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March 18, 2014

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

Re: **Notice of Exempt Modification – Facility Modification**
85 Plainfield Avenue, West Haven, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) wireless telecommunications antennas at the 122-foot level on the existing 148-foot tower at 85 Plainfield Avenue in West Haven, Connecticut (the "Property"). The tower is owned by Crown Castle. The Council approved Cellco's use of the existing tower in 2000. Cellco now intends to modify its facility, replacing seven (7) of its existing antennas with two (2) model BXA-80063-4CF, 850 MHz antennas; one (1) model BXA-80063-6CF, 850 MHz antenna; one (1) model BXA-70080-6CF, 700 MHz antenna; and three (3) model BXA-171063-8BF, 2100 MHz antennas, all at the same 122-foot level on the tower. Cellco also intends to install three (3) remote radio heads ("RRHs") behind its 2100 MHz antennas, two (2) coaxial cable diplexers and one (1) HYBRIFLEX™ antenna cable attached to the outside of the monopole tower. Included in Attachment 1 are specifications for Cellco's replacement antennas, RRHs, cable diplexers and HYBRIFLEX™ cable.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Edward M. O'Brien, Mayor for the City of West Haven. A copy of this letter is also being sent to Frank Frumento, the owner of the Property.

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

1. The proposed modifications will not result in an increase in the height of the existing tower. The replacement antennas and RRHs will be located at the 122-foot level on the 148-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 power density table for Cellco's modified facility is included behind Attachment 2.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The tower and its foundation can support Cellco's proposed modifications. (*See* Structural Analysis Report included in Attachment 3).

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

Sincerely,

Kenneth C. Baldwin

Enclosures
Copy to:
Edward M. O'Brien, West Haven Mayor
Frank Frumento
Sandy M. Carter

ATTACHMENT 1

BXA-80063-4CF-EDIN-X

X-Pol | FET Panel | 63° | 13.0 dBd

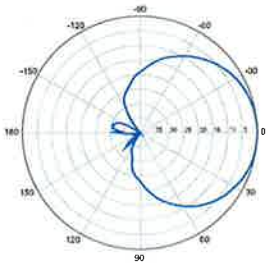
Replace "X" with desired electrical downtilt.

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

Electrical Characteristics				
Frequency bands	806-900 MHz*			
*Optional frequency band for iDEN	806-941 MHz (specify when ordering)			
Polarization	±45°			
Horizontal beamwidth	63°			
Vertical beamwidth	15°			
Gain	13.0 dBd (15.1 dBi)			
Electrical downtilt (X)	0, 2, 3, 4, 5, 6, 8, 9, 10, 12, 14			
Impedance	50Ω			
VSWR	≤1.4:1			
Upper sidelobe suppression (0°)	-22.1 dB			
Front-to-back ratio (+/-30°)	-34.9 dB			
Null fill	5% (-26.02 dB)			
Isolation between ports	< -30 dB			
Input power with EDIN connectors	500 W			
Input power with NE connectors	300 W			
Lightning protection	Direct Ground			
Connector(s)	2 Ports / EDIN or NE / Female / Center (Back)			
Mechanical Characteristics				
Dimensions Length x Width x Depth	1205 x 285 x 133 mm		47.4 x 11.2 x 5.2 in	
Depth with z-brackets	173 mm		6.8 in	
Weight without mounting brackets	4.5 kg		9.9 lbs	
Survival wind speed	> 201 km/hr		> 125 mph	
Wind area	Front: 0.34 m²	Side: 0.16 m²	Front: 3.7 ft²	Side: 1.7 ft²
Wind load @ 161 km/hr (100 mph)	Front: 498 N	Side: 260 N	Front: 111 lbf	Side: 55 lbf

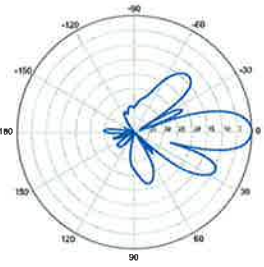
Mounting Options	Part Number	Fits Pipe Diameter	Weight
2-Point Mounting & Downtilt Bracket Kit	36210006	40-115 mm 1.57-4.5 in	4.1 kg 9 lbs
Concealment Configurations	For concealment configurations, order BXA-80063-4CF-EDIN-X-FP		

BXA-80063-4CF-EDIN-X



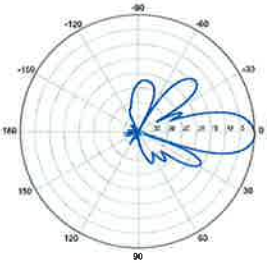
Horizontal

BXA-80063-4CF-EDIN-0



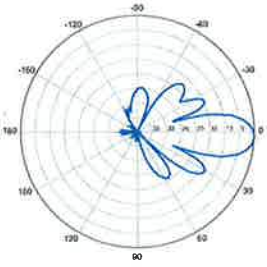
0° | Vertical

BXA-80063-4CF-EDIN-2



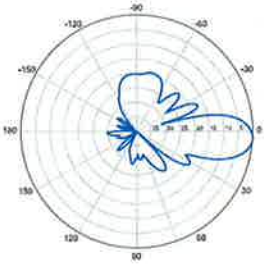
2° | Vertical

BXA-80063-4CF-EDIN-3



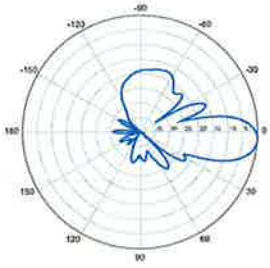
3° | Vertical

BXA-80063-4CF-EDIN-4



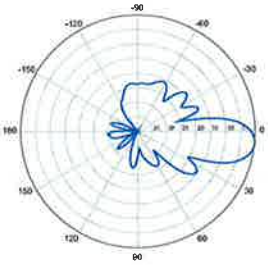
4° | Vertical

BXA-80063-4CF-EDIN-5



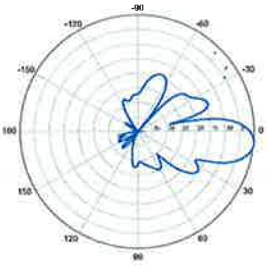
5° | Vertical

BXA-80063-4CF-EDIN-6



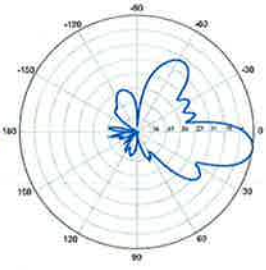
6° | Vertical

BXA-80063-4CF-EDIN-8



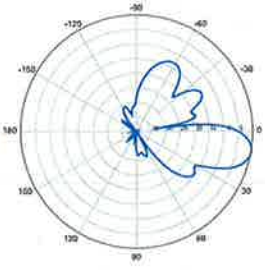
8° | Vertical

BXA-80063-4CF-EDIN-9



9° | Vertical

BXA-80063-4CF-EDIN-10

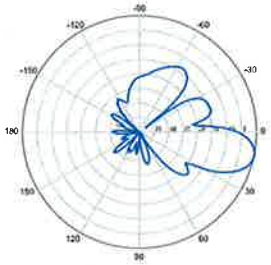


10° | Vertical

BXA-80063-4CF-EDIN-X

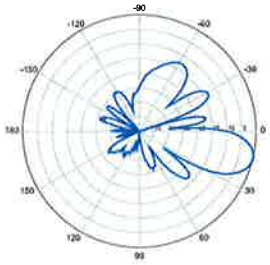
X-Pol | FET Panel | 63° | 13.0 dBd

BXA-80063-4CF-EDIN-12



12° | Vertical

BXA-80063-4CF-EDIN-14



14° | Vertical

BXA-80063-6CF-EDIN-X

X-Pol | FET Panel | 63° | 14.5 dBd

Replace "X" with desired electrical downtilt

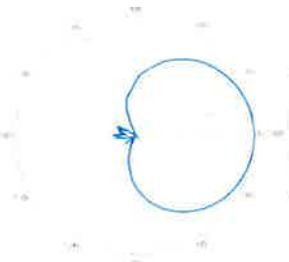
Antenna is also available with NE connector(s) Replace "EDIN" with "NE" in the model number when ordering

Electrical Characteristics	
Frequency bands	806-900 MHz*
*Optional frequency band for iDEN	806-941 MHz (specify when ordering)
Polarization	±45°
Horizontal beamwidth	63°
Vertical beamwidth	11°
Gain	14.5 dBd (16.6 dBi)
Electrical downtilt (X)	0, 2, 3, 4, 5, 6, 8, 10
Impedance	50Ω
VSWR	≤1.4:1
Upper sidelobe suppression (0°)	-18.2 dB
Front-to-back ratio (+/-30°)	-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
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 m² Side: 0.24 m²	Front: 5.5 ft² Side: 2.6 ft²
Wind load @ 161 km/hr (100 mph)	Front: 759 N Side: 391 N	Front: 169 lbf Side: 89 lbf

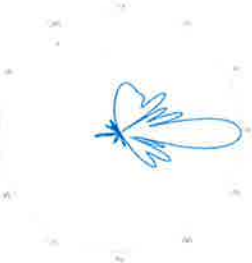
Mounting Options	Part Number	Fits Pipe Diameter	Weight
3-Point Mounting & Downtilt Bracket Kit	36210008	40-115 mm 1.57-4.5 in	6.9 kg 15.2 lbs
Concealment Configurations	For concealment configurations, order BXA-80063-6CF-EDIN-X-FP		

BXA-80063-6CF-EDIN-X



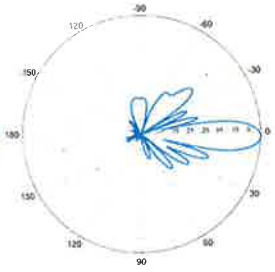
Horizontal

BXA-80063-6CF-EDIN-0



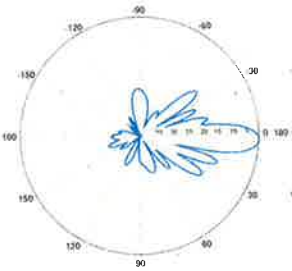
0° | Vertical

BXA-80063-6CF-EDIN-2



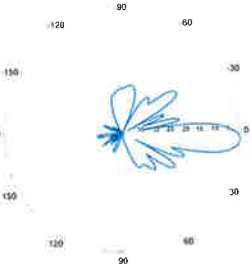
2° | Vertical

BXA-80063-6CF-EDIN-3



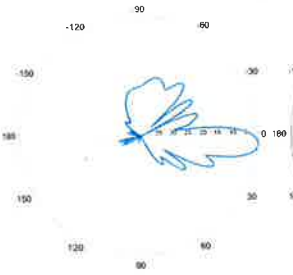
3° | Vertical

BXA-80063-6CF-EDIN-4



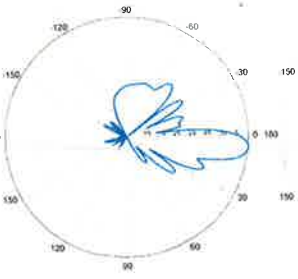
4° | Vertical

BXA-80063-6CF-EDIN-5



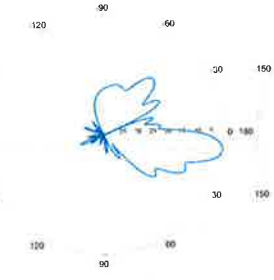
5° | Vertical

BXA-80063-6CF-EDIN-6



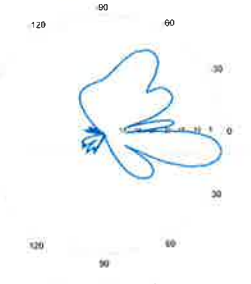
6° | Vertical

BXA-80063-6CF-EDIN-8



8° | Vertical

BXA-80063-6CF-EDIN-10



10° | Vertical

BXA-70080-6CF-EDIN-X

X-Pol | FET Panel | 80° | 13.5 dBd

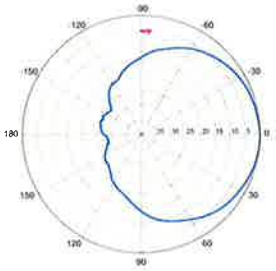
Replace "X" with desired electrical downtilt.

