

August 25, 2015

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

Re: **Notice of Exempt Modification – Facility Modification
38 Spring Hill Road, Bethel, Connecticut**

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless (“Cellco”) currently maintains twelve (12) antennas at the 95-foot level of the existing 125-foot tower at 38 Spring Hill Road in Bethel, Connecticut (the “Property”). The tower and the Property are owned by Blue Sky Towers LLC (“Blue Sky”). The Council approved Cellco’s use of this tower in 2006. Cellco now intends to replace nine (9) of its existing antennas with one (1) model X7C-FRO-660-V, 700 MHz antenna; two (2) model 80010735V01, 700 MHz antennas; three (3) model WWX063X19X00, 1900 MHz antennas; and three (3) model WWX063X19X00, 2100 MHz antennas, all at the same level on the tower. Cellco also intends to replace three (3) existing remote radio heads (“RRHs”) with three (3) newer model RRHs and install six (6) additional RRHs. Included in Attachment 1 are specifications for Cellco’s replacement antennas and RRHs.

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 Matthew Knickerbocker, First Selectman for the Town of Bethel. A copy of this letter is also being sent Blue Sky, the owner of the tower and 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).

14111734-v1

Robinson+Cole

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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 on its existing platform at the 95-foot level on the tower.

2. The proposed modifications will not involve any change to ground-mounted equipment and, therefore, will not require the extension of the site boundary.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.

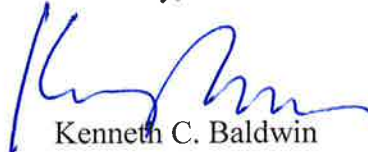
4. The operation of the replacement antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. Far Field Approximation tables for Cellco's modified facility are included in Attachment 2.

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:

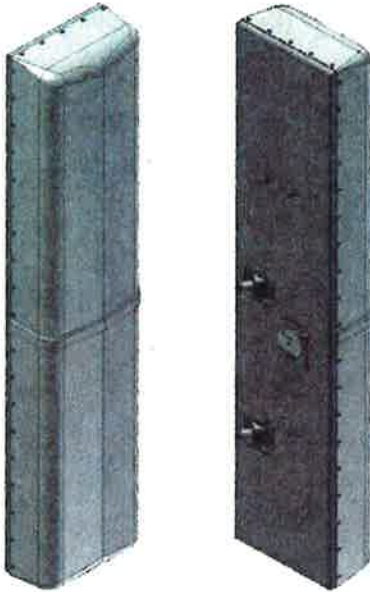
Matthew Knickerbocker, Bethel First Selectman
Blue Sky Towers LLC
Tim Parks

ATTACHMENT 1



X7C-FRO-660-V

X-Pol Antenna, 698-896MHz, Fast-Roll-Off 60° H-Beam
RET/MET



- Designed to improve SNR
- Greatly increases LTE data rates
- Broadband radiator
- Macro Cell, high gain antenna
- Suitable for LTE/CDMA/UMTS/GSM
- AISG 2.0 RET or manual MET tilt control

Electrical Specifications

Frequency Band, MHz	698-824	824-896
Horizontal Beamwidth, 3dB points	62	58
Gain, dBi	15.9	16.0
Vertical Beamwidth, 3dB points	12.0	10.5
Front-to-Back at 180°, dB	>28	
Upper Sidelobe Suppression, Typical, dB	<-18	
Polarization	+/-45°	
Electrical Downtilt	0-10° or 4-14°	
VSWR/Return Loss, dB, Maximum	1.5:1/14.0	
Isolation Between Ports, dB, Mimimum	-28	
Intermodulation (2x20w), IM3, dBc, Maximum	-150	
Impedance, ohms	50	
Maximum Power Per Connector, CW	500	

www.cssantenna.com

410-612-0080

All Specifications are subject to change.

Refer to www.cssantenna.com for the most current information

customerservice@cssantenna.com



X7C-FRO-660-V

X-Pol Antenna, 698-896MHz, Fast-Roll-Off 60° H-Beam
RET/MET

Mechanical Specifications

Dimensions, Length/Width/Depth	72.0/14.6/8.0 in (1829/372/204 mm)
Connector (Quantity) Type	(2) 7-16 DIN Female
Connector Torque	220-265 lbf-in (25-30 N-m)
Connector Location	Back
Antenna Weight	35.0 lbs
Bracket Weight	13.2 lbs (6.0 kg)
Standard Bracket Kit	CSS P/N 919011
Mechanical Downtilt Range	0-12°
Radome Material	Ultra High Strength Luran, UV Stabilized, ASTM D1925
Wind Survival	150 mph (241 km/h)
Front Wind Load	205.39 lbf (913.65 N) @100mph
Equivalent Flat Plate	4.09 sq-ft (c=2) @ 100mph

RET Information

Model	CSS-RET-200
Mounting Location	Rear of Antenna
Weight	1.2 lb (0.54 kg)
Communication Standard	AISG 2.0
Control System	CSS-PCU-220



Order Information

Model	Description
X7C-FRO-660-VR0	Antenna with manual RET adjust electrical downtilt 0-10°
X7C-FRO-660-VR4	Antenna with manual RET adjust electrical downtilt 4-14°
X7C-FRO-660-VM0	Antenna with remote MET adjust electrical downtilt 0-10°
X7C-FRO-660-VM4	Antenna with remote MET adjust electrical downtilt 4-14°

Optional Bracket Kit

919036	Bracket Kit, 2-Point, 12 deg D-tilt, For 4.5" OD Pole
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www.cssantenna.com

410-612-0080

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Refer to www.cssantenna.com for the most current information

customerservice@cssantenna.com

P

65° Single Band Panel Antenna, 6'

	Antenna
Single Band (MHz)	698–894
Dual Polarization	X
HPBW	65°
Adj. Electrical Downtilt <small>Manual or optional remote control</small>	0°–10°

General specifications:

Frequency range	698–894 MHz
VSWR	<1.5:1
Impedance	50 ohms
Intermodulation (2x20w)	IM3: <-150 dBc
Polarization	+45° and -45°
Maximum input power	500 watts per input (at 50°C)
Connector	2 x 7-16 DIN female (long neck) (bottom mounted)
Isolation	>30 dB
Electrical downtilt	0–10 degrees (continuously adjustable)

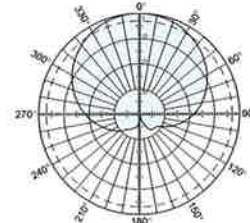
See reverse for order information.

Specifications:	698–806 MHz	824–894 MHz
Gain	15.5 dBi	16 dBi
Front-to-back ratio	>30 dB (co-polar) 35 dB (average)	>30 dB (co-polar) 35 dB (average)
+45° and -45° polarization horizontal beamwidth	67° (half-power)	65° (half-power)
+45° and -45° polarization vertical beamwidth	11.3° (half-power)	10° (half-power)
Min. sidelobe suppression for first sidelobe above main beam average	0° 5° 10° T 16 17 17 dB 16 19 20 dB	0° 5° 10° T 18 17 16 dB 20 20 20 dB
Cross polar ratio		
Main direction	0°	25 dB (typical)
Sector	±60°	>11 dB, Average: 15 dB

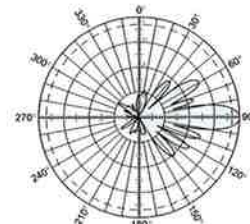
IRT specifications:

Logical interface ex factory ¹	3GPP/AISG 2.0
Protocols	AISG 1.1 and 3GPP/AISG 2.0 compliant
Hardware interface ²	2 x 8 pin connector acc. IEC 60130-9; according to AISG: – IRT in (male): Control / Daisy chain in – IRT in (female): Daisy chain out
Power supply	10–30 V
Power consumption	<1 watt (standby) <8.5 watts (motor activated)
Adjustment time (full range)	40 sec.
Adjustment cycles	>50,000
Certification	FCC 15.107 Class B Computing Devices

698–894 MHz



Horizontal pattern
±45°- polarization



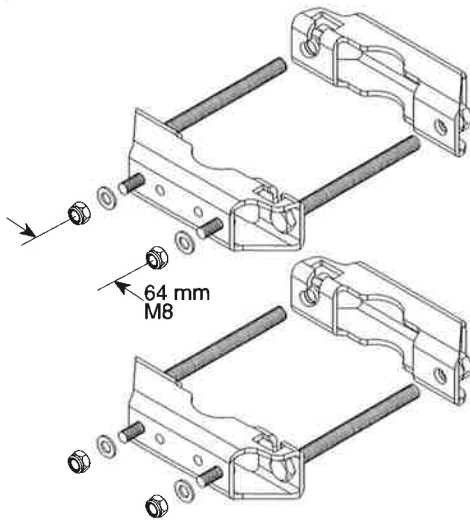
Vertical pattern
±45°- polarization
0°–10° electrical downtilt



¹) The protocol of the logical interface can be switched from 3GPP/AISG 2.0 to AISG 1.1 and vice versa with a vendor specific command. Start-up operation of the RCU 86010149 is possible in an RET system supporting AISG 1.1 or supporting 3GPP/AISG 2.0 after performing a layer 2 reset before address assignment. The protocol can also be changed as follows: AISG 1.1 to 3GPP: Enter "3GPP" into the additional data field "Installer's ID" and perform a layer 7 reset or a power reset. 3GPP to AISG 1.1: Enter "AISG 1" into the additional datafield "Installer's ID" and perform a layer 2 reset or a power reset. After switching the protocol any other information can be entered into the "Installer's ID" field.

