

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: siting.council@ct.gov

www.ct.gov/csc

December 27, 2013

Kenneth C. Baldwin, Esq.
Robinson & Cole LLP
280 Trumbull Street
Hartford, CT 06103

RE: **EM-VER-051-131209**– Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 281 Woodhouse Road, Fairfield, Connecticut.

Dear Attorney Baldwin:

The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the following conditions:

- Any deviation from the proposed modification as specified in this notice and supporting materials with the Council shall render this acknowledgement invalid;
- Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
- Within 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
- The validity of this action shall expire one year from the date of this letter; and
- The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration.

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated December 5, 2013. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Thank you for your attention and cooperation.

Very truly yours,

Melanie A. Bachman
Acting Executive Director

MAB/MP/jb

c: The Honorable Michael C. Tetreau, First Selectman, Town of Fairfield
Joseph E. Devonshuk, Town Planner, Town of Fairfield
Crown Castle

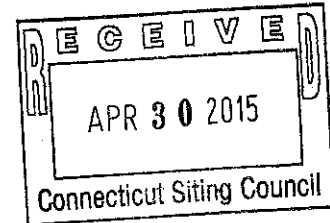


KENNETH C. BALDWIN

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kbaldwin@rc.com
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Also admitted in Massachusetts

April 27, 2015



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

Re: **EM-VER-033-140819 – 179 Shunpike Road, Cromwell, Connecticut**
EM-VER-033-131219 – 100 Berlin Road, Cromwell, Connecticut
EM-VER-054-130823 – 374 Three Mile Road, East Glastonbury, Connecticut
EM-VER-051-131209 – 281 Woodhouse Road, Fairfield, Connecticut
EM-VER-051-140218 – Congress Street, Fairfield, Connecticut
EM-VER-052-140828 – Rattlesnake Mountain, Farmington, Connecticut
EM-VER-057-150108 – 5 Perryridge Road, Greenwich, Connecticut
EM-VER-057-140224 – 411 West Putnam Avenue, Greenwich, Connecticut
EM-VER-060-140429 – 1919 Boston Post Road, Guilford, Connecticut
EM-VER-061-140708 – 539 Plains Road, Haddam, Connecticut

Completion of Construction Activity

Dear Ms. Bachman:

The purpose of this letter is to notify the Siting Council that construction activity associated with the above-referenced Cellco Partnership d/b/a Verizon Wireless telecommunications facilities has been completed.

If you have any questions or need any additional information regarding these facilities please do not hesitate to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "Kenneth C. Baldwin".

Kenneth C. Baldwin

Copy to:
Tim Parks

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Also admitted in Massachusetts

December 5, 2013

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

Re: **Notice of Exempt Modification – Facility Modification**
281 Woodhouse Road, Fairfield, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless (“Cellco”) currently maintains twelve (12) wireless telecommunications antennas at the 158-foot level on the existing 171-foot tower at the above-referenced address. The tower is owned by Crown Castle. The Council approved Cellco’s use of this tower in 1988. Cellco now intends to add three (3) model BXA-171063-12CF AWS antennas at the 158-foot level on the tower, for a total of fifteen (15) antennas. Cellco also intends to install three (3) remote radio heads (“RRHs”) behind its AWS antennas and one (1) HYBRIFLEX™ antenna cable. Included in Attachment 1 are specifications for the replacement antennas, RRHs and HYBRIFLEX™ cable.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Fairfield’s First Selectman, Michael C. Tetreau. A copy of this letter is being sent to Ranjan and Moitrayee Ghosh, the owners of the property where the tower is located.

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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12593483-v1

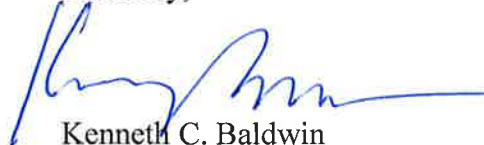
ROBINSON & COLE_{LLP}

Melanie A. Bachman
December 5, 2013
Page 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 158-foot level on the 171-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 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 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:

Michael C. Tetreau, First Selectman
Ranjan and Moitrayee Ghosh
Sandy M. Carter



ATTACHMENT 1

BXA-171063-12CF-EDIN-X

X-Pol | FET Panel | 63° | 19.0 dBi

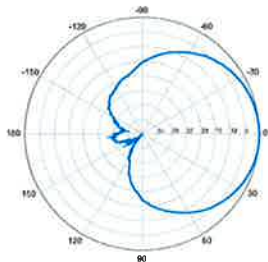
Replace "X" with desired electrical downtilt

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

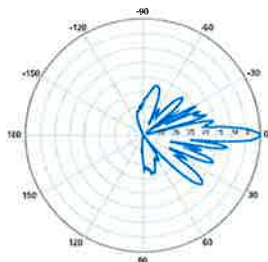


Electrical Characteristics	1710-2170 MHz			
Frequency bands	1710-1880 MHz	1850-1990 MHz	1920-2170 MHz	
Polarization	±45°	±45°	±45°	
Horizontal beamwidth	68°	65°	60°	
Vertical beamwidth	4.5°	4.5°	4.5°	
Gain	16.1 dBd / 18.2 dBi	16.5 dBd / 18.6 dBi	16.9 dBd / 19.0 dBi	
Electrical downtilt (X)	0, 2, 5			
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

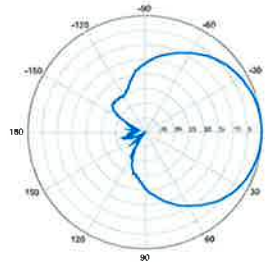


Horizontal | 1710-1880 MHz
BXA-171063-12CF-EDIN-0

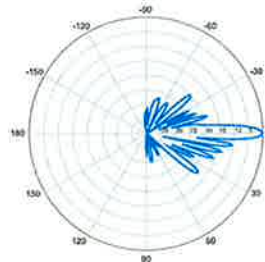


0° | Vertical | 1710-1880 MHz

BXA-171063-12CF-EDIN-X

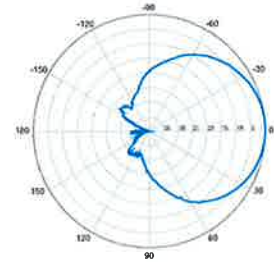


Horizontal | 1850-1990 MHz
BXA-171063-12CF-EDIN-0

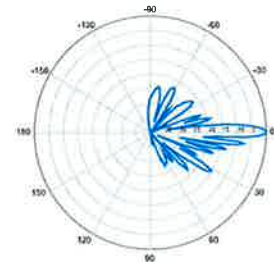


0° | Vertical | 1850-1990 MHz

BXA-171063-12CF-EDIN-X



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



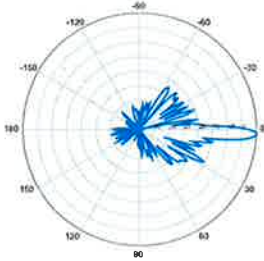
0° | Vertical | 1920-2170 MHz

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-171063-12CF-EDIN-X

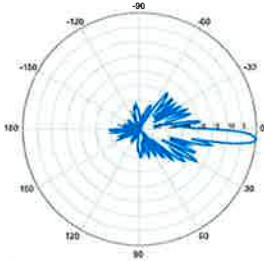
X-Pol | FET Panel | 63° | 19.0 dBi

BXA-171063-12CF-EDIN-2



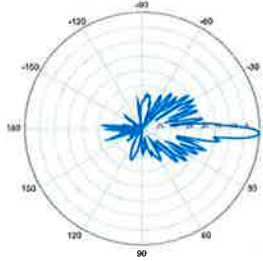
2° | Vertical | 1710-1880 MHz

BXA-171063-12CF-EDIN-5



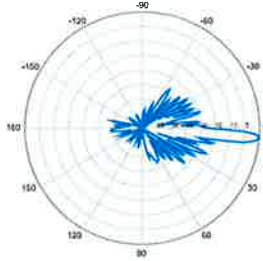
5° | Vertical | 1710-1880 MHz

BXA-171063-12CF-EDIN-2



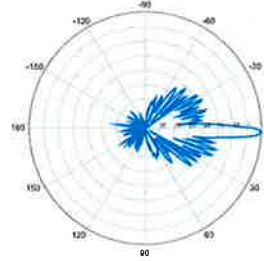
2° | Vertical | 1850-1990 MHz

BXA-171063-12CF-EDIN-5



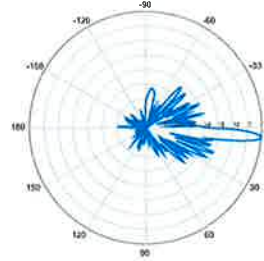
5° | Vertical | 1850-1990 MHz

BXA-171063-12CF-EDIN-2



2° | Vertical | 1920-2170 MHz

BXA-171063-12CF-EDIN-5



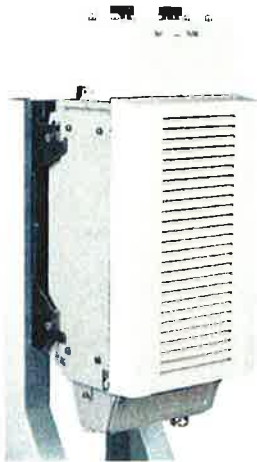
5° | Vertical | 1920-2170 MHz

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.

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

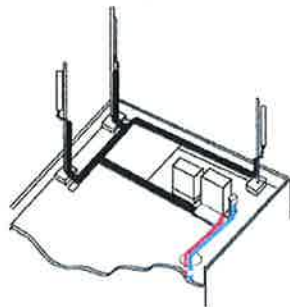
capital expenditures (CAPEX) and low operating expenditures (OPEX). The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment or require costly cranes to be employed, leaving coverage holes. However, many of these sites can host an Alcatel-Lucent 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

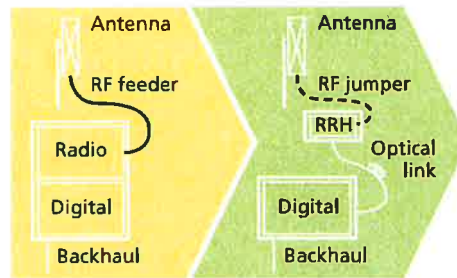
Because of its small size and weight, the Alcatel-Lucent RRH2x40-AWS can be installed close to the antenna. Operators can therefore locate the Alcatel-Lucent RRH2x40-AWS where RF engineering is deemed ideal, minimizing trade-offs between available sites and RF optimum sites. The RF feeder cost and installation 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.