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	82°	80°
Vertical beamwidth	12°	10°
Gain	13.0 dBd (15.1 dBi)	13.5 dBd (15.6 dBi)
Electrical downtilt (X)	0, 2, 4, 6, 8, 10	
Impedance	50Ω	
VSWR	≤1.35:1	
Upper sidelobe suppression (0°)	-18.3 dB	-18.6 dB
Front-to-back ratio (+/-30°)	-26.9 dB	-25.6 dB
Null fill	5% (-26.02 dB)	
Isolation between ports	< -30 dB	
Input power with EDIN connectors	500 W	
Input power with NE connectors	300 W	
Lightning protection	Direct Ground	
Connector(s)	2 Ports / EDIN or NE / Female / Center (Back)	
Mechanical Characteristics		
Dimensions Length x Width x Depth	1804 x 204 x 151 mm	71.0 x 8.0 x 5.9 in
Depth with z-brackets	191 mm	7.5 in
Weight without mounting brackets	8.2 kg	18 lbs
Survival wind speed	> 201 km/hr	> 125 mph
Wind area	Front: 0.37 m² Side: 0.27 m²	Front: 3.9 ft² Side: 2.9 ft²
Wind load @ 161 km/hr (100 mph)	Front: 531 N Side: 475 N	Front: 119 lbf Side: 104 lbf

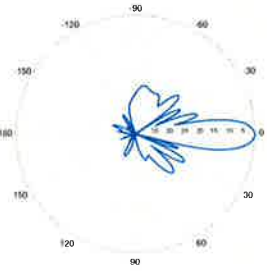
Mounting Options	Part Number	Fits Pipe Diameter	Weight
3-Point Mounting & Downtilt Bracket Kit	36210008	40-115 mm 1.57-4.5 in	6.9 kg 15.2 lbs
Concealment Configurations	For concealment configurations, order BXA-70080-6CF-EDIN-X-FP		

BXA-70080-6CF-EDIN-X



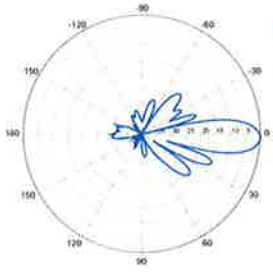
Horizontal | 750 MHz

BXA-70080-6CF-EDIN-0



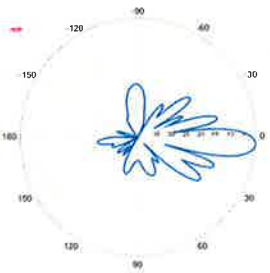
0° | Vertical | 750 MHz

BXA-70080-6CF-EDIN-2

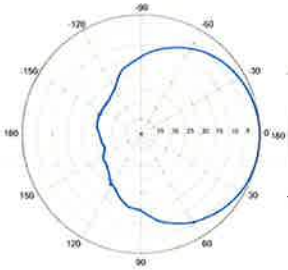


2° | Vertical | 750 MHz

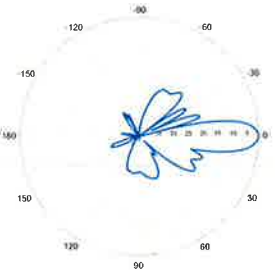
BXA-70080-6CF-EDIN-4



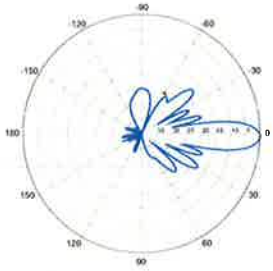
4° | Vertical | 750 MHz



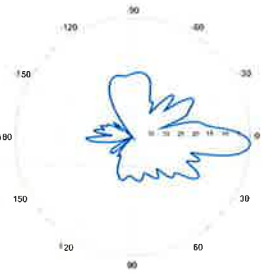
Horizontal | 850 MHz



0° | Vertical | 850 MHz



2° | Vertical | 850 MHz

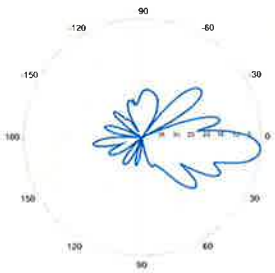


4° | Vertical | 850 MHz

BXA-70080-6CF-EDIN-X

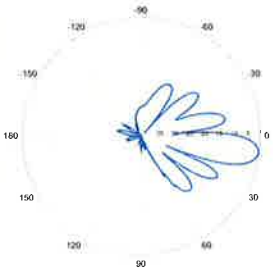
X-Pol | FET Panel | 80° | 13.5 dBd

BXA-70080-6CF-EDIN-6



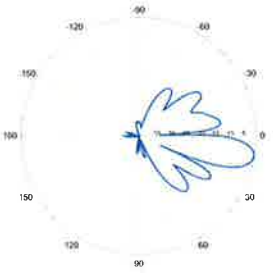
6° | Vertical | 750 MHz

BXA-70080-6CF-EDIN-8

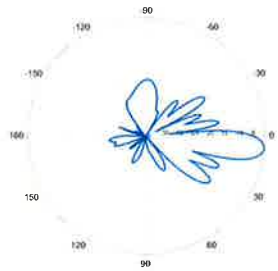


8° | Vertical | 750 MHz

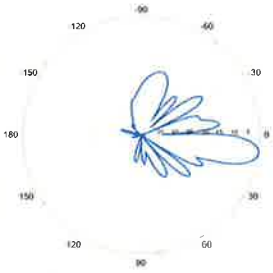
BXA-70080-6CF-EDIN-10



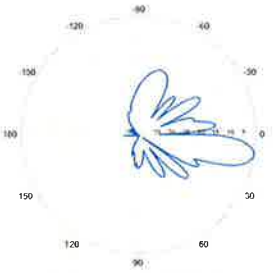
10° | Vertical | 750 MHz



6° | Vertical | 850 MHz



8° | Vertical | 850 MHz



10° | Vertical | 850 MHz

BXA-171063-8BF-EDIN-X

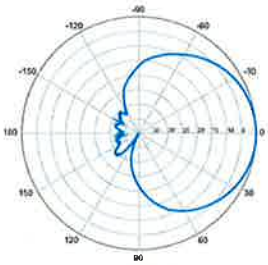
Replace "X" with desired electrical downtilt

X-Pol | FET Panel | 63° | 17.4 dBi

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	7°	7°	7°
Gain	14.5 dBd / 16.6 dBi	14.9 dBd / 17.0 dBi	15.3 dBd / 17.4 dBi
Electrical downtilt (X)	0, 2, 4, 6, 8		
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 / Female / Bottom		
Operating temperature	-40° to +60° C / -40° to +140° F		
Mechanical Characteristics			
Dimensions Length x Width x Depth	1225 x 154 x 105 mm	48.2 x 6.1 x 4.1 in	
Depth with t-brackets	133 mm	5.2 in	
Weight without mounting brackets	4.2 kg	9.2 lbs	
Survival wind speed	296 km/hr	184 mph	
Wind area	Front: 0.19 m² Side: 0.14 m²	Front: 2.0 ft² Side: 1.5 ft²	
Wind load @ 161 km/hr (100 mph)	Front: 281 N Side: 223 N	Front: 63 lbf Side: 50 lbf	

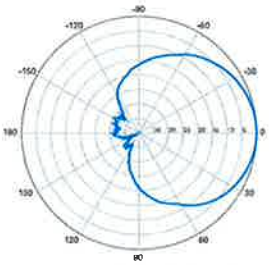
Mounting Options	Part Number	Fits Pipe Diameter	Weight
2-Point Mounting Bracket Kit	26799997	50-102 mm 2.0-4.0 in	2.3 kg 5 lbs
2-Point Mounting & Downtilt Bracket Kit	26799999	50-102 mm 2.0-4.0 in	3.6 kg 8 lbs
Concealment Configurations	For concealment configurations, order BXA-171063-8BF-EDIN-X-FP		