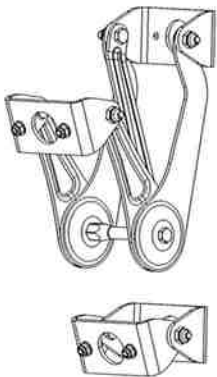
²) The tightening torque for fixing the connector must be 0.5 – 1.0 Nm ('hand-tightened'). The connector should be tightened by hand only!





Mounting Brackets

for use with 2-point mount antennas
Mast dia. 2–4.5 inches (50–115 mm)
Weight: 4.4 lb (2 kg)

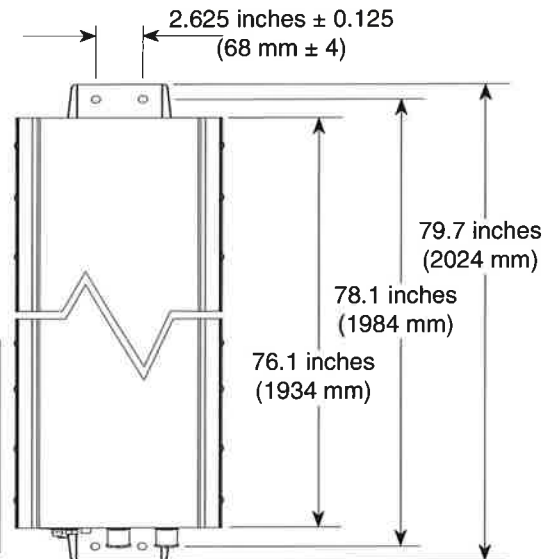


Mechanical Tilt Brackets

for use with 2-point mount antennas
Weight: 9.5 lb (4.3 kg)
(Model 850 10008)

Mechanical specifications:

Weight	30.9 lb (14 kg)	35.3 lb (16 kg) clamps included
Dimensions	H x W x D	76.1 x 11.9 x 3.9 inches (1934 x 303 x 99 mm)
Wind load	at 93 mph (150kph)	
Front/Side/Rear	203 lbf / 70 lbf / 232 lbf (900 N / 310 N / 1030 N)	
Mounting category	H (Heavy)	
Wind survival rating*	150 mph (240 kph)	
Shipping dimensions	81.1 x 12.4 x 4.5 inches (2060 x 315 x 115 mm)	
Shipping weight	39.7 lb (18 kg)	
Mounting bracket	2-point hot-dip galvanized with stainless steel hardware for 2 to 4.5 inch (50 to 115 mm) OD masts.	

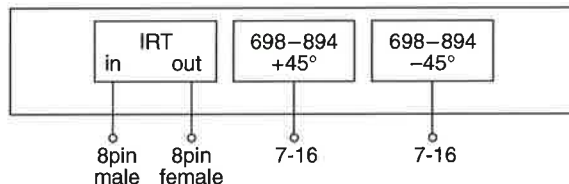
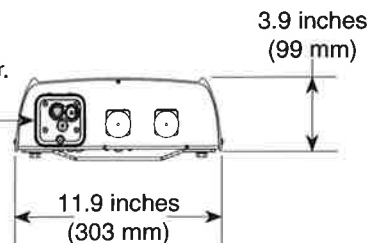


KATHREIN 860 10149

FC Tested To Comply With FCC Standards

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: Refer to part number 860 10149 for the specifications of the remote control actuator.



Order Information:

Model	Description
800 10735V01	Antenna with mounting bracket 0°–10° electrical downtilt
800 10735V01K	Antenna with mounting bracket and mechanical tilt bracket 0°–10° electrical downtilt


*Mechanical design is based on environmental conditions as stipulated in TIA-222-G-2 (December 2009) and/or ETS 300 019-1-4 which include the static mechanical load imposed on an antenna by wind at maximum velocity. See the Engineering Section of the catalog for further details.

All specifications are subject to change without notice. The latest specifications are available at www.kathrein-scala.com.

Kathrein Inc., Scala Division Post Office Box 4580 Medford, OR 97501 (USA) Phone: (541) 779-6500 Fax: (541) 779-3991
Email: communications@kathrein.com Internet: www.kathrein-scala.com

WWX063X19x00

2x X-Pol | Twin Band VET Panel | 65° | 19.0 / 19.0 dBi

Ordering Options		Model Number					
Manual Electrical Tilt		WWX063X19M00					
Remote Electrical Tilt AISG v1.1		WWX063X19R00					
Remote Electrical Tilt AISG v2.0 / 3GPP		WWX063X19G00					
Electrical Characteristics		2x 1710-2170 MHz					
Frequency bands		1710-1880 MHz	1850-1990 MHz	1900-2170 MHz			
Polarization		2x ±45° (Quad)					
Horizontal beamwidth		70°	67°	66°			
Vertical beamwidth		5°	4.5°	4°			
Gain		18.3 dBi	18.6 dBi	19.0 dBi			
Electrical downtilt		0-10°					
Impedance		50Ω					
VSWR		<1.5:1					
Upper sidelobe suppression		< -17 dB typical					
Front-to-back ratio		> 27 dB					
In-band isolation		> 30 dB					
Isolation between ports		> 30 dB					
Input power		4 x 250 W					
IM3 (2x20W carriers)		< -153 dBc					
Lightning protection		Direct Ground					
Operating temperature		-40° to +60° C (-40° to +140° F)					
Connector(s)		4 Ports / 7/16 DIN / Female / Bottom					
Mechanical Characteristics							
Dimensions Length x Width x Depth		1906 x 307.3 x 177.2 mm		75.0 x 12.1 x 7.0 in			
Weight without mounting brackets: MET		14.5 kg		32.0 lbs			
Weight without mounting brackets: RET		14.8 kg		32.7 lbs			
Survival wind speed		241 km/hr		150 mph			
Wind loads (160 km/hr or 100 mph)		Front: 707 N; Side: 419 N		Front: 159 lbf; Side: 94 lbf			
Remote Electrical Downtilt Control							
Remote Electrical Tilt (RET) Control		The remote control of the electrical tilt is managed by a module (MDCU) totally inserted at the bottom of the antenna. One single module controls individually the tilt of each band (no need of daisy chain cables between the bands). This module does not add any additional length at the bottom of the antenna. For RET control, the transparent caps must be in place and locked. The tilt angle indicators always remains visible and the antenna still has manual tilt control (manual override).					
RET Module Part Number (one per antenna)		MDCU-A0000 for AISG v1.1 protocol (one unit included in WWX063X19R00)					
		MDCU-G0000 for 3GPPP/AISG v2.0 protocol (one unit included in WWX063X19G00)					
Important Installation Instructions		 In order to operate RET control, the transparent caps covering the tilt adjustment indicators must be engaged and locked. Do not cut them from the antenna.					
Mounting Options		Part Number		Fits Pipe Diameter		Weight	
3-Point Mounting Bracket Kit		MKS09P02		50-115 mm	2.0-4.5 in	4.1 kg	9 lbs
3-Point Mounting & Downtilt Bracket Kit		MKS09T02		50-115 mm	2.0-4.5 in	6.4 kg	14 lbs
Tri-Sector UNICELL Options							
For use inside UNICELL modules		UNX-20-xx					

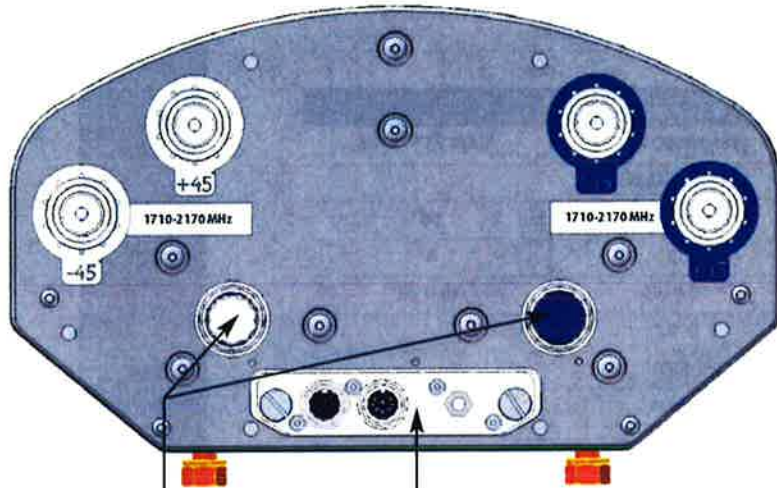


Quoted performance parameters are provided to offer typical or range values only and may vary as a result of normal manufacturing and operational conditions. Extreme operational conditions and/or stress on structural supports is beyond our control. Such conditions may result in damage to this product.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

