - Service	58.133	-6.278	-10.875	-1114.592	642.818	0.835

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.000	-58.133	0.000	0.000	58.133	0.000	0.000%
2	0.060	-58.133	-36.326	-0.060	58.133	36.326	0.000%
3	18.246	-58.133	-31.489	-18.246	58.133	31.489	0.000%
4	31.544	-58.133	-18.215	-31.544	58.133	18.215	0.000%

tnxTower

B+T Group
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Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
5	36.389	-58.133	-0.060	-36.389	58.133	0.060	0.000%
6	31.484	-58.133	18.112	-31.484	58.133	-18.112	0.000%
7	18.143	-58.133	31.430	-18.143	58.133	-31.430	0.000%
8	-0.060	-58.133	36.326	0.060	58.133	-36.326	0.000%
9	-18.246	-58.133	31.489	18.246	58.133	-31.489	0.000%
10	-31.544	-58.133	18.215	31.544	58.133	-18.215	0.000%
11	-36.389	-58.133	0.060	36.389	58.133	-0.060	0.000%
12	-31.484	-58.133	-18.112	31.484	58.133	18.112	0.000%
13	-18.143	-58.133	-31.430	18.143	58.133	31.430	0.000%
14	0.000	-82.351	0.000	0.000	82.351	0.000	0.000%
15	0.010	-82.351	-9.107	-0.010	82.351	9.107	0.000%
16	4.572	-82.351	-7.892	-4.573	82.351	7.892	0.000%
17	7.909	-82.351	-4.563	-7.910	82.351	4.563	0.000%
18	9.127	-82.351	-0.010	-9.127	82.351	0.010	0.000%
19	7.899	-82.351	4.545	-7.899	82.351	-4.545	0.000%
20	4.555	-82.351	7.882	-4.555	82.351	-7.882	0.000%
21	-0.010	-82.351	9.107	0.010	82.351	-9.107	0.000%
22	-4.572	-82.351	7.892	4.573	82.351	-7.892	0.000%
23	-7.909	-82.351	4.563	7.910	82.351	-4.563	0.000%
24	-9.127	-82.351	0.010	9.127	82.351	-0.010	0.000%
25	-7.899	-82.351	-4.545	7.899	82.351	4.545	0.000%
26	-4.555	-82.351	-7.882	4.555	82.351	7.882	0.000%
27	0.021	-58.133	-12.570	-0.021	58.133	12.570	0.000%
28	6.314	-58.133	-10.896	-6.314	58.133	10.896	0.000%
29	10.915	-58.133	-6.303	-10.915	58.133	6.303	0.000%
30	12.591	-58.133	-0.021	-12.591	58.133	0.021	0.000%
31	10.894	-58.133	6.267	-10.894	58.133	-6.267	0.000%
32	6.278	-58.133	10.875	-6.278	58.133	-10.875	0.000%
33	-0.021	-58.133	12.570	0.021	58.133	-12.570	0.000%
34	-6.314	-58.133	10.896	6.314	58.133	-10.896	0.000%
35	-10.915	-58.133	6.303	10.915	58.133	-6.303	0.000%
36	-12.591	-58.133	0.021	12.591	58.133	-0.021	0.000%
37	-10.894	-58.133	-6.267	10.894	58.133	6.267	0.000%
38	-6.278	-58.133	-10.875	6.278	58.133	10.875	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.0000001	0.0000001
2	Yes	4	0.0000001	0.00002396
3	Yes	4	0.0000001	0.00023192
4	Yes	4	0.0000001	0.00027270
5	Yes	4	0.0000001	0.00007685
6	Yes	4	0.0000001	0.00021060
7	Yes	4	0.0000001	0.00026901
8	Yes	4	0.0000001	0.00002151
9	Yes	4	0.0000001	0.00025076
10	Yes	4	0.0000001	0.00021892
11	Yes	4	0.0000001	0.00007415
12	Yes	4	0.0000001	0.00028346
13	Yes	4	0.0000001	0.00021607
14	Yes	4	0.0000001	0.00000001
15	Yes	4	0.0000001	0.00023578
16	Yes	4	0.0000001	0.00024422
17	Yes	4	0.0000001	0.00024449
18	Yes	4	0.0000001	0.00023498
19	Yes	4	0.0000001	0.00024067

