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Hartford, CT 06103-3597
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Also admitted in Massachusetts

June 16, 2014

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

Re: **Notice of Exempt Modification – Facility Modification
945 Center Street, Wallingford, Connecticut**

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless (“Cellco”) currently maintains twelve (12) wireless telecommunications antennas at the 121-foot level on an existing 147-foot tower at 945 Center Street in Wallingford, Connecticut (the “Property”). The tower is owned by Crown Castle. Cellco’s use of the tower was approved by the Council in 1998. Cellco now intends to modify its facility by removing three (3) 700 MHz antennas and three (3) 1900 MHz antennas and replacing them with three (3) model BXA-70063-6CF, 700 MHz antennas and three (3) HBX-6516DS-VTM, 1900 MHz antennas. Cellco also intends to add three (3) model BXA-171063-12CF, 2100 MHz antennas, for a total of fifteen (15) antennas, all at the same 121-foot level on the tower. Cellco also intends to install three (3) remote radio heads (“RRHs”) behind its new 2100 MHz antennas and one (1) HYBRIFLEX™ antenna cable attached to the outside of the monopole. Included in Attachment 1 are specifications for Cellco’s replacement antenna, RRHs and HYBRIFLEX™ cable.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this notice is being sent to William W. Dickinson, Jr., Mayor for the Town of Wallingford. A copy of this notice is also being sent to Albert W. Beaumont, the owner of the Property.

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



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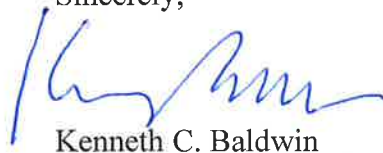
ROBINSON & COLE^{LLP}

Melanie A. Bachman
June 16, 2014
Page 2

1. The proposed modifications will not result in an increase in the height of the existing tower. Cellco's new and replacement antennas and RRHs will be installed at the 121-foot level on the existing 147-foot tower.
2. The proposed modifications will not involve any change to ground-mounted equipment and, therefore, will not require the extension of the site boundary.
3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and 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 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:

William W. Dickinson, Jr., Wallingford Mayor
Albert W. Beaumont
Sandy M. Carter



ATTACHMENT 1

BXA-70063-6CF-EDIN-X

X-Pol | FET Panel | 63° | 14.5 dBd

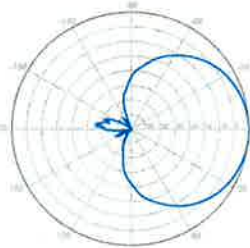
Replace "X" with desired electrical downtilt.

Antenna is also available with NE connector(s). Replace "EDIN" with "NE" in the model number when ordering.

Electrical Characteristics	696-900 MHz		
Frequency bands	696-806 MHz	806-900 MHz	
Polarization	±45°		
Horizontal beamwidth	65°	63°	
Vertical beamwidth	13°	11°	
Gain	14.0 dBd (16.1 dBi)	14.5 dBd (16.6 dBi)	
Electrical downtilt (X)	0, 2, 3, 4, 5, 6, 8, 10		
Impedance	50Ω		
VSWR	≤1.35:1		
Upper sidelobe suppression (0°)	-18.3 dB	-18.2 dB	
Front-to-back ratio (+/-30°)	-33.4 dB	-36.3 dB	
Null fill	5% (-26.02 dB)		
Isolation between ports	< -25 dB		
Input power with EDIN connectors	500 W		
Input power with NE connectors	300 W		
IM3 (2x20W carriers)	< -153 dBc		
Lightning protection	Direct Ground		
Connector(s)	2 Ports / EDIN or NE / Female / Center (Back)		
Mechanical Characteristics			
Dimensions Length x Width x Depth	1804 x 285 x 132 mm	71.0 x 11.2 x 5.2 in	
Depth with z-brackets	172 mm	6.8 in	
Weight without mounting brackets	7.9 kg	17 lbs	
Survival wind speed	> 201 km/hr	> 125 mph	
Wind area	Front: 0.51 m ² Side: 0.24 m ²	Front: 5.5 ft ² Side: 2.6 ft ²	
Wind load @ 161 km/hr (100 mph)	Front: 759 N Side: 391 N	Front: 169 lbf Side: 89 lbf	
Mounting Options	Part Number	Fits Pipe Diameter	Weight
3-Point Mounting & Downtilt Bracket Kit	36210008	40-115 mm 1.57-4.5 in	6.9 kg 15.2 lbs
Concealment Configurations	For concealment configurations, order BXA-70063-6CF-EDIN-X-FP		

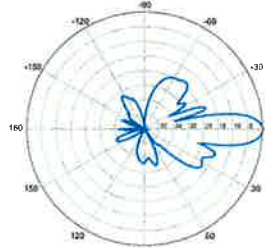


BXA-70063-6CF-EDIN-X



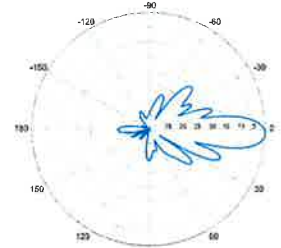
Horizontal | 750 MHz

BXA-70063-6CF-EDIN-0

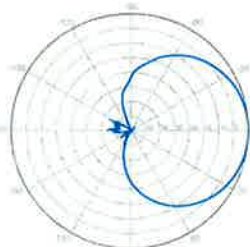


0° | Vertical | 750 MHz

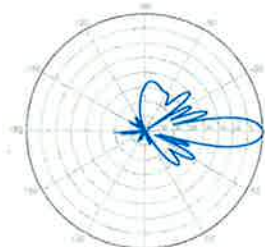
BXA-70063-6CF-EDIN-2



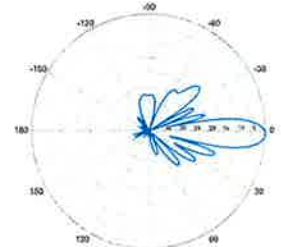
2° | Vertical | 750 MHz



Horizontal | 850 MHz



0° | Vertical | 850 MHz



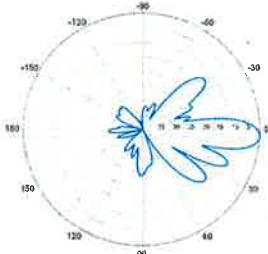
2° | Vertical | 850 MHz

Quoted performance parameters are provided to offer typical or range values only and may vary as a result of normal manufacturing and operational conditions. Extreme operational conditions and/or stress on structural supports is beyond our control. Such conditions may result in damage to this product. Improvements to product may be made without notice.

BXA-70063-6CF-EDIN-X

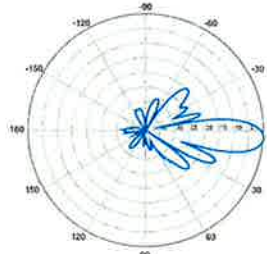
X-Pol | FET Panel | 63° | 14.5 dBd

BXA-70063-6CF-EDIN-3



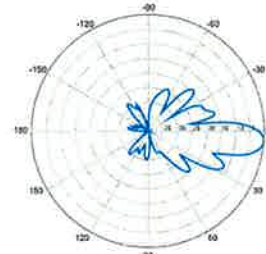
3° | Vertical | 750 MHz

BXA-70063-6CF-EDIN-4

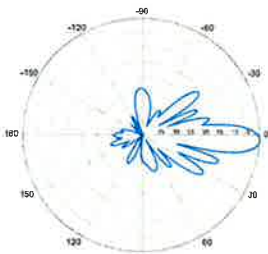


4° | Vertical | 750 MHz

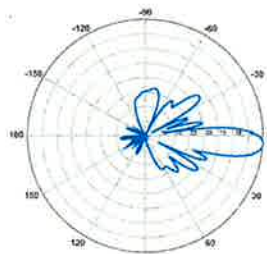
BXA-70063-6CF-EDIN-5



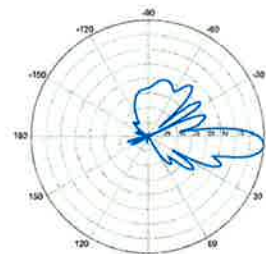
5° | Vertical | 750 MHz



3° | Vertical | 850 MHz

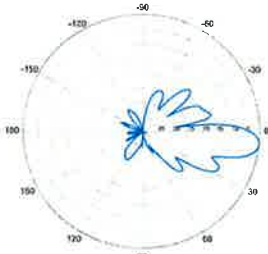


4° | Vertical | 850 MHz



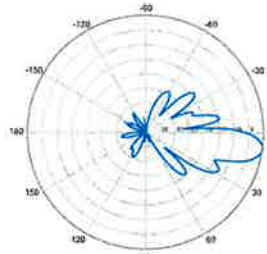
5° | Vertical | 850 MHz

BXA-70063-6CF-EDIN-6



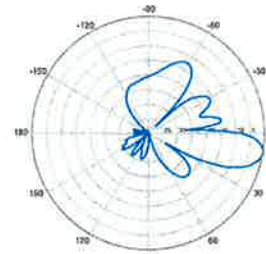
6° | Vertical | 750 MHz

BXA-70063-6CF-EDIN-8

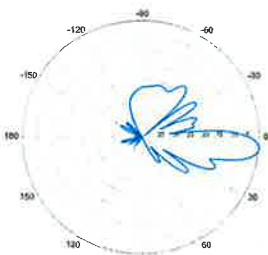


8° | Vertical | 750 MHz

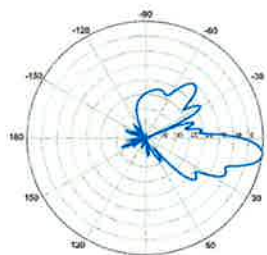
BXA-70063-6CF-EDIN-10



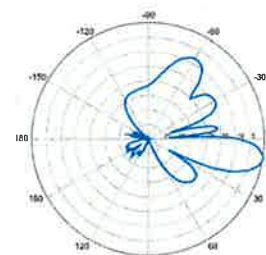
10° | Vertical | 750 MHz



6° | Vertical | 850 MHz



8° | Vertical | 850 MHz



10° | Vertical | 850 MHz

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Product Specifications



HBX-6516DS-VTM

Andrew® Teletilt® Antenna, 1710–2170 MHz, 65° horizontal beamwidth, RET compatible

- Superior azimuth tracking and pattern symmetry to minimize any sector overlap
- Rugged, reliable design with excellent passive intermodulation suppression
- The values presented on this datasheet have been calculated based on N-P-BASTA White Paper version 9.6 by the NGMN Alliance

Electrical Specifications

Frequency Band, MHz	1710–1880	1850–1990	1920–2170
Gain by all Beam Tilts, average, dBi	17.1	17.3	17.5
Gain by all Beam Tilts Tolerance, dB	±0.2	±0.3	±0.4
	0 ° 17.1	0 ° 17.3	0 ° 17.6
Gain by Beam Tilt, average, dBi	5 ° 17.2	5 ° 17.5	5 ° 17.7
	10 ° 16.9	10 ° 17.0	10 ° 17.1
Beamwidth, Horizontal, degrees	68	65	64
Beamwidth, Horizontal Tolerance, degrees	±1.9	±1.6	±2.1
Beamwidth, Vertical, degrees	7.5	7.0	6.7
Beamwidth, Vertical Tolerance, degrees	±0.4	±0.3	±0.4
Beam Tilt, degrees	0–10	0–10	0–10
USLS, dB	19	19	19
Front-to-Back Total Power at 180° ± 30°, dB	25	26	26
CPR at Boresight, dB	22	22	22
CPR at Sector, dB	11	9	9
Isolation, dB	30	30	30
VSWR Return Loss, dB	1.4 15.6	1.4 15.6	1.4 15.6
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153
Input Power per Port, maximum, watts	350	350	350
Polarization	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm

General Specifications

Antenna Brand	Andrew®
Antenna Type	DualPol®
Band	Single band
Brand	DualPol® Teletilt®
Operating Frequency Band	1710 – 2170 MHz
Number of Ports, all types	2

Mechanical Specifications

Color	Light gray
Lightning Protection	dc Ground
Radiator Material	Low loss circuit board
Radome Material	PVC, UV resistant
RF Connector Interface	7-16 DIN Female
RF Connector Location	Bottom

Product Specifications

COMMSCOPE®

HBX-6516DS-VTM



RF Connector Quantity, total	2
Wind Loading, maximum	257.0 N @ 150 km/h 57.8 lbf @ 150 km/h
Wind Speed, maximum	241.0 km/h 149.8 mph

Dimensions

Depth	83.0 mm 3.3 in
Length	1306.0 mm 51.4 in
Width	166.0 mm 6.5 in
Net Weight	4.7 kg 10.4 lb

Remote Electrical Tilt (RET) Information

Model with Factory Installed AISG 1.1 Actuator HBX-6516DS-R2M

Model with Factory Installed AISG 2.0 Actuator HBX-6516DS-A1M

RET System Teletilt®

Regulatory Compliance/Certifications

Agency

RoHS 2011/65/EU
China RoHS SJ/T 11364-2006
ISO 9001:2008

Classification

Compliant by Exemption
Above Maximum Concentration Value (MCV)
Designed, manufactured and/or distributed under this quality management system



Included Products

DB390 — Pipe Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members. Use for narrow panel antennas. Includes two pipe mounts.