WWX063X19x00

2x X-Pol | Twin Band VET Panel | 65° | 19.0 / 19.0 dBi

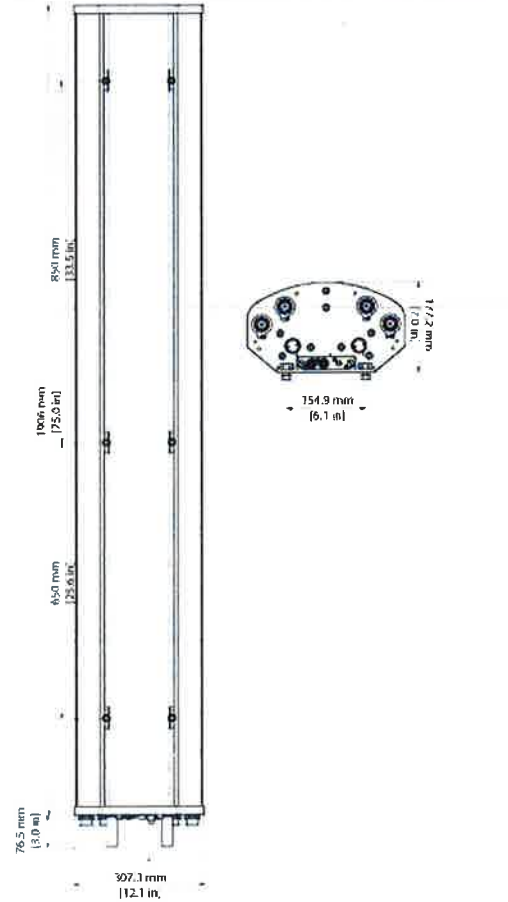
Bottom View



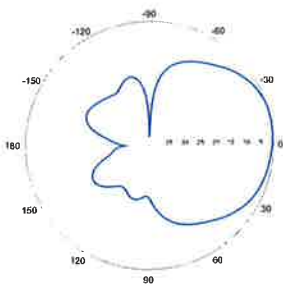
Location of the MDCU for RET Control

Tilt indicators covered by transparent caps. Manual adjustment is accessed by removing the caps. Knob colors are the same as the connectors.

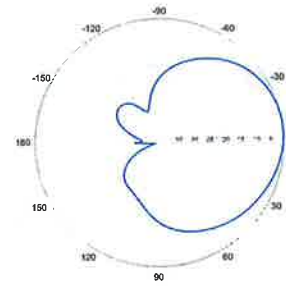
In order to operate RET control, the transparent caps covering the tilt adjustment indicators must be engaged and locked. Do not cut them from the antenna.



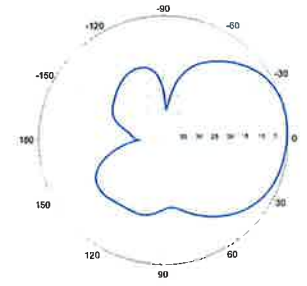
1710-2170 MHz (Left Array-Blue)



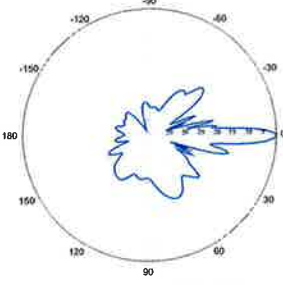
Horizontal | 1800 MHz



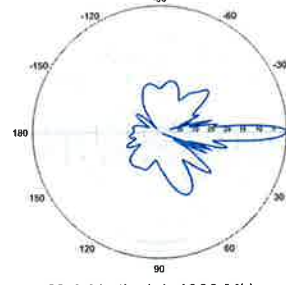
Horizontal | 1900 MHz



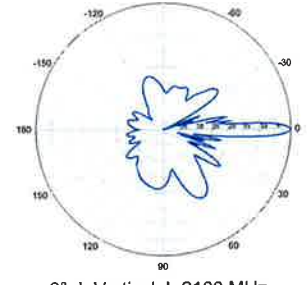
Horizontal | 2100 MHz



0° | Vertical | 1800 MHz



0° | Vertical | 1900 MHz



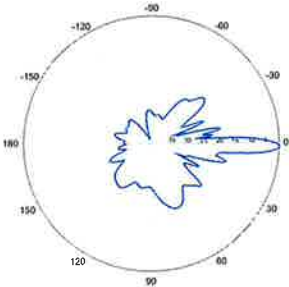
0° | Vertical | 2100 MHz

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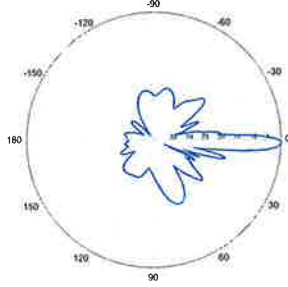
WWX063X19x00

2x X-Pol | Twin Band VET Panel | 65° | 19.0 / 19.0 dBi

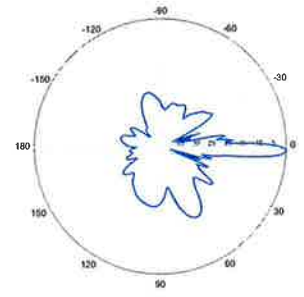
1710-2170 MHz (Left Array)



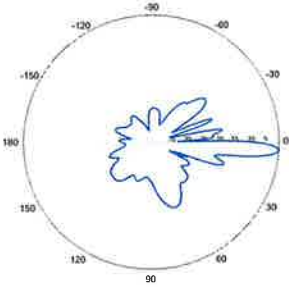
2° | Vertical | 1800 MHz



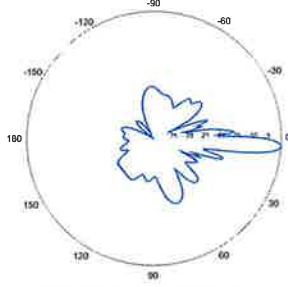
2° | Vertical | 1900 MHz



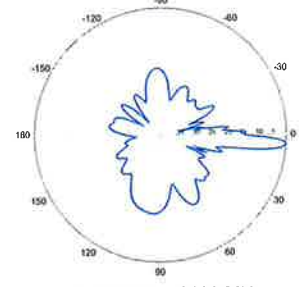
2° | Vertical | 2100 MHz



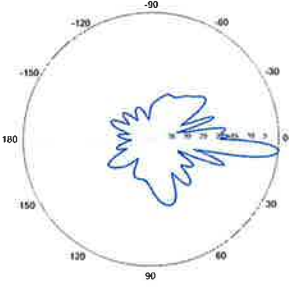
4° | Vertical | 1800 MHz



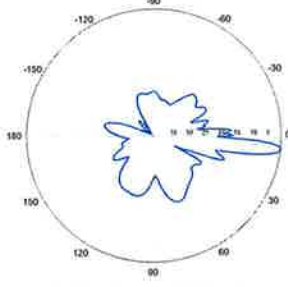
4° | Vertical | 1900 MHz



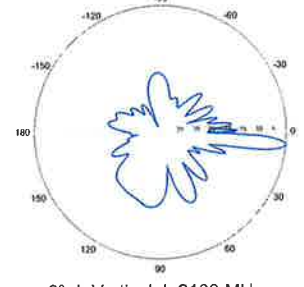
4° | Vertical | 2100 MHz



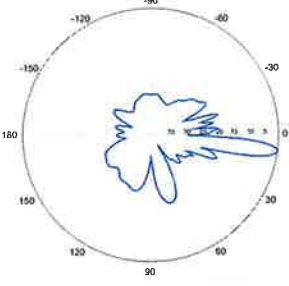
6° | Vertical | 1800 MHz



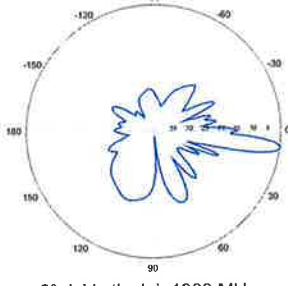
6° | Vertical | 1900 MHz



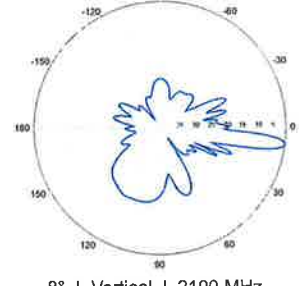
6° | Vertical | 2100 MHz



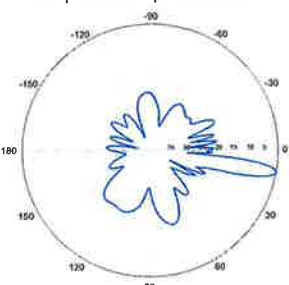
8° | Vertical | 1800 MHz



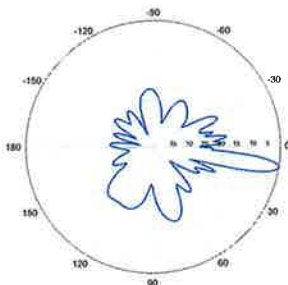
8° | Vertical | 1900 MHz



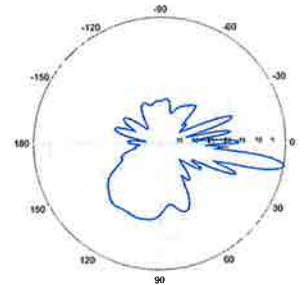
8° | Vertical | 2100 MHz



10° | Vertical | 1800 MHz



10° | Vertical | 1900 MHz



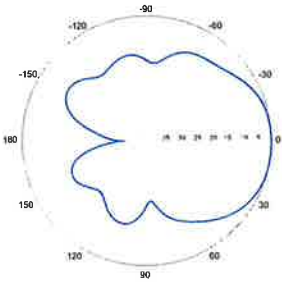
10° | Vertical | 2100 MHz

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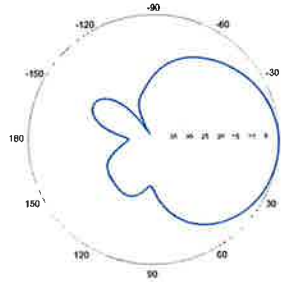
WWX063X19x00