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20	Yes	4	0.00000001	0.00023994
21	Yes	4	0.00000001	0.00023169
22	Yes	4	0.00000001	0.00024051
23	Yes	4	0.00000001	0.00024134
24	Yes	4	0.00000001	0.00023479
25	Yes	4	0.00000001	0.00024360
26	Yes	4	0.00000001	0.00024322
27	Yes	4	0.00000001	0.00000534
28	Yes	4	0.00000001	0.00001407
29	Yes	4	0.00000001	0.00002002
30	Yes	4	0.00000001	0.00001223
31	Yes	4	0.00000001	0.00001433
32	Yes	4	0.00000001	0.00001976
33	Yes	4	0.00000001	0.00000524
34	Yes	4	0.00000001	0.00001644
35	Yes	4	0.00000001	0.00001373
36	Yes	4	0.00000001	0.00001209
37	Yes	4	0.00000001	0.00002221
38	Yes	4	0.00000001	0.00001366

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	152 - 137.42	10.108	29	0.526	0.002
L2	142.59 - 91.09	9.073	29	0.524	0.002
L3	97.92 - 44.79	4.475	29	0.425	0.001
L4	53.21 - 0	1.337	29	0.226	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.000	(2) DB980F90T2E-M w/ Mount Pipe	29	9.888	0.526	0.002	303504
133.000	LNx-6515DS-VTM w/ Mount Pipe	29	8.025	0.515	0.002	53335
124.000	LPA-171080-12CF-EDIN-2 w/ Mount Pipe	29	7.061	0.500	0.002	32688
116.000	AM-X-CD-16-65-00T-RET w/ Mount Pipe	29	6.228	0.482	0.001	24319
107.000	742 213 w/ Mount Pipe	29	5.330	0.456	0.001	18878
74.000	KS24019-L112A	29	2.549	0.323	0.001	11930

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	152 - 137.42	29.192	4	1.519	0.006
L2	142.59 - 91.09	26.202	4	1.513	0.006
L3	97.92 - 44.79	12.927	4	1.227	0.003
L4	53.21 - 0	3.862	4	0.654	0.001

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Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
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Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.000	(2) DB980F90T2E-M w/ Mount Pipe	4	28.556	1.519	0.006	105468
133.000	LNx-6515DS-VTM w/ Mount Pipe	4	23.178	1.488	0.005	18520
124.000	LPA-171080-12CF-EDIN-2 w/ Mount Pipe	4	20.394	1.445	0.005	11345
116.000	AM-X-CD-16-65-00T-RET w/ Mount Pipe	4	17.989	1.392	0.004	8439
107.000	742 213 w/ Mount Pipe	4	15.395	1.317	0.004	6550
74.000	KS24019-L112A	4	7.362	0.933	0.002	4134

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 P/P _a
L1	152 - 137.42 (1)	TP37.31x33.03x0.313	14.580	152.000	144.8	7.121	35.192	-2.442	250.588	0.010
L2	137.42 - 91.09 (2)	TP50.15x35.167x0.375	51.500	152.000	107.5	12.918	56.880	-18.558	734.772	0.025
L3	91.09 - 44.79 (3)	TP62.86x47.413x0.438	53.130	152.000	85.7	19.810	83.282	-33.548	1649.840	0.020
L4	44.79 - 0 (4)	TP75x59.537x0.5	53.210	152.000	69.0	25.069	118.231	-58.123	2963.970	0.020