DB5098E — Downtilt Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members

BXA-171063-12CF-EDIN-X

X-Pol | FET Panel | 63° | 19.0 dBi

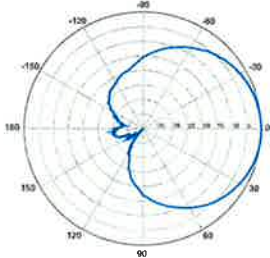
Replace "X" with desired electrical downtilt.

Antenna is also available with NE connector(s); Replace "EDIN" with "NE" in the model number when ordering.

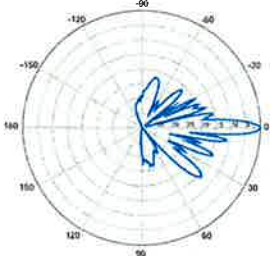
Electrical Characteristics	1710-2170 MHz			
Frequency bands	1710-1880 MHz	1850-1990 MHz	1920-2170 MHz	
Polarization	±45°	±45°	±45°	
Horizontal beamwidth	68°	65°	60°	
Vertical beamwidth	4.5°	4.5°	4.5°	
Gain	16.1 dBd / 18.2 dBi	16.5 dBd / 18.6 dBi	16.9 dBd / 19.0 dBi	
Electrical downtilt (X)	0, 2, 5			
Impedance	50Ω			
VSWR	≤1.5:1			
First upper sidelobe	< -17 dB			
Front-to-back ratio	> 30 dB			
In-band isolation	< -25 dB			
IM3 (20W carrier)	< -150 dBc			
Input power	300 W			
Lightning protection	Direct Ground			
Connector(s)	2 Ports / EDIN or NE / Female / Center (Back)			
Operating temperature	-40° to +60° C / -40° to +140° F			
Mechanical Characteristics				
Dimensions Length x Width x Depth	1842 x 154 x 105 mm	72.5 x 6.1 x 4.1 in		
Depth with z-brackets	133 mm	5.2 in		
Weight without mounting brackets	5.8 kg	12.8 lbs		
Survival wind speed	> 201 km/hr		> 125 mph	
Wind area	Front: 0.28 m ² Side: 0.19 m ²	Front: 3.1 ft ² Side: 2.1 ft ²		
Wind load @ 161 km/hr (100 mph)	Front: 460 N Side: 304 N	Front: 103 lbf Side: 68 lbf		
Mounting Options	Part Number	Fits Pipe Diameter		Weight
2-Point Mounting Bracket Kit	26799997	50-102 mm	2.0-4.0 in	2.3 kg 5 lbs
2-Point Mounting & Downtilt Bracket Kit	26799999	50-102 mm	2.0-4.0 in	3.6 kg 8 lbs
Concealment Configurations	For concealment configurations, order BXA-171063-12CF-EDIN-X-FP			



BXA-171063-12CF-EDIN-X

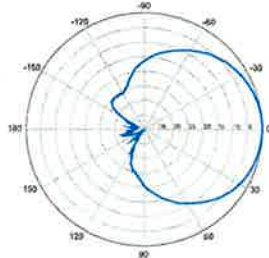


Horizontal | 1710-1880 MHz
BXA-171063-12CF-EDIN-0

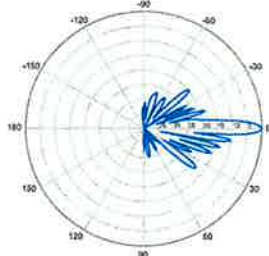


0° | Vertical | 1710-1880 MHz

BXA-171063-12CF-EDIN-X

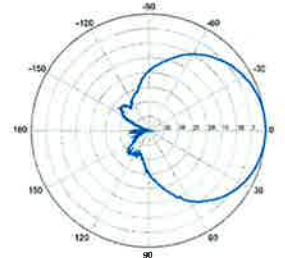


Horizontal | 1850-1990 MHz
BXA-171063-12CF-EDIN-0

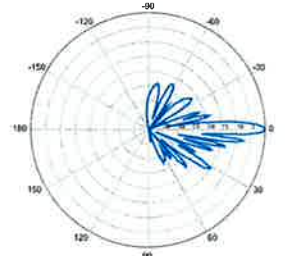


0° | Vertical | 1850-1990 MHz

BXA-171063-12CF-EDIN-X



Horizontal | 1920-2170 MHz
BXA-171063-12CF-EDIN-0



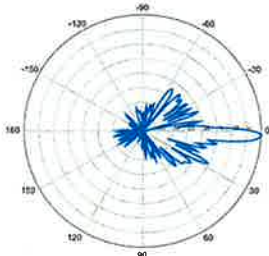
0° | Vertical | 1920-2170 MHz

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BXA-171063-12CF-EDIN-X

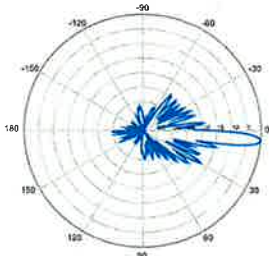
X-Pol | FET Panel | 63° | 19.0 dBi

BXA-171063-12CF-EDIN-2



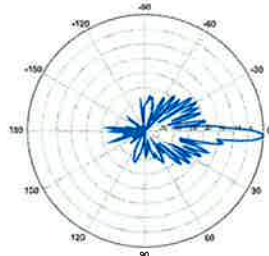
2° | Vertical | 1710-1880 MHz

BXA-171063-12CF-EDIN-5



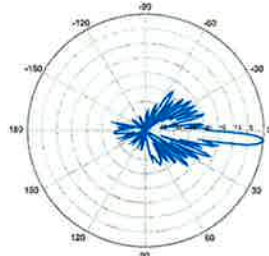
5° | Vertical | 1710-1880 MHz

BXA-171063-12CF-EDIN-2



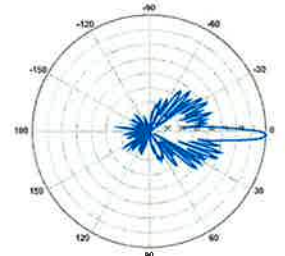
2° | Vertical | 1850-1990 MHz

BXA-171063-12CF-EDIN-5



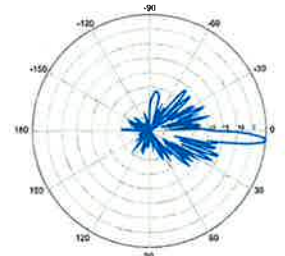
5° | Vertical | 1850-1990 MHz

BXA-171063-12CF-EDIN-2



2° | Vertical | 1920-2170 MHz

BXA-171063-12CF-EDIN-5



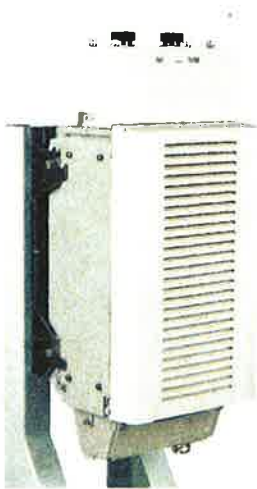
5° | Vertical | 1920-2170 MHz

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Alcatel-Lucent RRH2x40-AWS

REMOTE RADIO HEAD

The Alcatel-Lucent RRH2x40-AWS is a high-power, small form-factor Remote Radio Head (RRH) operating in the AWS frequency band (1700/2100MHz - 3GPP Band 4). The Alcatel-Lucent RRH2x40-AWS is designed with an eco-efficient approach, providing operators with the means to achieve high quality and capacity coverage with minimum site requirements.



A distributed eNodeB expands 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 an eNodeB to be installed separately, within the same site or several kilometres apart.

The Alcatel-Lucent RRH2x40-AWS is linked to the BBU by an optical-fiber connection carrying downlink and uplink digital radio signals along with operations, administration and maintenance (OA&M) information. The Alcatel-Lucent RRH2x40-AWS has two transmit RF paths, 40 W RF output power per transmit path, and is designed to manage up to four-way receive diversity. The device is ideally suited to support macro coverage, with multiple-input multiple-output (MIMO) 2x2 operation in up to 20 MHz of bandwidth.

The Alcatel-Lucent RRH2x40-AWS is designed to make available all the benefits of a distributed eNodeB, with excellent RF characteristics, with low

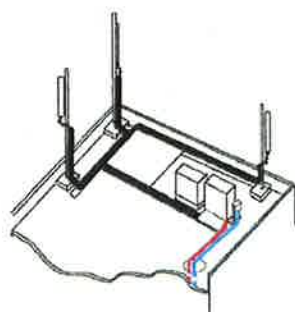
capital expenditures (CAPEX) and low operating expenditures (OPEX). The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment or require costly cranes to be employed, leaving coverage holes. However, many of these sites can host an Alcatel-Lucent RRH2x40-AWS installation, providing more flexible site selection and improved network quality along with greatly reduced installation time and costs.

Fast, low-cost installation and deployment

The Alcatel-Lucent RRH2x40-AWS is a zero-footprint solution and operates noise-free, simplifying negotiations with site property owners and minimizing environmental impacts. Installation can easily be done by a single person because the Alcatel-Lucent RRH2x40-AWS is compact and weighs less than 20 kg (44 lb), 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 — a fraction of the time required for a traditional BTS.

Excellent RF performance

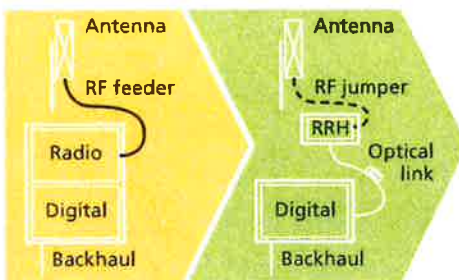
Because of its small size and weight, the Alcatel-Lucent RRH2x40-AWS can be installed close to the antenna. Operators can therefore locate the Alcatel-Lucent RRH2x40-AWS where RF engineering is deemed ideal, minimizing trade-offs between available sites and RF optimum sites. The RF feeder cost and installation costs are reduced or eliminated, and there is no need for a Tower Mounted Amplifier (TMA) because losses introduced by the RF feeder are greatly reduced. The Alcatel-Lucent RRH2x40-AWS provides more RF power while at the same time consuming less electricity.