2x X-Pol | Twin Band VET Panel | 65° | 19.0 / 19.0 dBi

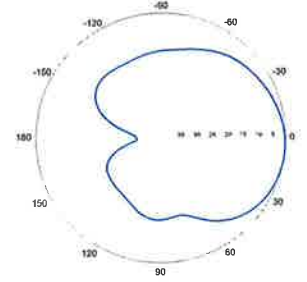
1710-2170 MHz (Right Array-White)



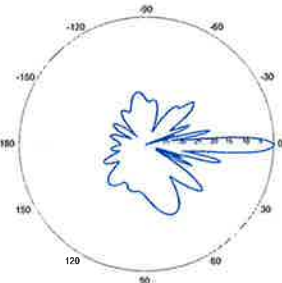
Horizontal | 1800 MHz



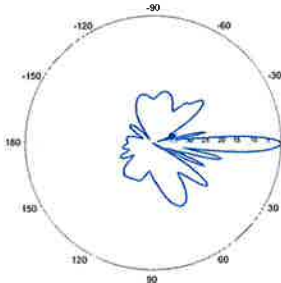
Horizontal | 1900 MHz



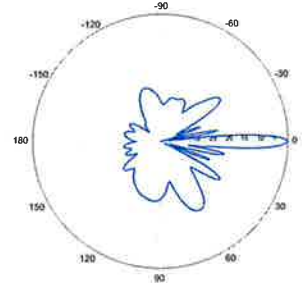
Horizontal | 2100 MHz



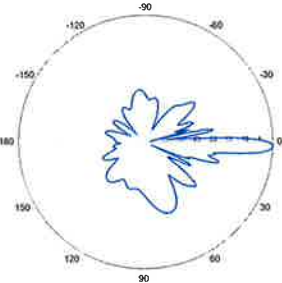
0° | Vertical | 1800 MHz



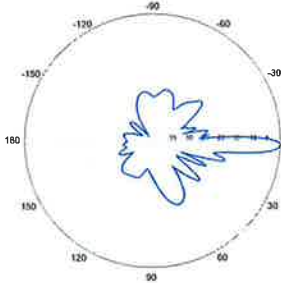
0° | Vertical | 1900 MHz



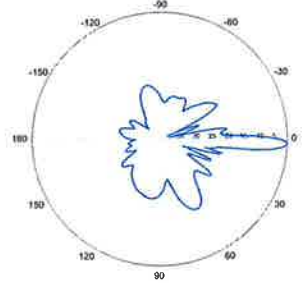
0° | Vertical | 2100 MHz



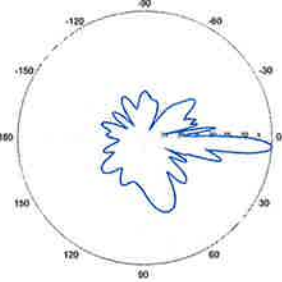
2° | Vertical | 1800 MHz



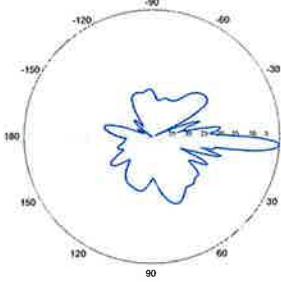
2° | Vertical | 1900 MHz



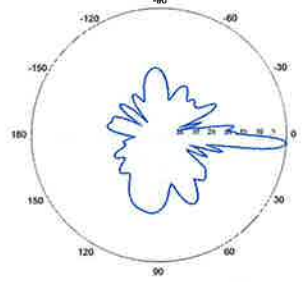
2° | Vertical | 2100 MHz



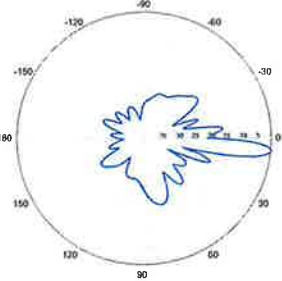
4° | Vertical | 1800 MHz



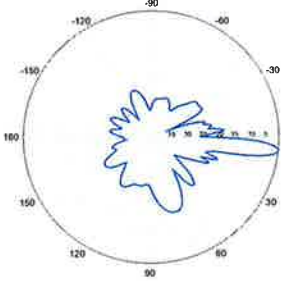
4° | Vertical | 1900 MHz



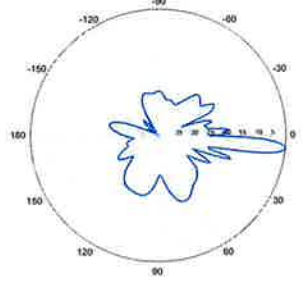
4° | Vertical | 2100 MHz



6° | Vertical | 1800 MHz



6° | Vertical | 1900 MHz



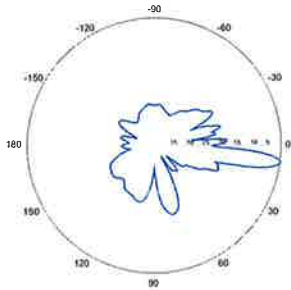
6° | Vertical | 2100 MHz

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.

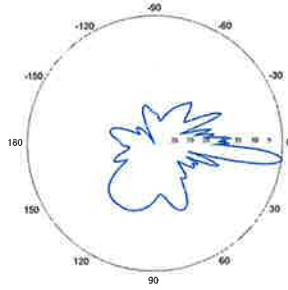
WWX063X19x00

2x X-Pol | Twin Band VET Panel | 65° | 19.0 / 19.0 dBi

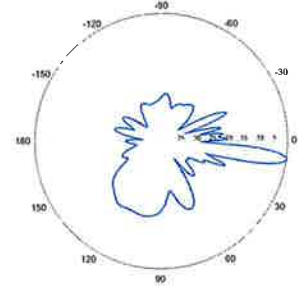
1710-2170 MHz (Right Array)



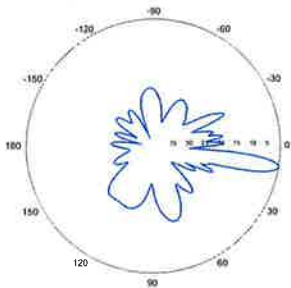
8° | Vertical | 1800 MHz



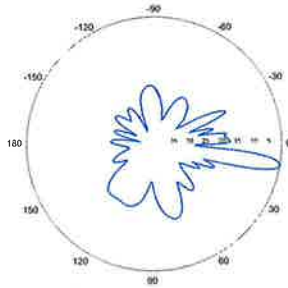
8° | Vertical | 1900 MHz



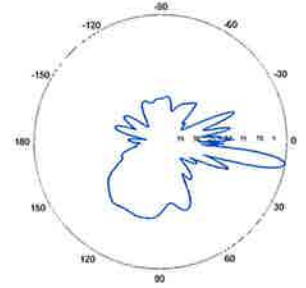
8° | Vertical | 2100 MHz



10° | Vertical | 1800 MHz



10° | Vertical | 1900 MHz



10° | Vertical | 2100 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 B13 RRH4X30-4R

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

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

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

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

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

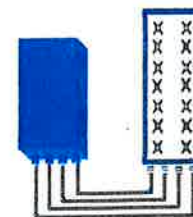


FEATURES

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

BENEFITS

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



4x30W with 4T4R
or
2x60W with 2T4R

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

TECHNICAL SPECIFICATIONS

Features & performance	
Number of TX/RX paths	4 duplexed (either 4T4R or 2T4R by SW)
Frequency band	U700 (C) (3GPP bands 13): DL: 746 - 756 MHz / UL: 777 - 787 MHz
Instantaneous bandwidth - #carriers	10MHz = 1 LTE carrier (in 10MHz occupied bandwidth)
LTE carrier bandwidth	10 MHz
RF output power	2x60W or 4x30W (by SW)
Noise figure – RX Diversity scheme	2 dB typ. (<2.5 dB max) – 2 or 4 way Rx diversity
Sizes (HxWxD) in mm (in.)	550 x 305 x 230 (21.6" x 12.0" x 9") (with solar shield)
Volume in L	38 (with solar shield)
Weight in kg (lb) (w/o mounting HW)	26 (57.2) (with solar shield)
DC voltage range	-40.5 to -57V at full performance, -38 to -57V with relaxation on power consumption
DC power consumption	550W typical @100% RF load (in 2Tx or 4Tx mode)
Environmental conditions	-40°C (-40°F) / +55°C (+131°F)
Wind load (@130km/h or 83mph)	IP65 Frontal: <200N / Lateral : <150N
Antenna ports	4 ports 7/16 DIN female (50 ohms) VSWR < 1.5
CPRI ports	2 CPRI ports (HW ready for Rate7, 9.8 Gbps) SFP single mode dual fiber
AISG interfaces	1 AISG2.0 output (RS485) Integrated Smart Bias Tees (x2)
Misc. Interfaces	4 external alarms (1 connector) – 4 RF Tx & 4 RF Rx monitor ports - 1 DC connector (2 pins)
Installation conditions	Pole and wall mounting
Regulatory compliance	3GPP 36.141 / 3GPP 36.113 / GR-1089-CORE / GR-3108-CORE / UL 60950-1 / FCC Part 27