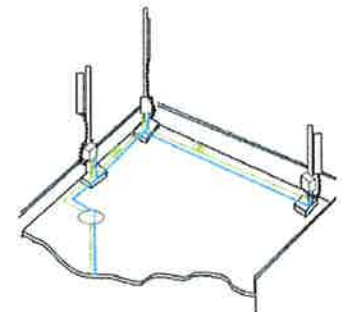
Macro

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



Distributed

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

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

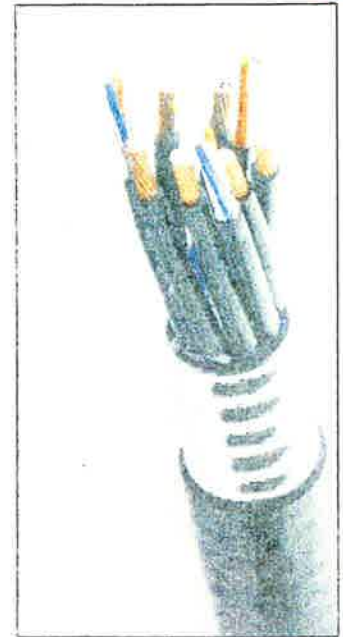


Figure 1: HYBRIFLEX Series

Technical Specifications

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
Physical 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)]	068 (0.205)
DC-Resistance Power Cable: 8.4mm ² (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)			UL94-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 XHHW-2, UL 44 UL-LS Limited Smoke, UL YW-1 IEEE-383 (1974), IEEE1202/FT4 RoHS Compliant
Temperature			
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

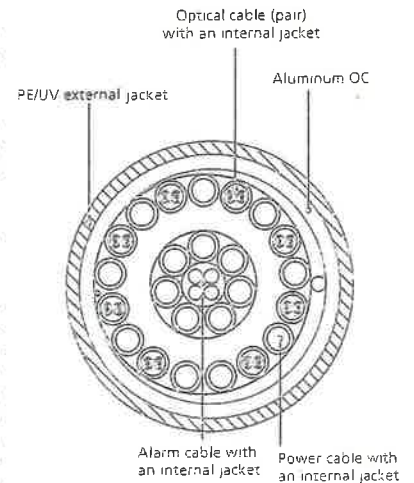


Figure 2: Construction Detail

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

ATTACHMENT 2

Site Name: Fairfield Tower Height: Verizon @ 158ft		General		Power		Density					
CARRIER	# OF CHAN.	WATTS ERP	HEIGHT	CALC. POWER DENS	FREQ.	MAX. PERMISS. EXP.	FRACTION MPE	Total			
*AT&T UMTS	1	500	150	0.0080	880	0.5867	1.36%				
*AT&T UMTS	2	500	150	0.0160	1900	1.0000	1.60%				
*AT&T GSM	10	296	150	0.0473	880	0.5867	8.06%				
*AT&T GSM	3	427	150	0.0205	1900	1.0000	2.05%				
*AT&T LTE	1	500	150	0.0080	740	0.4933	1.62%				
*Clearwire	2	153	128	0.0067	2496	1.0000	0.67%				
*Clearwire	1	211	132	0.0044	23 GHz	1.0000	0.44%				
*PageNet			120	0.0116	940.0875	0.6267	1.85%				
*T-Mobile GSM/UMTS	2	12	140	0.0004	1950	1.0000	0.04%				
*T-Mobile UMTS	2	12	140	0.0004	2100	1.0000	0.04%				
*T-Mobile LTE	2	24	140	0.0009	2100	1.0000	0.09%				
*XM Radio	2	4197	128	0.1842	2337.49	1.0000	18.42%				
*Metricom			100	0.0002	920	0.6133	0.03%				
Verizon PCS	15	397	158	0.0858	1970	1.0000	8.58%				
Verizon Cellular	9	301	158	0.0390	869	0.5793	6.74%				
Verizon AWS	1	1750	158	0.0252	2145	1.0000	2.52%				
Verizon 700	1	658	158	0.0095	698	0.4653	2.04%				56.15%
* Source: Siting Council											

ATTACHMENT 3

October 24, 2013

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



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

Subject: **Structural Analysis Report**

Carrier Designation: **Verizon Wireless Co-Locate**
Carrier Site Number: N/A
Carrier Site Name: Fairfield, CT

Crown Castle Designation: **Crown Castle BU Number:** 806355
Crown Castle Site Name: BRG 126 943086
Crown Castle JDE Job Number: 246094
Crown Castle Work Order Number: 659640
Crown Castle Application Number: 200500 Rev. 2

Engineering Firm Designation: **B+T Group Project Number:** 80964.001.01

Site Data: **281 WOODHOUSE ROAD, FAIRFIELD, Fairfield County, CT**
Latitude 41° 11' 45.3", Longitude -73° 16' 52.9"
171 Foot - Monopole Tower

Dear Ms. Harris,

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 588417, in accordance with application 200500, revision 2.

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

LC7: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table 1 and Table 2 for the proposed and existing/reserved loading, respectively.

The analysis has been performed in accordance with the TIA/EIA-222-F standard and 2005 CT State Building Code 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.

Venu Ambati
Project Engineer

Chad E. Tuttle, P.E.
President



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1) INTRODUCTION

This tower is a 171 ft. Monopole tower designed by Engineered Endeavors, Inc. in May of 1998. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-E&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 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
155.0	159.0	3	Alcatel Lucent	RRH2X40-AWS	1	1-5/8	--
	158.0	3	Antel	BXA-171063/12CF			
		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
166.0	167.0	3	Ems Wireless	DR90-14-00DPL2	6	1-5/8	4
	166.0	1	--	Pipe Mount [PM 601-3]			
155.0	160.0	1	Gps	GPS_A	12	1/2 1-5/8	1
	158.0	3	Andrew	LNx-6514DS-T4M			
		6	Decibel	DB844G65ZAXY			
		1	Rfs Celwave	FD9R6004/2C-3L			
		3	RymSa Wireless	MG D3-800TV			
	155.0	5	Rfs Celwave	FD9R6004/2C-3L			
		1	--	Platform Mount [LP 602-1]			
1	Rfs Celwave	FD9R6004/2C-3L	--	--	3		
146.0	149.0	1	Raycap	DC6-48-60-18-8F	12	5/8 3/8 1-5/8	1
	148.0	3	Ericsson	RRUS-11			
		6	Powerwave	7770.00			
		12	Powerwave	LGP2140X			
		3	Powerwave	P65-16-XLH-RR			
146.0	1	--	Platform Mount [LP 602-1]				
138.0	140.0	3	Ericsson	ERICSSON AIR 21 B2A B4P	1	1 5/8	2
		3	Ericsson	ERICSSON AIR 21 B4A B2P			
		3	Ericsson	KRY 112 144/1			
	138.0	1	--	Platform Mount [LP 602-1]	--	--	1
128.0	128.0	1	Andrew	VHLP800-11	12	1-5/8	1
		3	Kathrein	840 10054			
		1	--	Side Arm Mount [SO 101-3]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
118.0	118.0	1	--	Side Arm Mount [SO 301-1]	--	--	4
		2	--	Side Arm Mount [SO 702-1]			
		1	--	T-Arm Mount [TA 602-1]			

Notes:

- 1) Existing Equipment
- 2) Reserved Equipment
- 3) **Equipment To Be Removed**
- 4) Abounded Equipment 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)
160	160	12	Allgon	ALP 9212	--	--
148	148	12	Allgon	ALP 11011	--	--
138	138	6	Celwave	APN 199015	--	--
128	128	12	Allgon	ALP 9212	--	--
118	118	12	Allgon	ALP 9212	--	--

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Online Application	Verizon Wireless Co-Locate Revision:2	200500	CCI Sites
Tower Manufacturer Drawings	EEl, Inc., Job N0:3761	653293	CCI Sites
Previous Analysis	Crown; Project # 546208	3363325	CCI Sites
Tower Foundation Drawings	EEl, Inc., Project No:3761	1098364	CCI Sites
Geotech Reports	Clarence Welti Assoc., Inc. Date:05/15/1998	1099974	CCI Sites
Antenna Configuration	Crown CAD Package	Date:10/11/2013	CCI Sites

3.1) Analysis Method

TnxTower (version 6.1.3.1), 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	171 - 156.5	Pole	TP10.75x10.75x0.365	1	-0.731	333.349	14.5	Pass	
L2	156.5 - 156	Pole	TP19.5x10.75x0.365	2	-0.731	625.462	8.5	Pass	
L3	156 - 132.669	Pole	TP24.79x19.5x0.188	3	-6.828	735.449	73.8	Pass	
L4	132.669 - 87.0859	Pole	TP34.63x23.584x0.375	4	-15.256	2052.540	91.9	Pass	
L5	87.0859 - 43	Pole	TP43.75x32.796x0.438	5	-26.279	3029.762	94.6	Pass	
L6	43 - 0	Pole	TP52.5x41.531x0.5	6	-36.993	3955.811	87.9	Pass	
							Summary		
							Pole (L5)	94.6	Pass
							RATING =	94.6	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	Base	79.0	Pass
1	Base Plate	Base	95.6	Pass
1	Base Foundation	Base	91.6	Pass
1	Flange Bolts & Plate	156	28.2	Pass

Structure Rating (max from all components) =	95.6%
---	--------------

Notes:

- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
- 2) Capacities up to 100% are considered acceptable based on analysis methods used.

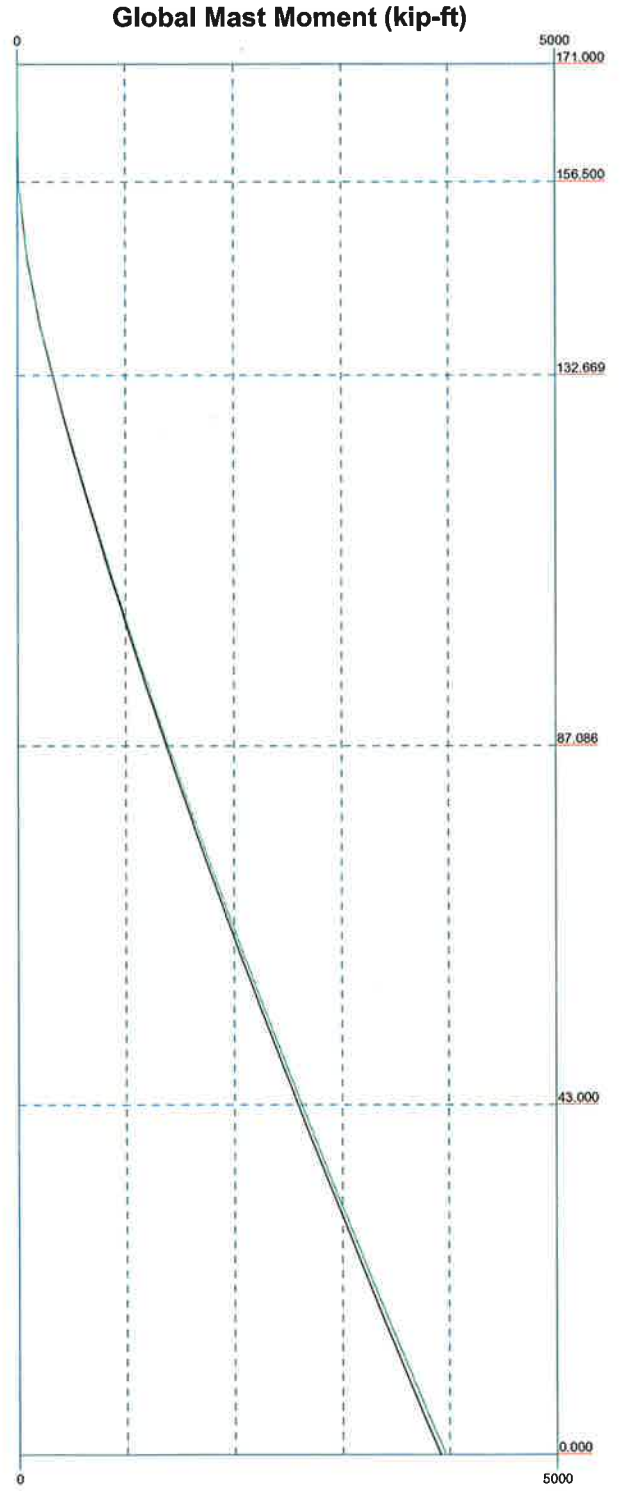
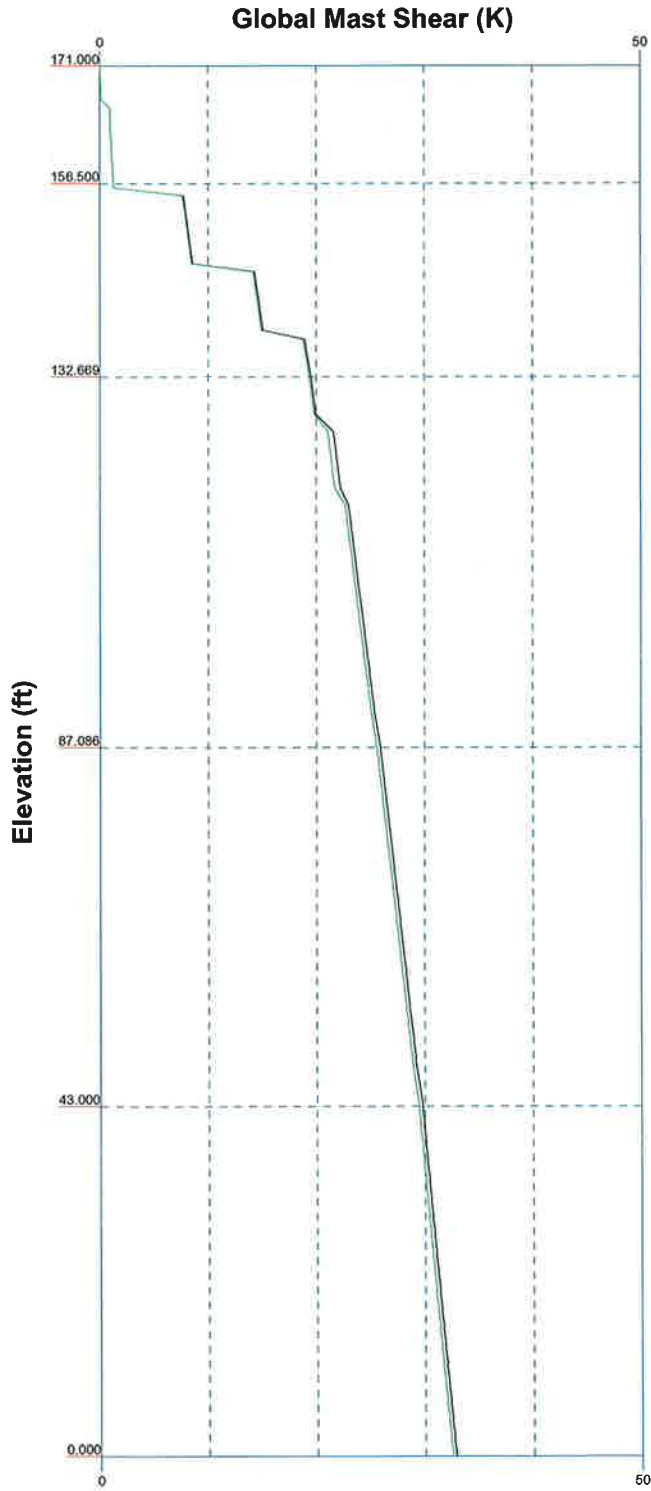
4.1) Recommendations