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M _x kip-ft	Actual f _{bx} ksi	Allow. F _{bx} ksi	Ratio f _{bx} /F _{bx}	Actual M _y kip-ft	Actual f _{by} ksi	Allow. F _{by} ksi	Ratio f _{by} /F _{by}
L1	152 - 137.42 (1)	TP37.31x33.03x0.313	27.680	1.079	39.000	0.028	0.000	0.000	39.000	0.000
L2	137.42 - 91.09 (2)	TP50.15x35.167x0.375	734.838	13.147	39.000	0.337	0.000	0.000	39.000	0.000
L3	91.09 - 44.79 (3)	TP62.86x47.413x0.438	1960.62	19.078	39.000	0.489	0.000	0.000	39.000	0.000
L4	44.79 - 0 (4)	TP75x59.537x0.5	3733.84	20.591	39.000	0.528	0.000	0.000	39.000	0.000

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	Client Crown Castle	Designed by kmurphy

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f _v ksi	Allow. F _v ksi	Ratio f _v / F _v	Actual T kip-ft	Actual f _{vt} ksi	Allow. F _{vt} ksi	Ratio f _{vt} / F _{vt}
L1	152 - 137.42 (1)	TP37.31x33.03x0.313	3.806	0.108	26.000	0.008	0.004	0.000	26.000	0.000
L2	137.42 - 91.09 (2)	TP50.15x35.167x0.375	24.633	0.433	26.000	0.033	2.439	0.021	26.000	0.001
L3	91.09 - 44.79 (3)	TP62.86x47.413x0.438	30.194	0.363	26.000	0.028	2.568	0.012	26.000	0.000
L4	44.79 - 0 (4)	TP75x59.537x0.5	36.440	0.308	26.000	0.024	2.729	0.007	26.000	0.000