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PCS RF MODULES

RRH1900 2X60 - HW CHARACTERISTICS

LA6.0.1/13.3

RRH2x60	
RF Output Power	2x60W
Instantaneous Bandwidth	20MHz
Transmitter	2 TX
Receiver	1900 HW version 1900A HW version
Features	2 Branch RX – LA6.0.1 4 Branch RX – LR13.3 AISG 2.0 for RET/TMA Internal Smart Bias-T
Power	-48VDC
CPRI Ports	2 CPRI Rate 3 Ports
External Alarms	4 External User Alarms
Monitor Ports	TX
Environmental	GR487 Compliance
RF Connectors	7/16 DIN (top mounted)



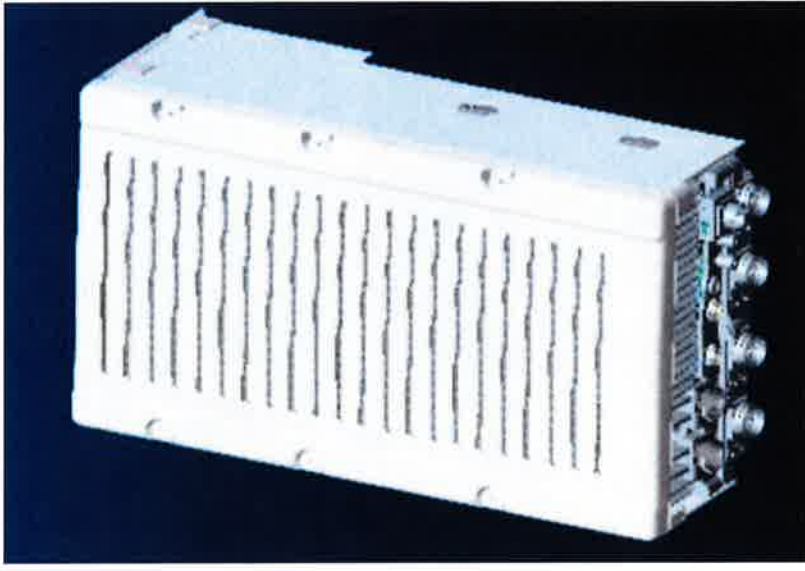
** Not a Verizon Wireless deployed product

NEW PCS RF MODULES FOR VZW

RRH2X60 - HW CHARACTERISTICS

LR14.3

RRH2x60	
RF Output Power	2x60W (4x30W HW Ready)
Instantaneous Bandwidth	60MHz
Target Reliability (Annual Return Rate)	<2%
Receiver	4 Branch Rx
Features	AISG 2.0 for RET/TMA
Power	-48VDC Internal Smart Bias-T
CPRI Ports	2 CPRI Rate 5 Ports
External Alarms	4 External User Alarms
Monitor Ports	TX, RX
Environmental	GR487 Compliance
RF Connectors	7/16 DIN (downward facing)
Dimensions	22"(h) x 12"(w) x 9.4" (d)**
Weight	55lb**



** - Includes solar shield but not mounting brackets (8 lbs.)

ALCATEL-LUCENT WIRELESS PRODUCT DATASHEET RRH2X60-AWS FOR BAND 4 APPLICATIONS

The Alcatel-Lucent RRH2x60-AWS is a high power, small form factor Remote Radio Head operating in the AWS frequency band (3GPP Band 4) for LTE technology. It is designed with an eco-efficient approach, providing operators with the means to achieve high quality and high capacity coverage with minimum site requirements and efficient operation.



A distributed Node B expands the deployment options by using two components, a Base Band Unit (BBU) containing the digital assets and a separate RRH containing the radio-frequency (RF) elements. This modular design optimizes available space and allows the main components of a Node B to be installed separately, within the same site or several kilometers apart.

The Alcatel-Lucent RRH2x60-AWS is linked to the BBU by an optical-fiber connection carrying downlink and uplink digital radio signals

along with operations, administration and maintenance (OA&M) information.

SUPERIOR RF PERFORMANCE

The Alcatel-Lucent RRH2x60-AWS integrates all the latest technologies. This allows to offer best-in-class characteristics.

It delivers an outstanding 120 watts of total RF power thanks to its two transmit RF paths of 60 W each.

It is ideally suited to support multiple-input multiple-output (MIMO) 2x2 operation.

It includes four RF receivers to natively support 4-way uplink reception diversity. This improves the radio uplink coverage and this can be used to extend the cell radius commensurate with 2x2MIMO 2x60 W for the downlink.

It supports multiple discontinuous LTE carriers within an instantaneous bandwidth of 45 MHz corresponding to the entire AWS B4 spectrum.

The latest generation power amplifiers (PA) used in this product achieve high efficiency (>40%), resulting in improved power consumption figures.

OPTIMIZED TCO

The Alcatel-Lucent RRH2x60-AWS is designed to make available all the benefits of a distributed Node B, with excellent RF characteristics, with low capital expenditures (CAPEX) and low operating expenditures (OPEX).

The Alcatel-Lucent RRH2x60-AWS is a very cost-effective solution to deploy LTE MIMO.

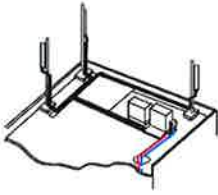
EASY INSTALLATION

The RRH2x60-AWS includes a reversible mounting bracket which allows for ease of installation behind an antenna, or on a rooftop knee wall while providing easy access to the mid body RF connectors.

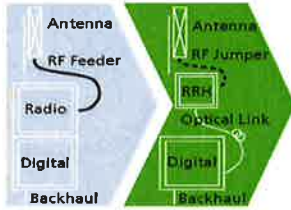
The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment. However, many of these sites can host an Alcatel-Lucent RRH2x60-AWS installation, providing more flexible site selection and improved network quality along with greatly reduced installation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

The Alcatel-Lucent RRH2x60-AWS is a zero-footprint solution and is convection cooled without fans for silent operation, simplifying negotiations with site property owners and minimizing environmental impacts.

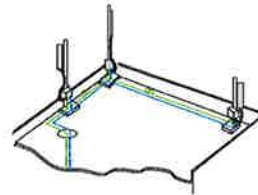
Installation can easily be done by a single person as the Alcatel-Lucent RRH2x60-AWS is compact and weighs about 20 kg, eliminating the need for a crane to hoist the BTS cabinet to the rooftop. A site can be in operation in less than one day.



Macro



RRH for space-constrained cell sites



Distributed

FEATURES

- RRH2x60-AWS integrates two power amplifiers of 60W rating (at each antenna connector)
- Support multiple carriers over the entire 3GPP band 4
- RRH2x60-AWS is optimized for LTE operation
- RRH2x60-AWS is a very compact and lightweight product
- Advanced power management techniques are embedded to provide power savings, such as PA bias control

BENEFITS

- MIMO LTE operation with only one single unit per sector
- Improved uplink coverage with built-in 4-way receive diversity capability
- RRH can be mounted close to the antenna, eliminating nearly all losses in RF cables and thus reducing power consumption by 50% compared to conventional solutions
- Distributed configurations provide easily deployable and cost-effective solutions, near zero footprint and

silent solutions, with minimum impact on the neighborhood, which ease the deployment

- RETA and TMA support without additional hardware thanks to the AISG v2.0 port and the integrated Bias-Tees. Bias-Tees support AISG DC supply and signaling.

TECHNICAL SPECIFICATIONS

Specifications listed are hardware capabilities. Some capabilities depend on support in a specific software release or future release.

Dimensions and weights

- HxWxD : 510x285x186mm (27 l with solar shield)
- Weight : 20 kg (44 lbs)

Electrical Data

- Power Supply : -48V DC (-40.5 to -57V)
- Power Consumption (ETSI average traffic load reference) : 250W @2x60W

RF Characteristics

- Frequency band: 1710-1755, UL / 2110-2155 MHz, DL (3GPP band 4)
- Output power: 2x60W at antenna connectors
- Technology supported: LTE
- Instantaneous bandwidth: 45 MHz
- Rx diversity: 2-way and 4-way uplink reception
- Typical sensitivity without Rx diversity: -105 dBm for LTE

Connectivity

- Two CPRI optical ports for daisy chaining and up to six RRHs per fiber
- Type of optical fiber: Single-Mode (SM) and Multi-Mode (MM) SFPs
- Optical fiber length: up to 500m using MM fiber, up to 20km using SM fiber
- TMA/RETA : AISG 2.0 (RS485 connector and internal Bias-Tee)
- Six external alarms
- Surge protection for all external ports (DC and RF)

Safety and Regulatory Data

- EMC : 3GPP 25113, EN 301 489-1, EN 301 489-23, GR 1089, GR 3108, OET-65
- Safety : IEC60950-1, EN 60825-1, UL, ANSI/NFPA 70, CAN/CSA-C22.2
- Regulatory : FCC Part 15 Class B, CE Mark – European Directive : 2002/95/EC (ROHS); 2002/96/EC (WEEE); 1999/5/EC (R&TTE)
- Health : EN 50385

Environmental specifications

- Operating temperature: -40°C to 55°C including solar load
- Operating relative humidity: 8% to 100%
- Environmental Conditions : ETS 300 019-1-4 class 4.1E
- Ingress Protection : IEC 60529 IP65
- Acoustic Noise : Noiseless (natural convection cooling)