Macro

Features

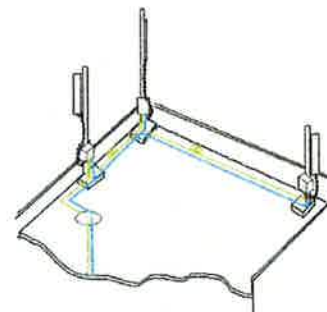
- Zero-footprint deployment
- Easy installation, with a lightweight unit can be carried and set up by one person
- Optimized RF power, with flexible site selection and elimination of a TMA
- Convection-cooled (fanless)
- Noise-free
- Best-in-class power efficiency, with significantly reduced energy consumption



RRH for space-constrained cell sites

Benefits

- Leverages existing real estate with lower site costs
- Reduces installation costs, with fewer installation materials and simplified logistics
- Decreases power costs and minimizes environmental impacts, with the potential for eco-sustainable power options
- Improves RF performance and adds flexibility to network planning



Distributed

Technical specifications

Physical dimensions

- Height: 620 mm (24.4 in.)
- Width: 270 mm (10.63 in.)
- Depth: 170mm (6.7 in.)
- Weight (without mounting kit): less than 20 kg (44 lb)

Power

- Power supply: -48VDC

Operating environment

- Outdoor temperature range:
 - With solar load: -40°C to +50°C (-40°F to +122°F)
 - Without solar load: -40°C to +55°C (-40°F to +131°F)

- Passive convection cooling (no fans)
- Enclosure protection
 - IP65 (International Protection rating)

RF characteristics

- Frequency band: 1700/2100 MHz (AWS); 3GPP Band 4
- Bandwidth: up to 20 MHz
- RF output power at antenna port: 40 W nominal RF power for each Tx port
- Rx diversity: 2-way or 4-way with optional Rx Diversity module
- Noise figure: below 2.0 dB typical
- Antenna Line Device features
 - TMA and Remote electrical tilt (RET) support via AISG v2.0

Optical characteristics

Type/number of fibers

- Single-mode variant
 - One Single Mode Single Fiber per RRH2x, carrying UL and DL using CWDM
 - Single mode dual fiber (SM/DF)
- Multi-mode variant
 - Two Multi-mode fibers per RRH2x: one carrying UL, the other carrying DL

Optical fiber length

- Up to 500 m (0.31 mi), using MM fiber
- Up to 20 km (12.43 mi), using SM fiber

Digital Ports and Alarms

- Two optical ports to support daisy-chaining
- Six external alarms

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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

General		
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
Mechanical Properties		
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)
Electrical Properties		
DC-Resistance Outer Conductor Armor		(Ω/km (Ω/1000ft)) 0.68 (0.265)
DC-Resistance Power Cable, 8.4mm² (8AWG)		(Ω/km (Ω/1000ft)) 2.1 (0.307)
Optical Properties		
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)		UL34-V0, UL1666 RoHS Compliant
DC Power Cable Properties		
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 XHHyV-2, UL 44 UL-LS Limited Smoke, UL VW-1 IEEE-383 (1974), IEEE1202/FT4 RoHS Compliant
Environmental		
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

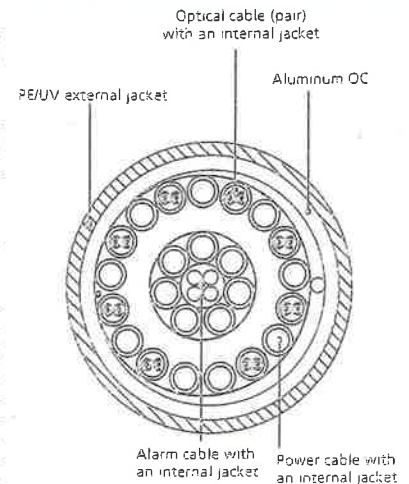


Figure 2: Construction Detail

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

ATTACHMENT 2

		General		Power		Density								
Site Name: Wallingford E Tower Height: 147Ft		# OF CHAN.	WATTS ERP	HEIGHT	CALC. POWER DENS	FREQ.	MAX. PERMISS. EXP.	FRACTION MPE	Total					
*AT&T UMTS		2	565	112	0.0324	880	0.5867	5.52%						
*AT&T UMTS		2	875	112	0.0502	1900	1.0000	5.02%						
*AT&T GSM		1	286	112	0.0082	880	0.5867	1.40%						
*AT&T GSM		4	525	112	0.0602	1900	1.0000	6.02%						
*AT&T LTE		1	1313	112	0.0376	734	0.4893	7.69%						
*Clearwire		2	153	128	0.0067	2496	1.0000	0.67%						
*Clearwire		1	211	128	0.0046	11 GHz	1.0000	0.46%						
*Sprint CDMA/LTE		2	778	130	0.0331	1900	1.0000	3.31%						
*Sprint CDMA/LTE		1	438	130	0.0093	850	0.5667	1.64%						
*Sprint WiMAX		3	562	130	0.0359	2657	1.0000	3.59%						
*Sprint microwave		2	4.42	130	0.0002	22500	1.0000	0.02%						
*Sprint microwave		2	4.42	130	0.0002	22500	1.0000	0.02%						
Verizon		7	324	121	0.0557	1970	1.0000	5.57%						
Verizon		9	397	121	0.0877	869	0.5793	15.15%						
Verizon		1	1183	121	0.0291	2145	1.0000	2.91%						
Verizon		1	835	121	0.0205	698	0.4653	4.41%						
										63.39%				
* Source: Siting Council														

ATTACHMENT 3

Date: April 18, 2014

Marianne Dunst
Crown Castle
3530 Toringdon Way
Charlotte, NC 28277



Crown Castle
2000 Corporate Drive
Canonsburg, PA 15317
(724) 416-2149

Subject: Structural Analysis Report

Carrier Designation: Verizon Wireless Co-Locate
Carrier Site Number: 20125
Carrier Site Name: Wallingford Easat, CT

Crown Castle Designation: Crown Castle BU Number: 876310
Crown Castle Site Name: BEAUMONT FARM
Crown Castle JDE Job Number: 282809
Crown Castle Work Order Number: 747184
Crown Castle Application Number: 215510 Rev. 2

Engineering Firm Designation: Crown Castle Project Number: 747184

Site Data: 945 East Center St., Wallingford, New Haven County, CT
Latitude 41° 26' 37.36", Longitude -72° 47' 48.58"
147 Foot - Monopole Tower

Dear Marianne Dunst,

Crown Castle 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 747184, in accordance with application 215510, revision 2.

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

LC5: Existing + Proposed Equipment

Sufficient Capacity

Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

This analysis has been performed in accordance with the TIA/EIA-222-F standard and 2005 CT State Building Code with 2009 amendment based upon a wind speed of 85 mph fastest mile.

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

We at Crown Castle appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Structural analysis prepared by: Drew Skupien, E.I.T. / MFB

Respectfully submitted by:

Jamal A. Huwel, P.E.
Manager Engineering



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1) INTRODUCTION

This tower is a 147 ft Monopole tower designed by SUMMIT in June of 2006. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-F. A 14' extension was added to the tower.

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 0.75 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
121.0	121.0	3	antel	BXA-171063/12CF w/ Mount Pipe	1	1-5/8	-
		2	antel	BXA-70063/6CFx2 w/ Mount Pipe			
		1	antel	BXA-70063/6CFx4 w/ Mount Pipe			
		3	commscope	HBX-6516DS-VTM w/ Mount Pipe			
		1	rfs celwave	DB-T1-6Z-8AB-0Z			
119.0	119.0	3	alcatel lucent	RRH2X40-AWS	-	-	-
		1	tower mounts	Side Arm Mount [SO 102-3]			

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
130.0	133.0	1	rfs celwave	APXVSP18-C-A20 w/ Mount Pipe	3 6 3	1-1/4 5/16 1/2	1
		1	andrew	VHLP1-23			
	132.0	1	andrew	VHLP2-23			
		1	andrew	VHLP2.5-23			
		3	alcatel lucent	1900MHz RRH (65MHz)			
	130.0	3	alcatel lucent	800 EXTERNAL NOTCH FILTER			
		3	alcatel lucent	800MHZ RRH			
		9	rfs celwave	ACU-A20-N			
		1	rfs celwave	APXV9ERR18-C-A20 w/ Mount Pipe			
		1	rfs celwave	APXVSP18-C-A20 w/ Mount Pipe			
		1	tower mounts	Platform Mount [LP 712-1]			
	128.0	3	argus technologies	LLPX310R w/ Mount Pipe			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
		3	samsung communications	FDD_R6_RRH			
121.0	121.0	1	andrew	LNx-6514DS-T4M w/ Mount Pipe	-	-	2
		2	powerwave technologies	P65.16.XL.2 w/ Mount Pipe			
		3	rymsa wireless	MG D3-800TV w/ Mount Pipe			
		2	antel	LPA-80063/6CF w/ Mount Pipe	12	1-5/8	1
		4	antel	LPA-80080-6CF-EDIN w/ Mount Pipe			
		1	tower mounts	Platform Mount [LP 712-1]			
111.0	112.0	3	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe	2 1 12	3/4 3/8 1-1/4	1
		6	powerwave technologies	7770.00 w/ Mount Pipe			
	111.0	6	ericsson	RRUS-11			
		12	powerwave technologies	LGP2140X			
		1	raycap	DC6-48-60-18-8F			
		1	tower mounts	Platform Mount [LP 712-1]			
80.0	81.0	1	kathrein	OG-860/1920/GPS-A	1	1/2	1
	80.0	1	tower mounts	Side Arm Mount [SO 701-1]			

- Notes:
 1) Existing Equipment
 2) 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)
130	130	12	PCS	DB980H	-	-
110	110	12	generic	Panel Antenna (3.9 S.F. Each)	-	-
95	95	12	generic	Panel Antenna (3.9 S.F. Each)	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	O'brien & Gere Engineers, Inc	1531484	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Summit	1855118	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Summit	1855980	CCISITES

3.1) Analysis Method

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

3.2) Assumptions

- 1) Tower and structures were built in accordance with the manufacturer's specifications.
- 2) The tower and structures have been maintained in accordance with the manufacturer's specification.
- 3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
- 4) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by TIA/EIA-222-F.

This analysis may be affected if any assumptions are not valid or have been made in error. Crown Castle 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	147 - 133	Pole	TP12.75x12.75x0.1875	1	-0.30	207.15	5.5	Pass
L2	133 - 85.5	Pole	TP29.418x19.537x0.3125	2	-10.40	1481.76	75.1	Pass
L3	85.5 - 42.75	Pole	TP37.687x27.4771x0.375	3	-18.53	2276.76	97.4	Pass
L4	42.75 - 0	Pole	TP45.83x35.8941x0.4375	4	-31.34	3324.40	97.6	Pass
							Summary	
						Pole (L4)	97.6	Pass
						Rating =	97.6	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	83.5	Pass
1	Base Plate	0	92.4	Pass
1	Base Foundation Soil Interaction	0	95.1	Pass

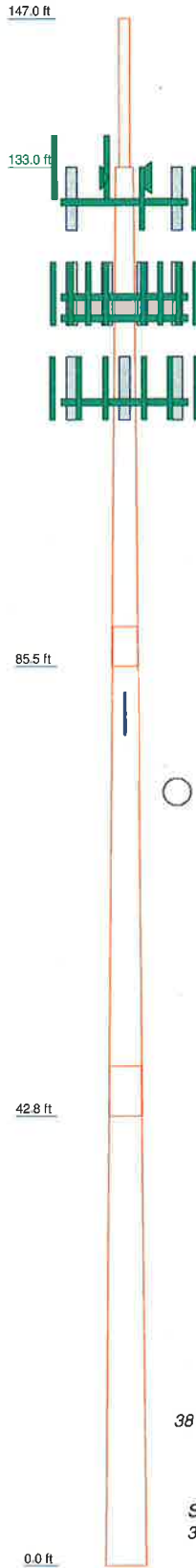
Structure Rating (max from all components) =	97.6%
---	--------------