BXA-171063-8BF-EDIN-X



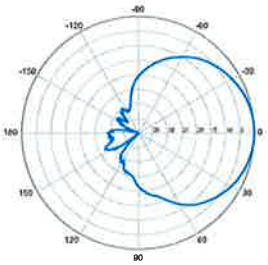
Horizontal | 1710-1880 MHz

BXA-171063-8BF-EDIN-X



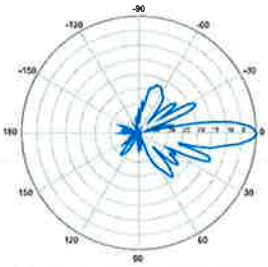
Horizontal | 1850-1990 MHz

BXA-171063-8BF-EDIN-X



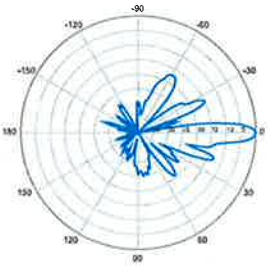
Horizontal | 1920-2170 MHz

BXA-171063-8BF-EDIN-0



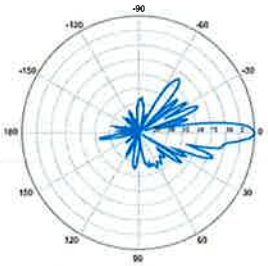
0° | Vertical | 1710-1880 MHz

BXA-171063-8BF-EDIN-0



0° | Vertical | 1850-1990 MHz

BXA-171063-8BF-EDIN-0

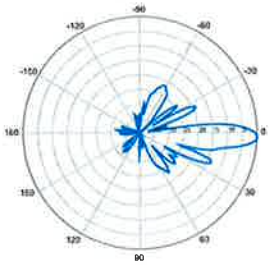


0° | Vertical | 1920-2170 MHz

BXA-171063-8BF-EDIN-X

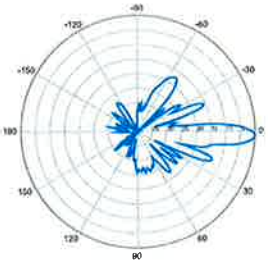
X-Pol | FET Panel | 63° | 17.4 dBi

BXA-171063-8BF-EDIN-2



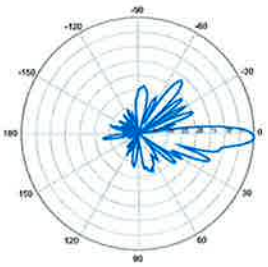
2° | Vertical | 1710-1880 MHz

BXA-171063-8BF-EDIN-2



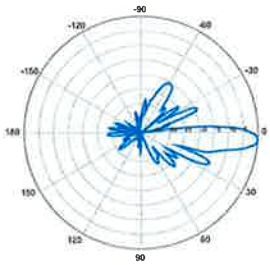
2° | Vertical | 1850-1990 MHz

BXA-171063-8BF-EDIN-2



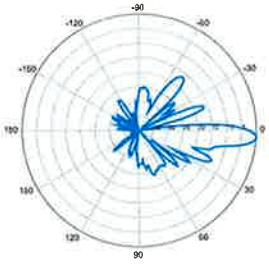
2° | Vertical | 1920-2170 MHz

BXA-171063-8BF-EDIN-4



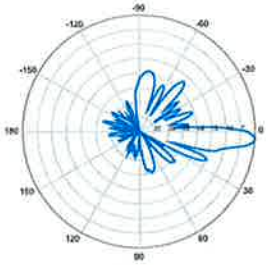
4° | Vertical | 1710-1880 MHz

BXA-171063-8BF-EDIN-4



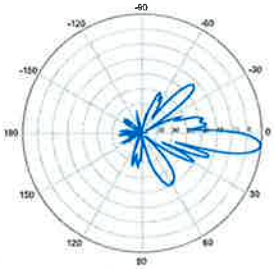
4° | Vertical | 1850-1990 MHz

BXA-171063-8BF-EDIN-4



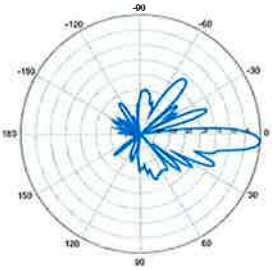
4° | Vertical | 1920-2170 MHz

BXA-171063-8BF-EDIN-6



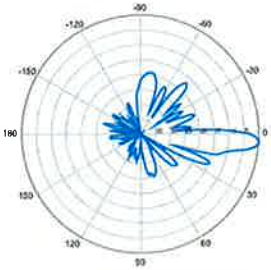
6° | Vertical | 1710-1880 MHz

BXA-171063-8BF-EDIN-6



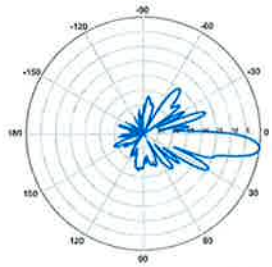
6° | Vertical | 1850-1990 MHz

BXA-171063-8BF-EDIN-6



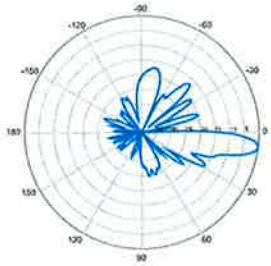
6° | Vertical | 1920-2170 MHz

BXA-171063-8BF-EDIN-8



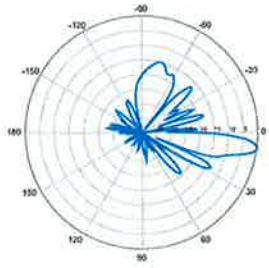
8° | Vertical | 1710-1880 MHz

BXA-171063-8BF-EDIN-8



8° | Vertical | 1850-1990 MHz

BXA-171063-8BF-EDIN-8



8° | Vertical | 1920-2170 MHz

Product Data Sheet FD9R6004/2C-3L

ShareLite Wideband Diplexer – In-line 698-960 MHz/1710-2200 MHz, DC pass in high frequency path

Product Description

The ShareLite FD9R6004 Series of diplexers are designed to enable feeder sharing between systems in the 698-960 MHz range and in the 1710-2200 MHz range. The diplexer is equipped with in-line connector placement so it can be installed in the BTS cabinet or at the tower top. This is especially valuable in crowded sites or when the feeders are not easily accessible. Due to its wideband design, the FD9R6004 Series can accommodate many combining solutions between 698-960 MHz and 1710-2200 MHz systems such as LTE 700 MHz, Cellular 800 MHz with PCS, GSM900 with GSM1800, or GSM900 with UMTS. This diplexer features a highly selective filter. It provides a high level of isolation between ports, while keeping the insertion loss on both paths at an extremely low level. The FD9R6004 diplexers are available with various DC pass options, helpful in configurations with or without the Tower Mount Amplifiers installed.

Features/Benefits

- **LTE ready design**
- **Extremely Low Insertion Loss**
- **High level of Rejection between bands – Protection against interferences**
- **Extremely High Power Handling Capability**
- **Integrated DC block/bypass versions available**
- **Very compact & small size design – Easy installation and reduced tower load**
- **In-line long-neck connectors for easy connection & waterproofing**
- **Exceptional reliability & environmental protection (IP 67)**
- **Equipped with 1 * Breathable Vent – Prevent any humidity inside the product**
- **Mounting hardware for Wall and Pole mount provided (P/N SEM2-1A)**
- **Grounding already provided through the mounting bracket**
- **Kit available for easy dual mount**

Technical Specifications

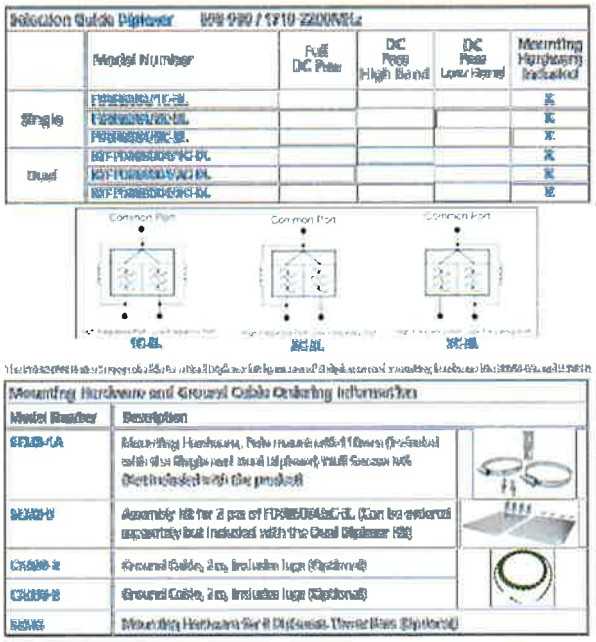
Product Type	Diplexer/Cross Band Coupler
Application	LTE700, GSM900, UMTS, GSM1800, Cellular 800, PCS
Frequency Range 1, MHz	698-960
Frequency Range 2, MHz	1710-2200
Configuration	Sharelite Single diplexer, outdoor, DC pass in the 1710-2170MHz path, with mounting hardware SEM2-1A
Mounting	Wall Mounting: With 4 screws (maximum 6mm diameter); Pole Mounting: With included clamp set 40-110mm (1.57-4.33)
Return Loss All Ports Min/Typ, dB	19/23
Power Handling Continuous, Max, W	1250 at common port; 750 in low frequency path & 500 in high frequency path
Power Handling Peak, Max, W	15000 in low frequency path & 8000 in high frequency path
Impedance, Ohms	50
Insertion Loss, Path 1, dB	0.07 typ.
Insertion Loss, Path 2, dB	0.13 typ.
Rejection Between Bands Min/Typ, dB	58/64@698-960MHz; 57/70@1710-2200MHz
IMP Level at the COM Port, Typ, dBm	-112 @ 2x43
DC Pass in Low Frequency Path	No
DC Pass in High Frequency Path	Yes
Temperature Range, °C (°F)	-40 to +60 (-40 to +140)
Environmental	ETSI 300-019-2-4 Class 4.1E
Ingress Protection	IP 67
Lightning Protection	EN/IEC61000-4-5 Level 4
Connectors	In-line long-neck 7-16-Female
Weight, kg (lb)	1.2 (2.6)
Shipping Weight, kg (lb)	3.2 (7) for 2 * single units in 1 * box, 9.8 (21.6) for 6 * units = 3 * Boxes in 1 * overwrap
Dimensions, H x W x D, mm (in)	147 x 164 x 37 (5.8 x 6.5 x 1.5)
Shipping Dimensions, H x W x D, mm (in)	254 x 406 x 82 (10 x 16 x 3.2) for 2 * Single Units in 1 * box, 280 x 406 x 241 (11 x 16 x 9.5) for 6 * units = 3 * Boxes in 1 * overwrap
Volume, L	0.43
Housing	Aluminum

Notes

ShareLite Wideband Diplexer – In-line 698-960 MHz/1710-2200 MHz, DC pass in high frequency path

Other Documentation

FD9R6004/2C-3L Installation Instructions: Wideband_Diplexer_Installation_Rev5.pdf



	Model Number	Full DC Pass	DC Pass High Band	DC Pass Low Band	Mounting Hardware Included
Single					
Dual					

Mounting Hardware and Ground Cable Ordering Information		
Model Number	Description	

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

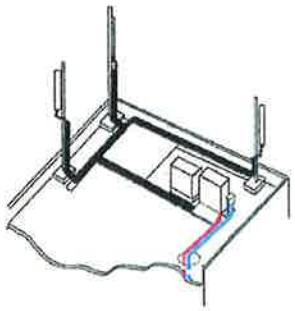
Because of its small size and weight, the Alcatel-Lucent RRH2x40-AWS can be installed close to the antenna. Operators can therefore locate the Alcatel-Lucent RRH2x40-AWS where RF engineering is deemed ideal, minimizing trade-offs between available sites and RF optimum sites. The RF feeder cost and installation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

Features

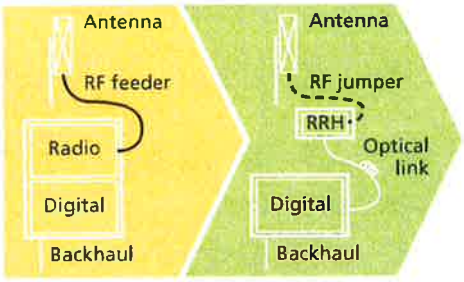
- Zero-footprint deployment
- Easy installation, with a lightweight unit can be carried and set up by one person
- Optimized RF power, with flexible site selection and elimination of a TMA
- Convection-cooled (fanless)
- Noise-free
- Best-in-class power efficiency, with significantly reduced energy consumption

Benefits

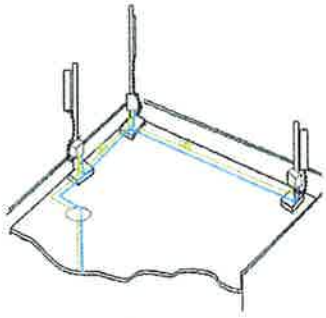
- Leverages existing real estate with lower site costs
- Reduces installation costs, with fewer installation materials and simplified logistics
- Decreases power costs and minimizes environmental impacts, with the potential for eco-sustainable power options
- Improves RF performance and adds flexibility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



Macro



RRH for space-constrained cell sites



Distributed

Technical specifications

Physical dimensions

- Height: 620 mm (24.4 in.)
- Width: 270 mm (10.63 in.)
- Depth: 170m (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

Alcatel·Lucent

Product Data Sheet HB158-1-08U8-S8J18

HYBRIFLEX™ RRH Hybrid Feeder Cabling Solution, 1-5/8", Single-Mode Fiber

Product Description

RFS' HYBRIFLEX Remote Radio Head (RRH) hybrid feeder cabling solution combines optical fiber and DC power for RRHs in a single lightweight aluminum corrugated cable, making it the world's most innovative solution for RRH deployments.

It was developed to reduce installation complexity and costs at Cellular sites. HYBRIFLEX allows mobile operators deploying an RRH architecture to standardize the RRH installation process and eliminate the need for and cost of cable grounding. HYBRIFLEX combines optical fiber (multi-mode or single-mode) and power in a single corrugated cable. It eliminates the need for junction boxes and can connect multiple RRHs with a single feeder. Standard RFS CELLFLEX® accessories can be used with HYBRIFLEX cable. Both pre-connectorized and on-site options are available.