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ATTACHMENT 2

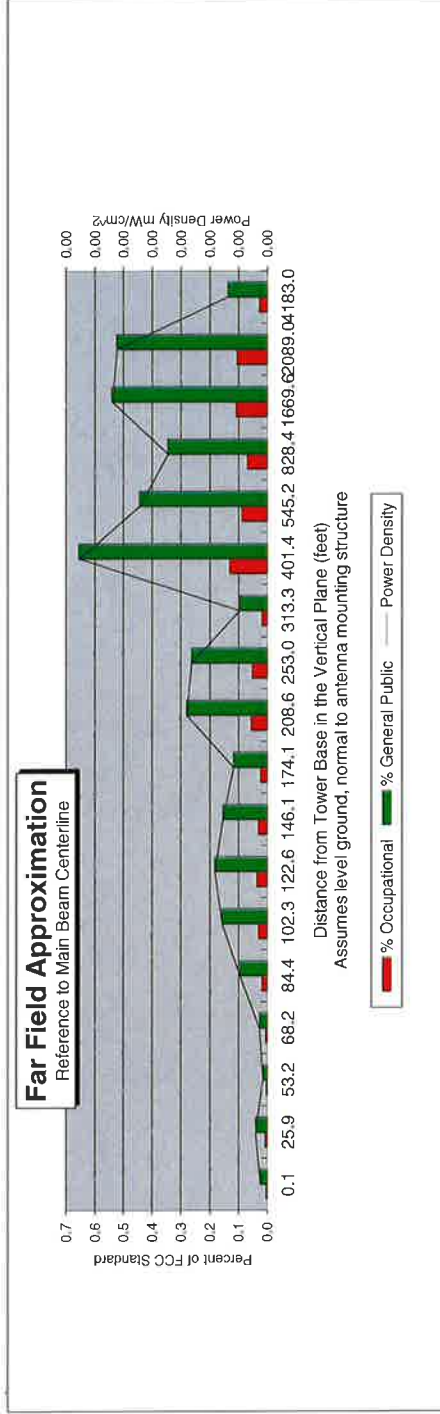
Far Field Approximation
with downtilt variation

**Estimated Radiated Emission
Single Emitter Far Field Model
Dipole / Wire/ Yagi Antenna Types**



Location:	BETHEL, CT
Site #:	5-0033
Date:	08/25/15
Name:	Ryan Ulanday
File Name:	BETHEL, CT - FF Power

Operating Freq. (MHz)	746.0
Antenna Height (ft)	149.0
Antenna Gain (dBi)	16.5
Antenna Size (in.)	53.3
Downtilt (degrees)	0.0
Feedline Loss (dB)	0.0
Power @ J4 (w)	1235.0
Number of Channels:	



Distance in feet below:

Calc Angle	90.0	80.0	70.0	65.0	60.0	55.0	50.0	45.0	40.0	35.0	30.0	25.0	20.0	15.0	10.0	5.0	4.0	2.0
Solve for r, dx to antenna	146.0	148.3	155.4	161.1	168.6	178.3	190.7	206.6	227.2	254.7	292.1	345.6	427.1	564.4	841.2	1676.0	2094.1	4185.6
Distance from Antenna Structure Base in Horizontal plane	0.1	25.9	53.2	68.2	84.4	102.3	122.6	146.1	174.1	208.6	253.0	313.3	401.4	545.2	828.4	1669.6	2089.0	#NUM!
Angle from Main Beam (reference to horizontal plane)	90	80	70	65	60	55	50	45	40	35	30	25	20	15	10	5	4	2
dB down from centerline (referenced to centerline)	36.76	34.35	38.52	35.34	29.54	26.8	25.59	25.63	25.99	21.21	20.29	23.24	13.03	12.3	9.92	2	0.2	0
Reflection Coefficient (1 to 4, 2.56 typical)	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56
Power Density (mW/cm²)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#NUM!
Percent of Occupational Standard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	#NUM!
Percent of General Population Standard	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.1	0.3	0.3	0.1	0.7	0.4	0.3	0.5	0.5	0.1

Antenna Type X7C-FRO-660-VRO
Max% 0.66%

Instructions:

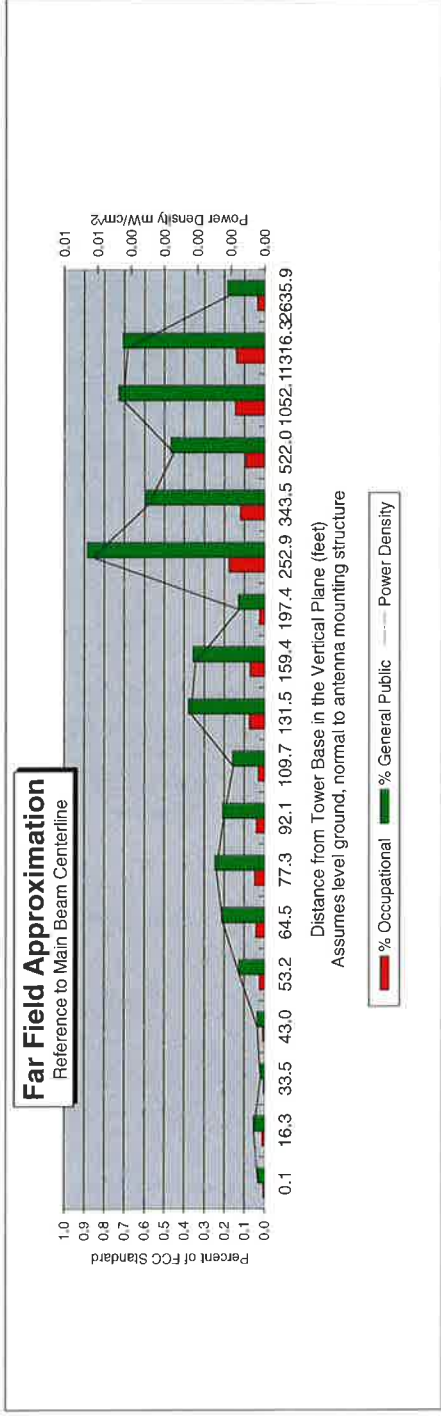
- 1) Fill in Site Location, Site number, Date, Name of Person Responsible for Date, and enter File Name to be saved as.
- 2) References to J4 refer to a point where the transmission line exits the equipment shelter and proceeds to the antenna(s). There is typically a connector located here where power measurements are made.
- 3) Enter Antenna Height (in feet to bottom of antenna), Antenna Gain (expressed as dBi, add 2.17 to dBi to obtain dBi), Antenna Size (vertical size in inches), Downtilt (in Degrees, enter zero if none), Feedline loss from J4 to Antenna, and J4 P.
- 4) From manufacturer's plots, or data sheet, input Angle from mainbeam and dB below mainbeam centerline.
- 5) Enter Reflection coefficient (2.56 would be typical, 1 for free space)
- 6) Spreadsheet calculates actual power density, then relates as Occupational or General Population percentage of FCC Standard.
- 7) An odd distance may be entered in the rightmost column of the lower table.

Far Field Approximation
with downtilt variation

Estimated Radiated Emission
Single Emitter Far Field Model
Dipole / Wire/ Yagi Antenna Types



Location:	BETHEL, CT
Site #:	5-0033
Date:	08/25/15
Name:	Ryan Ulanday
File Name:	BETHEL, CT - FF Power
Operating Freq. (MHz)	869.0
Antenna Height (ft):	95.0
Antenna Gain (dBi):	16.7
Antenna Size (in.):	68.6
Downtilt (degrees):	0.0
Feedline Loss (dB):	0.0
Power @ J4 (w):	3771.0
Number of Channels:	



Distance in feet below:

Calc Angle	90.0	80.0	70.0	65.0	60.0	55.0	50.0	45.0	40.0	35.0	30.0	25.0	20.0	15.0	10.0	5.0	4.0	2.0
Solve for r, dx to antenna	92.0	93.4	97.9	101.5	106.3	112.3	120.1	130.2	143.2	160.5	184.1	217.8	269.1	355.6	530.1	1056.1	1319.5	2637.5
Distance from Antenna Structure Base in Horizontal plane	0.1	16.3	33.5	43.0	53.2	64.5	77.3	92.1	109.7	131.5	159.4	197.4	252.9	343.5	522.0	1052.1	1316.3	2635.9
Angle from Main Beam (reference to horizontal plane)	90	80	70	65	60	55	50	45	40	35	30	25	20	15	10	5	4	2
dB down from centerline (referenced to centerline)	36.76	34.35	38.52	35.34	29.54	26.8	25.59	25.63	25.99	21.21	20.29	23.24	13.03	12.3	9.92	2	0.2	0
Reflection Coefficient (1 to 4, 2.56 typical)	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56
Power Density (mW/cm²)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Percent of Occupational Standard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.2	0.1	0.1	0.1	0.1	0.0
Percent of General Population Standard	0.0	0.1	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.4	0.4	0.1	0.9	0.6	0.5	0.7	0.7	0.2

Antenna Type BXA-80063-6BF-EDIN-2
Max% 0.89%

Instructions:

- 1) Fill in Site Location, Site number, Date, and enter File Name to be saved as.
- 2) References to J4 refer to a point where the transmission line exits the equipment shelter and proceeds to the antenna(s). There is typically a connector located here where power measurements are made.
- 3) Enter Antenna Height (in feet to bottom of antenna), Antenna Gain (expressed as dBi, add 2.17 to dBd to obtain dBi), Antenna Size (vertical size in inches), Downtilt (in Degrees, enter zero if none), Feedline loss from J4 to Antenna, and J4 P
- 4) From manufacturer's plots, or data sheet, input Angle from mainbeam and dB below mainbeam centerline.
- 5) Enter Reflection coefficient (2.56 would be typical, 1 for free space)
- 6) Spreadsheet calculates actual power density, then relates as Occupational or General Population percentage of FCC Standard.
- 7) An odd distance may be entered in the rightmost column of the lower table.