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

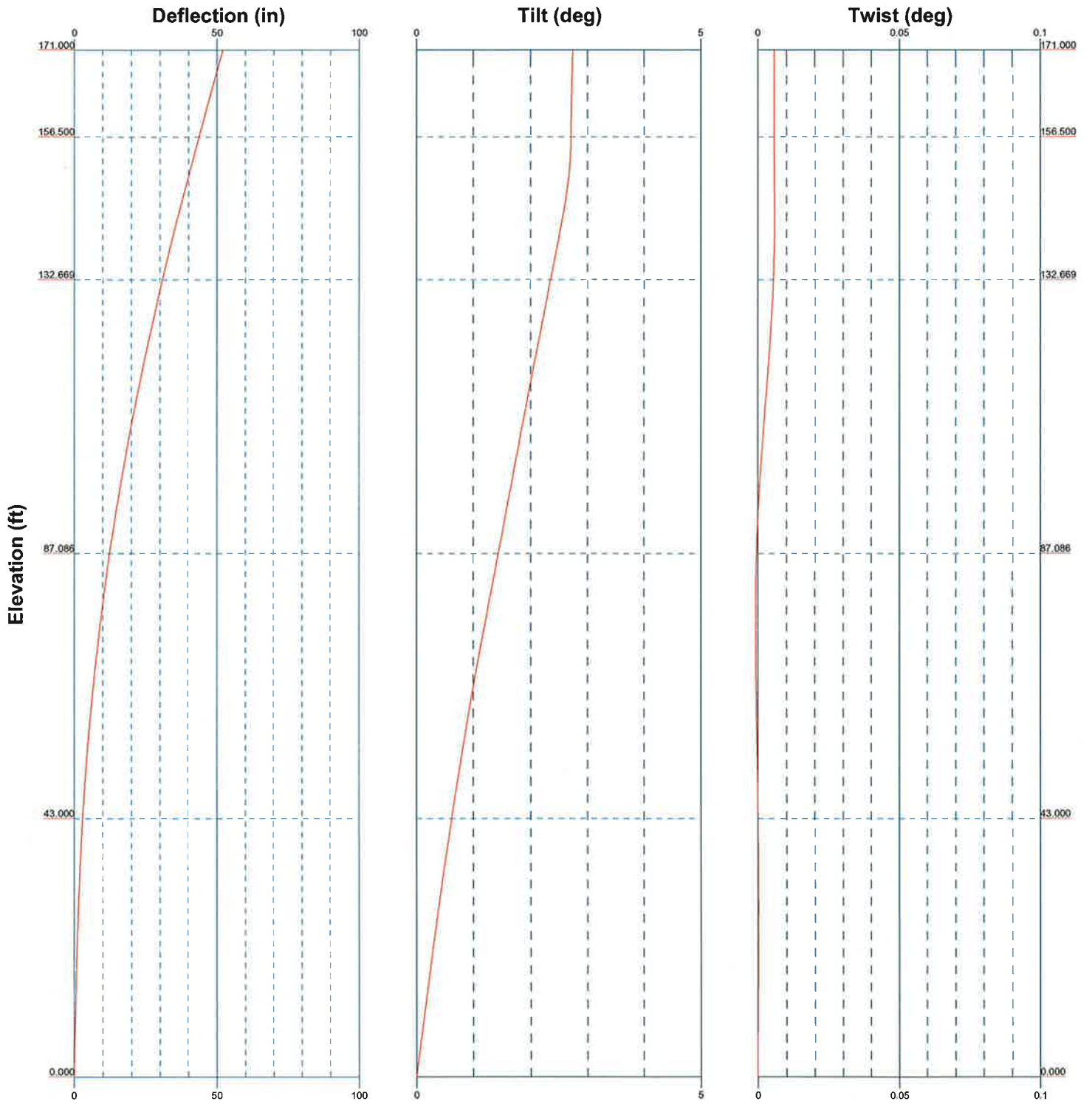
APPENDIX A
TNXTOWER OUTPUT


Vx Vz

Mx Mz



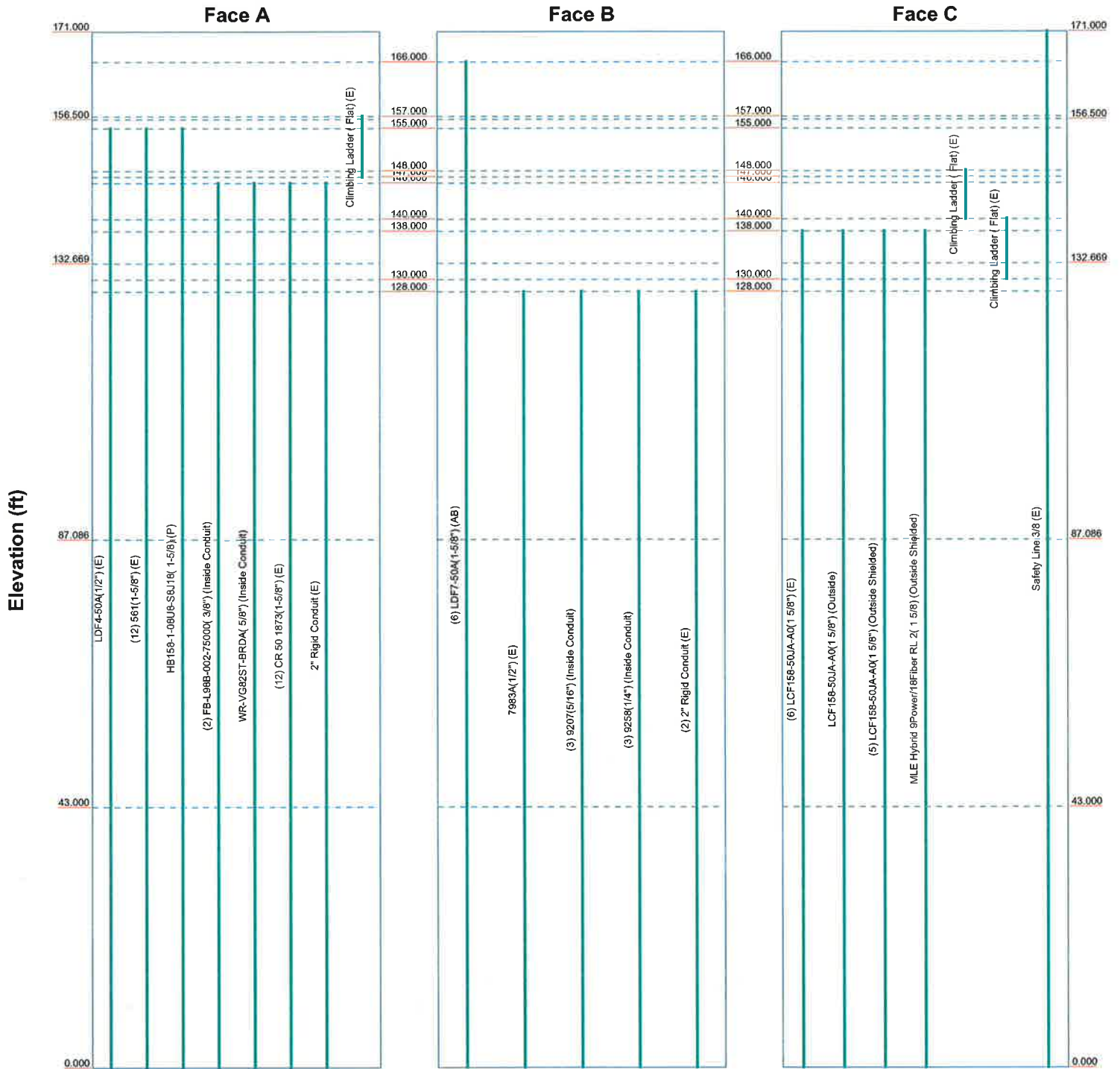
 <p>B+T Group 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265</p>	Job: 80964.001.01 - BRG 126943086, CT (BU# 80635)		
	Project:		
	Client: Crown Castle	Drawn by: VenuAmbati	App'd:
	Code: TIA/EIA-222-F	Date: 10/24/13	Scale: NTS
Path:		Dwg No. E-4	



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Project:			
Client: Crown Castle	Drawn by: VenuAmbati	App'd:	
Code: TIA/EIA-222-F	Date: 10/24/13	Scale: NTS	
Path:	Dwg No. E-5		

Feed Line Distribution Chart 0' - 171'

— Round
 — Flat
 — App In Face
 — App Out Face
 — Truss Log



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	Project:		
	Client: Crown Castle	Drawn by: VenuAmbati	App'd:
	Code: TIA/EIA-222-F	Date: 10/24/13	Scale: NTS
	Path:		Dwg No. E-7

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	Client Crown Castle	Designed by VenuAmbati

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 Fairfield County, Connecticut.

Basic wind speed of 85 mph.

Nominal ice thickness of 0.750 in.

Ice thickness is considered to increase with height.

Ice density of 56.000 pcf.

A wind speed of 38 mph is used in combination with ice.

Temperature drop of 50.000 °F.

Deflections calculated using a wind speed of 50 mph.

A non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

Stress ratio used in pole design is 1.333.

Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	Elevation 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	171.000-156.500	14.500	0.000	Round	10.750	10.750	0.365		A53-B-35 (35 ksi)
L2	156.500-156.000	0.500	0.000	18	10.750	19.500	0.365	1.460	A572-65 (65 ksi)
L3	156.000-132.669	23.331	3.667	18	19.500	24.790	0.188	0.750	A572-65 (65 ksi)
L4	132.669-87.086	49.250	4.833	18	23.584	34.630	0.375	1.500	A572-65 (65 ksi)
L5	87.086-43.000	48.919	6.000	18	32.796	43.750	0.438	1.750	A572-65

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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 (65 ksi) A572-65 (65 ksi)
L6	43.000-0.000	49.000		18	41.531	52.500	0.500	2.000	

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
L1	10.750	11.908	160.659	3.676	5.375	29.890	320.880	5.951	0.000	0
	10.750	11.908	160.659	3.676	5.375	29.890	320.880	5.951	0.000	0
L2	10.916	12.031	163.929	3.687	5.461	30.018	328.074	6.017	1.250	3.424
	19.801	22.168	1025.469	6.793	9.906	103.520	2052.288	11.086	2.790	7.643
L3	19.801	11.493	541.578	6.856	9.906	54.672	1083.869	5.748	3.102	16.544
	25.172	14.642	1119.653	8.734	12.593	88.908	2240.779	7.322	4.033	21.51
L4	24.783	27.624	1879.852	8.239	11.980	156.910	3762.178	13.815	3.491	9.309
	35.164	40.772	6044.321	12.161	17.592	343.583	12096.596	20.390	5.435	14.493
L5	34.401	44.934	5944.077	11.487	16.660	356.780	11895.976	22.471	5.002	11.433
	44.425	60.145	14254.835	15.376	22.225	641.387	28528.426	30.078	6.930	15.84
L6	43.536	65.117	13850.506	14.566	21.098	656.485	27719.236	32.565	6.430	12.859
	53.310	82.524	28191.904	18.460	26.670	1057.064	56420.904	41.270	8.360	16.72

Tower Elevation ft	Gusset Area (per face) ft ²	Gusset Thickness in	Gusset Grade	Adjust. Factor A _f	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontal in
L1 171.000-156.500				1	1	1		
L2 156.500-156.000				1	1	1		
L3 156.000-132.669				1	1	1		
L4 132.669-87.086				1	1	1		
L5 87.086-43.000				1	1	1		
L6 43.000-0.000				1	1	1		

Feed Line/Linear Appurtenances - Entered As Round Or Flat

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

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Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	C _A A _A ft ² /ft	Weight klf	
LDF7-50A(1-5/8") (AB)	B	No	Inside Pole	166.000 - 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
/										
LDF4-50A(1/2") (E)	A	No	Inside Pole	155.000 - 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
561(1-5/8") (E)	A	No	Inside Pole	155.000 - 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
HB158-1-08U 8-S8J18(1-5/8) (P)	A	No	CaAa (Out Of Face)	155.000 - 0.000	0.000	0	1	No Ice	0.198	0.001
								1/2" Ice	0.298	0.003
								1" Ice	0.398	0.005
								2" Ice	0.598	0.011
								4" Ice	0.998	0.031
/										
FB-L98B-002-75000(3/8") (Inside Conduit)	A	No	Inside Pole	146.000 - 0.000	0.000	0	2	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-VG82ST-BRDA(5/8") (Inside Conduit)	A	No	Inside Pole	146.000 - 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
CR 50 1873(1-5/8") (E)	A	No	Inside Pole	146.000 - 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
2" Rigid Conduit (E)	A	No	Inside Pole	146.000 - 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
/										
LCF158-50JA-A0(1 5/8") (E)	C	No	Inside Pole	138.000 - 0.000	0.000	0	6	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
LCF158-50JA-A0(1 5/8") (Outside)	C	No	CaAa (Out Of Face)	138.000 - 0.000	0.000	0	1	No Ice	0.198	0.000
								1/2" Ice	0.298	0.002
								1" Ice	0.398	0.004
								2" Ice	0.598	0.010
								4" Ice	0.998	0.029
LCF158-50JA-A0(1 5/8") (Outside Shielded)	C	No	CaAa (Out Of Face)	138.000 - 0.000	0.000	0	5	No Ice	0.000	0.000
								1/2" Ice	0.000	0.002
								1" Ice	0.000	0.004
								2" Ice	0.000	0.010
								4" Ice	0.000	0.029

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	Client Crown Castle	Designed by VenuAmbati

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#		C _{AA} ft ² /ft	Weight klf
MLE Hybrid 9Power/18Fiber er RL 2(1 5/8) (Outside Shielded) *//*/	C	No	CaAa (Out Of Face)	138.000 - 0.000	0.000	0	1	No Ice	0.000	0.001
								1/2" Ice	0.000	0.002
								1" Ice	0.000	0.004
								2" Ice	0.000	0.010
								4" Ice	0.000	0.029
7983A(1/2") (E)	B	No	Inside Pole	128.000 - 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
9207(5/16") (Inside Conduit)	B	No	Inside Pole	128.000 - 0.000	0.000	0	3	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
9258(1/4") (Inside Conduit)	B	No	Inside Pole	128.000 - 0.000	0.000	0	3	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
2" Rigid Conduit (E)	B	No	Inside Pole	128.000 - 0.000	0.000	0	2	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
/// Climbing Ladder (Flat) (E)	A	No	CaAa (Out Of Face)	157.000 - 147.000	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
Climbing Ladder (Flat) (E)	C	No	CaAa (Out Of Face)	148.000 - 140.000	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
Climbing Ladder (Flat) (E)	C	No	CaAa (Out Of Face)	140.000 - 130.000	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
/// Safety Line 3/8 (E)	C	No	CaAa (Out Of Face)	171.000 - 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
///										

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	171.000-156.500	A	0.000	0.000	0.000	0.292	0.002
		B	0.000	0.000	0.000	0.000	0.047
		C	0.000	0.000	0.000	0.544	0.003

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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
L2	156.500-156.000	A	0.000	0.000	0.000	0.292	0.002
		B	0.000	0.000	0.000	0.000	0.002
		C	0.000	0.000	0.000	0.019	0.000
L3	156.000-132.669	A	0.000	0.000	0.000	9.681	0.613
		B	0.000	0.000	0.000	0.000	0.115
		C	0.000	0.000	0.000	10.890	0.090
L4	132.669-87.086	A	0.000	0.000	0.000	9.025	1.406
		B	0.000	0.000	0.000	0.000	0.535
		C	0.000	0.000	0.000	12.295	0.115
L5	87.086-43.000	A	0.000	0.000	0.000	8.729	1.359
		B	0.000	0.000	0.000	0.000	0.551
		C	0.000	0.000	0.000	10.382	0.099
L6	43.000-0.000	A	0.000	0.000	0.000	8.514	1.326
		B	0.000	0.000	0.000	0.000	0.538
		C	0.000	0.000	0.000	10.127	0.097

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} In Face ft ²	C_{AA} Out Face ft ²	Weight K
L1	171.000-156.500	A	0.909	0.000	0.000	0.000	0.697	0.005
		B		0.000	0.000	0.000	0.000	0.047
		C		0.000	0.000	0.000	3.180	0.017
L2	156.500-156.000	A	0.904	0.000	0.000	0.000	0.695	0.005
		B		0.000	0.000	0.000	0.000	0.002
		C		0.000	0.000	0.000	0.109	0.001
L3	156.000-132.669	A	0.895	0.000	0.000	0.000	20.859	0.728
		B		0.000	0.000	0.000	0.000	0.115
		C		0.000	0.000	0.000	28.252	0.303
L4	132.669-87.086	A	0.866	0.000	0.000	0.000	17.184	1.551
		B		0.000	0.000	0.000	0.000	0.535
		C		0.000	0.000	0.000	30.742	1.173
L5	87.086-43.000	A	0.813	0.000	0.000	0.000	16.361	1.495
		B		0.000	0.000	0.000	0.000	0.551
		C		0.000	0.000	0.000	25.645	1.070
L6	43.000-0.000	A	0.750	0.000	0.000	0.000	15.506	1.448
		B		0.000	0.000	0.000	0.000	0.538
		C		0.000	0.000	0.000	24.111	0.975

Feed Line Center of Pressure

Section	Elevation ft	CP_x in	CP_z in	CP_x Ice in	CP_z Ice in
L1	171.000-156.500	-0.046	-0.002	-0.194	0.063
L2	156.500-156.000	-0.033	-0.568	-0.118	-0.802
L3	156.000-132.669	-0.428	-0.158	-0.735	-0.154
L4	132.669-87.086	-0.288	-0.083	-0.577	-0.047
L5	87.086-43.000	-0.270	-0.106	-0.564	-0.090
L6	43.000-0.000	-0.276	-0.109	-0.575	-0.095

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Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA}		Weight	
			Horz	Lateral			Front	Side		
			ft	ft	°	ft	ft ²	ft ²	K	
DR90-14-00DPL2 (AB)	A	From Leg	1.000		0.000	166.000	No Ice	4.356	1.974	0.018
			0.000				1/2" Ice	4.775	2.312	0.040
			1.000				1" Ice	5.202	2.658	0.067
							2" Ice	6.084	3.371	0.136
							4" Ice	7.951	4.888	0.335
DR90-14-00DPL2 (AB)	B	From Leg	1.000		0.000	166.000	No Ice	4.356	1.974	0.018
			0.000				1/2" Ice	4.775	2.312	0.040
			1.000				1" Ice	5.202	2.658	0.067
							2" Ice	6.084	3.371	0.136
							4" Ice	7.951	4.888	0.335
DR90-14-00DPL2 (AB)	C	From Leg	1.000		0.000	166.000	No Ice	4.356	1.974	0.018
			0.000				1/2" Ice	4.775	2.312	0.040
			1.000				1" Ice	5.202	2.658	0.067
							2" Ice	6.084	3.371	0.136
							4" Ice	7.951	4.888	0.335
Pipe Mount [PM 601-3] (AB)	C	None			0.000	166.000	No Ice	4.390	4.390	0.195
							1/2" Ice	5.480	5.480	0.237
							1" Ice	6.570	6.570	0.280
							2" Ice	8.750	8.750	0.365
							4" Ice	13.110	13.110	0.534
/// (2) DB844G65ZAXY w/ Mount Pipe (E)	A	From Leg	4.000		0.000	155.000	No Ice	4.904	4.921	0.034
			0.000				1/2" Ice	5.346	5.596	0.080
			3.000				1" Ice	5.797	6.284	0.132
							2" Ice	6.731	7.712	0.257
							4" Ice	8.735	10.833	0.617
DB844G65ZAXY w/ Mount Pipe (E)	B	From Leg	4.000		0.000	155.000	No Ice	4.904	4.921	0.034
			0.000				1/2" Ice	5.346	5.596	0.080
			3.000				1" Ice	5.797	6.284	0.132
							2" Ice	6.731	7.712	0.257
							4" Ice	8.735	10.833	0.617
(3) DB844G65ZAXY w/ Mount Pipe (E)	C	From Leg	4.000		0.000	155.000	No Ice	4.904	4.921	0.034
			0.000				1/2" Ice	5.346	5.596	0.080
			3.000				1" Ice	5.797	6.284	0.132
							2" Ice	6.731	7.712	0.257
							4" Ice	8.735	10.833	0.617
LNX-6514DS-T4M w/ Mount Pipe (E)	A	From Leg	4.000		0.000	155.000	No Ice	8.568	7.004	0.058
			0.000				1/2" Ice	9.220	8.185	0.127
			3.000				1" Ice	9.838	9.081	0.203
							2" Ice	11.104	10.904	0.384
							4" Ice	13.754	14.926	0.889
LNX-6514DS-T4M w/ Mount Pipe (E)	B	From Leg	4.000		0.000	155.000	No Ice	8.568	7.004	0.058
			0.000				1/2" Ice	9.220	8.185	0.127
			3.000				1" Ice	9.838	9.081	0.203
							2" Ice	11.104	10.904	0.384
							4" Ice	13.754	14.926	0.889
LNX-6514DS-T4M w/ Mount Pipe (E)	C	From Leg	4.000		0.000	155.000	No Ice	8.568	7.004	0.058
			0.000				1/2" Ice	9.220	8.185	0.127
			3.000				1" Ice	9.838	9.081	0.203
							2" Ice	11.104	10.904	0.384
							4" Ice	13.754	14.926	0.889
MG D3-800TV w/ Mount	A	From Leg	4.000		0.000	155.000	No Ice	3.570	3.418	0.037