Figure 1: HYBRIFLEX Series

Features/Benefits

- Aluminum corrugated armor with outstanding bending characteristics – minimizes installation time and enables mechanical protection and shielding
- Same accessories as 1 5/8" coaxial cable
- Outer conductor grounding – Eliminates typical grounding requirements and saves on installation costs
- Lightweight solution and compact design – Decreases tower loading
- Robust cabling – Eliminates need for expensive cable trays and ducts
- Installation of tight bundled fiber optic cable pairs directly to the RRH – Reduces CAPEX and wind load by eliminating need for interconnection
- Optical fiber and power cables housed in single corrugated cable – Saves CAPEX by standardizing RRH cable installation and reducing installation requirements
- Outdoor polyethylene jacket – Ensures long-lasting cable protection

Technical Specifications

Structure			
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)]	.068 (0.205)
DC-Resistance Power Cable, 8.4mm² (8AWG)		[Ω/km (Ω/1000ft)]	2.1 (0.307)
Fiber Optic 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)		[mm² (AWG)]	8.4 (8)
Quantity, Wire Count (Power)			16 (8 pairs)
Size (Alarm)		[mm² (AWG)]	0.8 (18)
Quantity, Wire Count (Alarm)			4 (2 pairs)
Type			UV protected
Strands			19
Primary Jacket Diameter, Nominal		[mm (in)]	6.8 (0.27)
Standards (Meets or exceeds)			NFPA 130, ICEA S-93-658 UL Type XHHW-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 to149)
Operation Temperature		[°C (°F)]	-40 to +65 (-40 to149)

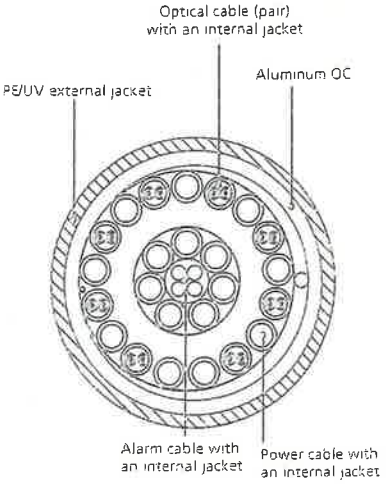


Figure 2: Construction Detail

* This data is provisional and subject to change

ATTACHMENT 2

	General	Power	Density					
Site Name: West Haven 3								
Tower Height: 148Ft								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*MetroPCS CDMA	3	727	148	0.0358	2135	1.0000	3.58%	
*MetroPCS LTE	1	1200	148	0.0197	2130	1.0000	1.97%	
*Clearwire	2	153	134	0.0061	2496	1.0000	0.61%	
*Clearwire	1	211	134	0.0042	11 GHz	1.0000	0.42%	
*Sprint CDMA/LTE	5	778	140.4	0.0710	1900	1.0000	7.10%	
*Sprint CDMA/LTE	1	438	140.4	0.0080	850	0.5667	1.41%	
*Sprint Nextel microwave	2	4.42	138	0.0002	22500	1.0000	0.02%	
Verizon	**7**	**436**	**122**	**0.0737**	**1970**	**1.0000**	**7.37%**	
Verizon	**9**	**285**	**122**	**0.0620**	**869**	**0.5793**	**10.70%**	
Verizon	**1**	**1265**	**122**	**0.0306**	**2145**	**1.0000**	**3.06%**	
Verizon	**1**	**833**	**122**	**0.0201**	**698**	**0.4653**	**4.32%**	
								40.56%
* Source: Siting Council								

ATTACHMENT 3

Date: **December 21, 2013**

Jason Rouse
Crown Castle
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Charlotte, NC 28277

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

Subject: **Structural Analysis Report**

Carrier Designation:	***Verizon Wireless* Co-Locate**	
	Carrier Site Name:	West Haven-3, CT
Crown Castle Designation:	**Crown Castle BU Number:**	876323
	Crown Castle Site Name:	HILLSIDE
	Crown Castle JDE Job Number:	241352
	Crown Castle Work Order Number:	691024
	Crown Castle Application Number:	195726 Rev. 11
Engineering Firm Designation:	**Crown Castle Project Number:**	691024
Site Data:	**85 Plainfield Ave, WEST HAVEN, New Haven County, CT** **Latitude *41° 18' 4.59"*, Longitude *-72° 58' 35.2"*** **148 Foot - Monopole Tower**	

Dear Jason Rouse,

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 691024, in accordance with application 195726, revision 11.

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 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:

Respectfully submitted by: Christopher Hall, E.I.T. / CMS

Reza Jenabzadeh, P.E
Engineering Supervisor

STATE OF CONNECTICUT
REZA JENABZADEH
No. 28558
LICENSED
PROFESSIONAL ENGINEER

12/21/13

tnxTower Report - version 6.1.3.1

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1) INTRODUCTION

This tower is a 148 ft Monopole tower designed by Summit in June of 1997. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-F. The tower has been modified per reinforcement drawings prepared by PSG Engineering, in February of 2009. Reinforcement consists of a 10 ft, 24 in diameter pipe extension.

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
122.0	122.0	1	rfs celwave	DB-T1-6Z-8AB-0Z	-	-	-
		1	tower mounts	Side Arm Mount [SO 102-1]			
120.0	122.0	3	alcatel lucent	RRH2X40-AWS	1	1-5/8	-
		3	antel	BXA-171063-8BF-EDIN-0 w/ Mount Pipe			
		1	antel	BXA-70080-6CF-2 w/ Mount Pipe			
		2	antel	BXA-80063/4CF w/ Mount Pipe			
		1	antel	BXA-80063/6CF w/ Mount Pipe			
		2	rfs celwave	FD9R6004/2C-3L			

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
146.0	146.0	3	rfs celwave	APX18-206517-CT2 w/ Mount Pipe	6	1-5/8	1
138.0	141.0	1	andrew	VHLP2-11	-	-	2
	140.0	3	alcatel lucent	800 EXTERNAL NOTCH FILTER	3	1-1/4	1
		6	powerwave technologies	P40-16-XLPP-RR-A			
		18	rfs celwave	ACU-A20-N			
	139.0	1	andrew	FPA5150-23-1	6 4	5/16 1/2	2
	138.0	1	andrew	VHLP2-11			
		3	samsung telecommunications	FDD_R6_RRH			
		1	tower mounts	Platform Mount [LP 301-1]	-	-	1
	137.0	1	andrew	VHLP2-18	-	-	2
	134.0	3	argus technologies	LLPX310R			
136.0	136.0	6	alcatel lucent	1900MHz RRH (65MHz) w/Mount pipe	-	-	1
		3	alcatel lucent	TME-800MHZ RRH			
		1	tower mounts	Side Arm Mount [SO 104-3]			
120.0	126.0	1	gps	GPS_A	-	-	1
	122.0	1	antel	BXA-70063-6CF-2 w/ Mount Pipe			
		1	antel	BXA-70063/6CF w/ Mount Pipe			
		3	rymsa wireless	MG D3-800TV w/ Mount Pipe			
		2	decibel	DB846F65ZAXY w/ Mount Pipe	2	1-5/8	3
		4	swedcom	SC-E 6014 rev2 w/ Mount Pipe			
		2	swedcom	SLXW 5514 w/ Mount Pipe			
	120.0	1	tower mounts	Platform Mount [LP 712-1]	1 16	1/2 1-5/8	1
90.0	91.0	1	lucent	KS24019-L112A	1	1/2	1
	90.0	1	tower mounts	Side Arm Mount [SO 701-1]			

Notes:
1) Existing Equipment
2) Reserved Equipment
3) Equipment To Be Removed, Not Considered in This Analysis

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
138	138	12	DECIBEL	DB980H PCS	-	-
120	120	12	SWEDCOM	ALP-9212-N	-	-
100	100	12	SWEDCOM	ALP-9212-N	-	-
90	90	1	GENERIC	GPS	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH	2134228	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Summit	1614608	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Summit	1615021	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	PSG	2384593	CCISITES

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.

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	148 - 138	Pole	TP22x22x0.25	1	-0.76	628.69	3.9	Pass
L2	138 - 90.75	Pole	TP31.924x22x0.25	2	-8.93	1174.11	74.7	Pass
L3	90.75 - 44.75	Pole	TP41.086x30.5839x0.3125	3	-16.61	1888.25	90.0	Pass
L4	44.75 - 0	Pole	TP49.86x39.3583x0.375	4	-28.76	2826.47	88.0	Pass
							Summary	
						Pole (L3)	90.0	Pass
						Rating =	90.0	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	88.8	Pass
1	Base Plate	0	73.4	Pass
1	Base Foundation Soil Interaction	0	76.8	Pass
1	Flange Bolts & Plate	138	4.7 & 13.3	Pass

Structure Rating (max from all components) =	90%

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

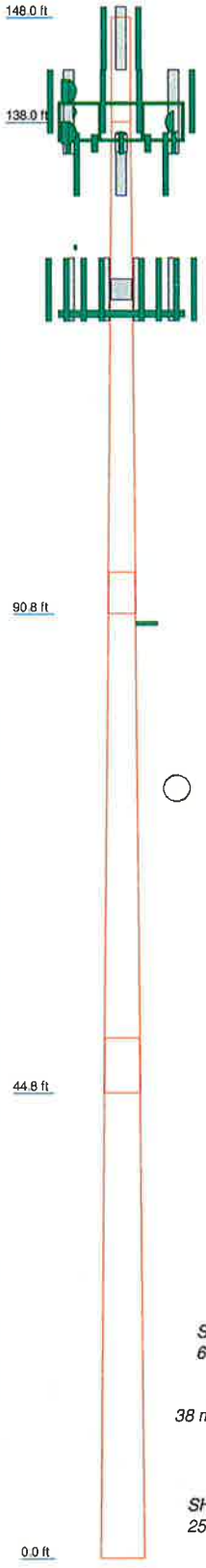
4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT

Section	1	2	3	4
Length (ft)	10.00	47.25	50.00	50.00
Number of Sides	1	18	18	18
Thickness (in)	0.2500	0.2500	0.3125	0.3750
Socket Length (ft)		4.00	5.25	
Top Dia (in)	22.0000	22.0000	30.5839	39.3583
Bot Dia (in)	22.0000	31.9240	41.0860	49.8600
Grade	A500-50		A607-60	
Weight (K)	0.7	3.4	6.0	9.0



AXIAL
42 K
SHEAR
6 K
MOMENT
637 kip-ft
TORQUE 0 kip-ft
38 mph WIND - 0.7500 in ICE

AXIAL
29 K
SHEAR
25 K
MOMENT
2501 kip-ft
TORQUE 2 kip-ft
REACTIONS - 85 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
APX18-206517-CT2 w/ Mount Pipe	146	TME-800MHZ RRH	136
APX18-206517-CT2 w/ Mount Pipe	146	(2) 1900MHz RRH (65MHz) w/Mount pipe	136
APX18-206517-CT2 w/ Mount Pipe	146	DB-T1-6Z-8AB-0Z	122
LLPX310R	138	Side Arm Mount [SO 102-1]	122
LLPX310R	138	BXA-70063/6CF w/ Mount Pipe	120
LLPX310R	138	BXA-171063-8BF-EDIN-0 w/ Mount Pipe	120
FDD_R6_RRH	138	BXA-171063-8BF-EDIN-0 w/ Mount Pipe	120
FDD_R6_RRH	138	BXA-171063-8BF-EDIN-0 w/ Mount Pipe	120
FDD_R6_RRH	138	BXA-70080-6CF-2 w/ Mount Pipe	120
Platform Mount [LP 301-1]	136	BXA-70063-6CF-2 w/ Mount Pipe	120
(2) P40-16-XLPP-RR-A	138	BXA-80063/4CF w/ Mount Pipe	120
(2) P40-16-XLPP-RR-A	138	BXA-80063/4CF w/ Mount Pipe	120
(2) P40-16-XLPP-RR-A	138	BXA-80063/6CF w/ Mount Pipe	120
800 EXTERNAL NOTCH FILTER	138	FD9R6004/2C-3L	120
800 EXTERNAL NOTCH FILTER	138	FD9R6004/2C-3L	120
800 EXTERNAL NOTCH FILTER	138	RRH2X40-AWS	120
(6) ACU-A20-N	138	RRH2X40-AWS	120
(6) ACU-A20-N	138	RRH2X40-AWS	120
(6) ACU-A20-N	138	Platform Mount [LP 712-1]	120
FPA5150-23-1	138	MG D3-800TV w/ Mount Pipe	120
VHLP2-18	138	GPS_A	120
VHLP2-11	138	MG D3-800TV w/ Mount Pipe	120
VHLP2-11	138	MG D3-800TV w/ Mount Pipe	120
(2) 1900MHz RRH (65MHz) w/Mount pipe	136	KS24019-L112A	90
(2) 1900MHz RRH (65MHz) w/Mount pipe	136	Side Arm Mount [SO 701-1]	90
Side Arm Mount [SO 104-3]	136		
TME-800MHZ RRH	136		
TME-800MHZ RRH	136		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A500-50	50 ksi	62 ksi	A607-60	60 ksi	75 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: 90%