4.1) Recommendations

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

APPENDIX A
TNXTOWER OUTPUT

Section	1	2	3	4	19.6
Length (ft)	14.00	47.50	46.50	47.50	47.50
Number of Sides	1	12	12	12	12
Thickness (in)	0.1875	0.3125	0.3750	0.4375	0.4375
Socket Length (ft)		3.75	4.75	35.8941	45.8300
Top Dia (in)	12.7500	19.6370	27.4771	35.8941	45.8300
Bot Dia (in)	12.7500	29.4180	37.8870	45.8300	45.8300
Grade			A572-65		
Weight (K)	0.4	3.9	6.2	9.2	19.6



DESIGNED APPURTENANCE LOADING

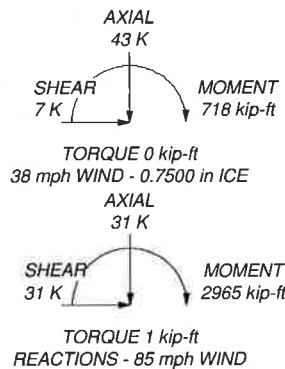
TYPE	ELEVATION	TYPE	ELEVATION
APXV9ERR18-C-A20 w/ Mount Pipe	130	BXA-70063/6CFx2 w/ Mount Pipe	121
APXVSP18-C-A20 w/ Mount Pipe	130	BXA-70063/6CFx4 w/ Mount Pipe	121
APXVSP18-C-A20 w/ Mount Pipe	130	DB-T1-6Z-8AB-0Z	121
LLPX310R w/ Mount Pipe	130	Platform Mount [LP 712-1]	121
LLPX310R w/ Mount Pipe	130	(2) LPA-80080-6CF-EDIN w/ Mount Pipe	121
LLPX310R w/ Mount Pipe	130	(2) LPA-80080-6CF-EDIN w/ Mount Pipe	121
FDD_R6_RRH	130	(2) LPA-80063/6CF w/ Mount Pipe	121
FDD_R6_RRH	130	Side Arm Mount [SO 102-3]	119
FDD_R6_RRH	130	(2) LPA-80063/6CF w/ Mount Pipe	121
1900MHz RRH (65MHz)	130	4' x 2" Pipe Mount	119
1900MHz RRH (65MHz)	130	4' x 2" Pipe Mount	119
1900MHz RRH (65MHz)	130	4' x 2" Pipe Mount	119
800 EXTERNAL NOTCH FILTER	130	RRH2X40-AWS	119
800 EXTERNAL NOTCH FILTER	130	RRH2X40-AWS	119
800 EXTERNAL NOTCH FILTER	130	RRH2X40-AWS	119
800MHz RRH	130	AM-X-CD-16-65-00T-RET w/ Mount Pipe	111
800MHz RRH	130	AM-X-CD-16-65-00T-RET w/ Mount Pipe	111
800MHz RRH	130	AM-X-CD-16-65-00T-RET w/ Mount Pipe	111
(3) ACU-A20-N	130	AM-X-CD-16-65-00T-RET w/ Mount Pipe	111
(3) ACU-A20-N	130	AM-X-CD-16-65-00T-RET w/ Mount Pipe	111
(3) ACU-A20-N	130	AM-X-CD-16-65-00T-RET w/ Mount Pipe	111
Platform Mount [LP 712-1]	130	(2) RRUS-11	111
5' x 2" Pipe Mount	130	(2) RRUS-11	111
5' x 2" Pipe Mount	130	(2) RRUS-11	111
5' x 2" Pipe Mount	130	(4) LGP2140X	111
VHLP1-23	130	(4) LGP2140X	111
VHLP2-5-23	130	(4) LGP2140X	111
VHLP2-23	130	DC6-48-60-18-8F	111
BXA-171063/12CF w/ Mount Pipe	121	Platform Mount [LP 712-1]	111
BXA-171063/12CF w/ Mount Pipe	121	(2) 7770.00 w/ Mount Pipe	111
BXA-171063/12CF w/ Mount Pipe	121	(2) 7770.00 w/ Mount Pipe	111
HBX-6516DS-VTM w/ Mount Pipe	121	(2) 7770.00 w/ Mount Pipe	111
HBX-6516DS-VTM w/ Mount Pipe	121	Side Arm Mount [SO 701-1]	80
HBX-6516DS-VTM w/ Mount Pipe	121	OG-860/1920/GPS-A	80
BXA-70063/6CFx2 w/ Mount Pipe	121		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in New Haven 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 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: 97.6%



<p>Crown Castle 2000 Corporate Drive Canonsburg, PA 15317 We Are Solutions Phone: (724) 416-2149 FAX: (724) 416-4594</p>	Job: BU# 876310
	Project:
	Client: Crown Castle
	Code: TIA/EIA-222-F
Drawn by: jskupien	App'd:
Date: 04/18/14	Scale: NTS
Path: X:\ENG Work Area\DSkupien\876310\876310.dwg	Dwg No. E-1

Tower Input Data

There is a pole section.

This tower is designed using the TIA/EIA-222-F standard.

The following design criteria apply:

- 3) Tower is located in New Haven County, Connecticut.
- 4) Basic wind speed of 85 mph.
- 5) Nominal ice thickness of 0.7500 in.
- 6) Ice thickness is considered to increase with height.
- 7) Ice density of 56 pcf.
- 8) A wind speed of 38 mph is used in combination with ice.
- 9) Temperature drop of 50 °F.
- 10) Deflections calculated using a wind speed of 50 mph.
- 11) A non-linear (P-delta) analysis was used.
- 12) Pressures are calculated at each section.
- 13) Stress ratio used in pole design is 1.333.
- 14) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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	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	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 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	147.00-133.00	14.00	0.00	Round	12.7500	12.7500	0.1875		A53-B-35 (35 ksi)
L2	133.00-85.50	47.50	3.75	12	19.5370	29.4180	0.3125	1.2500	A572-65 (65 ksi)
L3	85.50-42.75	46.50	4.75	12	27.4771	37.6870	0.3750	1.5000	A572-65 (65 ksi)
L4	42.75-0.00	47.50		12	35.8941	45.8300	0.4375	1.7500	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	I/Q in ²	w in	w/t
---------	----------------	-------------------------	----------------------	---------	---------	------------------------	----------------------	------------------------	---------	-----

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	I/Q in ²	w in	w/t
L1	12.7500	7.3999	146.0112	4.4420	6.3750	22.9037	292.0224	3.6978	0.0000	0
	12.7500	7.3999	146.0112	4.4420	6.3750	22.9037	292.0224	3.6978	0.0000	0
L2	20.2262	19.3447	912.5507	6.8824	10.1202	90.1715	1849.0751	9.5208	4.3984	14.075
	30.4558	29.2874	3166.7738	10.4198	15.2385	207.8137	6416.7422	14.4144	7.0465	22.549
L3	29.2988	32.7258	3068.1894	9.7026	14.2331	215.5666	6216.9835	16.1066	6.3589	16.957
	39.0165	45.0542	8006.0570	13.3577	19.5219	410.1072	16222.442	22.1743	9.0951	24.254
L4	38.1889	49.9494	8015.1094	12.6934	18.5931	431.0793	16240.784	24.5836	8.4471	19.308
	47.4467	63.9467	16817.916	16.2505	23.7399	708.4229	34077.657	31.4726	11.1099	25.394

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A _r	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 147.00-133.00				1	1	1		
L2 133.00-85.50				1	1	1		
L3 85.50-42.75				1	1	1		
L4 42.75-0.00				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement	Total Number		C _A A _A	Weight
				ft			ft ² /ft	plf
7983A(1/2")	C	No	Inside Pole	130.00 - 0.00	3	No Ice	0.00	0.08
						1/2" Ice	0.00	0.08
						1" Ice	0.00	0.08
						2" Ice	0.00	0.08
						4" Ice	0.00	0.08
9207(5/16")	C	No	Inside Pole	130.00 - 0.00	6	No Ice	0.00	0.60
						1/2" Ice	0.00	0.60
						1" Ice	0.00	0.60
						2" Ice	0.00	0.60
						4" Ice	0.00	0.60
HB114-1-0813U4-M5J(1 1/4")	C	No	Inside Pole	130.00 - 0.00	3	No Ice	0.00	1.20
						1/2" Ice	0.00	1.20
						1" Ice	0.00	1.20
						2" Ice	0.00	1.20
						4" Ice	0.00	1.20
2" Rigid Conduit	C	No	Inside Pole	130.00 - 0.00	1	No Ice	0.00	2.80
						1/2" Ice	0.00	2.80
						1" Ice	0.00	2.80
						2" Ice	0.00	2.80
						4" Ice	0.00	2.80
FLC 158-50J(1-5/8")	A	No	Inside Pole	121.00 - 0.00	12	No Ice	0.00	0.92
						1/2" Ice	0.00	0.92
						1" Ice	0.00	0.92
						2" Ice	0.00	0.92
						4" Ice	0.00	0.92
HB158-1-08U8-S8J18(1-5/8)	A	No	CaAa (Out Of Face)	121.00 - 0.00	1	No Ice	0.20	1.30
						1/2" Ice	0.30	2.81
						1" Ice	0.40	4.94
						2" Ice	0.60	11.02
						4" Ice	1.00	30.52
FLC 114-50J(1-1/4")	A	No	Inside Pole	111.00 - 0.00	12	No Ice	0.00	0.70
						1/2" Ice	0.00	0.70
						1" Ice	0.00	0.70
						2" Ice	0.00	0.70

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C _{AA} A		Weight plf
						In Face	Out Face	
FB-L98B-002-75000(3/8")	A	No	Inside Pole	111.00 - 0.00	1	4" Ice	0.00	0.70
						No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
						2" Ice	0.00	0.06
WR-VG86ST-BRD(3/4)	A	No	Inside Pole	111.00 - 0.00	2	4" Ice	0.00	0.06
						No Ice	0.00	0.59
						1/2" Ice	0.00	0.59
						1" Ice	0.00	0.59
						2" Ice	0.00	0.59
2" Rigid Conduit	A	No	Inside Pole	111.00 - 0.00	2	4" Ice	0.00	0.59
						No Ice	0.00	2.80
						1/2" Ice	0.00	2.80
						1" Ice	0.00	2.80
						2" Ice	0.00	2.80
* LDF4-50A(1/2")	C	No	Inside Pole	80.00 - 0.00	1	4" Ice	0.00	2.80
						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

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation	Face	A _R	A _F	C _{AA} A In Face	C _{AA} A Out Face	Weight
n	ft		ft ²	ft ²	ft ²	ft ²	K
L1	147.00-133.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L2	133.00-85.50	A	0.000	0.000	0.000	7.029	0.83
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.46
L3	85.50-42.75	A	0.000	0.000	0.000	8.465	1.18
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.44
L4	42.75-0.00	A	0.000	0.000	0.000	8.465	1.18
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.44

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation	Face or Leg	Ice Thickness	A _R	A _F	C _{AA} A In Face	C _{AA} A Out Face	Weight
n	ft		in	ft ²	ft ²	ft ²	ft ²	K
L1	147.00-133.00	A	0.892	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L2	133.00-85.50	A	0.865	0.000	0.000	0.000	13.168	0.94
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.46
L3	85.50-42.75	A	0.811	0.000	0.000	0.000	15.858	1.31
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.44
L4	42.75-0.00	A	0.750	0.000	0.000	0.000	15.403	1.30
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.44

Feed Line Center of Pressure

Section	Elevation	CP _x	CP _z	CP _x Ice	CP _z Ice
	ft	in	in	in	in
L1	147.00-133.00	0.0000	0.0000	0.0000	0.0000
L2	133.00-85.50	0.0000	-0.2175	0.0000	-0.3622
L3	85.50-42.75	0.0000	-0.2770	0.0000	-0.4686
L4	42.75-0.00	0.0000	-0.2809	0.0000	-0.4725