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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
Pipe (E)			0.000 3.000			1/2" Ice 3.979 1" Ice 4.387 2" Ice 5.325 4" Ice 7.341	4.119 4.784 6.164 9.175	0.071 0.111 0.210 0.520
MG D3-800TV w/ Mount Pipe (E)	B	From Leg	4.000 0.000 3.000	0.000	155.000	No Ice 3.570 1/2" Ice 3.979 1" Ice 4.387 2" Ice 5.325 4" Ice 7.341	3.418 4.119 4.784 6.164 9.175	0.037 0.071 0.111 0.210 0.520
MG D3-800TV w/ Mount Pipe (E)	C	From Leg	4.000 0.000 3.000	0.000	155.000	No Ice 3.570 1/2" Ice 3.979 1" Ice 4.387 2" Ice 5.325 4" Ice 7.341	3.418 4.119 4.784 6.164 9.175	0.037 0.071 0.111 0.210 0.520
GPS_A (E)	A	From Leg	4.000 0.000 5.000	0.000	155.000	No Ice 0.297 1/2" Ice 0.374 1" Ice 0.459 2" Ice 0.655 4" Ice 1.151	0.297 0.374 0.459 0.655 1.151	0.001 0.005 0.010 0.025 0.079
(2) FD9R6004/2C-3L (E)	A	From Leg	4.000 0.000 0.000	0.000	155.000	No Ice 0.367 1/2" Ice 0.451 1" Ice 0.543 2" Ice 0.755 4" Ice 1.281	0.085 0.136 0.196 0.343 0.740	0.003 0.005 0.009 0.020 0.063
FD9R6004/2C-3L (E)	B	From Leg	4.000 0.000 0.000	0.000	155.000	No Ice 0.367 1/2" Ice 0.451 1" Ice 0.543 2" Ice 0.755 4" Ice 1.281	0.085 0.136 0.196 0.343 0.740	0.003 0.005 0.009 0.020 0.063
(2) FD9R6004/2C-3L (E)	C	From Leg	4.000 0.000 0.000	0.000	155.000	No Ice 0.367 1/2" Ice 0.451 1" Ice 0.543 2" Ice 0.755 4" Ice 1.281	0.085 0.136 0.196 0.343 0.740	0.003 0.005 0.009 0.020 0.063
FD9R6004/2C-3L (E)	C	From Leg	4.000 0.000 3.000	0.000	155.000	No Ice 0.367 1/2" Ice 0.451 1" Ice 0.543 2" Ice 0.755 4" Ice 1.281	0.085 0.136 0.196 0.343 0.740	0.003 0.005 0.009 0.020 0.063
BXA-171063/12CF w/ Mount Pipe (P)	A	From Leg	4.000 0.000 3.000	0.000	155.000	No Ice 5.029 1/2" Ice 5.583 1" Ice 6.103 2" Ice 7.166 4" Ice 9.438	5.289 6.459 7.348 9.148 12.947	0.041 0.087 0.140 0.273 0.677
BXA-171063/12CF w/ Mount Pipe (P)	B	From Leg	4.000 0.000 3.000	0.000	155.000	No Ice 5.029 1/2" Ice 5.583 1" Ice 6.103 2" Ice 7.166 4" Ice 9.438	5.289 6.459 7.348 9.148 12.947	0.041 0.087 0.140 0.273 0.677
BXA-171063/12CF w/ Mount Pipe (P)	C	From Leg	4.000 0.000 3.000	0.000	155.000	No Ice 5.029 1/2" Ice 5.583 1" Ice 6.103 2" Ice 7.166 4" Ice 9.438	5.289 6.459 7.348 9.148 12.947	0.041 0.087 0.140 0.273 0.677
RRH2X40-AWS w/ Mount Pipe (P)	A	From Leg	4.000 0.000 4.000	0.000	155.000	No Ice 3.180 1/2" Ice 3.501 1" Ice 3.834	2.287 2.725 3.181	0.056 0.084 0.116

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA}		Weight K	
						Front ft ²	Side ft ²		
						2" Ice	4.535	4.147	0.196
						4" Ice	6.125	6.474	0.437
						No Ice	3.180	2.287	0.056
						1/2" Ice	3.501	2.725	0.084
						1" Ice	3.834	3.181	0.116
						2" Ice	4.535	4.147	0.196
						4" Ice	6.125	6.474	0.437
RRH2X40-AWS w/ Mount Pipe (P)	B	From Leg	4.000 0.000 4.000	0.000	155.000	No Ice	3.180	2.287	0.056
						1/2" Ice	3.501	2.725	0.084
						1" Ice	3.834	3.181	0.116
						2" Ice	4.535	4.147	0.196
						4" Ice	6.125	6.474	0.437
RRH2X40-AWS w/ Mount Pipe (P)	C	From Leg	4.000 0.000 4.000	0.000	155.000	No Ice	3.180	2.287	0.056
						1/2" Ice	3.501	2.725	0.084
						1" Ice	3.834	3.181	0.116
						2" Ice	4.535	4.147	0.196
						4" Ice	6.125	6.474	0.437
DB-T1-6Z-8AB-0Z (P)	B	From Leg	4.000 0.000 3.000	0.000	155.000	No Ice	5.600	2.333	0.044
						1/2" Ice	5.915	2.558	0.080
						1" Ice	6.240	2.791	0.120
						2" Ice	6.914	3.284	0.213
						4" Ice	8.365	4.373	0.455
Platform Mount [LP 602-1] (E)	C	None		0.000	155.000	No Ice	32.030	32.030	1.343
						1/2" Ice	38.710	38.710	1.800
						1" Ice	45.390	45.390	2.257
						2" Ice	58.750	58.750	3.170
						4" Ice	85.470	85.470	4.998
/////									
P65-16-XLH-RR w/ Mount Pipe (E)	A	From Leg	4.000 0.000 2.000	0.000	146.000	No Ice	8.637	6.362	0.079
						1/2" Ice	9.290	7.538	0.144
						1" Ice	9.910	8.427	0.218
						2" Ice	11.176	10.239	0.393
						4" Ice	13.829	14.099	0.886
P65-16-XLH-RR w/ Mount Pipe (E)	B	From Leg	4.000 0.000 2.000	0.000	146.000	No Ice	8.637	6.362	0.079
						1/2" Ice	9.290	7.538	0.144
						1" Ice	9.910	8.427	0.218
						2" Ice	11.176	10.239	0.393
						4" Ice	13.829	14.099	0.886
P65-16-XLH-RR w/ Mount Pipe (E)	C	From Leg	4.000 0.000 2.000	0.000	146.000	No Ice	8.637	6.362	0.079
						1/2" Ice	9.290	7.538	0.144
						1" Ice	9.910	8.427	0.218
						2" Ice	11.176	10.239	0.393
						4" Ice	13.829	14.099	0.886
(2) 7770.00 w/ Mount Pipe (E)	A	From Leg	4.000 0.000 2.000	0.000	146.000	No Ice	6.119	4.254	0.055
						1/2" Ice	6.626	5.014	0.103
						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 2.000	0.000	146.000	No Ice	6.119	4.254	0.055
						1/2" Ice	6.626	5.014	0.103
						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 2.000	0.000	146.000	No Ice	6.119	4.254	0.055
						1/2" Ice	6.626	5.014	0.103
						1" Ice	7.128	5.711	0.157
						2" Ice	8.164	7.155	0.287
						4" Ice	10.360	10.412	0.665
(4) LGP2140X (E)	A	From Leg	4.000 0.000 2.000	0.000	146.000	No Ice	1.260	0.378	0.014
						1/2" Ice	1.416	0.493	0.021
						1" Ice	1.581	0.617	0.030
						2" Ice	1.936	0.890	0.055

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz	Vert						
			ft	ft	°	ft	ft ²	ft ²	K	
(4) LGP2140X (E)	B	From Leg	4.000		0.000	146.000	4" Ice	2.750	1.541	0.135
			0.000				No Ice	1.260	0.378	0.014
			2.000				1/2" Ice	1.416	0.493	0.021
							1" Ice	1.581	0.617	0.030
							2" Ice	1.936	0.890	0.055
(4) LGP2140X (E)	C	From Leg	4.000		0.000	146.000	4" Ice	2.750	1.541	0.135
			0.000				No Ice	1.260	0.378	0.014
			2.000				1/2" Ice	1.416	0.493	0.021
							1" Ice	1.581	0.617	0.030
							2" Ice	1.936	0.890	0.055
RRUS-11 (E)	A	From Leg	4.000		0.000	146.000	4" Ice	2.750	1.541	0.135
			0.000				No Ice	4.424	1.186	0.055
			2.000				1/2" Ice	4.708	1.351	0.081
							1" Ice	5.001	1.526	0.110
							2" Ice	5.613	1.900	0.179
RRUS-11 (E)	B	From Leg	4.000		0.000	146.000	4" Ice	6.940	2.753	0.368
			0.000				No Ice	4.424	1.186	0.055
			2.000				1/2" Ice	4.708	1.351	0.081
							1" Ice	5.001	1.526	0.110
							2" Ice	5.613	1.900	0.179
RRUS-11 (E)	C	From Leg	4.000		0.000	146.000	4" Ice	6.940	2.753	0.368
			0.000				No Ice	4.424	1.186	0.055
			2.000				1/2" Ice	4.708	1.351	0.081
							1" Ice	5.001	1.526	0.110
							2" Ice	5.613	1.900	0.179
DC6-48-60-18-8F (E)	A	From Leg	4.000		0.000	146.000	4" Ice	6.940	2.753	0.368
			0.000				No Ice	2.567	4.317	0.019
			3.000				1/2" Ice	2.798	4.596	0.050
							1" Ice	3.038	4.885	0.085
							2" Ice	3.543	5.488	0.167
6' x 2" Mount Pipe (E)	A	From Leg	4.000		0.000	146.000	4" Ice	4.658	6.797	0.383
			0.000				No Ice	1.425	1.425	0.022
			0.000				1/2" Ice	1.925	1.925	0.033
							1" Ice	2.294	2.294	0.048
							2" Ice	3.060	3.060	0.090
6' x 2" Mount Pipe (E)	B	From Leg	4.000		0.000	146.000	4" Ice	4.702	4.702	0.231
			0.000				No Ice	1.425	1.425	0.022
			0.000				1/2" Ice	1.925	1.925	0.033
							1" Ice	2.294	2.294	0.048
							2" Ice	3.060	3.060	0.090
6' x 2" Mount Pipe (E)	C	From Leg	4.000		0.000	146.000	4" Ice	4.702	4.702	0.231
			0.000				No Ice	1.425	1.425	0.022
			0.000				1/2" Ice	1.925	1.925	0.033
							1" Ice	2.294	2.294	0.048
							2" Ice	3.060	3.060	0.090
Platform Mount [LP 602-1] (E)	C	None			0.000	146.000	4" Ice	4.702	4.702	0.231
							No Ice	32.030	32.030	1.343
							1/2" Ice	38.710	38.710	1.800
							1" Ice	45.390	45.390	2.257
							2" Ice	58.750	58.750	3.170
//// ERICSSON AIR 21 B2A B4P w/ Mount Pipe (R)	A	From Leg	4.000		0.000	138.000	4" Ice	85.470	85.470	4.998
			0.000				No Ice	6.825	5.642	0.112
			2.000				1/2" Ice	7.347	6.480	0.169
							1" Ice	7.863	7.257	0.233
							2" Ice	8.926	8.864	0.383
		4" Ice	11.175	12.293	0.807					

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	Client	Crown Castle	Designed by	VenuAmbati