CROWN CASTLE
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Phone: (724) 416-2000
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Job: BU#: 876323			
Project:			
Client: CCI	Drawn by: chall		App'd:
Code: TIA/EIA-222-F	Date: 12/20/13		Scale: NTS
Path: R:\SA Models - Letters\Work Area\CHall\production\Active Work Orders\876323\876323.eri			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:

4) Tower is located in New Haven County, Connecticut.
5) Basic wind speed of 85 mph.
6) Nominal ice thickness of 0.7500 in.
7) Ice thickness is considered to increase with height.
8) Ice density of 56 pcf.
9) A wind speed of 38 mph is used in combination with ice.
10) Temperature drop of 50 °F.
11) Deflections calculated using a wind speed of 50 mph.
12) A non-linear (P-delta) analysis was used.
13) Pressures are calculated at each section.
14) Stress ratio used in pole design is 1.333.
15) 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	148.00-138.00	10.00	0.00	Round	22.0000	22.0000	0.2500		A500-50 (50 ksi)
L2	138.00-90.75	47.25	4.00	18	22.0000	31.9240	0.2500	1.0000	A607-60 (60 ksi)
L3	90.75-44.75	50.00	5.25	18	30.5839	41.0860	0.3125	1.2500	A607-60 (60 ksi)
L4	44.75-0.00	50.00		18	39.3583	49.8600	0.3750	1.5000	A607-60 (60 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	22.0000	17.0824	1010.9050	7.6995	11.0000	91.9005	2019.0560	8.5361	0.0000	0
	22.0000	17.0824	1010.9050	7.6995	11.0000	91.9005	2019.0560	8.5361	0.0000	0
L2	22.3394	17.2586	1031.4832	7.7212	11.1760	92.2945	2064.3237	8.6310	3.4320	13.728
	32.4165	25.1333	3185.6138	11.2443	16.2174	196.4319	6375.4192	12.5690	5.1786	20.714
L3	31.9088	30.0254	3476.0879	10.7463	15.5366	223.7353	6956.7498	15.0156	4.8328	15.465
	41.7198	40.4422	8494.3152	14.4746	20.8717	406.9779	16999.8075	20.2250	6.6811	21.38
L4	41.0851	46.3998	8908.6246	13.8391	19.9940	445.5648	17828.9715	23.2043	6.2671	16.712
	50.6292	58.8995	18222.0135	17.5672	25.3289	719.4165	36468.0040	29.4554	8.1154	21.641

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 148.00-138.00				1	1.1	1.2		
L2 138.00-90.75				1	1	1		
L3 90.75-44.75				1	1	1		
L4 44.75-0.00				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 plf
*										

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
LDF7-50A(1-5/8")	A	No	CaAa (Out Of Face)	146.00 - 0.00	2	No Ice	0.20	0.82
						1/2" Ice	0.30	2.33
						1" Ice	0.40	4.46
						2" Ice	0.60	10.54
						4" Ice	1.00	30.04
LDF7-50A(1-5/8")	A	No	CaAa (Out Of Face)	146.00 - 0.00	4	No Ice	0.00	0.82
						1/2" Ice	0.00	2.33
						1" Ice	0.00	4.46
						2" Ice	0.00	10.54
						4" Ice	0.00	30.04
*								
HB114-1-0813U4-M5J(1 1/4")	C	No	Inside Pole	138.00 - 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
7983A(1/2")	C	No	Inside Pole	138.00 - 0.00	4	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	138.00 - 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

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
						4" Ice	0.00	0.60
*								
561(1-5/8")	B	No	Inside Pole	120.00 - 0.00	16	No Ice	0.00	1.35
						1/2" Ice	0.00	1.35
						1" Ice	0.00	1.35
						2" Ice	0.00	1.35
						4" Ice	0.00	1.35
FSJ4-50B(1/2")	B	No	Inside Pole	120.00 - 0.00	1	No Ice	0.00	0.14
						1/2" Ice	0.00	0.14
						1" Ice	0.00	0.14
						2" Ice	0.00	0.14
						4" Ice	0.00	0.14
HB158-1-08U8-S8J18(1-5/8)	B	No	CaAa (Out Of Face)	120.00 - 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
*								
LDF4-50A(1/2")	C	No	Inside Pole	90.00 - 0.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
						2" Ice	0.00	0.15
						4" Ice	0.00	0.15
*								

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	148.00-138.00	A	0.000	0.000	0.000	3.168	0.04
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L2	138.00-90.75	A	0.000	0.000	0.000	18.711	0.23
		B	0.000	0.000	0.000	5.792	0.67
		C	0.000	0.000	0.000	0.000	0.36
L3	90.75-44.75	A	0.000	0.000	0.000	18.216	0.23
		B	0.000	0.000	0.000	9.108	1.06
		C	0.000	0.000	0.000	0.000	0.35
L4	44.75-0.00	A	0.000	0.000	0.000	17.721	0.22
		B	0.000	0.000	0.000	8.861	1.03
		C	0.000	0.000	0.000	0.000	0.34

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	148.00-138.00	A	0.894	0.000	0.000	0.000	6.030	0.19
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L2	138.00-90.75	A	0.870	0.000	0.000	0.000	35.147	1.11
		B		0.000	0.000	0.000	10.879	0.76
		C		0.000	0.000	0.000	0.000	0.36
L3	90.75-44.75	A	0.817	0.000	0.000	0.000	34.217	1.08
		B		0.000	0.000	0.000	17.109	1.20
		C		0.000	0.000	0.000	0.000	0.35
L4	44.75-0.00	A	0.750	0.000	0.000	0.000	32.344	0.99
		B		0.000	0.000	0.000	16.172	1.16
		C		0.000	0.000	0.000	0.000	0.34

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L1	148.00-138.00	0.0000	-0.3734	0.0000	-0.5957
L2	138.00-90.75	0.1384	-0.4027	0.2137	-0.6215
L3	90.75-44.75	0.2149	-0.3723	0.3409	-0.5905
L4	44.75-0.00	0.2221	-0.3848	0.3545	-0.6140

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
***									
APX18-206517-CT2 w/ Mount Pipe	A	From Leg	1.00 0.00 0.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.36 5.91 6.44 7.51 9.86	4.73 5.90 6.79 8.58 12.36	0.05 0.09 0.15 0.28 0.68
APX18-206517-CT2 w/ Mount Pipe	B	From Leg	1.00 0.00 0.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.36 5.91 6.44 7.51 9.86	4.73 5.90 6.79 8.58 12.36	0.05 0.09 0.15 0.28 0.68
APX18-206517-CT2 w/ Mount Pipe	C	From Leg	1.00 0.00 0.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.36 5.91 6.44 7.51 9.86	4.73 5.90 6.79 8.58 12.36	0.05 0.09 0.15 0.28 0.68
*									
LLPX310R	A	From Leg	4.00 0.00 -4.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.84 5.19 5.55 6.30 7.91	1.96 2.23 2.50 3.13 4.55	0.03 0.05 0.08 0.16 0.36
LLPX310R	B	From Leg	4.00 0.00 -4.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.84 5.19 5.55 6.30 7.91	1.96 2.23 2.50 3.13 4.55	0.03 0.05 0.08 0.16 0.36
LLPX310R	C	From Leg	4.00 0.00 -4.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.84 5.19 5.55 6.30 7.91	1.96 2.23 2.50 3.13 4.55	0.03 0.05 0.08 0.16 0.36
FDD_R6_RRH	A	From Leg	4.00 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.79 1.97 2.16 2.57 3.49	0.78 0.92 1.07 1.39 2.14	0.03 0.04 0.06 0.09 0.20
FDD_R6_RRH	B	From Leg	4.00 0.00	0.0000	138.00	No Ice 1/2"	1.79 1.97	0.78 0.92	0.03 0.04

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			Ice	2.16	1.07	0.06
						1" Ice	2.57	1.39	0.09
						2" Ice	3.49	2.14	0.20
						4" Ice			
FDD_R6_RRH	C	From Leg	4.00	0.0000	138.00	No Ice	1.79	0.78	0.03
			0.00			1/2"	1.97	0.92	0.04
			0.00			Ice	2.16	1.07	0.06
						1" Ice	2.57	1.39	0.09
						2" Ice	3.49	2.14	0.20
						4" Ice			
Platform Mount [LP 301-1]	C	None		0.0000	138.00	No Ice	30.10	30.10	1.59
						1/2"	40.80	40.80	2.03
						Ice	51.50	51.50	2.47
						1" Ice	72.90	72.90	3.35
						2" Ice	115.70	115.70	5.11
						4" Ice			
(2) P40-16-XLPP-RR-A	A	From Leg	4.00	0.0000	138.00	No Ice	10.50	3.52	0.05
			0.00			1/2"	10.98	3.87	0.11
			2.00			Ice	11.48	4.22	0.16
						1" Ice	12.49	5.05	0.30
						2" Ice	14.61	6.83	0.64
						4" Ice			
(2) P40-16-XLPP-RR-A	B	From Leg	4.00	0.0000	138.00	No Ice	10.50	3.52	0.05
			0.00			1/2"	10.98	3.87	0.11
			2.00			Ice	11.48	4.22	0.16
						1" Ice	12.49	5.05	0.30
						2" Ice	14.61	6.83	0.64
						4" Ice			
(2) P40-16-XLPP-RR-A	C	From Leg	4.00	0.0000	138.00	No Ice	10.50	3.52	0.05
			0.00			1/2"	10.98	3.87	0.11
			2.00			Ice	11.48	4.22	0.16
						1" Ice	12.49	5.05	0.30
						2" Ice	14.61	6.83	0.64
						4" Ice			
800 EXTERNAL NOTCH FILTER	A	From Leg	4.00	0.0000	138.00	No Ice	0.77	0.37	0.01
			0.00			1/2"	0.89	0.46	0.02
			2.00			Ice	1.02	0.56	0.02
						1" Ice	1.30	0.79	0.04
						2" Ice	1.97	1.34	0.11
						4" Ice			
800 EXTERNAL NOTCH FILTER	B	From Leg	4.00	0.0000	138.00	No Ice	0.77	0.37	0.01
			0.00			1/2"	0.89	0.46	0.02
			2.00			Ice	1.02	0.56	0.02
						1" Ice	1.30	0.79	0.04
						2" Ice	1.97	1.34	0.11
						4" Ice			
800 EXTERNAL NOTCH FILTER	C	From Leg	4.00	0.0000	138.00	No Ice	0.77	0.37	0.01
			0.00			1/2"	0.89	0.46	0.02
			2.00			Ice	1.02	0.56	0.02
						1" Ice	1.30	0.79	0.04
						2" Ice	1.97	1.34	0.11
						4" Ice			
(6) ACU-A20-N	A	From Leg	4.00	0.0000	138.00	No Ice	0.08	0.14	0.00
			0.00			1/2"	0.12	0.19	0.00
			2.00			Ice	0.17	0.25	0.00
						1" Ice	0.30	0.40	0.01
						2" Ice	0.67	0.80	0.04
						4" Ice			
(6) ACU-A20-N	B	From Leg	4.00	0.0000	138.00	No Ice	0.08	0.14	0.00
			0.00			1/2"	0.12	0.19	0.00
			2.00			Ice	0.17	0.25	0.00
						1" Ice	0.30	0.40	0.01
						2" Ice	0.67	0.80	0.04
						4" Ice			