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
APXV9ERR18-C-A20 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice	8.50	7.47	0.09
						1/2" Ice	9.15	8.66	0.16
						Ice	9.77	9.56	0.24
						1" Ice	11.03	11.39	0.42
						2" Ice	13.68	15.53	0.94
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice	8.50	6.95	0.08
						1/2" Ice	9.15	8.13	0.15
						Ice	9.77	9.02	0.23
						1" Ice	11.03	10.84	0.41
						2" Ice	13.68	14.85	0.91
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.00 0.00 3.00	0.0000	130.00	No Ice	8.50	6.95	0.08
						1/2" Ice	9.15	8.13	0.15
						Ice	9.77	9.02	0.23
						1" Ice	11.03	10.84	0.41
						2" Ice	13.68	14.85	0.91
LLPX310R w/ Mount Pipe	A	From Leg	4.00 0.00 -2.00	0.0000	130.00	No Ice	5.07	2.98	0.05
						1/2" Ice	5.48	3.53	0.08
						Ice	5.91	4.09	0.13
						1" Ice	6.79	5.31	0.23
						2" Ice	8.70	8.13	0.54
LLPX310R w/ Mount Pipe	B	From Leg	4.00 0.00 -2.00	0.0000	130.00	No Ice	5.07	2.98	0.05
						1/2" Ice	5.48	3.53	0.08
						Ice	5.91	4.09	0.13
						1" Ice	6.79	5.31	0.23
						2" Ice	8.70	8.13	0.54
LLPX310R w/ Mount Pipe	C	From Leg	4.00 0.00 -2.00	0.0000	130.00	No Ice	5.07	2.98	0.05
						1/2" Ice	5.48	3.53	0.08
						Ice	5.91	4.09	0.13
						1" Ice	6.79	5.31	0.23
						2" Ice	8.70	8.13	0.54
FDD_R6_RRH	A	From Leg	4.00 0.00 -2.00	0.0000	130.00	No Ice	1.79	0.78	0.03
						1/2" Ice	1.97	0.92	0.04
						Ice	2.16	1.07	0.06
						1" Ice	2.57	1.39	0.09
						2" Ice	3.49	2.14	0.20
FDD_R6_RRH	B	From Leg	4.00 0.00 -2.00	0.0000	130.00	No Ice	1.79	0.78	0.03
						1/2" Ice	1.97	0.92	0.04
						Ice	2.16	1.07	0.06
						1" Ice	2.57	1.39	0.09
						2" Ice	3.49	2.14	0.20
FDD_R6_RRH	C	From Leg	4.00 0.00 -2.00	0.0000	130.00	No Ice	1.79	0.78	0.03
						1/2" Ice	1.97	0.92	0.04
						Ice	2.16	1.07	0.06
						1" Ice	2.57	1.39	0.09
						2" Ice	3.49	2.14	0.20
FDD_R6_RRH	B	From Leg	4.00 0.00 -2.00	0.0000	130.00	No Ice	1.79	0.78	0.03
						1/2" Ice	1.97	0.92	0.04
						Ice	2.16	1.07	0.06
						1" Ice	2.57	1.39	0.09
						2" Ice	3.49	2.14	0.20
FDD_R6_RRH	C	From Leg	4.00 0.00 -2.00	0.0000	130.00	No Ice	1.79	0.78	0.03
						1/2" Ice	1.97	0.92	0.04
						Ice	2.16	1.07	0.06
						1" Ice	2.57	1.39	0.09
						2" Ice	3.49	2.14	0.20

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement ft	C _{AA}		Weight K
			Horz Lateral ft ft	Vert ft			Front ft ²	Side ft ²	
FDD_R6_RRH	C	From Leg	4.00 0.00 -2.00	0.0000	130.00	No Ice	1.79	0.78	0.03
						1/2" Ice	1.97	0.92	0.04
						Ice	2.16	1.07	0.06
						1" Ice	2.57	1.39	0.09
						2" Ice	3.49	2.14	0.20
1900MHz RRH (65MHz)	A	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice	2.70	2.77	0.06
						1/2" Ice	2.94	3.01	0.08
						Ice	3.18	3.26	0.11
						1" Ice	3.70	3.78	0.18
						2" Ice	4.85	4.93	0.35
1900MHz RRH (65MHz)	B	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice	2.70	2.77	0.06
						1/2" Ice	2.94	3.01	0.08
						Ice	3.18	3.26	0.11
						1" Ice	3.70	3.78	0.18
						2" Ice	4.85	4.93	0.35
1900MHz RRH (65MHz)	C	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice	2.70	2.77	0.06
						1/2" Ice	2.94	3.01	0.08
						Ice	3.18	3.26	0.11
						1" Ice	3.70	3.78	0.18
						2" Ice	4.85	4.93	0.35
800 EXTERNAL NOTCH FILTER	A	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice	0.77	0.37	0.01
						1/2" Ice	0.89	0.46	0.02
						Ice	1.02	0.56	0.02
						1" Ice	1.30	0.79	0.04
						2" Ice	1.97	1.34	0.11
800 EXTERNAL NOTCH FILTER	B	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice	0.77	0.37	0.01
						1/2" Ice	0.89	0.46	0.02
						Ice	1.02	0.56	0.02
						1" Ice	1.30	0.79	0.04
						2" Ice	1.97	1.34	0.11
800 EXTERNAL NOTCH FILTER	C	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice	0.77	0.37	0.01
						1/2" Ice	0.89	0.46	0.02
						Ice	1.02	0.56	0.02
						1" Ice	1.30	0.79	0.04
						2" Ice	1.97	1.34	0.11
800MHZ RRH	A	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice	2.49	2.07	0.05
						1/2" Ice	2.71	2.27	0.07
						Ice	2.93	2.48	0.10
						1" Ice	3.41	2.93	0.16
						2" Ice	4.46	3.93	0.32
800MHZ RRH	B	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice	2.49	2.07	0.05
						1/2" Ice	2.71	2.27	0.07
						Ice	2.93	2.48	0.10
						1" Ice	3.41	2.93	0.16
						2" Ice	4.46	3.93	0.32
800MHZ RRH	C	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice	2.49	2.07	0.05
						1/2" Ice	2.71	2.27	0.07
						Ice	2.93	2.48	0.10
						1" Ice	3.41	2.93	0.16
						2" Ice	4.46	3.93	0.32
(3) ACU-A20-N	A	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice	0.08	0.14	0.00
						1/2" Ice	0.12	0.19	0.00
						Ice	0.17	0.25	0.00
						1" Ice	0.30	0.40	0.01
						2" Ice	0.67	0.80	0.04

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz Lateral	Vert					
			ft	ft	°	ft	ft ²	ft ²	K
(3) ACU-A20-N	B	From Leg	4.00	0.0000	130.00	4" Ice			
			0.00			No Ice	0.08	0.14	0.00
			0.00			1/2"	0.12	0.19	0.00
						Ice	0.17	0.25	0.00
						1" Ice	0.30	0.40	0.01
(3) ACU-A20-N	C	From Leg	4.00	0.0000	130.00	2" Ice	0.67	0.80	0.04
			0.00			4" Ice			
			0.00			No Ice	0.08	0.14	0.00
						1/2"	0.12	0.19	0.00
						Ice	0.17	0.25	0.00
Platform Mount [LP 712-1]	C	None		0.0000	130.00	1" Ice	0.30	0.40	0.01
						2" Ice	0.67	0.80	0.04
						4" Ice			
						No Ice	24.53	24.53	1.34
						1/2"	29.94	29.94	1.65
5' x 2" Pipe Mount	A	From Leg	4.00	0.0000	130.00	Ice	35.35	35.35	1.96
			0.00			1" Ice	46.17	46.17	2.58
			0.00			2" Ice	67.81	67.81	3.82
						4" Ice			
						No Ice	1.00	1.00	0.03
5' x 2" Pipe Mount	B	From Leg	4.00	0.0000	130.00	1/2"	1.39	1.39	0.04
			0.00			Ice	1.70	1.70	0.05
			0.00			1" Ice	2.35	2.35	0.08
						2" Ice	3.78	3.78	0.20
						4" Ice			
5' x 2" Pipe Mount	C	From Leg	4.00	0.0000	130.00	No Ice	1.00	1.00	0.03
			0.00			1/2"	1.39	1.39	0.04
			0.00			Ice	1.70	1.70	0.05
						1" Ice	2.35	2.35	0.08
						2" Ice	3.78	3.78	0.20
5' x 2" Pipe Mount	C	From Leg	4.00	0.0000	130.00	4" Ice			
			0.00			No Ice	1.00	1.00	0.03
			0.00			1/2"	1.39	1.39	0.04
						Ice	1.70	1.70	0.05
						1" Ice	2.35	2.35	0.08
(2) LPA-80080-6CF-EDIN w/ Mount Pipe	A	From Leg	4.00	0.0000	121.00	2" Ice	3.78	3.78	0.20
			0.00			4" Ice			
			0.00			No Ice	4.56	10.74	0.05
						1/2"	5.10	12.00	0.11
						Ice	5.61	12.98	0.19
(2) LPA-80080-6CF-EDIN w/ Mount Pipe	B	From Leg	4.00	0.0000	121.00	1" Ice	6.65	14.99	0.36
			0.00			2" Ice	8.83	19.23	0.86
			0.00			4" Ice			
						No Ice	4.56	10.74	0.05
						1/2"	5.10	12.00	0.11
(2) LPA-80063/6CF w/ Mount Pipe	C	From Leg	4.00	0.0000	121.00	Ice	5.61	12.98	0.19
			0.00			1" Ice	6.65	14.99	0.36
			0.00			2" Ice	8.83	19.23	0.86
						4" Ice			
						No Ice	10.58	10.67	0.05
BXA-171063/12CF w/ Mount Pipe	A	From Leg	4.00	0.0000	121.00	1/2"	11.24	11.93	0.14
			0.00			Ice	11.87	12.91	0.25
			0.00			1" Ice	13.16	14.92	0.48
						2" Ice	15.87	19.16	1.09
						4" Ice			
BXA-171063/12CF w/ Mount Pipe	B	From Leg	4.00	0.0000	121.00	No Ice	5.03	5.29	0.04
			0.00			1/2"	5.58	6.46	0.09
			0.00			Ice	6.10	7.35	0.14
						1" Ice	7.17	9.15	0.27
						2" Ice	9.44	12.95	0.68
BXA-171063/12CF w/ Mount Pipe	B	From Leg	4.00	0.0000	121.00	4" Ice			
			0.00			No Ice	5.03	5.29	0.04
			0.00			1/2"	5.58	6.46	0.09
		Ice	6.10	7.35	0.14				