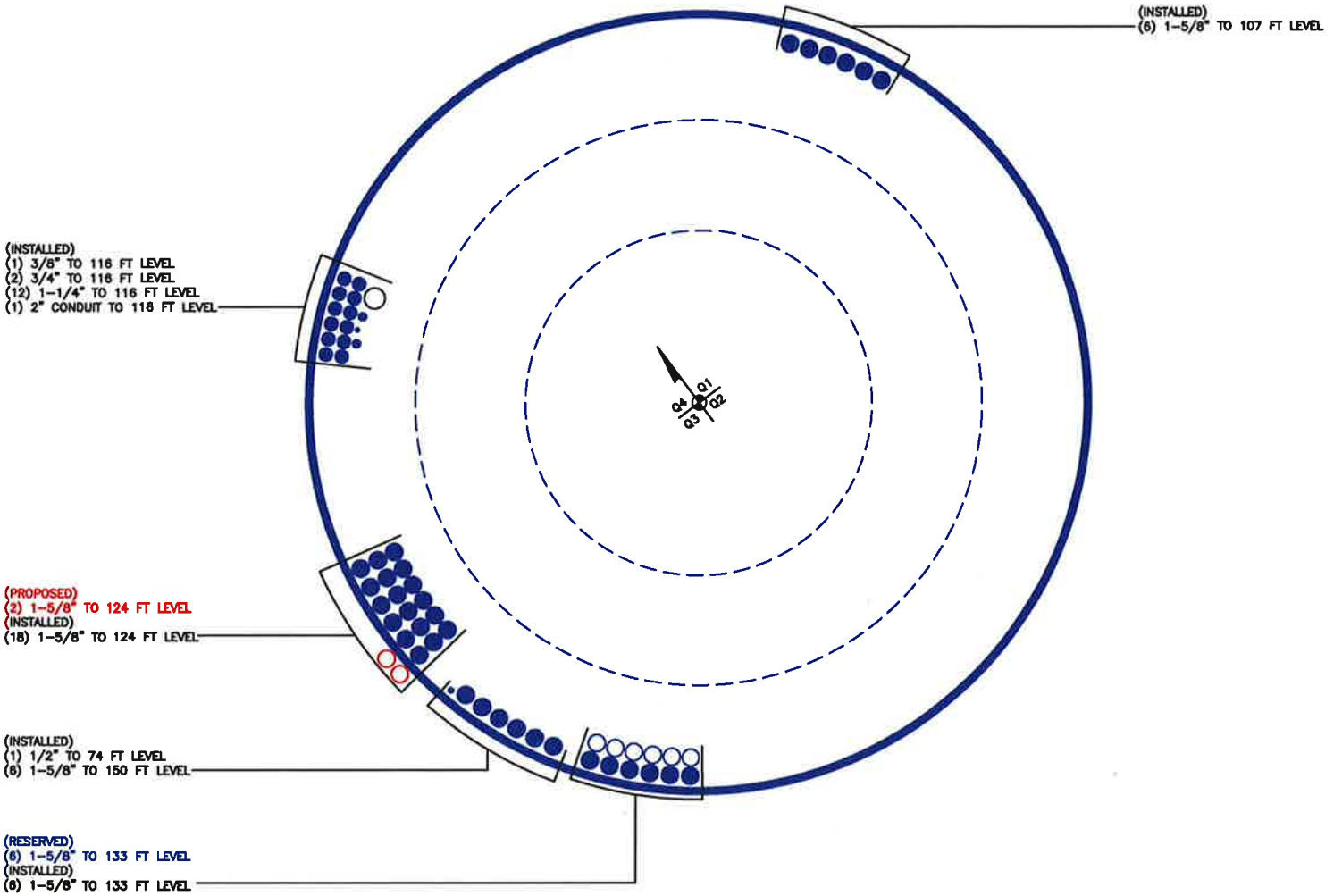
Pole Interaction Design Data

Section No.	Elevation ft	Ratio P P _a	Ratio f _{bx} F _{bx}	Ratio f _{by} F _{by}	Ratio f _v F _v	Ratio f _{vt} F _{vt}	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	152 - 137.42 (1)	0.010	0.028	0.000	0.008	0.000	0.037	1.333	H1-3+VT ✓
L2	137.42 - 91.09 (2)	0.025	0.337	0.000	0.033	0.001	0.363	1.333	H1-3+VT ✓
L3	91.09 - 44.79 (3)	0.020	0.489	0.000	0.028	0.000	0.510	1.333	H1-3+VT ✓
L4	44.79 - 0 (4)	0.020	0.528	0.000	0.024	0.000	0.548	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	152 - 137.42	Pole	TP37.31x33.03x0.313	1	-2.442	334.034	2.8	Pass	
L2	137.42 - 91.09	Pole	TP50.15x35.167x0.375	2	-18.558	979.451	27.2	Pass	
L3	91.09 - 44.79	Pole	TP62.86x47.413x0.438	3	-33.548	2199.237	38.2	Pass	
L4	44.79 - 0	Pole	TP75x59.537x0.5	4	-58.123	3950.972	41.1	Pass	
							Summary		
							Pole (L4)	41.1	Pass
							RATING =	41.1	Pass

APPENDIX B
BASE LEVEL DRAWING



BUSINESS UNIT: 876385

APPENDIX C
ADDITIONAL CALCULATIONS

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

TIA Rev F

Site Data

BU#: 876385	
Site Name: N. COVENTRY / WALLBEC	
App #: 320997 Revision # 5	
Pole Manufacturer:	Other

Anchor Rod Data

Qty:	28		
Diam:	2.25	in	
Rod Material:	A615-J		
Strength (Fu):	100	ksi	
Yield (Fy):	75	ksi	
Bolt Circle:	85	in	

Plate Data

Diam:	91		
Thick:	2.25	in	
Grade:	60	ksi	
Single-Rod B-eff:	8.50	in	

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	

Pole Data

Diam:	75		
Thick:	0.5	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
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Reactions

Moment:	3734	ft-kips
Axial:	58	kips
Shear:	36	kips

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

Anchor Rod Results

Maximum Rod Tension: 73.2 Kips
 Allowable Tension: 195.0 Kips
 Anchor Rod Stress Ratio: 37.6% Pass

Rigid
Service ASD
Fty*ASIF

Base Plate Results

Base Plate Stress: 32.9 ksi
 Allowable Plate Stress: 60.0 ksi
 Base Plate Stress Ratio: 54.9% Pass