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(6) ACU-A20-N	C	From Leg	4.00 0.00 2.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.08 0.12 0.17 0.30 0.67	0.14 0.19 0.25 0.40 0.80	0.00 0.00 0.00 0.01 0.04
*									
TME-800MHZ RRH	A	From Leg	2.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.49 2.71 2.93 3.41 4.46	2.07 2.27 2.48 2.93 3.93	0.05 0.07 0.10 0.16 0.32
TME-800MHZ RRH	B	From Leg	2.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.49 2.71 2.93 3.41 4.46	2.07 2.27 2.48 2.93 3.93	0.05 0.07 0.10 0.16 0.32
TME-800MHZ RRH	C	From Leg	2.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.49 2.71 2.93 3.41 4.46	2.07 2.27 2.48 2.93 3.93	0.05 0.07 0.10 0.16 0.32
(2) 1900MHz RRH (65MHz) w/Mount pipe	A	From Leg	2.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.70 2.94 3.18 3.70 4.85	2.93 3.25 3.60 4.35 6.09	0.06 0.09 0.12 0.20 0.41
(2) 1900MHz RRH (65MHz) w/Mount pipe	B	From Leg	2.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.70 2.94 3.18 3.70 4.85	2.93 3.25 3.60 4.35 6.09	0.06 0.09 0.12 0.20 0.41
(2) 1900MHz RRH (65MHz) w/Mount pipe	C	From Leg	2.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.70 2.94 3.18 3.70 4.85	2.93 3.25 3.60 4.35 6.09	0.06 0.09 0.12 0.20 0.41
Side Arm Mount [SO 104-3]	C	None		0.0000	136.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.30 4.13 4.96 6.62 9.94	3.30 4.13 4.96 6.62 9.94	0.29 0.32 0.35 0.41 0.53
*									
DB-T1-6Z-8AB-0Z	A	From Leg	1.00 0.00 0.00	0.0000	122.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.60 5.92 6.24 6.91 8.37	2.33 2.56 2.79 3.28 4.37	0.04 0.08 0.12 0.21 0.45
Side Arm Mount [SO 102-1]	A	From Leg	0.50 0.00 0.00	0.0000	122.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.50 1.74 1.98 2.46 3.42	1.50 1.75 2.00 2.50 3.50	0.03 0.04 0.04 0.07 0.11
*									
MG D3-800TV w/ Mount Pipe	A	From Leg	4.00 0.00	0.0000	120.00	No Ice 1/2"	3.57 3.98	3.42 4.12	0.04 0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			2.00			Ice	4.39	4.78	0.11
						1" Ice	5.33	6.16	0.21
						2" Ice	7.34	9.18	0.52
						4" Ice			
MG D3-800TV w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.57 3.98 4.39 5.33 7.34	3.42 4.12 4.78 6.16 9.18	0.04 0.07 0.11 0.21 0.52
MG D3-800TV w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.57 3.98 4.39 5.33 7.34	3.42 4.12 4.78 6.16 9.18	0.04 0.07 0.11 0.21 0.52
GPS_A	C	From Leg	4.00 0.00 6.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.30 0.37 0.46 0.65 1.15	0.30 0.37 0.46 0.65 1.15	0.00 0.00 0.01 0.02 0.08
BXA-70063/6CF w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.98 8.62 9.23 10.47 13.08	5.70 6.85 7.71 9.50 13.26	0.04 0.10 0.17 0.33 0.80
BXA-171063-8BF-EDIN-0 w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.18 3.56 3.96 4.85 6.77	3.35 3.97 4.60 5.89 8.89	0.03 0.06 0.10 0.19 0.49
BXA-171063-8BF-EDIN-0 w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.18 3.56 3.96 4.85 6.77	3.35 3.97 4.60 5.89 8.89	0.03 0.06 0.10 0.19 0.49
BXA-171063-8BF-EDIN-0 w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.18 3.56 3.96 4.85 6.77	3.35 3.97 4.60 5.89 8.89	0.03 0.06 0.10 0.19 0.49
BXA-70080-6CF-2 w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.01 6.56 7.08 8.17 10.69	6.20 7.36 8.23 10.02 13.84	0.04 0.10 0.16 0.31 0.75
BXA-70063-6CF-2 w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.97 8.61 9.22 10.46 13.07	5.80 6.95 7.82 9.60 13.37	0.04 0.10 0.17 0.34 0.80
BXA-80063/4CF w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.40 5.84 6.30 7.24 9.26	3.42 4.02 4.64 5.92 8.93	0.03 0.07 0.12 0.23 0.56
BXA-80063/4CF w/ Mount	B	From Leg	4.00	0.0000	120.00	No Ice	5.40	3.42	0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Pipe			0.00				1/2"	5.84	4.02	0.07
			2.00				Ice	6.30	4.64	0.12
							1" Ice	7.24	5.92	0.23
							2" Ice	9.26	8.93	0.56
							4" Ice			
BXA-80063/6CF w/ Mount Pipe	C	From Leg	4.00		0.0000	120.00	No Ice	7.98	5.41	0.04
			0.00				1/2"	8.62	6.56	0.10
			2.00				Ice	9.23	7.42	0.17
							1" Ice	10.47	9.20	0.33
							2" Ice	13.08	12.95	0.79
							4" Ice			
FD9R6004/2C-3L	A	From Leg	4.00		0.0000	120.00	No Ice	0.37	0.08	0.00
			0.00				1/2"	0.45	0.14	0.01
			2.00				Ice	0.54	0.20	0.01
							1" Ice	0.75	0.34	0.02
							2" Ice	1.28	0.74	0.06
							4" Ice			
FD9R6004/2C-3L	B	From Leg	4.00		0.0000	120.00	No Ice	0.37	0.08	0.00
			0.00				1/2"	0.45	0.14	0.01
			2.00				Ice	0.54	0.20	0.01
							1" Ice	0.75	0.34	0.02
							2" Ice	1.28	0.74	0.06
							4" Ice			
RRH2X40-AWS	A	From Leg	4.00		0.0000	120.00	No Ice	2.52	1.59	0.04
			0.00				1/2"	2.75	1.80	0.06
			2.00				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	B	From Leg	4.00		0.0000	120.00	No Ice	2.52	1.59	0.04
			0.00				1/2"	2.75	1.80	0.06
			2.00				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	4.00		0.0000	120.00	No Ice	2.52	1.59	0.04
			0.00				1/2"	2.75	1.80	0.06
			2.00				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			
Platform Mount [LP 712-1]	C	None			0.0000	120.00	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			
KS24019-L112A	B	From Leg	3.00		0.0000	90.00	No Ice	0.10	0.10	0.01
			0.00				1/2"	0.18	0.18	0.01
			1.00				Ice	0.26	0.26	0.01
							1" Ice	0.42	0.42	0.01
							2" Ice	0.74	0.74	0.02
							4" Ice			
Side Arm Mount [SO 701-1]	B	From Leg	1.50		0.0000	90.00	No Ice	0.85	1.67	0.07
			0.00				1/2"	1.14	2.34	0.08
			0.00				Ice	1.43	3.01	0.09
							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
*											
FPA5150-23-1	C	Paraboloid w/o Radome	From Leg	4.00 0.00 1.00	45.0000		138.00	1.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.79 0.92 1.06 1.33 1.88	0.00 0.01 0.01 0.02 0.04
VHLP2-18	C	Paraboloid w/Shroud (HP)	From Leg	4.00 0.00 -1.00	45.0000		138.00	2.17	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.72 4.01 4.30 4.88 6.04	0.03 0.05 0.07 0.11 0.20
VHLP2-11	B	Paraboloid w/o Radome	From Leg	4.00 0.00 0.00	45.0000		138.00	2.17	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.72 4.01 4.30 4.88 6.04	0.03 0.05 0.07 0.11 0.19
VHLP2-11	C	Paraboloid w/Shroud (HP)	From Leg	4.00 0.00 3.00	45.0000		138.00	2.17	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.72 4.01 4.30 4.88 6.04	0.03 0.05 0.07 0.11 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
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

Comb. No.	Description
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	148 - 138	Pole	Max Tension	11	0.00	-0.00	0.00
			Max. Compression	14	-1.62	0.32	-0.01
			Max. Mx	11	-0.76	10.49	0.09
			Max. My	8	-0.77	-0.14	-10.20
			Max. Vy	5	1.79	-10.37	-0.09
			Max. Vx	8	1.66	-0.14	-10.20
			Max. Torque	7			-1.06
L2	138 - 90.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-16.95	0.39	0.94
			Max. Mx	5	-8.94	-548.37	-5.92
			Max. My	2	-8.94	8.41	546.12
			Max. Vy	5	16.14	-548.37	-5.92
			Max. Vx	2	-16.10	8.41	546.12
			Max. Torque	4			-2.15
L3	90.75 - 44.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-26.98	-0.10	2.24
			Max. Mx	5	-16.61	-1368.78	-11.27
			Max. My	2	-16.61	15.98	1365.30
			Max. Vy	5	20.44	-1368.78	-11.27
			Max. Vx	2	-20.42	15.98	1365.30
			Max. Torque	4			-1.86
L4	44.75 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-41.77	-0.43	4.09
			Max. Mx	5	-28.76	-2497.18	-16.81
			Max. My	2	-28.76	24.31	2492.83
			Max. Vy	5	24.66	-2497.18	-16.81
			Max. Vx	2	-24.64	24.31	2492.83
			Max. Torque	4			-1.78

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	15	41.77	0.04	6.05
	Max. H_x	11	28.78	24.56	0.19
	Max. H_z	2	28.78	0.16	24.62
	Max. M_x	2	2492.83	0.16	24.62
	Max. M_z	5	2497.18	-24.64	-0.12
	Max. Torsion	10	0.79	21.25	-12.19
	Min. Vert	1	28.78	0.00	0.00
	Min. H_x	5	28.78	-24.64	-0.12
	Min. H_z	8	28.78	-0.13	-24.52
	Min. M_x	8	-2477.38	-0.13	-24.52
	Min. M_z	11	-2485.01	24.56	0.19
	Min. Torsion	4	-1.70	-21.33	12.26