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K	
						1" Ice	7.17	9.15	0.27
						2" Ice	9.44	12.95	0.68
						4" Ice			
BXA-171063/12CF w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	121.00	No Ice	5.03	5.29	0.04
						1/2"	5.58	6.46	0.09
						Ice	6.10	7.35	0.14
						1" Ice	7.17	9.15	0.27
						2" Ice	9.44	12.95	0.68
						4" Ice			
HBX-6516DS-VTM w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	121.00	No Ice	3.56	3.24	0.03
						1/2"	3.96	3.91	0.06
						Ice	4.38	4.56	0.10
						1" Ice	5.32	5.91	0.20
						2" Ice	7.31	8.88	0.50
						4" Ice			
HBX-6516DS-VTM w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	121.00	No Ice	3.56	3.24	0.03
						1/2"	3.96	3.91	0.06
						Ice	4.38	4.56	0.10
						1" Ice	5.32	5.91	0.20
						2" Ice	7.31	8.88	0.50
						4" Ice			
HBX-6516DS-VTM w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	121.00	No Ice	3.56	3.24	0.03
						1/2"	3.96	3.91	0.06
						Ice	4.38	4.56	0.10
						1" Ice	5.32	5.91	0.20
						2" Ice	7.31	8.88	0.50
						4" Ice			
BXA-70063/6CFx2 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	121.00	No Ice	7.97	5.40	0.04
						1/2"	8.61	6.55	0.10
						Ice	9.22	7.41	0.17
						1" Ice	10.46	9.18	0.33
						2" Ice	13.07	12.93	0.79
						4" Ice			
BXA-70063/6CFx2 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	121.00	No Ice	7.97	5.40	0.04
						1/2"	8.61	6.55	0.10
						Ice	9.22	7.41	0.17
						1" Ice	10.46	9.18	0.33
						2" Ice	13.07	12.93	0.79
						4" Ice			
BXA-70063/6CFx4 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	121.00	No Ice	7.97	5.40	0.04
						1/2"	8.61	6.55	0.10
						Ice	9.22	7.41	0.17
						1" Ice	10.46	9.18	0.33
						2" Ice	13.07	12.93	0.79
						4" Ice			
DB-T1-6Z-8AB-OZ	C	From Leg	4.00 0.00 0.00	0.0000	121.00	No Ice	5.60	2.33	0.04
						1/2"	5.92	2.56	0.08
						Ice	6.24	2.79	0.12
						1" Ice	6.91	3.28	0.21
						2" Ice	8.37	4.37	0.45
						4" Ice			
Platform Mount [LP 712-1]	C	None		0.0000	121.00	No Ice	24.53	24.53	1.34
						1/2"	29.94	29.94	1.65
						Ice	35.35	35.35	1.96
						1" Ice	46.17	46.17	2.58
						2" Ice	67.81	67.81	3.82
						4" Ice			
RRH2X40-AWS	A	From Leg	2.00 0.00 0.00	0.0000	119.00	No Ice	2.52	1.59	0.04
						1/2"	2.75	1.80	0.06
						Ice	2.99	2.01	0.08
						1" Ice	3.50	2.46	0.13
						2" Ice	4.61	3.48	0.28
						4" Ice			
RRH2X40-AWS	B	From Leg	2.00	0.0000	119.00	No Ice	2.52	1.59	0.04

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	
			0.00			1/2"	2.75	1.80	0.06
			0.00			Ice	2.99	2.01	0.08
						1" Ice	3.50	2.46	0.13
						2" Ice	4.61	3.48	0.28
						4" Ice			
RRH2X40-AWS	C	From Leg	2.00	0.0000	119.00	No Ice	2.52	1.59	0.04
			0.00			1/2"	2.75	1.80	0.06
			0.00			Ice	2.99	2.01	0.08
						1" Ice	3.50	2.46	0.13
						2" Ice	4.61	3.48	0.28
						4" Ice			
Side Arm Mount [SO 102-3]	C	None		0.0000	119.00	No Ice	3.00	3.00	0.08
						1/2"	3.48	3.48	0.11
						Ice	3.96	3.96	0.14
						1" Ice	4.92	4.92	0.20
						2" Ice	6.84	6.84	0.32
						4" Ice			
4' x 2" Pipe Mount	A	From Leg	2.00	0.0000	119.00	No Ice	0.79	0.79	0.03
			0.00			1/2"	1.03	1.03	0.04
			0.00			Ice	1.28	1.28	0.04
						1" Ice	1.81	1.81	0.07
						2" Ice	3.11	3.11	0.17
						4" Ice			
4' x 2" Pipe Mount	B	From Leg	2.00	0.0000	119.00	No Ice	0.79	0.79	0.03
			0.00			1/2"	1.03	1.03	0.04
			0.00			Ice	1.28	1.28	0.04
						1" Ice	1.81	1.81	0.07
						2" Ice	3.11	3.11	0.17
						4" Ice			
4' x 2" Pipe Mount	C	From Leg	2.00	0.0000	119.00	No Ice	0.79	0.79	0.03
			0.00			1/2"	1.03	1.03	0.04
			0.00			Ice	1.28	1.28	0.04
						1" Ice	1.81	1.81	0.07
						2" Ice	3.11	3.11	0.17
						4" Ice			

(2) 7770.00 w/ Mount Pipe	A	From Leg	4.00	0.0000	111.00	No Ice	6.12	4.25	0.06
			0.00			1/2"	6.63	5.01	0.10
			1.00			Ice	7.13	5.71	0.16
						1" Ice	8.16	7.16	0.29
						2" Ice	10.36	10.41	0.66
						4" Ice			
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.00	0.0000	111.00	No Ice	6.12	4.25	0.06
			0.00			1/2"	6.63	5.01	0.10
			1.00			Ice	7.13	5.71	0.16
						1" Ice	8.16	7.16	0.29
						2" Ice	10.36	10.41	0.66
						4" Ice			
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.00	0.0000	111.00	No Ice	6.12	4.25	0.06
			0.00			1/2"	6.63	5.01	0.10
			1.00			Ice	7.13	5.71	0.16
						1" Ice	8.16	7.16	0.29
						2" Ice	10.36	10.41	0.66
						4" Ice			
AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Leg	4.00	0.0000	111.00	No Ice	8.50	6.30	0.07
			0.00			1/2"	9.15	7.48	0.14
			1.00			Ice	9.77	8.37	0.21
						1" Ice	11.03	10.18	0.38
						2" Ice	13.68	14.02	0.87
						4" Ice			
AM-X-CD-16-65-00T-RET w/ Mount Pipe	B	From Leg	4.00	0.0000	111.00	No Ice	8.50	6.30	0.07
			0.00			1/2"	9.15	7.48	0.14
			1.00			Ice	9.77	8.37	0.21
						1" Ice	11.03	10.18	0.38
						2" Ice	13.68	14.02	0.87
						4" Ice			

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
			Horz Lateral ft	Vert ft					
AM-X-CD-16-65-00T-RET w/ Mount Pipe	C	From Leg	4.00	0.0000	111.00	4" Ice			
			0.00			No Ice	8.50	6.30	0.07
			1.00			1/2"	9.15	7.48	0.14
						Ice	9.77	8.37	0.21
						1" Ice	11.03	10.18	0.38
(2) RRUS-11	A	From Leg	4.00	0.0000	111.00	2" Ice	13.68	14.02	0.87
			0.00			4" Ice			
			0.00			No Ice	3.25	1.37	0.05
						1/2"	3.49	1.55	0.07
						Ice	3.74	1.74	0.09
(2) RRUS-11	B	From Leg	4.00	0.0000	111.00	1" Ice	4.27	2.14	0.15
			0.00			2" Ice	5.43	3.04	0.31
			0.00			4" Ice			
						No Ice	3.25	1.37	0.05
						1/2"	3.49	1.55	0.07
(2) RRUS-11	C	From Leg	4.00	0.0000	111.00	Ice	3.74	1.74	0.09
			0.00			1" Ice	4.27	2.14	0.15
			0.00			2" Ice	5.43	3.04	0.31
						4" Ice			
						No Ice	3.25	1.37	0.05
(4) LGP2140X	A	From Leg	4.00	0.0000	111.00	1/2"	3.49	1.55	0.07
			0.00			Ice	3.74	1.74	0.09
			0.00			1" Ice	4.27	2.14	0.15
						2" Ice	5.43	3.04	0.31
						4" Ice			
(4) LGP2140X	B	From Leg	4.00	0.0000	111.00	No Ice	1.26	0.38	0.02
			0.00			1/2"	1.42	0.49	0.03
			0.00			Ice	1.58	0.62	0.04
						1" Ice	1.94	0.89	0.06
						2" Ice	2.75	1.54	0.14
(4) LGP2140X	C	From Leg	4.00	0.0000	111.00	4" Ice			
			0.00			No Ice	1.26	0.38	0.02
			0.00			1/2"	1.42	0.49	0.03
						Ice	1.58	0.62	0.04
						1" Ice	1.94	0.89	0.06
DC6-48-60-18-8F	A	From Leg	4.00	0.0000	111.00	2" Ice	2.75	1.54	0.14
			0.00			4" Ice			
			0.00			No Ice	1.27	1.27	0.02
						1/2"	1.46	1.46	0.04
						Ice	1.66	1.66	0.05
Platform Mount [LP 712-1]	C	None		0.0000	111.00	1" Ice	2.09	2.09	0.10
						2" Ice	3.10	3.10	0.21
						4" Ice			
						No Ice	24.53	24.53	1.34
						1/2"	29.94	29.94	1.65
*** OG-860/1920/GPS-A	A	From Leg	2.00	0.0000	80.00	Ice	35.35	35.35	1.96
			0.00			1" Ice	46.17	46.17	2.58
			1.00			2" Ice	67.81	67.81	3.82
						4" Ice			
						No Ice	0.33	0.40	0.00
Side Arm Mount [SO 701-1]	A	None		0.0000	80.00	1/2"	0.43	0.51	0.01
						Ice	0.55	0.63	0.01
						1" Ice	0.80	0.89	0.03
						2" Ice	1.41	1.52	0.08
						4" Ice			
		No Ice	0.85	1.67	0.07				
		1/2"	1.14	2.34	0.08				
		Ice	1.43	3.01	0.09				

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K	
						1" Ice	2.01	4.35	0.12
						2" Ice	3.17	7.03	0.18
						4" Ice			

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft ²	Weight K	
VHLP1-23	C	Paraboloid w/o Radome	From Leg	1.00 0.00 2.00	0.0000		130.00	1.27	No Ice	1.28	0.01
									1/2" Ice	1.45	0.02
									1" Ice	1.62	0.02
									2" Ice	1.97	0.04
									4" Ice	2.66	0.07
VHLP2.5-23	B	Paraboloid w/o Radome	From Leg	1.00 0.00 2.00	0.0000		130.00	2.92	No Ice	6.68	0.05
									1/2" Ice	7.07	0.08
									1" Ice	7.46	0.12
									2" Ice	8.23	0.19
									4" Ice	9.78	0.34
VHLP2-23	C	Paraboloid w/o Radome	From Leg	1.00 0.00 2.00	0.0000		130.00	2.17	No Ice	3.72	0.03
									1/2" Ice	4.00	0.03
									1" Ice	4.31	0.04
									2" Ice	4.94	0.07
									4" Ice	6.34	0.19

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

Comb. No.	Description
25	Dead+Wind 300 deg+Ice+Temp
26	Dead+Wind 330 deg+Ice+Temp
27	Dead+Wind 0 deg - Service
28	Dead+Wind 30 deg - Service
29	Dead+Wind 60 deg - Service
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	147 - 133	Pole	Max Tension	11	0.00	-0.00	0.00
			Max. Compression	14	-0.56	0.00	-0.00
			Max. Mx	11	-0.30	3.16	0.00
			Max. My	2	-0.31	-0.00	3.15
			Max. Vy	11	-0.45	3.16	0.00
			Max. Vx	2	-0.45	-0.00	3.15
			Max. Torque	5			-0.00
L2	133 - 85.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-19.61	0.84	-0.25
			Max. Mx	11	-10.43	630.01	0.47
			Max. My	2	-10.50	-5.49	614.87
			Max. Vy	11	-21.15	630.01	0.47
			Max. Vx	2	-20.71	-5.49	614.87
			Max. Torque	13			0.69
L3	85.5 - 42.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-28.72	0.84	0.03
			Max. Mx	11	-18.54	1611.43	-2.21
			Max. My	2	-18.58	-14.22	1577.70
			Max. Vy	11	-25.79	1611.43	-2.21
			Max. Vx	2	-25.34	-14.22	1577.70
			Max. Torque	13			0.52
L4	42.75 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-42.62	0.84	0.36
			Max. Mx	11	-31.34	2949.90	-5.23
			Max. My	2	-31.34	-23.97	2895.39
			Max. Vy	11	-30.57	2949.90	-5.23
			Max. Vx	2	-30.14	-23.97	2895.39
			Max. Torque	10			-0.60