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz	Lateral						ft
					°	ft	ft ²	ft ²	K	
ERICSSON AIR 21 B2A B4P w/ Mount Pipe (R)	B	From Leg	4.000	0.000	0.000	138.000	No Ice	6.825	5.642	0.112
			0.000	0.000			1/2" Ice	7.347	6.480	0.169
			2.000	0.000			1" Ice	7.863	7.257	0.233
							2" Ice	8.926	8.864	0.383
							4" Ice	11.175	12.293	0.807
ERICSSON AIR 21 B2A B4P w/ Mount Pipe (R)	C	From Leg	4.000	0.000	0.000	138.000	No Ice	6.825	5.642	0.112
			0.000	0.000			1/2" Ice	7.347	6.480	0.169
			2.000	0.000			1" Ice	7.863	7.257	0.233
							2" Ice	8.926	8.864	0.383
							4" Ice	11.175	12.293	0.807
ERICSSON AIR 21 B4A B2P w/ Mount Pipe (R)	A	From Leg	4.000	0.000	0.000	138.000	No Ice	6.825	5.642	0.112
			0.000	0.000			1/2" Ice	7.347	6.480	0.169
			2.000	0.000			1" Ice	7.863	7.257	0.233
							2" Ice	8.926	8.864	0.383
							4" Ice	11.175	12.293	0.807
ERICSSON AIR 21 B4A B2P w/ Mount Pipe (R)	B	From Leg	4.000	0.000	0.000	138.000	No Ice	6.825	5.642	0.112
			0.000	0.000			1/2" Ice	7.347	6.480	0.169
			2.000	0.000			1" Ice	7.863	7.257	0.233
							2" Ice	8.926	8.864	0.383
							4" Ice	11.175	12.293	0.807
ERICSSON AIR 21 B4A B2P w/ Mount Pipe (R)	C	From Leg	4.000	0.000	0.000	138.000	No Ice	6.825	5.642	0.112
			0.000	0.000			1/2" Ice	7.347	6.480	0.169
			2.000	0.000			1" Ice	7.863	7.257	0.233
							2" Ice	8.926	8.864	0.383
							4" Ice	11.175	12.293	0.807
KRY 112 144/1 (R)	A	From Leg	4.000	0.000	0.000	138.000	No Ice	0.408	0.204	0.011
			0.000	0.000			1/2" Ice	0.497	0.273	0.014
			2.000	0.000			1" Ice	0.594	0.351	0.019
							2" Ice	0.815	0.533	0.032
							4" Ice	1.359	0.999	0.082
KRY 112 144/1 (R)	B	From Leg	4.000	0.000	0.000	138.000	No Ice	0.408	0.204	0.011
			0.000	0.000			1/2" Ice	0.497	0.273	0.014
			2.000	0.000			1" Ice	0.594	0.351	0.019
							2" Ice	0.815	0.533	0.032
							4" Ice	1.359	0.999	0.082
KRY 112 144/1 (R)	C	From Leg	4.000	0.000	0.000	138.000	No Ice	0.408	0.204	0.011
			0.000	0.000			1/2" Ice	0.497	0.273	0.014
			2.000	0.000			1" Ice	0.594	0.351	0.019
							2" Ice	0.815	0.533	0.032
							4" Ice	1.359	0.999	0.082
6' x 2" Mount Pipe (E)	A	From Leg	4.000	0.000	0.000	138.000	No Ice	1.425	1.425	0.022
			0.000	0.000			1/2" Ice	1.925	1.925	0.033
			0.000	0.000			1" Ice	2.294	2.294	0.048
							2" Ice	3.060	3.060	0.090
							4" Ice	4.702	4.702	0.231
6' x 2" Mount Pipe (E)	B	From Leg	4.000	0.000	0.000	138.000	No Ice	1.425	1.425	0.022
			0.000	0.000			1/2" Ice	1.925	1.925	0.033
			0.000	0.000			1" Ice	2.294	2.294	0.048
							2" Ice	3.060	3.060	0.090
							4" Ice	4.702	4.702	0.231
6' x 2" Mount Pipe (E)	C	From Leg	4.000	0.000	0.000	138.000	No Ice	1.425	1.425	0.022
			0.000	0.000			1/2" Ice	1.925	1.925	0.033
			0.000	0.000			1" Ice	2.294	2.294	0.048
							2" Ice	3.060	3.060	0.090
							4" Ice	4.702	4.702	0.231
Platform Mount [LP 602-1] (E)	C	None			0.000	138.000	No Ice	32.030	32.030	1.343
							1/2" Ice	38.710	38.710	1.800

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz	Lateral						ft
							1" Ice	45.390	45.390	2.257
							2" Ice	58.750	58.750	3.170
							4" Ice	85.470	85.470	4.998
////										
840 10054 w/ Mount Pipe (E)	A	From Leg	2.000	0.000	128.000	No Ice	5.413	2.385	0.051	
			0.000			1/2" Ice	5.833	2.917	0.088	
			0.000			1" Ice	6.263	3.466	0.129	
						2" Ice	7.156	4.614	0.230	
						4" Ice	9.093	7.316	0.533	
840 10054 w/ Mount Pipe (E)	B	From Leg	2.000	0.000	128.000	No Ice	5.413	2.385	0.051	
			0.000			1/2" Ice	5.833	2.917	0.088	
			0.000			1" Ice	6.263	3.466	0.129	
						2" Ice	7.156	4.614	0.230	
						4" Ice	9.093	7.316	0.533	
840 10054 w/ Mount Pipe (E)	C	From Leg	2.000	0.000	128.000	No Ice	5.413	2.385	0.051	
			0.000			1/2" Ice	5.833	2.917	0.088	
			0.000			1" Ice	6.263	3.466	0.129	
						2" Ice	7.156	4.614	0.230	
						4" Ice	9.093	7.316	0.533	
6' x 2" Mount Pipe (E)	B	From Leg	2.000	0.000	128.000	No Ice	1.425	1.425	0.022	
			0.000			1/2" Ice	1.925	1.925	0.033	
			0.000			1" Ice	2.294	2.294	0.048	
						2" Ice	3.060	3.060	0.090	
						4" Ice	4.702	4.702	0.231	
Side Arm Mount [SO 101-3] (E)	C	None		0.000	128.000	No Ice	7.500	7.500	0.252	
						1/2" Ice	8.900	8.900	0.333	
						1" Ice	10.300	10.300	0.414	
						2" Ice	13.100	13.100	0.576	
						4" Ice	18.700	18.700	0.900	
////										
T-Arm Mount [TA 602-1] (AB)	A	From Leg	2.000	0.000	118.000	No Ice	7.280	3.020	0.258	
			0.000			1/2" Ice	9.520	4.200	0.330	
			0.000			1" Ice	11.760	5.380	0.402	
						2" Ice	16.240	7.740	0.546	
						4" Ice	25.200	12.460	0.834	
Side Arm Mount [SO 301-1] (AB)	B	From Leg	4.000	0.000	118.000	No Ice	1.000	0.900	0.023	
			0.000			1/2" Ice	1.390	1.420	0.033	
			0.000			1" Ice	1.780	1.940	0.042	
						2" Ice	2.560	2.980	0.061	
						4" Ice	4.120	5.060	0.100	
Side Arm Mount [SO 702-1] (AB)	B	From Leg	2.000	0.000	118.000	No Ice	1.000	1.430	0.027	
			0.000			1/2" Ice	1.000	2.050	0.038	
			0.000			1" Ice	1.000	2.670	0.049	
						2" Ice	1.000	3.910	0.071	
						4" Ice	1.000	6.390	0.115	
Side Arm Mount [SO 702-1] (AB)	C	From Leg	2.000	0.000	118.000	No Ice	1.000	1.430	0.027	
			0.000			1/2" Ice	1.000	2.050	0.038	
			0.000			1" Ice	1.000	2.670	0.049	
						2" Ice	1.000	3.910	0.071	
						4" Ice	1.000	6.390	0.115	
(3) 6' x 2" Mount Pipe (AB)	A	From Leg	4.000	0.000	118.000	No Ice	1.425	1.425	0.022	
			0.000			1/2" Ice	1.925	1.925	0.033	
			0.000			1" Ice	2.294	2.294	0.048	
						2" Ice	3.060	3.060	0.090	
						4" Ice	4.702	4.702	0.231	
6' x 2" Mount Pipe (AB)	C	From Leg	4.000	0.000	118.000	No Ice	1.425	1.425	0.022	
			0.000			1/2" Ice	1.925	1.925	0.033	

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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 ²	ft ²	K
			0.000		1" Ice	2.294	2.294	0.048
					2" Ice	3.060	3.060	0.090
					4" Ice	4.702	4.702	0.231
////								

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	3 dB Beam Width	Elevation	Outside Diameter	Aperture Area	Weight	
				ft	°	°	ft	ft	ft ²	K	
VHLP800-11 (E)	B	Paraboloid w/o Radome	From Leg	2.000 0.000 0.000	-36.000		128.000	2.917	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.681 7.069 7.456 8.230 9.779	0.022 0.058 0.094 0.167 0.312
////											

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

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Comb. No.	Description
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	171 - 156.5	Pole	Max Tension	36	0.000	-0.000	-0.000
			Max. Compression	14	-1.304	0.010	-0.001
			Max. Mx	11	-0.731	10.926	0.003
			Max. My	2	-0.733	0.007	10.916
			Max. Vy	11	-1.219	10.926	0.003
			Max. Vx	2	-1.218	0.007	10.916
			Max. Torque	20			-0.003
			Max Tension	1	0.000	0.000	0.000
L2	156.5 - 156	Pole	Max. Compression	14	-1.350	0.010	0.002
			Max. Mx	11	-0.760	11.545	0.005
			Max. My	2	-0.762	0.008	11.535
			Max. Vy	11	-1.258	11.545	0.005
			Max. Vx	2	-1.257	0.008	11.535
			Max. Torque	21			-0.003
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-16.502	0.884	0.186
L3	156 - 132.669	Pole	Max. Mx	11	-6.828	260.726	1.227
			Max. My	2	-6.878	1.320	257.628
			Max. Vy	11	-19.066	260.726	1.227
			Max. Vx	2	-18.892	1.320	257.628
			Max. Torque	3			1.828
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-27.955	1.828	1.164
			Max. Mx	11	-15.256	1271.037	2.800
L4	132.669 - 87.0859	Pole	Max. My	2	-15.305	1.821	1253.800
			Max. Vy	11	-25.361	1271.037	2.800
			Max. Vx	8	25.046	0.875	-1252.149
			Max. Torque	3			1.850
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-41.054	3.241	0.655
			Max. Mx	11	-26.279	2444.135	2.972
			Max. My	2	-26.303	1.827	2413.072
L5	87.0859 - 43	Pole	Max. Vy	11	-29.185	2444.135	2.972
			Max. Vx	8	28.873	3.944	-2411.593
			Max. Torque	3			1.604
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-60.393	5.084	-0.007
			Max. Mx	11	-43.064	3966.977	3.118
			Max. My	2	-43.065	1.811	3920.446
			Max. Vy	11	-32.884	3966.977	3.118
L6	43 - 0	Pole	Max. Vx	8	32.583	7.411	-3919.166
			Max. Torque	3			1.715

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
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Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	24	60.393	8.404	0.002
	Max. H _x	11	43.091	32.849	0.002
	Max. H _z	2	43.091	-0.004	32.543
	Max. M _x	2	3920.446	-0.004	32.543
	Max. M _z	5	3944.182	-32.683	-0.055
	Max. Torsion	3	1.715	-16.264	28.206
	Min. Vert	1	43.091	0.000	0.000
	Min. H _x	5	43.091	-32.683	-0.055
	Min. H _z	8	43.091	0.067	-32.549
	Min. M _x	8	-3919.166	0.067	-32.549
	Min. M _z	11	-3966.977	32.849	0.002
	Min. Torsion	10	-1.617	28.486	-16.196

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	43.091	0.000	0.000	-0.983	0.416	0.000
Dead+Wind 0 deg - No Ice	43.091	0.004	-32.543	-3920.446	1.811	-1.334
Dead+Wind 30 deg - No Ice	43.091	16.264	-28.206	-3397.423	-1960.058	-1.715
Dead+Wind 60 deg - No Ice	43.091	28.253	-16.288	-1961.232	-3408.042	-1.589
Dead+Wind 90 deg - No Ice	43.091	32.683	0.055	8.091	-3944.182	-1.230
Dead+Wind 120 deg - No Ice	43.091	28.284	16.372	1973.522	-3413.874	-0.615
Dead+Wind 150 deg - No Ice	43.091	16.395	28.226	3399.832	-1980.644	0.539
Dead+Wind 180 deg - No Ice	43.091	-0.067	32.549	3919.166	7.411	1.198
Dead+Wind 210 deg - No Ice	43.091	-16.639	28.148	3387.678	2010.662	1.474
Dead+Wind 240 deg - No Ice	43.091	-28.486	16.196	1946.990	3439.662	1.617
Dead+Wind 270 deg - No Ice	43.091	-32.849	-0.002	-3.118	3966.977	0.840
Dead+Wind 300 deg - No Ice	43.091	-28.553	-16.210	-1954.097	3450.334	-0.345
Dead+Wind 330 deg - No Ice	43.091	-16.706	-28.175	-3395.054	2022.616	-1.306
Dead+Ice+Temp	60.393	-0.000	-0.004	0.007	5.084	-0.000
Dead+Wind 0 deg+Ice+Temp	60.393	-0.001	-8.362	-1053.218	5.885	-0.449
Dead+Wind 30 deg+Ice+Temp	60.393	4.166	-7.246	-912.410	-519.716	-0.538
Dead+Wind 60 deg+Ice+Temp	60.393	7.235	-4.183	-526.439	-907.199	-0.473
Dead+Wind 90 deg+Ice+Temp	60.393	8.368	0.013	2.351	-1050.525	-0.321
Dead+Wind 120 deg+Ice+Temp	60.393	7.243	4.204	530.198	-908.840	-0.098
Dead+Wind 150 deg+Ice+Temp	60.393	4.197	7.252	913.741	-524.867	0.233
Dead+Wind 180 deg+Ice+Temp	60.393	-0.013	8.363	1053.381	6.453	0.425
Dead+Wind 210 deg+Ice+Temp	60.393	-4.247	7.233	910.709	541.228	0.488
Dead+Wind 240 deg+Ice+Temp	60.393	-7.285	4.163	523.738	924.510	0.475
Dead+Wind 270 deg+Ice+Temp	60.393	-8.404	-0.002	-0.803	1065.884	0.229
Dead+Wind 300 deg+Ice+Temp	60.393	-7.301	-4.169	-525.455	927.225	-0.116
Dead+Wind 330 deg+Ice+Temp	60.393	-4.264	-7.241	-912.245	544.466	-0.401
Dead+Wind 0 deg - Service	43.091	0.001	-11.283	-1363.889	0.919	-0.465
Dead+Wind 30 deg - Service	43.091	5.639	-9.779	-1182.031	-681.261	-0.603
Dead+Wind 60 deg - Service	43.091	9.795	-5.647	-682.653	-1184.761	-0.563