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	28.78	0.00	0.00	-0.70	-0.21	0.00
Dead+Wind 0 deg - No Ice	28.78	-0.16	-24.62	-2492.83	24.31	-0.54
Dead+Wind 30 deg - No Ice	28.78	12.23	-21.31	-2156.95	-1235.84	0.70
Dead+Wind 60 deg - No Ice	28.78	21.33	-12.26	-1238.44	-2161.89	1.70
Dead+Wind 90 deg - No Ice	28.78	24.64	0.12	16.81	-2497.18	1.11
Dead+Wind 120 deg - No Ice	28.78	21.39	12.27	1241.31	-2171.16	1.43
Dead+Wind 150 deg - No Ice	28.78	12.50	21.23	2144.99	-1275.27	1.27
Dead+Wind 180 deg - No Ice	28.78	0.13	24.52	2477.38	-19.43	0.76
Dead+Wind 210 deg - No Ice	28.78	-12.32	21.16	2134.45	1248.11	-0.13
Dead+Wind 240 deg - No Ice	28.78	-21.25	12.19	1227.15	2148.74	-0.79
Dead+Wind 270 deg - No Ice	28.78	-24.56	-0.19	-28.27	2485.01	-0.24
Dead+Wind 300 deg - No Ice	28.78	-21.26	-12.45	-1268.43	2151.31	-0.12
Dead+Wind 330 deg - No Ice	28.78	-12.36	-21.32	-2160.12	1255.51	-0.41
Dead+Ice+Temp	41.77	-0.00	-0.00	-4.09	-0.43	-0.00
Dead+Wind 0 deg+Ice+Temp	41.77	-0.04	-6.05	-636.60	5.32	-0.09
Dead+Wind 30 deg+Ice+Temp	41.77	3.01	-5.23	-551.31	-314.15	0.16
Dead+Wind 60 deg+Ice+Temp	41.77	5.24	-3.01	-318.30	-548.76	0.37
Dead+Wind 90 deg+Ice+Temp	41.77	6.05	0.03	-0.01	-633.78	0.21
Dead+Wind 120 deg+Ice+Temp	41.77	5.25	3.02	311.19	-550.96	0.27
Dead+Wind 150 deg+Ice+Temp	41.77	3.07	5.22	540.67	-323.41	0.24
Dead+Wind 180 deg+Ice+Temp	41.77	0.03	6.03	625.02	-5.09	0.14
Dead+Wind 210 deg+Ice+Temp	41.77	-3.03	5.20	538.11	316.06	-0.04
Dead+Wind 240 deg+Ice+Temp	41.77	-5.22	3.00	307.76	544.79	-0.16
Dead+Wind 270 deg+Ice+Temp	41.77	-6.03	-0.04	-10.60	630.12	-0.01
Dead+Wind 300 deg+Ice+Temp	41.77	-5.22	-3.06	-325.47	545.53	0.03
Dead+Wind 330 deg+Ice+Temp	41.77	-3.03	-5.24	-552.22	317.91	-0.04
Dead+Wind 0 deg - Service	28.78	-0.06	-8.52	-864.09	8.28	-0.19
Dead+Wind 30 deg - Service	28.78	4.23	-7.37	-747.72	-428.29	0.24
Dead+Wind 60 deg - Service	28.78	7.38	-4.24	-429.52	-749.12	0.59
Dead+Wind 90 deg - Service	28.78	8.53	0.04	5.36	-865.28	0.39
Dead+Wind 120 deg - Service	28.78	7.40	4.25	429.58	-752.33	0.50
Dead+Wind 150 deg - Service	28.78	4.32	7.35	742.65	-441.96	0.45
Dead+Wind 180 deg - Service	28.78	0.04	8.48	857.78	-6.88	0.27
Dead+Wind 210 deg - Service	28.78	-4.26	7.32	738.97	432.24	-0.05
Dead+Wind 240 deg - Service	28.78	-7.35	4.22	424.65	744.25	-0.28
Dead+Wind 270 deg - Service	28.78	-8.50	-0.06	-10.27	860.76	-0.08
Dead+Wind 300 deg - Service	28.78	-7.36	-4.31	-439.91	745.17	-0.04
Dead+Wind 330 deg - Service	28.78	-4.28	-7.38	-748.83	434.82	-0.14

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-28.78	0.00	0.00	28.78	0.00	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
2	-0.16	-28.78	-24.62	0.16	28.78	24.62	0.000%
3	12.23	-28.78	-21.31	-12.23	28.78	21.31	0.000%
4	21.33	-28.78	-12.26	-21.33	28.78	12.26	0.000%
5	24.64	-28.78	0.12	-24.64	28.78	-0.12	0.000%
6	21.39	-28.78	12.27	-21.39	28.78	-12.27	0.000%
7	12.50	-28.78	21.23	-12.50	28.78	-21.23	0.000%
8	0.13	-28.78	24.52	-0.13	28.78	-24.52	0.000%
9	-12.32	-28.78	21.16	12.32	28.78	-21.16	0.000%
10	-21.25	-28.78	12.19	21.25	28.78	-12.19	0.000%
11	-24.56	-28.78	-0.19	24.56	28.78	0.19	0.000%
12	-21.26	-28.78	-12.45	21.26	28.78	12.45	0.000%
13	-12.36	-28.78	-21.32	12.36	28.78	21.32	0.000%
14	0.00	-41.77	0.00	0.00	41.77	0.00	0.000%
15	-0.04	-41.77	-6.05	0.04	41.77	6.05	0.000%
16	3.01	-41.77	-5.23	-3.01	41.77	5.23	0.000%
17	5.24	-41.77	-3.01	-5.24	41.77	3.01	0.000%
18	6.05	-41.77	0.03	-6.05	41.77	-0.03	0.000%
19	5.25	-41.77	3.02	-5.25	41.77	-3.02	0.000%
20	3.07	-41.77	5.22	-3.07	41.77	-5.22	0.000%
21	0.03	-41.77	6.03	-0.03	41.77	-6.03	0.000%
22	-3.03	-41.77	5.20	3.03	41.77	-5.20	0.000%
23	-5.22	-41.77	3.00	5.22	41.77	-3.00	0.000%
24	-6.03	-41.77	-0.04	6.03	41.77	0.04	0.000%
25	-5.22	-41.77	-3.06	5.22	41.77	3.06	0.000%
26	-3.03	-41.77	-5.24	3.03	41.77	5.24	0.000%
27	-0.06	-28.78	-8.52	0.06	28.78	8.52	0.000%
28	4.23	-28.78	-7.37	-4.23	28.78	7.37	0.000%
29	7.38	-28.78	-4.24	-7.38	28.78	4.24	0.000%
30	8.53	-28.78	0.04	-8.53	28.78	-0.04	0.000%
31	7.40	-28.78	4.25	-7.40	28.78	-4.25	0.000%
32	4.32	-28.78	7.35	-4.32	28.78	-7.35	0.000%
33	0.04	-28.78	8.48	-0.04	28.78	-8.48	0.000%
34	-4.26	-28.78	7.32	4.26	28.78	-7.32	0.000%
35	-7.35	-28.78	4.22	7.35	28.78	-4.22	0.000%
36	-8.50	-28.78	-0.06	8.50	28.78	0.06	0.000%
37	-7.36	-28.78	-4.31	7.36	28.78	4.31	0.000%
38	-4.28	-28.78	-7.38	4.28	28.78	7.38	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	5	0.00000001	0.00006071
3	Yes	5	0.00000001	0.00078371
4	Yes	5	0.00000001	0.00071285
5	Yes	5	0.00000001	0.00009036
6	Yes	5	0.00000001	0.00083197
7	Yes	5	0.00000001	0.00073770
8	Yes	4	0.00000001	0.00081935
9	Yes	5	0.00000001	0.00075392
10	Yes	5	0.00000001	0.00078580
11	Yes	4	0.00000001	0.00018869
12	Yes	5	0.00000001	0.00076522
13	Yes	5	0.00000001	0.00079581
14	Yes	4	0.00000001	0.00001103
15	Yes	5	0.00000001	0.00012999
16	Yes	5	0.00000001	0.00019971
17	Yes	5	0.00000001	0.00019433
18	Yes	5	0.00000001	0.00013072
19	Yes	5	0.00000001	0.00020447
20	Yes	5	0.00000001	0.00019528
21	Yes	5	0.00000001	0.00012757
22	Yes	5	0.00000001	0.00019357
23	Yes	5	0.00000001	0.00019621

24	Yes	5	0.00000001	0.00012831
25	Yes	5	0.00000001	0.00020051
26	Yes	5	0.00000001	0.00020323
27	Yes	4	0.00000001	0.00023723
28	Yes	5	0.00000001	0.00006739
29	Yes	5	0.00000001	0.00005610
30	Yes	4	0.00000001	0.00041387
31	Yes	5	0.00000001	0.00007648
32	Yes	5	0.00000001	0.00005941
33	Yes	4	0.00000001	0.00021611
34	Yes	5	0.00000001	0.00006188
35	Yes	5	0.00000001	0.00006815
36	Yes	4	0.00000001	0.00010007
37	Yes	5	0.00000001	0.00006325
38	Yes	5	0.00000001	0.00006905

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	148 - 138	33.323	31	1.9103	0.0090
L2	138 - 90.75	29.325	31	1.9067	0.0088
L3	94.75 - 44.75	13.705	31	1.4161	0.0027
L4	50 - 0	3.685	31	0.6846	0.0008

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
146.00	APX18-206517-CT2 w/ Mount Pipe	31	32.521	1.9115	0.0090	31676
141.00	VHLP2-11	31	30.520	1.9114	0.0089	22655
139.00	FPA5150-23-1	31	29.723	1.9088	0.0089	17739
138.00	VHLP2-11	31	29.325	1.9067	0.0088	16063
137.00	VHLP2-18	31	28.928	1.9041	0.0088	14719
136.00	TME-800MHZ RRH	31	28.532	1.9008	0.0087	13613
122.00	DB-T1-6Z-8AB-0Z	31	23.109	1.8010	0.0071	6792
120.00	MG D3-800TV w/ Mount Pipe	31	22.359	1.7796	0.0068	6339
90.00	KS24019-L112A	31	12.294	1.3379	0.0022	3393

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	148 - 138	95.974	6	5.5090	0.0256
L2	138 - 90.75	84.473	6	5.4985	0.0250
L3	94.75 - 44.75	39.515	6	4.0842	0.0077
L4	50 - 0	10.634	6	1.9754	0.0024

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
146.00	APX18-206517-CT2 w/ Mount Pipe	6	93.667	5.5124	0.0256	11235
141.00	VHLP2-11	6	87.910	5.5119	0.0253	8035
139.00	FPA5150-23-1	6	85.617	5.5044	0.0251	6289
138.00	VHLP2-11	6	84.473	5.4985	0.0250	5693
137.00	VHLP2-18	6	83.331	5.4908	0.0248	5215
136.00	TME-800MHZ RRH	6	82.191	5.4815	0.0247	4821
122.00	DB-T1-6Z-8AB-0Z	6	66.587	5.1935	0.0200	2395
120.00	MG D3-800TV w/ Mount Pipe	6	64.427	5.1318	0.0191	2235
90.00	KS24019-L112A	6	35.452	3.8590	0.0062	1190

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L1	148 - 138 (1)	TP22x22x0.25	10.00	0.00	0.0	27.609	17.0824	-0.76	471.63	0.002
L2	138 - 90.75 (2)	TP31.924x22x0.25	47.25	0.00	0.0	36.000	24.4667	-8.93	880.80	0.010
L3	90.75 - 44.75 (3)	TP41.086x30.5839x0.3125	50.00	0.00	0.0	36.000	39.3484	-16.61	1416.54	0.012
L4	44.75 - 0 (4)	TP49.86x39.3583x0.375	50.00	0.00	0.0	36.000	58.8995	-28.76	2120.38	0.014