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	23	42.62	6.19	-3.47
	Max. H _x	11	31.37	30.54	-0.06
	Max. H _z	2	31.37	-0.20	30.11
	Max. M _x	2	2895.39	-0.20	30.11
	Max. M _z	5	2944.61	-30.50	0.47
	Max. Torsion	2	0.44	-0.20	30.11
	Min. Vert	1	31.37	0.00	0.00
	Min. H _x	5	31.37	-30.50	0.47
	Min. H _z	8	31.37	0.29	-29.88

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Min. M _x	8	-2864.64	0.29	-29.88
	Min. M _z	11	-2949.90	30.54	-0.06
	Min. Torsion	10	-0.60	26.76	-14.97

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overtuning Moment, M _x kip-ft	Overtuning Moment, M _z kip-ft	Torque kip-ft
Dead Only	31.37	0.00	0.00	-0.20	0.15	0.00
Dead+Wind 0 deg - No Ice	31.37	0.20	-30.11	-2895.39	-23.97	-0.44
Dead+Wind 30 deg - No Ice	31.37	15.60	-26.00	-2496.18	-1516.82	-0.28
Dead+Wind 60 deg - No Ice	31.37	26.57	-15.27	-1474.01	-2569.84	-0.27
Dead+Wind 90 deg - No Ice	31.37	30.50	-0.47	-61.87	-2944.61	-0.22
Dead+Wind 120 deg - No Ice	31.37	26.40	14.53	1378.78	-2550.81	-0.16
Dead+Wind 150 deg - No Ice	31.37	14.88	25.73	2462.13	-1425.18	0.00
Dead+Wind 180 deg - No Ice	31.37	-0.29	29.88	2864.64	36.49	0.29
Dead+Wind 210 deg - No Ice	31.37	-15.38	26.00	2495.52	1488.05	0.52
Dead+Wind 240 deg - No Ice	31.37	-26.76	14.97	1432.44	2595.80	0.60
Dead+Wind 270 deg - No Ice	31.37	-30.54	0.06	5.23	2949.90	0.36
Dead+Wind 300 deg - No Ice	31.37	-26.32	-14.79	-1414.62	2539.95	-0.02
Dead+Wind 330 deg - No Ice	31.37	-15.16	-25.74	-2463.17	1463.87	-0.38
Dead+Ice+Temp	42.62	0.00	0.00	-0.36	0.84	0.00
Dead+Wind 0 deg+Ice+Temp	42.62	0.04	-6.98	-703.70	-4.41	-0.10
Dead+Wind 30 deg+Ice+Temp	42.62	3.61	-6.03	-606.66	-365.67	-0.09
Dead+Wind 60 deg+Ice+Temp	42.62	6.15	-3.54	-357.51	-621.46	-0.11
Dead+Wind 90 deg+Ice+Temp	42.62	7.07	-0.10	-13.81	-712.90	-0.10
Dead+Wind 120 deg+Ice+Temp	42.62	6.12	3.38	336.12	-617.80	-0.08
Dead+Wind 150 deg+Ice+Temp	42.62	3.46	5.98	598.77	-345.78	-0.02
Dead+Wind 180 deg+Ice+Temp	42.62	-0.06	6.94	696.06	8.51	0.08
Dead+Wind 210 deg+Ice+Temp	42.62	-3.56	6.03	605.85	360.72	0.15
Dead+Wind 240 deg+Ice+Temp	42.62	-6.19	3.47	347.57	628.82	0.18
Dead+Wind 270 deg+Ice+Temp	42.62	-7.07	0.01	0.33	715.66	0.13
Dead+Wind 300 deg+Ice+Temp	42.62	-6.10	-3.44	-345.00	616.81	0.03
Dead+Wind 330 deg+Ice+Temp	42.62	-3.52	-5.98	-599.65	356.14	-0.07
Dead+Wind 0 deg - Service	31.37	0.07	-10.42	-1003.67	-8.20	-0.15
Dead+Wind 30 deg - Service	31.37	5.40	-9.00	-865.32	-525.64	-0.10
Dead+Wind 60 deg - Service	31.37	9.19	-5.28	-511.07	-890.67	-0.09
Dead+Wind 90 deg - Service	31.37	10.55	-0.16	-21.59	-1020.56	-0.08
Dead+Wind 120 deg - Service	31.37	9.14	5.03	477.74	-884.01	-0.06
Dead+Wind 150 deg - Service	31.37	5.15	8.90	853.17	-493.82	0.00
Dead+Wind 180 deg - Service	31.37	-0.10	10.34	992.69	12.76	0.10
Dead+Wind 210 deg - Service	31.37	-5.32	9.00	864.81	515.87	0.18
Dead+Wind 240 deg - Service	31.37	-9.26	5.18	496.38	899.90	0.21
Dead+Wind 270 deg - Service	31.37	-10.57	0.02	1.67	1022.61	0.12
Dead+Wind 300 deg - Service	31.37	-9.11	-5.12	-490.44	880.47	-0.01

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+Wind 330 deg - Service	31.37	-5.25	-8.91	-853.82	507.47	-0.13

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	0.00	-31.37	0.00	0.00	31.37	0.00	0.000%
2	0.20	-31.37	-30.11	-0.20	31.37	30.11	0.000%
3	15.60	-31.37	-26.00	-15.60	31.37	26.00	0.000%
4	26.57	-31.37	-15.27	-26.57	31.37	15.27	0.000%
5	30.50	-31.37	-0.47	-30.50	31.37	0.47	0.000%
6	26.40	-31.37	14.53	-26.40	31.37	-14.53	0.000%
7	14.88	-31.37	25.73	-14.88	31.37	-25.73	0.000%
8	-0.29	-31.37	29.88	0.29	31.37	-29.88	0.000%
9	-15.38	-31.37	26.00	15.38	31.37	-26.00	0.000%
10	-26.76	-31.37	14.97	26.76	31.37	-14.97	0.000%
11	-30.54	-31.37	0.06	30.54	31.37	-0.06	0.000%
12	-26.32	-31.37	-14.79	26.32	31.37	14.79	0.000%
13	-15.16	-31.37	-25.74	15.16	31.37	25.74	0.000%
14	0.00	-42.62	0.00	0.00	42.62	0.00	0.000%
15	0.04	-42.62	-6.98	-0.04	42.62	6.98	0.000%
16	3.61	-42.62	-6.03	-3.61	42.62	6.03	0.000%
17	6.15	-42.62	-3.54	-6.15	42.62	3.54	0.000%
18	7.07	-42.62	-0.10	-7.07	42.62	0.10	0.000%
19	6.12	-42.62	3.38	-6.12	42.62	-3.38	0.000%
20	3.46	-42.62	5.98	-3.46	42.62	-5.98	0.000%
21	-0.06	-42.62	6.94	0.06	42.62	-6.94	0.000%
22	-3.56	-42.62	6.03	3.56	42.62	-6.03	0.000%
23	-6.19	-42.62	3.47	6.19	42.62	-3.47	0.000%
24	-7.07	-42.62	0.01	7.07	42.62	-0.01	0.000%
25	-6.10	-42.62	-3.44	6.10	42.62	3.44	0.000%
26	-3.52	-42.62	-5.98	3.52	42.62	5.98	0.000%
27	0.07	-31.37	-10.42	-0.07	31.37	10.42	0.000%
28	5.40	-31.37	-9.00	-5.40	31.37	9.00	0.000%
29	9.19	-31.37	-5.28	-9.19	31.37	5.28	0.000%
30	10.55	-31.37	-0.16	-10.55	31.37	0.16	0.000%
31	9.14	-31.37	5.03	-9.14	31.37	-5.03	0.000%
32	5.15	-31.37	8.90	-5.15	31.37	-8.90	0.000%
33	-0.10	-31.37	10.34	0.10	31.37	-10.34	0.000%
34	-5.32	-31.37	9.00	5.32	31.37	-9.00	0.000%
35	-9.26	-31.37	5.18	9.26	31.37	-5.18	0.000%
36	-10.57	-31.37	0.02	10.57	31.37	-0.02	0.000%
37	-9.11	-31.37	-5.12	9.11	31.37	5.12	0.000%
38	-5.25	-31.37	-8.91	5.25	31.37	8.91	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00024165
3	Yes	5	0.00000001	0.00055614
4	Yes	5	0.00000001	0.00056174
5	Yes	4	0.00000001	0.00091067
6	Yes	5	0.00000001	0.00053066
7	Yes	5	0.00000001	0.00052416
8	Yes	4	0.00000001	0.00066469
9	Yes	5	0.00000001	0.00055379
10	Yes	5	0.00000001	0.00054979
11	Yes	4	0.00000001	0.00021511

12	Yes	5	0.00000001	0.00053653
13	Yes	5	0.00000001	0.00054244
14	Yes	4	0.00000001	0.00000001
15	Yes	5	0.00000001	0.00011361
16	Yes	5	0.00000001	0.00015648
17	Yes	5	0.00000001	0.00015830
18	Yes	5	0.00000001	0.00011523
19	Yes	5	0.00000001	0.00015117
20	Yes	5	0.00000001	0.00014902
21	Yes	5	0.00000001	0.00011247
22	Yes	5	0.00000001	0.00015613
23	Yes	5	0.00000001	0.00015728
24	Yes	5	0.00000001	0.00011589
25	Yes	5	0.00000001	0.00015371
26	Yes	5	0.00000001	0.00015316
27	Yes	4	0.00000001	0.00006122
28	Yes	5	0.00000001	0.00005150
29	Yes	5	0.00000001	0.00005278
30	Yes	4	0.00000001	0.00008657
31	Yes	5	0.00000001	0.00004770
32	Yes	5	0.00000001	0.00004628
33	Yes	4	0.00000001	0.00008371
34	Yes	5	0.00000001	0.00005129
35	Yes	5	0.00000001	0.00005074
36	Yes	4	0.00000001	0.00006052
37	Yes	5	0.00000001	0.00004851
38	Yes	5	0.00000001	0.00004944

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	147 - 133	40.986	35	2.2140	0.0012
L2	133 - 85.5	34.504	35	2.2040	0.0012
L3	89.25 - 42.75	15.717	35	1.7215	0.0007
L4	47.5 - 0	4.310	35	0.8463	0.0003

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
132.00	VHLP1-23	35	34.042	2.2011	0.0020	41530
130.00	APXV9ERR18-C-A20 w/ Mount Pipe	35	33.119	2.1939	0.0019	27182
121.00	(2) LPA-80080-6CF-EDIN w/ Mount Pipe	35	28.996	2.1414	0.0017	9524
119.00	RRH2X40-AWS	35	28.091	2.1254	0.0017	8313
111.00	(2) 7770.00 w/ Mount Pipe	35	24.537	2.0463	0.0014	5512
80.00	OG-860/1920/GPS-A	35	12.502	1.5421	0.0005	2733

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	147 - 133	117.822	10	6.3744	0.0034
L2	133 - 85.5	99.218	10	6.3457	0.0035
L3	89.25 - 42.75	45.261	10	4.9595	0.0017

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L4	47.5 - 0	12.425	10	2.4402	0.0007

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
132.00	VHLP1-23	10	97.891	6.3373	0.0045	14882
130.00	APXV9ERR18-C-A20 w/ Mount Pipe	10	95.241	6.3168	0.0044	9706
121.00	(2) LPA-80080-6CF-EDIN w/ Mount Pipe	10	83.404	6.1661	0.0040	3391
119.00	RRH2X40-AWS	10	80.806	6.1201	0.0038	2960
111.00	(2) 7770.00 w/ Mount Pipe	10	70.602	5.8929	0.0033	1960
80.00	OG-860/1920/GPS-A	10	36.013	4.4434	0.0016	962

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _v ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio $\frac{P}{P_a}$
L1	147 - 133 (1)	TP12.75x12.75x0.1875	14.00	0.00	0.0	21.000	7.3999	-0.30	155.40	0.002
L2	133 - 85.5 (2)	TP29.418x19.537x0.3125	47.50	0.00	0.0	39.000	28.5025	-10.40	1111.60	0.009
L3	85.5 - 42.75 (3)	TP37.687x27.4771x0.375	46.50	0.00	0.0	39.000	43.7949	-18.53	1708.00	0.011
L4	42.75 - 0 (4)	TP45.83x35.8941x0.4375	47.50	0.00	0.0	39.000	63.9467	-31.34	2493.92	0.013