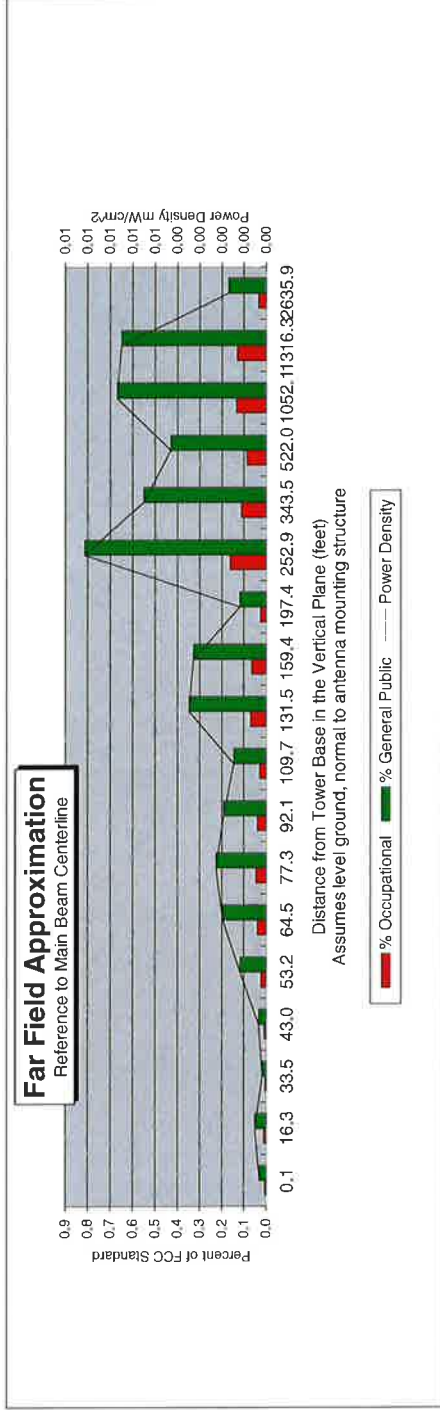
Far Field Approximation
with downtilt variation

Estimated Radiated Emission
Single Emitter Far Field Model
Dipole / Wire/ Yagi Antenna Types



Location:	BETHEL, CT
Site #:	5-0033
Date:	08/25/15
Name:	Ryan Ulanday
File Name:	BETHEL, CT - FF Power

Operating Freq. (MHz)	1971.0
Antenna Height (ft):	95.0
Antenna Gain (dBi):	18.7
Antenna Size (ft.):	75.0
Downtilt (degrees):	0.0
Feedline Loss (dB):	0.0
Power @ J4 (w):	1743.0
Number of Channels:	



Distance in feet below:

Calc Angle	90.0	80.0	70.0	65.0	60.0	55.0	50.0	45.0	40.0	35.0	30.0	25.0	20.0	15.0	10.0	5.0	4.0	2.0	
Solve for r, dx to antenna	92.0	93.4	97.9	101.5	106.3	112.3	120.1	130.2	143.2	160.5	184.1	217.8	269.1	355.6	530.1	1056.1	1319.5	2637.5	
Distance from Antenna Structure Base in Horizontal plane	0.1	16.3	33.5	43.0	53.2	64.5	77.3	92.1	109.7	131.5	159.4	197.4	252.9	343.5	522.0	1052.1	1316.3	2635.9	#NUM!
Angle from Main Beam (reference to horizontal plane)	90	80	70	65	60	55	50	45	40	35	30	25	20	15	10	5	4	2	0
dB down from centerline (referenced to centerline)	36.76	34.35	36.52	35.34	29.54	26.8	25.59	25.63	25.99	21.21	20.29	23.24	13.03	12.3	9.92	2	0.2	0	0
Reflection Coefficient (1 to 4, 2.56 typical)	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56
Power Density (mW/cm²)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.00	#NUM!
Percent of Occupational Standard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.2	0.1	0.1	0.1	0.1	0.0	#NUM!
Percent of General Population Standard	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.1	0.3	0.3	0.1	0.8	0.6	0.4	0.7	0.6	0.2	#NUM!

Antenna Type WWX063X19X00
Max% 0.81%

Instructions:

- 1) Fill in Site Location, Site number, Date, Name of Person Responsible for Date, and enter File Name to be saved as.
- 2) References to J4 refer to a point where the transmission line exits the equipment shelter and proceeds to the antenna(s). There is typically a connector located here where power measurements are made.
- 3) Enter Antenna Height (in feet to bottom of antenna), Antenna Gain (expressed as dBi, add 2.17 to dBi to obtain dBi), Antenna Size (vertical size in inches), Downtilt (in Degrees, enter zero if none), Feedline loss from J4 to Antenna, and J4 Ft.
- 4) From manufacturer's plots, or data sheet, input Angle from mainbeam and dB below mainbeam centerline.
- 5) Enter Reflection coefficient (2.56 would be typical, 1 for free space)
- 6) Spreadsheet calculates actual power density, then relates as Occupational or General Population percentage of FCC Standard.
- 7) An odd distance may be entered in the rightmost column of the lower table.

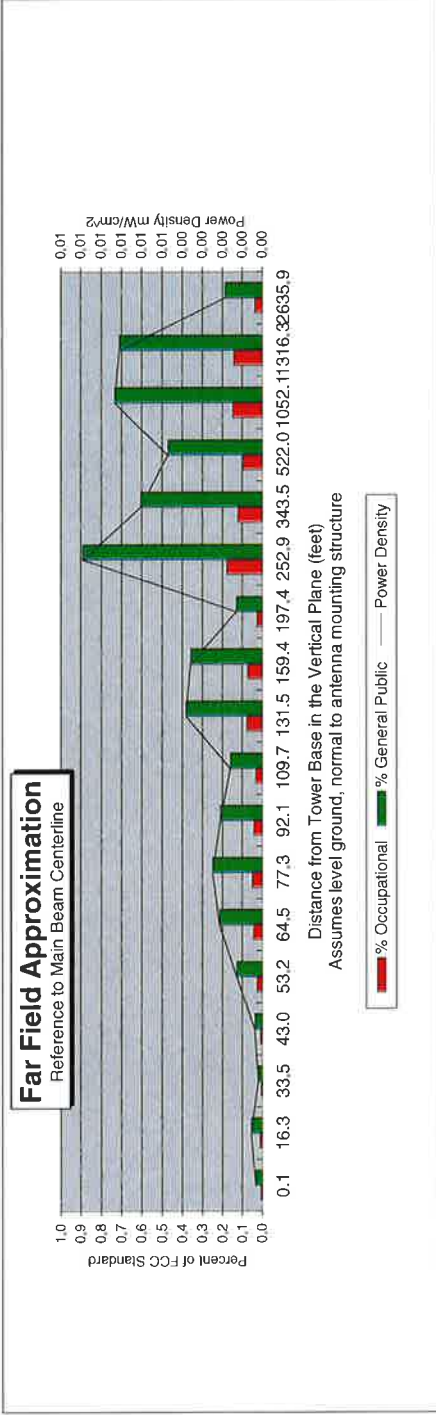
Far Field Approximation
with downtilt variation

**Estimated Radiated Emission
Single Emitter Far Field Model
Dipole / Wire/ Yagi Antenna Types**



Location:	BETHEL, CT
Site #:	5-0033
Date:	08/25/15
Name:	Ryan Ulanday
File Name:	BETHEL, CT - FF Power

Operating Freq. (MHz)	2110.0
Antenna Height (ft):	95.0
Antenna Gain (dBi):	19.1
Antenna Size (in.):	75.0
Downtilt (degrees):	0.0
Feedline Loss (dB):	0.0
Power @ J4 (w):	1911.0
Number of Channels:	



Distance in feet below:

Calc Angle	90.0	80.0	70.0	60.0	55.0	50.0	45.0	40.0	35.0	30.0	25.0	20.0	15.0	10.0	5.0	4.0	2.0		
Solve for r, dx to antenna	92.0	93.4	97.9	101.5	106.3	112.3	120.1	130.2	143.2	160.5	184.1	217.8	269.1	355.6	530.1	1056.1	1319.5	2637.5	
Distance from Antenna Structure Base in Horizontal plane	0.1	16.3	33.5	43.0	53.2	64.5	77.3	92.1	109.7	131.5	159.4	197.4	252.9	343.5	522.0	1052.1	1316.3	2635.9	#NUM!
Angle from Main Beam (reference to horizontal plane)	90	80	70	65	60	55	50	45	40	35	30	25	20	15	10	5	4	2	0
dB down from centerline (referenced to centerline)	36.76	34.35	36.52	35.34	29.54	26.8	25.59	25.63	25.99	21.21	20.29	23.24	13.03	12.3	9.92	2	0.2	0	0
Reflection Coefficient (1 to 4, 2.56 typical)	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56
Power Density (mW/cm²)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#NUM!
Percent of Occupational Standard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	#NUM!
Percent of General Population Standard	0.0	0.1	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.4	0.4	0.1	0.9	0.6	0.5	0.7	0.7	0.2	#NUM!