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Load Combination	Vertical K	Shear _x K	Shear _y K	Overturning Moment, M _x kip-ft	Overturning Moment, M _y kip-ft	Torque kip-ft
Dead+Wind 90 deg - Service	43.091	11.331	0.019	2.117	-1371.200	-0.436
Dead+Wind 120 deg - Service	43.091	9.806	5.676	685.549	-1186.807	-0.216
Dead+Wind 150 deg - Service	43.091	5.684	9.786	1181.512	-688.416	0.193
Dead+Wind 180 deg - Service	43.091	-0.023	11.285	1362.067	2.854	0.427
Dead+Wind 210 deg - Service	43.091	-5.769	9.759	1177.292	699.391	0.523
Dead+Wind 240 deg - Service	43.091	-9.876	5.615	676.347	1196.320	0.567
Dead+Wind 270 deg - Service	43.091	-11.389	-0.001	-1.774	1379.703	0.291
Dead+Wind 300 deg - Service	43.091	-9.899	-5.620	-680.207	1200.043	-0.125
Dead+Wind 330 deg - Service	43.091	-5.791	-9.768	-1181.250	703.553	-0.461

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	-43.091	0.000	0.000	43.091	0.000	0.000%
2	0.004	-43.091	-32.543	-0.004	43.091	32.543	0.000%
3	16.264	-43.091	-28.206	-16.264	43.091	28.206	0.000%
4	28.253	-43.091	-16.288	-28.253	43.091	16.288	0.000%
5	32.683	-43.091	0.055	-32.683	43.091	-0.055	0.000%
6	28.284	-43.091	16.372	-28.284	43.091	-16.372	0.000%
7	16.395	-43.091	28.226	-16.395	43.091	-28.226	0.000%
8	-0.067	-43.091	32.549	0.067	43.091	-32.549	0.000%
9	-16.639	-43.091	28.148	16.639	43.091	-28.148	0.000%
10	-28.486	-43.091	16.196	28.486	43.091	-16.196	0.000%
11	-32.849	-43.091	-0.002	32.849	43.091	0.002	0.000%
12	-28.553	-43.091	-16.210	28.553	43.091	16.210	0.000%
13	-16.706	-43.091	-28.175	16.706	43.091	28.175	0.000%
14	0.000	-60.393	0.000	0.000	60.393	0.004	0.007%
15	-0.001	-60.393	-8.362	0.001	60.393	8.362	0.000%
16	4.166	-60.393	-7.246	-4.166	60.393	7.246	0.000%
17	7.235	-60.393	-4.183	-7.235	60.393	4.183	0.000%
18	8.368	-60.393	0.013	-8.368	60.393	-0.013	0.000%
19	7.243	-60.393	4.204	-7.243	60.393	-4.204	0.000%
20	4.197	-60.393	7.252	-4.197	60.393	-7.252	0.000%
21	-0.013	-60.393	8.363	0.013	60.393	-8.363	0.000%
22	-4.247	-60.393	7.233	4.247	60.393	-7.233	0.000%
23	-7.285	-60.393	4.163	7.285	60.393	-4.163	0.000%
24	-8.404	-60.393	-0.002	8.404	60.393	0.002	0.000%
25	-7.301	-60.393	-4.169	7.301	60.393	4.169	0.000%
26	-4.264	-60.393	-7.241	4.264	60.393	7.241	0.000%
27	0.001	-43.091	-11.283	-0.001	43.091	11.283	0.000%
28	5.639	-43.091	-9.779	-5.639	43.091	9.779	0.000%
29	9.795	-43.091	-5.647	-9.795	43.091	5.647	0.000%
30	11.331	-43.091	0.019	-11.331	43.091	-0.019	0.000%
31	9.806	-43.091	5.676	-9.806	43.091	-5.676	0.000%
32	5.684	-43.091	9.786	-5.684	43.091	-9.786	0.000%
33	-0.023	-43.091	11.285	0.023	43.091	-11.285	0.000%
34	-5.769	-43.091	9.759	5.769	43.091	-9.759	0.000%
35	-9.876	-43.091	5.615	9.876	43.091	-5.615	0.000%
36	-11.389	-43.091	-0.001	11.389	43.091	0.001	0.000%
37	-9.899	-43.091	-5.620	9.899	43.091	5.620	0.000%
38	-5.791	-43.091	-9.768	5.791	43.091	9.768	0.000%

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Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00018820
3	Yes	6	0.00000001	0.00011436
4	Yes	6	0.00000001	0.00012473
5	Yes	5	0.00000001	0.00005796
6	Yes	6	0.00000001	0.00012072
7	Yes	6	0.00000001	0.00011721
8	Yes	5	0.00000001	0.00017905
9	Yes	6	0.00000001	0.00012575
10	Yes	6	0.00000001	0.00011578
11	Yes	5	0.00000001	0.00007252
12	Yes	6	0.00000001	0.00011888
13	Yes	6	0.00000001	0.00012552
14	Yes	4	0.00000001	0.00002832
15	Yes	5	0.00000001	0.00036297
16	Yes	5	0.00000001	0.00074250
17	Yes	5	0.00000001	0.00079416
18	Yes	5	0.00000001	0.00035064
19	Yes	5	0.00000001	0.00077843
20	Yes	5	0.00000001	0.00075690
21	Yes	5	0.00000001	0.00036104
22	Yes	5	0.00000001	0.00082025
23	Yes	5	0.00000001	0.00076257
24	Yes	5	0.00000001	0.00035541
25	Yes	5	0.00000001	0.00078572
26	Yes	5	0.00000001	0.00082878
27	Yes	4	0.00000001	0.00086828
28	Yes	5	0.00000001	0.00027870
29	Yes	5	0.00000001	0.00032033
30	Yes	4	0.00000001	0.00037595
31	Yes	5	0.00000001	0.00030454
32	Yes	5	0.00000001	0.00029043
33	Yes	4	0.00000001	0.00083606
34	Yes	5	0.00000001	0.00032692
35	Yes	5	0.00000001	0.00028417
36	Yes	4	0.00000001	0.00033174
37	Yes	5	0.00000001	0.00029984
38	Yes	5	0.00000001	0.00032987

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	171 - 156.5	52.084	37	2.747	0.008
L2	156.5 - 156	43.773	37	2.712	0.008
L3	156 - 132.669	43.489	37	2.711	0.008
L4	136.336 - 87.0859	32.762	36	2.428	0.003
L5	91.9193 - 43	13.976	36	1.533	0.001
L6	49 - 0	3.755	36	0.717	0.000

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Critical Deflections and Radius of Curvature - Service Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
166.000	DR90-14-00DPL2	37	49.206	2.732	0.009	31546
155.000	(2) DB844G65ZAXY w/ Mount Pipe	37	42.923	2.709	0.009	8579
146.000	P65-16-XLH-RR w/ Mount Pipe	36	37.905	2.614	0.007	4472
138.000	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	36	33.624	2.462	0.004	3169
128.000	VHLP800-11	36	28.613	2.256	0.002	2930
118.000	T-Arm Mount [TA 602-1]	36	24.012	2.054	0.002	2898

Maximum Tower Deflections - Design Wind

Section No.	Elevation	Horz. Deflection	Gov. Load Comb.	Tilt	Twist
	ft	in		°	°
L1	171 - 156.5	149.083	11	7.856	0.025
L2	156.5 - 156	125.370	11	7.760	0.025
L3	156 - 132.669	124.560	11	7.758	0.025
L4	136.336 - 87.0859	93.914	11	6.955	0.010
L5	91.9193 - 43	40.123	11	4.399	0.004
L6	49 - 0	10.790	11	2.059	0.001

Critical Deflections and Radius of Curvature - Design Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
166.000	DR90-14-00DPL2	11	140.873	7.815	0.025	11827
155.000	(2) DB844G65ZAXY w/ Mount Pipe	11	122.942	7.752	0.025	3170
146.000	P65-16-XLH-RR w/ Mount Pipe	11	108.611	7.483	0.020	1625
138.000	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	11	96.378	7.053	0.013	1144
128.000	VHLP800-11	11	82.048	6.468	0.007	1052
118.000	T-Arm Mount [TA 602-1]	11	68.881	5.890	0.005	1035

Compression Checks

Pole Design Data

Section No.	Elevation	Size	L	L _u	KL/r	F _a	A	Actual P	Allow. P _a	Ratio P/P _a
	ft		ft	ft		ksi	in ²	K	K	
L1	171 - 156.5 (1)	TP10.75x10.75x0.365	14.500	0.000	0.0	21.000	11.908	-0.731	250.074	0.003

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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
L2	156.5 - 156 (2)	TP19.5x10.75x0.365	0.500	0.000	0.0	39.000	12.031	-0.731	469.214	0.002
L3	156 - 132.669 (3)	TP24.79x19.5x0.188	23.331	0.000	0.0	39.000	14.147	-6.828	551.725	0.012
L4	132.669 - 87.0859 (4)	TP34.63x23.584x0.375	49.250	0.000	0.0	39.000	39.482	-15.256	1539.790	0.010
L5	87.0859 - 43 (5)	TP43.75x32.796x0.438	48.919	0.000	0.0	39.000	58.279	-26.279	2272.890	0.012
L6	43 - 0 (6)	TP52.5x41.531x0.5	49.000	0.000	0.0	39.000	76.092	-36.993	2967.600	0.012

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M _x kip-ft	Actual f _{bx} ksi	Allow. F _{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M _y kip-ft	Actual f _{by} ksi	Allow. F _{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	171 - 156.5 (1)	TP10.75x10.75x0.365	10.927	4.387	23.100	0.190	0.000	0.000	23.100	0.000
L2	156.5 - 156 (2)	TP19.5x10.75x0.365	10.926	4.368	39.000	0.112	0.000	0.000	39.000	0.000
L3	156 - 132.669 (3)	TP24.79x19.5x0.188	261.103	37.759	39.000	0.968	0.000	0.000	39.000	0.000
L4	132.669 - 87.0859 (4)	TP34.63x23.584x0.375	1271.04 2	47.358	39.000	1.214	0.000	0.000	39.000	0.000
L5	87.0859 - 43 (5)	TP43.75x32.796x0.438	2444.13 3	48.719	39.000	1.249	0.000	0.000	39.000	0.000
L6	43 - 0 (6)	TP52.5x41.531x0.5	3384.14 2	45.223	39.000	1.160	0.000	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	171 - 156.5 (1)	TP10.75x10.75x0.365	1.219	0.102	14.000	0.015	0.001	0.000	14.000	0.000
L2	156.5 - 156 (2)	TP19.5x10.75x0.365	1.258	0.105	26.000	0.004	0.002	0.000	26.000	0.000
L3	156 - 132.669 (3)	TP24.79x19.5x0.188	19.075	1.348	26.000	0.104	0.098	0.007	26.000	0.000
L4	132.669 - 87.0859 (4)	TP34.63x23.584x0.375	25.361	0.642	26.000	0.049	0.767	0.014	26.000	0.001
L5	87.0859 - 43 (5)	TP43.75x32.796x0.438	29.185	0.501	26.000	0.039	0.799	0.008	26.000	0.000
L6	43 - 0 (6)	TP52.5x41.531x0.5	31.728	0.417	26.000	0.032	0.826	0.005	26.000	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio P $\frac{P}{P_a}$	Ratio f _{bx} $\frac{f_{bx}}{F_{bx}}$	Ratio f _{by} $\frac{f_{by}}{F_{by}}$	Ratio f _v $\frac{f_v}{F_v}$	Ratio f _{vt} $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	171 - 156.5 (1)	0.003	0.190	0.000	0.015	0.000	0.193	1.333	H1-3+VT ✓