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	147 - 133 (1)	TP12.75x12.75x0.1875	3.16	1.654	23.100	0.072	0.00	0.000	23.100	0.000
L2	133 - 85.5 (2)	TP29.418x19.537x0.3125	633.69	38.647	39.000	0.991	0.00	0.000	39.000	0.000
L3	85.5 - 42.75 (3)	TP37.687x27.4771x0.375	1620.4	50.195	39.000	1.287	0.00	0.000	39.000	0.000
L4	42.75 - 0 (4)	TP45.83x35.8941x0.4375	2964.8	50.221	39.000	1.288	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	147 - 133 (1)	TP12.75x12.75x0.1875	0.45	0.061	14.000	0.009	0.00	0.000	14.000	0.000
L2	133 - 85.5 (2)	TP29.418x19.537x0.3125	21.28	0.747	26.000	0.058	0.35	0.010	26.000	0.000
L3	85.5 - 42.75 (3)	TP37.687x27.4771x0.375	25.91	0.592	26.000	0.046	0.49	0.007	26.000	0.000

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L4	42.75 - 0 (4)	TP45.83x35.8941x0.4375	30.69	0.480	26.000	0.038	0.60	0.005	26.000	0.000

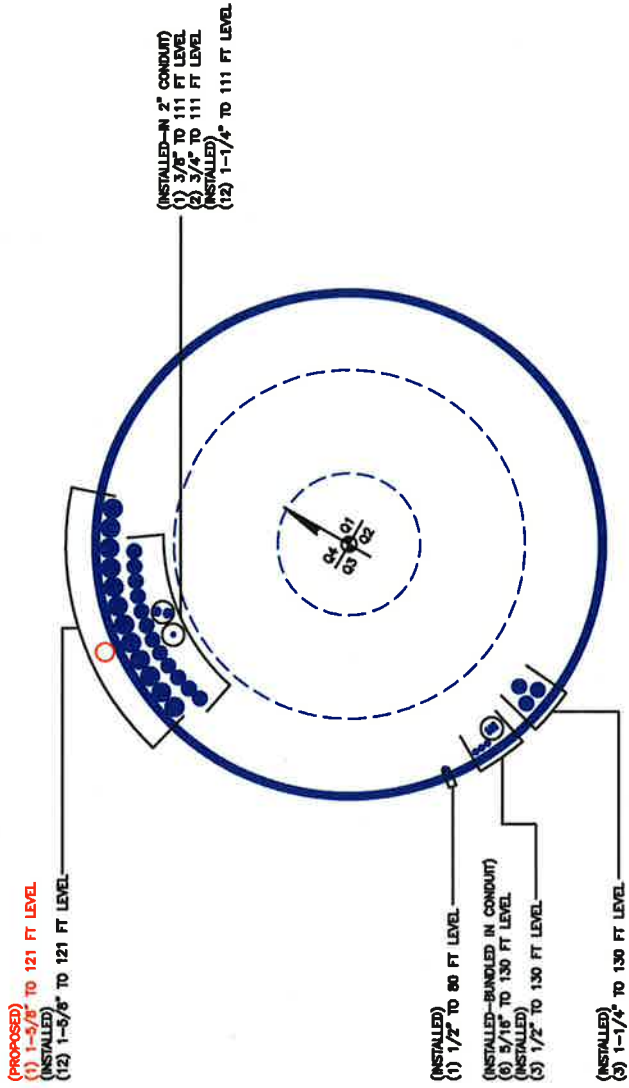
Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	147 - 133 (1)	0.002	0.072	0.000	0.009	0.000	0.074	1.333	H1-3+VT ✓
L2	133 - 85.5 (2)	0.009	0.991	0.000	0.058	0.000	1.001	1.333	H1-3+VT ✓
L3	85.5 - 42.75 (3)	0.011	1.287	0.000	0.046	0.000	1.298	1.333	H1-3+VT ✓
L4	42.75 - 0 (4)	0.013	1.288	0.000	0.038	0.000	1.301	1.333	H1-3+VT ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF \cdot P_{allow}$ K	% Capacity	Pass Fail
L1	147 - 133	Pole	TP12.75x12.75x0.1875	1	-0.30	207.15	5.5	Pass
L2	133 - 85.5	Pole	TP29.418x19.537x0.3125	2	-10.40	1481.76	75.1	Pass
L3	85.5 - 42.75	Pole	TP37.687x27.4771x0.375	3	-18.53	2276.76	97.4	Pass
L4	42.75 - 0	Pole	TP45.83x35.8941x0.4375	4	-31.34	3324.40	97.6	Pass
Summary								
Pole (L4)							97.6	Pass
RATING =							97.6	Pass

APPENDIX B
BASE LEVEL DRAWING



APPENDIX C
ADDITIONAL CALCULATIONS

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

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

Site Data

BU#: 876310	
Site Name: BEAUMONT FARM	
App #: 215510 Rev.2	
Anchor Rod Data	
Qty:	16
Diam:	2.25 in
Rod Material:	A615-J
Yield, Fy:	75 ksi
Strength, Fu:	100 ksi
Bolt Circle:	54 in
Anchor Spacing:	6 in

Plate Data

W=Side:	54 in
Thick:	3 in
Grade:	50 ksi
Clip Distance:	10 in

Stiffener Data (Welding at both sides)

Configuration:	Unstiffened
Weld Type:	**
Groove Depth:	in **
Groove Angle:	degrees
Fillet H. Weld:	<-- Disregard
Fillet V. Weld:	in
Width:	in
Height:	in
Thick:	in
Notch:	in
Grade:	ksi
Weld str.:	ksi

Pole Data

Diam:	45.83 in
Thick:	0.4375 in
Grade:	65 ksi
# of Sides:	12 "0" IF Round

Stress Increase Factor

ASD ASIF:	1.333
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** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Base Reactions

TIA Revision:	F	
Unfactored Moment, M:	2965	ft-kips
Unfactored Axial, P:	31	kips
Unfactored Shear, V:	31	kips

Anchor Rod Results

TIA F -> Maximum Rod Tension	162.8 Kips
Allowable Tension:	195.0 Kips
Anchor Rod Stress Ratio:	83.5% Pass

Base Plate Results

Base Plate Stress:	46.2 ksi	Flexural Check
Allowable PL Bending Stress:	50.0 ksi	
Base Plate Stress Ratio:	92.4% Pass	

PL Ref. Data

Yield Line (in):	30.54
Max PL Length:	30.54

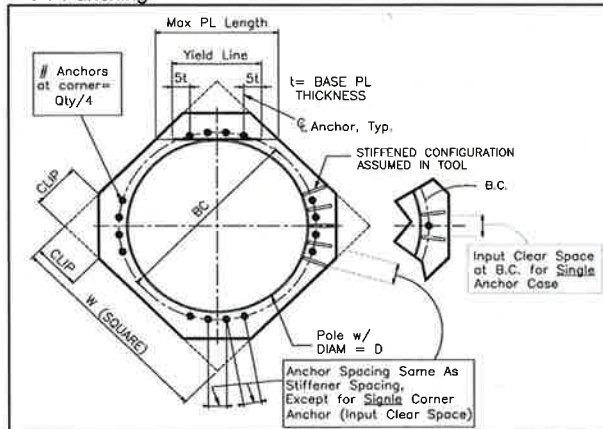
N/A - Unstiffened

Stiffener Results

Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, $f_b/F_b + (f_v/F_v)^2$:	N/A
Plate Tension+Shear, $f_t/F_t + (f_v/F_v)^2$:	N/A
Plate Comp. (AISC Bracket):	N/A

Pole Results

Pole Punching Shear Check:	N/A
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Monopole Block Foundation

Checks capacity of monolithic block foundation for a monopole tower, per TIA/EIA-222-F

BU #: 876310
 Site Name: BEAUMONT FARM
 App No.: 215510 Rev.2



Design Reactions	
Shear, S:	31.00 kips
Moment, M:	2965.00 ft*kips
Height, H:	147.00 ft
Weight, W:	31.00 kips
Base Diameter, BD:	45.8 in

Foundation Dimensions	
Depth, D:	4.5 ft
Block Width, W:	23.0 ft
Neglected Depth, N:	3.5 ft
Ext. Above Grade, E:	0.5 ft
Anchor Steel Length, Lst:	72.0 in
Clear Cover, cc:	3.0 in

Soil Properties	
Soil Unit Weight, γ	0.125 kcf
Allowable Bearing, Bc:	20.000 ksf
Int. Angle of Friction, Φ :	0.00 deg
Cohesion, Cc:	4.000 ksf
Passive Pressure, Pp:	0.000 kcf
Base Friction, μ :	0.4
Seismic Zone, z:	1

Material Properties	
Rebar Yield Strength, Fy:	60000 psi
Concrete Strength, F'c:	3000 psi
Concrete Density, &cc:	0.150 kcf

Rebar Properties	
Pad Rebar Size, sp:	11
Rebar Quantity, mp:	22
	10

Design Checks			
	Capacity/ Availability	Demands/ Limits	Check
Shear (ksf)	74.86	31.00	OK
Overturning (ft*kips)	3279.42	3120.00	OK
Bearing (ksf)	20.00	2.95	OK
Shear - 1-Way (kips)	1702.04	688.75	OK
Pad Rebar Area (in ²)	34.35	14.90	OK
Bar Spacing (in)	11.38	18 > Bs > 2	OK
Development Length (in)	135.00	60.24	OK



Modification Checks			
	Capacity/ Availability	Demands/ Limits	Check
Minimum Extra Thickness (in)	0.00	0.00	Not Used
Pad Rebar Area-short (in ²)	8.84	0.00	Not Used
Pad Rebar Area-long (in ²)	2.21	0.00	Not Used
Pad Rebar Spacing-short (in2)	13.42	18 > Bs > 2	Not Used
Pad Rebar Spacing-long (in2)	66.56	18 > Bs > 2	Not Used
End Cap Width (in)	0.00	0.00	Not Used
End Cap Rebar Area (in2)	4.81	0.00	Not Used
EC Rebar Spacing (in)	-1.73	18 > Bs > 2	Not Used
Tie Spacing (in)	13.71	270 > s > 4.5	Not Used
Dowel Area (in2)	8.84	0.00	Not Used
Dowel Embedment (in)	15.00	6.00	Not Used
Shear Strength of Cone (kips)	59.53	23.86	Not Used
Dowel Edge Distance (in)	12.00	14.51	Not Used
Dowel Spacing (in)	28.00	30.00	Not Used
Dowel Edge Distance (vert) (in)	30.00	14.51	Not Used
Dowel Devel. Length (in)	-3.00	15.38	Not Used

Modifications			
	End Cap Width, Wc:	Revised Width, Wx:	EC Rebar Size, Sec:
Pad Thickness, Te:	0 in	23 ft	7
Revised Pad Thickness, Tx:	5 ft	23 ft	7
Pad Rebar Size, Se:	6	7	8
Rebar Quantity (long), me:	20	8	4
Rebar Quantity (short), mex:	5	4	20
Dowel Size, Sed:	7	6	20
Dowel Quantity, med:	20	6	20
End Cap Width, Wc:	0 in	23 ft	7
Revised Width, Wx:	5 ft	23 ft	8
EC Rebar Size, Sec:	6	7	4
EC Rebar Quantity, mec:	20	8	20
EC Tie Size, Sect:	5	4	20
Tie Quantity, mecd:	7	6	20
EC Dowel Size, Secd:	20	6	20
Dowel Quantity, mecd:	20	6	20
Rows of Dowels, Nid:	2	2	15
Dowel Depth, decd:	15	15	12
Edge Distances, secd:	12	12	12