Flexural Check

Rigid
Service ASD
0.75*Fy*ASIF
Y.L. Length: 40.00

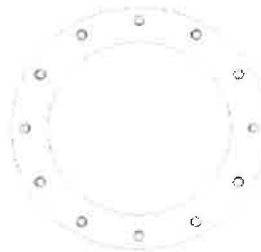
n/a

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



* 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	876385 - N. COVENTRY / WALLBEOFF		
SUBJECT	Foundation Analysis		
DATE	12/03/15	PAGE	1 OF 1

Monopole Pad & Pier Foundation Analysis

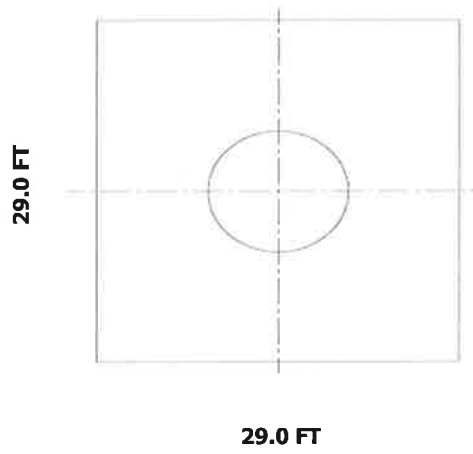
Rev. Type: **F**

Design Loads:

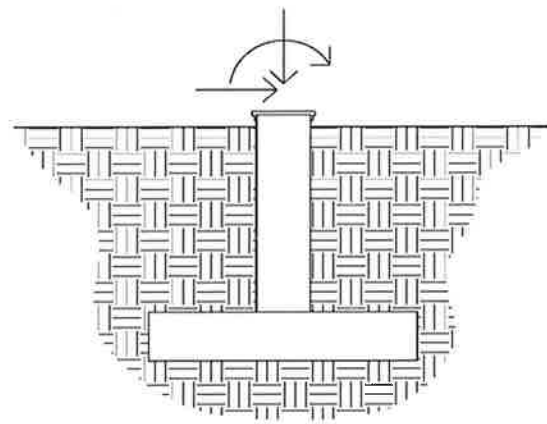
	Input unfactored loads	
Shear:	<u>36.0</u>	kips
Moment:	<u>3,734.0</u>	ft-kips
Tower Height:	<u>152.0</u>	ft
Tower Weight:	<u>58.0</u>	kips

Pad & Pier Dimensions / Properties:

Pole Diameter at Base:	<u>75.00</u>	in
Bearing Depth:	<u>8.0</u>	ft
Pad Width:	<u>29.0</u>	ft
Neglected Depth:	<u>3.3</u>	ft
Thickness:	<u>3.0</u>	ft
Pier Diameter:	<u>9.0</u>	ft
Pier Height Above Grade:	<u>1.0</u>	ft
BP Dist. Above Pier:	<u>3.0</u>	in
Clear Cover:	<u>3.0</u>	in
Pier Rebar Size:	<u>8</u>	
Pier Rebar Quantity:	<u>62</u>	
Pad Rebar Size:	<u>9</u>	
Pad Rebar Quantity:	<u>54</u>	
Pier Tie Size:	<u>4</u>	
Tie Quantity:	<u>10</u>	
Rebar Yield Strength:	<u>60000</u>	psi
Concrete Strength:	<u>4000</u>	psi
Concrete Unit Weight:	<u>0.15</u>	kcf



Elevation Overview



Soil Data:

	Allowable Values	
Soil Unit Weight:	<u>0.110</u>	kcf
Ult. Bearing Capacity:	<u>16.000</u>	ksf
Angle of Friction:	<u>28.000</u>	deg
Cohesion:	<u>0.000</u>	ksf
Passive Pressure:	<u>0.000</u>	ksf
Base Friction:	<u>0.550</u>	

**** Notes:**

Summary of Results

Req'd Pier Diam.	OK
Overturning	43.1%
Shear Capacity	12.9%
Bearing	18.9%
Pad Shear - 1-way	50.1%
Pad Shear - 2-way	6.9%
Pad Moment Capacity	20.9%
Pier Moment Capacity	60.8%