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Section No.	Elevation ft	Ratio	Ratio	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		P	f_{bx}	f_{by}	f_v	f_{vt}			
L2	156.5 - 156 (2)	0.002	0.112	0.000	0.004	0.000	0.114	1.333	H1-3+VT ✓
L3	156 - 132.669 (3)	0.012	0.968	0.000	0.104	0.000	0.983	1.333	H1-3+VT ✓
L4	132.669 - 87.0859 (4)	0.010	1.214	0.000	0.049	0.001	1.225	1.333	H1-3+VT ✓
L5	87.0859 - 43 (5)	0.012	1.249	0.000	0.039	0.000	1.261	1.333	H1-3+VT ✓
L6	43 - 0 (6)	0.012	1.160	0.000	0.032	0.000	1.172	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	171 - 156.5	Pole	TP10.75x10.75x0.365	1	-0.731	333.349	14.5	Pass	
L2	156.5 - 156	Pole	TP19.5x10.75x0.365	2	-0.731	625.462	8.5	Pass	
L3	156 - 132.669	Pole	TP24.79x19.5x0.188	3	-6.828	735.449	73.8	Pass	
L4	132.669 - 87.0859	Pole	TP34.63x23.584x0.375	4	-15.256	2052.540	91.9	Pass	
L5	87.0859 - 43	Pole	TP43.75x32.796x0.438	5	-26.279	3029.762	94.6	Pass	
L6	43 - 0	Pole	TP52.5x41.531x0.5	6	-36.993	3955.811	87.9	Pass	
							Summary		
							Pole (L5)	94.6	Pass
							RATING =	94.6	Pass

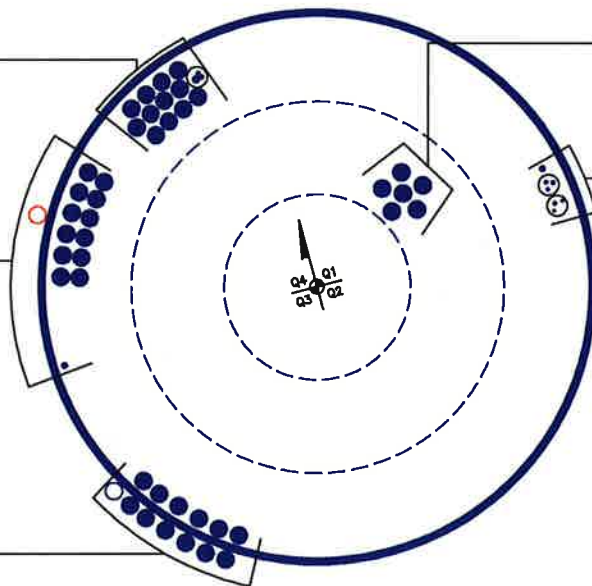
APPENDIX B

BASE LEVEL DRAWING

(INSTALLED-BUNDLED IN 2" CONDUIT)
(1) 5/8" TO 146 FT LEVEL
(2) 5/8" TO 146 FT LEVEL
(INSTALLED)
(12) 1-5/8" TO 146 FT LEVEL

(PROPOSED)
(1) 1-5/8" TO 155 FT LEVEL
(INSTALLED)
(1) 1/2" TO 155 FT LEVEL
(12) 1-5/8" TO 155 FT LEVEL

(RESERVED)
(1) 1-5/8" TO 136 FT LEVEL
(INSTALLED)
(12) 1-5/8" TO 136 FT LEVEL



(ABANDONED)
(6) 1-5/8" TO 166 FT LEVEL

(INSTALLED)
(1) 1/2" TO 126 FT LEVEL
(INSTALLED-BUNDLED IN (2) 2" CONDUIT)
(3) 1/4" TO 126 FT LEVEL
(5) 5/16" TO 126 FT LEVEL

APPENDIX C
ADDITIONAL CALCULATIONS

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

TIA Rev F

Site Data	
BU#:	806355
Site Name:	BRG 126 943086, CT
App #:	200500 Revision # 2
Pole Manufacturer:	Other

Reactions		
Moment:	3967	ft-kips
Axial:	43	kips
Shear:	33	kips

Anchor Rod Data		
Qty:	20	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	61	in

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

Anchor Rod Results

Maximum Rod Tension: 153.9 Kips
 Allowable Tension: 195.0 Kips
 Anchor Rod Stress Ratio: 79.0% **Pass**

Rigid
Service ASD
Fty*ASIF

Plate Data		
Diam:	67	in
Thick:	2.25	in
Grade:	60	ksi
Single-Rod B-eff:	8.33	in

Base Plate Results

Base Plate Stress: 57.3 ksi
 Allowable Plate Stress: 60.0 ksi
 Base Plate Stress Ratio: 95.6% **Pass**

Rigid
Service ASD
0.75*Fy*ASIF
Y.L. Length:
31.06

Stiffener Data (Welding at both sides)		
Config:	0	*
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

n/a

Stiffener Results

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

Pole Results

Pole Punching Shear Check: n/a

Pole Data		
Diam:	52.5	in
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



* 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

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Monopole Pad & Pier Foundation Analysis

Rev. Type: **F**

Design Loads:

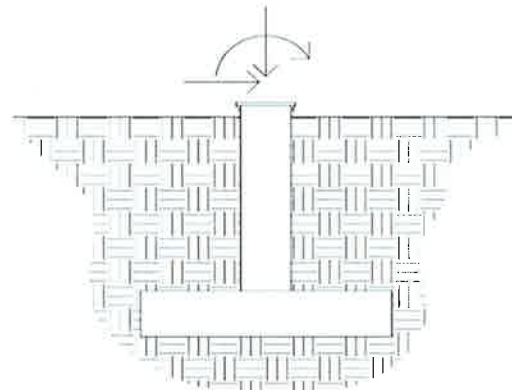
	Input unfactored loads	
Shear:	<u>33.0</u>	kips
Moment:	<u>3,967.0</u>	ft-kips
Tower Height:	<u>171.0</u>	ft
Tower Weight:	<u>43.0</u>	kips

Pad & Pier Dimensions / Properties:

Pole Diameter at Base:	<u>52.50</u>	in	22.0 FT
Bearing Depth:	<u>9.0</u>	ft	
Pad Width:	<u>22.0</u>	ft	
Neglected Depth:	<u>4.0</u>	ft	
Thickness:	<u>3.0</u>	ft	
Pier Diameter:	<u>7.0</u>	ft	
Pier Height Above Grade:	<u>1.0</u>	ft	
BP Dist. Above Pier:	<u>4.0</u>	in	
Clear Cover:	<u>3.0</u>	in	
Pier Rebar Size:	<u>8</u>		
Pier Rebar Quantity:	<u>46</u>		
Pad Rebar Size:	<u>8</u>		
Pad Rebar Quantity:	<u>36</u>		
Pier Tie Size:	<u>4</u>		
Tie Quantity:	<u>7</u>		
Rebar Yield Strength:	<u>60000</u>	psi	
Concrete Strength:	<u>4000</u>	psi	
Concrete Unit Weight:	<u>0.15</u>	kcf	

22.0 FT

Elevation Overview



Soil Data:

	Allowable Values	
Soil Unit Weight:	<u>0.125</u>	kcf
Ult. Bearing Capacity:	<u>24.000</u>	ksf
Angle of Friction:	<u>36.000</u>	deg
Cohesion:	<u>0.000</u>	ksf
Passive Pressure:	<u>0.000</u>	ksf
Base Friction:	<u>0.600</u>	

** Notes:

Summary of Results

Req'd Pier Diam.	OK
Overturning	76.6%
Shear Capacity	10.4%
Bearing	33.0%
Pad Shear - 1-way	89.8%
Pad Shear - 2-way	5.8%
Pad Moment Capacity	38.1%
Pier Moment Capacity	91.6%

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: 806355
 Site Name: BRG 126 943086,CT
 App #: 200500 Revision # 2

Pole Manufacturer: Other

Bolt Data

Qty:	15	Bolt Fu:	120
Diameter (in.):	1	Bolt Fy:	92
Bolt Material:	A325	Bolt Fty:	44.00
N/A:	75	<-- Disregard	
N/A:	55	<-- Disregard	
Circle (in.):	25.75		

Plate Data

Diam:	28.5	in
Thick, t:	1	in
Grade (Fy):	60	ksi
Strength, Fu:	75	ksi
Single-Rod B-eff:	2.27	in

Stiffener Data (Welding at Both Sides)

Config:	0	*
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:	10.75	in
Thick:	0.365	in
Grade:	35	ksi
# of Sides:	18	"0" IF Round
Fu:	63	ksi
Reinf. Fillet Weld:	0	"0" if None

Stress Increase Factor

ASIF: 1.333

Reactions

Moment:	11.545	ft-kips
Axial:	0.762	kips
Shear:	1.258	kips
Elevation:	156	feet

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

Flange Bolt Results

Bolt Tension Capacity, B:	46.07 kips
Max Bolt <u>directly</u> applied T:	1.38 Kips
Min. PL "tc" for B cap. <u>w/o Pry:</u>	3.785 in
Min PL "treq" for actual T <u>w/ Pry:</u>	0.531 in
Min PL "t1" for actual T <u>w/o Pry:</u>	0.656 in
T allowable with Prying:	4.91 kips
Prying Force, Q:	0.00 kips
Total Bolt Tension=T+Q:	1.38 kips
Prying Bolt Stress Ratio=(T+Q)/(B):	3.0% Pass

Non-Rigid
Service, ASD
Fty*ASIF

$\alpha > 1$ case

Exterior Flange Plate Results

Flexural Check	
Compression Side Plate Stress:	9.0 ksi
Allowable Plate Stress:	60.0 ksi
Compression Plate Stress Ratio:	15.0% Pass
No Prying	
Tension Side Stress Ratio, (treq/t)^2:	28.2% Pass

Non-Rigid
Service ASD
0.75*Fy*ASIF
Comp. Y.L. Length:
23.40

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

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: 806355
 Site Name: BRG 126 943086,CT
 App #: 200500 Revision # 2

Reactions		
Moment:	11.545	ft-kips
Axial:	0.762	kips
Shear:	1.258	kips
Elevation:	156	feet

Pole Manufacturer: Other

Bolt Data

Qty:	15		Bolt Fu:	120
Diameter (in.):	1		Bolt Fy:	92
Bolt Material:	A325		Bolt Fty:	44.00
N/A:	75	<-- Disregard		
N/A:	55	<-- Disregard		
Circle (in.):	25.75			

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

Flange Bolt Results

Bolt Tension Capacity, B:	46.07 kips
Max Bolt <u>directly</u> applied T:	1.38 Kips
Min. PL "tc" for B cap. <u>w/o Pry:</u>	1.721 in
Min PL "treq" for actual T <u>w/ Pry:</u>	0.226 in
Min PL "t1" for actual T <u>w/o Pry:</u>	0.298 in
T allowable with Prying:	39.61 kips
Prying Force, Q:	0.00 kips
Total Bolt Tension=T+Q:	1.38 kips
Prying Bolt Stress Ratio=(T+Q)/(B):	3.0% Pass

Rigid
Service ASD
Fty*ASIF

0 ≤ α ≤ 1 case

Plate Data

Diam:	28.5	in
Thick, t:	1.5	in
Grade (Fy):	60	ksi
Strength, Fu:	75	ksi
Single-Rod B-eff:	4.13	in

Exterior Flange Plate Results

Flexural Check	
Compression Side Plate Stress:	1.6 ksi
Allowable Plate Stress:	60.0 ksi
Compression Plate Stress Ratio:	2.7% Pass

Rigid
Service ASD
0.75*Fy*ASIF
Comp. Y.L. Length:
16.82

No Prying

Tension Side Stress Ratio, (treq/t)^2: 2.3% **Pass**

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

Stiffener Data (Welding at Both Sides)

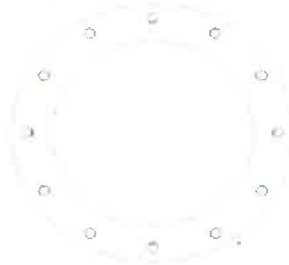
Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data

Diam:	19.5	in
Thick:	0.365	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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* 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