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	148 - 138 (1)	TP22x22x0.25	10.49	1.370	27.523	0.050	0.00	0.000	27.523	0.000
L2	138 - 90.75 (2)	TP31.924x22x0.25	549.87	35.455	36.000	0.985	0.00	0.000	36.000	0.000
L3	90.75 - 44.75 (3)	TP41.086x30.5839x0.3125	1371.43	42.726	36.000	1.187	0.00	0.000	36.000	0.000
L4	44.75 - 0 (4)	TP49.86x39.3583x0.375	2500.95	41.716	36.000	1.159	0.00	0.000	36.000	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	148 - 138 (1)	TP22x22x0.25	1.73	0.101	20.000	0.010	0.59	0.038	13.794	0.003
L2	138 - 90.75 (2)	TP31.924x22x0.25	16.17	0.661	24.000	0.055	1.78	0.056	24.000	0.002
L3	90.75 - 44.75 (3)	TP41.086x30.5839x0.3125	20.47	0.520	24.000	0.043	1.62	0.025	24.000	0.001
L4	44.75 - 0 (4)	TP49.86x39.3583x0.375	24.69	0.419	24.000	0.035	1.44	0.012	24.000	0.000

Pole Interaction Design Data

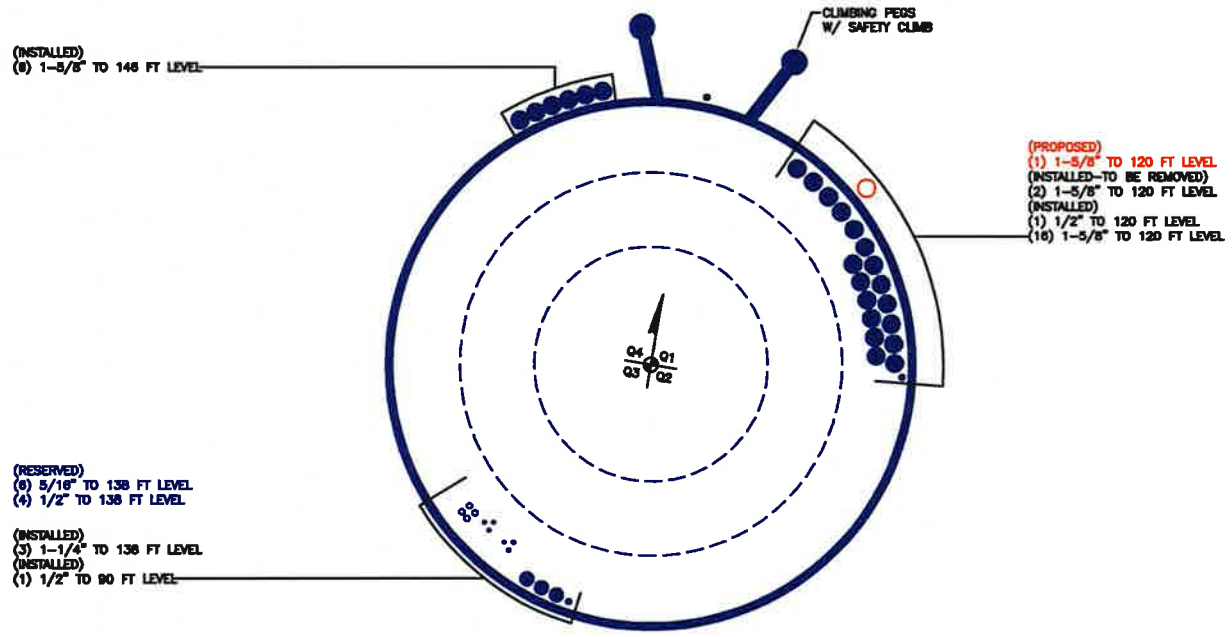
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	148 - 138 (1)	0.002	0.050	0.000	0.010	0.003	0.051 ✔	1.333	H1-3+VT ✔
L2	138 - 90.75 (2)	0.010	0.985	0.000	0.055	0.002	0.996 ✔	1.333	H1-3+VT ✔
L3	90.75 - 44.75 (3)	0.012	1.187	0.000	0.043	0.001	1.199 ✔	1.333	H1-3+VT ✔
L4	44.75 - 0 (4)	0.014	1.159	0.000	0.035	0.000	1.173 ✔	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	148 - 138	Pole	TP22x22x0.25	1	-0.76	628.69	3.9	Pass
L2	138 - 90.75	Pole	TP31.924x22x0.25	2	-8.93	1174.11	74.7	Pass
L3	90.75 - 44.75	Pole	TP41.086x30.5839x0.3125	3	-16.61	1888.25	90.0	Pass
L4	44.75 - 0	Pole	TP49.86x39.3583x0.375	4	-28.76	2826.47	88.0	Pass
							Summary	
						Pole (L3)	90.0	Pass
						RATING =	**90.0**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 876323 TOWER ID: C_BASELEVEL

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#: *876323*
Site Name: *HILLSIDE*
App #: *195726 Rev.11*

Anchor Rod Data		
Qty:	12	
Diam:	2.25	in
Rod Material:	A615-J	
Yield, Fy:	75	ksi
Strength, Fu:	100	ksi
Bolt Circle:	57	in
Anchor Spacing:	6	in

Plate Data		
W=Side:	53	in
Thick:	3	in
Grade:	60	ksi
Clip Distance:	3.5	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:	49.86	in
Thick:	0.375	in
Grade:	60	ksi
# of Sides:	18	"0" IF Round

Stress Increase Factor		
ASD ASIF:	1.333	

Base Reactions		
TIA Revision:	F	
Unfactored Moment, M:	2501	ft-kips
Unfactored Axial, P:	29	kips
Unfactored Shear, V:	25	kips

Anchor Rod Results

TIA F --> Maximum Rod Tension	173.1 Kips
Allowable Tension:	195.0 Kips
Anchor Rod Stress Ratio:	88.8% **Pass**

Base Plate Results Flexural Check

Base Plate Stress:	44.0 ksi
Allowable PL Bending Stress:	60.0 ksi
Base Plate Stress Ratio:	73.4% **Pass**

PL Ref. Data
Yield Line (in): 25.09
Max PL Length: 25.09

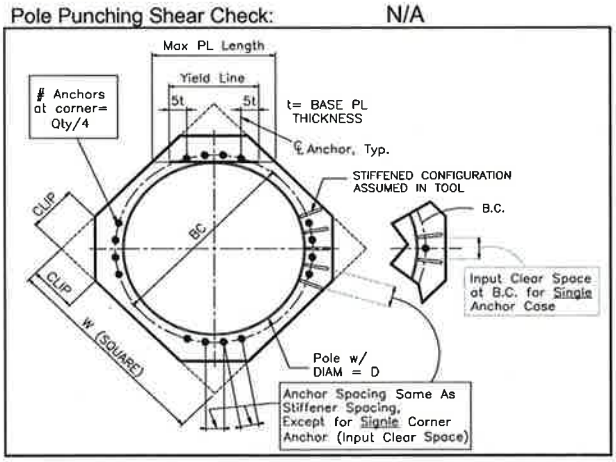
N/A - Unstiffened

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



** 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#: *876323*
Site Name: *HILLSIDE*
App #: *195726 Rev.11*

Pole Manufacturer:	Other

Reactions		
Moment:	10.49	ft-kips
Axial:	0.76	kips
Shear:	1.73	kips
Elevation:	138	feet

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

Bolt Data			
Qty:	8		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	Bolt Fty: 44.00
N/A:		<-- Disregard	
Circle (in.):	28		

Plate Data		
Diam:	32	in
Thick, t:	0.75	in
Grade (Fy):	50	ksi
Strength, Fu:	65	ksi
Single-Rod B-eff:	9.00	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:	24	in
Thick:	0.25	in
Grade:	50	ksi
# of Sides:	0	"0" IF Round
Fu	62	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Flange Bolt Results

		Non-Rigid
Bolt Tension Capacity, **B**:	46.07 kips	Service, ASD
Max Bolt directly applied T:	2.15 Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	0.960 in	
Min PL "treq" for actual **T w/ Pry**:	0.151 in	
Min PL "t1" for actual **T w/o Pry**:	0.208 in	
T allowable with Prying:	39.33 kips	0≤α'≤1 case
Prying Force, Q:	0.00 kips	
Total Bolt Tension=T+Q:	2.15 kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	4.7% **Pass**	

Exterior Flange Plate Results Flexural Check

		Non-Rigid
Compression Side Plate Stress:	6.7 ksi	Service ASD
Allowable Plate Stress:	50.0 ksi	0.75*Fy*ASIF
Compression Plate Stress Ratio:	13.3% **Pass**	Comp. Y.L. Length:
No Prying		7.50
Tension Side Stress Ratio, (treq/t)^2:	4.1% **Pass**	

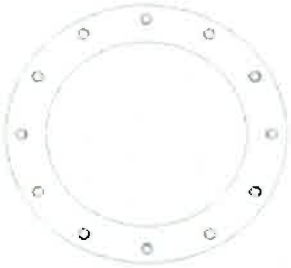
n/a

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



* 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

CCI Foundation Tool Suite - Monopole Pier - Beta Release

CCI Foundation Tool Suite - v1.0 Date: 12/21/2013

BU:	876323
Site Name:	HILLSIDE
App Number:	195726 Rev.11
Work Order:	691024

Monopole Drilled Pier

Input

Criteria

TIA Revision:	F
ACI 318 Revision:	2002
Seismic Category:	B

Forces

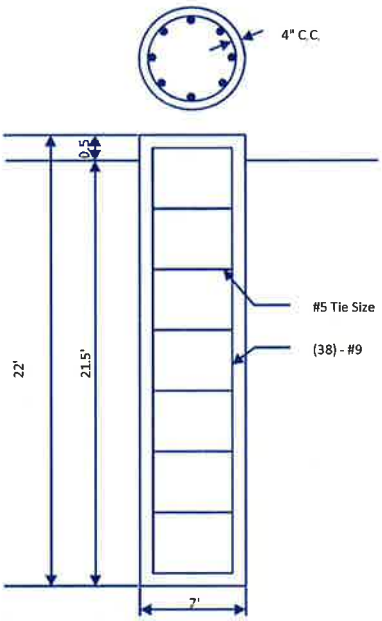
Compression	29 kips
Shear	25 kips
Moment	2501 k-ft
Swelling Force	0 kips

Foundation Dimensions

Pier Diameter:	7 ft
Ext. above grade:	0.5 ft
Depth below grade:	21.5 ft

Material Properties

Number of Rebar:	38
Rebar Size:	9
Tie Size	5
Rebar tensile strength:	60 ksi
Concrete Strength:	3000 psi
Ultimate Concrete Strain	0.003 in/in
Clear Cover to Ties:	4 in



Soil Profile: 1

Layer	Thickness (ft)	From (ft)	To (ft)	Unit Weight (pcf)	Cohesion (psf)	Friction Angle (deg)	Ultimate Uplift Skin Friction (ksf)	Ultimate Comp. Skin Friction (ksf)	Ultimate Bearing Capacity (ksf)	SPT 'N' Counts
1	5	0	5	115	0				0	
2	3	5	8	68		40			0	
3	13.5	8	21.5	68		42			11.7	

Analysis Results

Soil Lateral Capacity

Depth to Zero Shear:	6.06 ft
Max Moment, Mu:	2674.90 k-ft
Soil Safety Factor:	2.60
Safety Factor Req'd:	2
RATING:	76.8%

Soil Axial Capacity

Skin Friction (k):	128.94 kips
End Bearing (k):	225.13 kips
Comp. Capacity (k), ϕCn:	354.08 kips
Comp. (k), Cu:	29.00 kips
RATING:	8.2%

Concrete/Steel Check

Mu (from soil analysis)	3477.37	k-ft
ϕMn	5869.46	k-ft
RATING:	59.2%	
rho provided	0.69	
rho required	0.33	OK
Rebar Spacing	4.96	
Spacing required	18.05	OK
Dev. Length required	15.11	
Dev. Length provided	49.43	OK

Overall Foundation Rating: 76.8%