Antenna Type: WWX063X19X00
Max%: 0.89%

Instructions:

- 1) Fill in Site Location, Site number, Date, Name of Person Responsible for Date, and enter File Name to be saved as.
- 2) References to J4 refer to a point where the transmission line exits the equipment shelter and proceeds to the antenna(s). There is typically a connector located here where power measurements are made.
- 3) Enter Antenna Height (in feet to bottom of antenna), Antenna Gain (expressed as dBi, add 2.17 to dBi to obtain dBi), Antenna Size (vertical size in inches), Downtilt (in Degrees, enter zero if none), Feedline loss from J4 to Antenna, and J4 P.
- 4) From manufacturer's plots, or data sheet, input Angle from mainbeam and dB below mainbeam centerline.
- 5) Enter Reflection coefficient (2.56 would be typical, 1 for free space)
- 6) Spreadsheet calculates actual power density, then relates as Occupational or General Population percentage of FCC Standard.
- 7) An odd distance may be entered in the rightmost column of the lower table.

ATTACHMENT 3



Structural Analysis Report

Structure : 125 foot Monopole
BST Site Name : Spring Hill
BST Site Number : CT-5003
Proposed Carrier : Verizon Wireless
Site Location : 38 Spring Hill Road
Bethel, Connecticut 06801
41.3622/-73.3967
Date : May 21, 2015
Max Member Stress Level : 99%
Result : PASS

Prepared by:
Bennett & Pless, Inc.



Table of Contents

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Appendix A (Calculations) Attached

Appendix B (Collocation Application) Attached

Introduction

We have completed our structural analysis of the proposed equipment installation on the foregoing tower to determine its ability to support the new loads proposed by Verizon Wireless. The objective of the analysis is to determine if the existing structure is in conformance with the current codes and standards for the proposed equipment installation.

Supporting Documents

The following documents were made available for our structural analysis.

Tower Information	Ramaker & Associates SA dated July 15, 2014 Structural Analysis by Bennett & Pless, April 10, 2015
Foundation Information	Foundation Information was not available.
Geotechnical Information	Geotechnical Information was not available.
Equipment Information	Engineered Tower Solutions Mapping dated November 21, 2014 Collocation Application from BlueSky Tower, May 20, 2015
Tower Reinforcement Information	Tower has not been previously reinforced.

Design Criteria

The tower was analyzed using tnxTower (Version 6.1.4.1) tower analysis software using the following design criteria.

State Building Code	Connecticut (CBC 2005)
TIA/EIA Standard Code	Rev G
Basic Wind Speed	100 MPH
Basic Wind Speed w/ Ice	50 MPH w/ 0.75" Ice
Steel Grade	65 ksi Pole, 50 ksi Base Plate, Anchor Bolts A615 Grade 75
Topographic Category	I
Exposure Category	C
Tower Class	II

Final Proposed Equipment Loading for Verizon Wireless

The following proposed loading was obtained from the collocation application provided by Blue Sky Tower. (May 20, 2015):

Antenna/Equipment				Coax		
Mount	RAD	Qty.	Antenna	Qty.	Size/Type	
95	-	1	Low Platform	12 1	1 5/8" Coax 1 5/8" Fiber	
	95		1			CSS X7C-FRO-660-VR0
			2			Kathrein 80010735V01
			6			Amphenol WWX063X19G00
			1			Amphenol BXA-80063-6CF
			2			Amphenol BXA-80080-6CF
			3			ALU RH 2 x 60 - 700
			3			ALU RH 2 x 60 - PCS
			3			ALU RH 2 x 60 - AWS
			2			Raycap DB-T1-6Z-8AB-0Z

Note: Proposed equipment will replace the existing equipment Verizon currently has installed.

Note: All additional equipment considered in the analysis is listed on the tower profile.

Analysis Results

Based on the foregoing information, our structural analysis determined that **the existing tower is structurally capable of supporting the proposed equipment loads without modification.** The existing foundations have not been evaluated. Due to the high level of stress at the base of the tower, a foundation and geotechnical mapping is recommended to determine if the foundation can adequately support the proposed installation.

Assumptions

The following assumptions were used in this structural analysis:

1. The existing tower has been maintained to manufacturer's specifications and is in good condition.
2. All member connections are assumed to have been designed to meet the load carrying capacity of the connected member.
3. Antenna mount loads have been estimated based on general information obtained in the field.
4. The mounts for the proposed antennas have been analyzed and designed by others.
5. See additional assumptions contained in the report attached.

Conclusions

The existing tower described above **has sufficient capacity** to support the proposed loading based on the TIA/EIA-222-G Standard referenced by the State Building Code. The foundation could not be evaluated. No foundation or geotechnical information was available at the time of analysis.

We appreciate the opportunity of providing our continuing professional services to you. If you have any questions or need further assistance please call us anytime at 605-540-4620.

Yours Very Truly,
Bennett & Pless, Inc.



Michael T. De Boer, PE
Senior Technical Director



Standard Conditions

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but not necessarily limited, to:

- Information supplied by the client regarding the structure itself, the antenna and transmission line loading on the structure and its components, or relevant information.
- Information from drawings in possession of Bennett & Pless, or generated by field inspections or measurements of the structure.

It is the responsibility of the client to ensure that the information provided to Bennett & Pless and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we consider that all structures were constructed in accordance with the drawings and specifications and are in an uncorroded condition and have not deteriorated; and we, therefore consider that their capacity has not significantly changed from the original design condition.

All services will be performed to the codes and standards specified by the client, and we do not imply to meet any other code and standard requirements unless explicitly agreed to in writing. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes and standards, the client shall specify the exact requirements. In the absence of information to the contrary, all work will be performed in accordance with the revision of ANSI/TIA/EIA-222 requested.

All services are performed, results obtained and recommendations made in accordance with the generally accepted engineering principles and practices. Bennett & Pless is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

Disclaimer of Warranties

Bennett & Pless. makes no warranties, expressed or implied, in connection with this report, and disclaims any liability arising from the ability of the existing structure to support the design loads for which it was originally designed. Bennett & Pless. will not be responsible whatsoever for or on account of, consequential or incidental damages sustained by any person, firm, or organization as a result of any data or conclusions contained in this report. The maximum liability of Bennett & Pless pursuant to this report will be limited to the total fee received for preparation of this report.

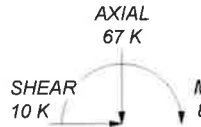
Appendix A

Calculations

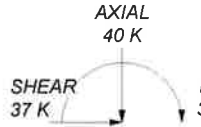
DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
15' Omni (tower)	123	IBC1900HB-2 (Sprint)	105.5
LP 303-1 (ATT)	122	IBC1900HB-2 (Sprint)	105.5
8' x 2" Antenna Mount Pipe (ATT)	122	IBC1900HB-2 (Sprint)	105.5
8' x 2" Antenna Mount Pipe (ATT)	122	LP 303-1 (T-Mobile)	102
8' x 2" Antenna Mount Pipe (ATT)	122	(2) 8' x 2" Antenna Mount Pipe (T-Mobile)	102
7770 w/ Mount Pipe (ATT)	122	(2) 8' x 2" Antenna Mount Pipe (T-Mobile)	102
7770 w/ Mount Pipe (ATT)	122	(2) 8' x 2" Antenna Mount Pipe (T-Mobile)	102
7770 w/ Mount Pipe (ATT)	122	(2) 8' x 2" Antenna Mount Pipe (T-Mobile)	102
AM-X-CD-16-65-00T-RET w/ Mount Pipe (ATT)	122	(2) Kathrein 81010020R4B (T-Mobile)	102
AM-X-CD-16-65-00T-RET w/ Mount Pipe (ATT)	122	(2) Kathrein 81010020R4B (T-Mobile)	102
AM-X-CD-16-65-00T-RET w/ Mount Pipe (ATT)	122	(2) Kathrein 81010020R4B (T-Mobile)	102
P65-16-XLH-RR w/ Mount Pipe (ATT)	122	14' 16 element dipole (T-Mobile)	102
P65-16-XLH-RR w/ Mount Pipe (ATT)	122	LNx6515DS-VTM w/Pipe (T-Mobile)	102
P65-16-XLH-RR w/ Mount Pipe (ATT)	122	LNx6515DS-VTM w/Pipe (T-Mobile)	102
P90-15-XLPP-RR w/ Mount Pipe (ATT)	122	LNx6515DS-VTM w/Pipe (T-Mobile)	102
LGP21401 (ATT)	122	RRUS 11 (T-Mobile)	102
LGP21401 (ATT)	122	RRUS 11 (T-Mobile)	102
LGP21401 (ATT)	122	RRUS 11 (T-Mobile)	102
LGP21401 (ATT)	122	X7C-FRO-660-VR0 w/ pipe mount (Verizon)	96
LGP21401 (ATT)	122	(2) WWW063X19G00 w/ pipe mount (Verizon)	96
TT08-19DB111-001 (ATT)	122	BXA-80063-6CF w/ pipe mount (Verizon)	96
TT08-19DB111-001 (ATT)	122	800 10736V01 w/ Mount Pipe (Verizon)	96
TT08-19DB111-001 (ATT)	122	DC6-48-60-18-8F (ATT)	122
Tri-Antenna Mount (ATT)	118.5	(2) WWW063X19G00 w/ pipe mount (Verizon)	96
(2) RRUS-11 (ATT)	118.5	BXA-80060-6CF w/ pipe mount (Verizon)	96
(2) RRUS-11 (ATT)	118.5	(2) RRUS-11 (ATT)	118.5
(2) RRUS-11 (ATT)	118.5	800 10736V01 w/ Mount Pipe (Verizon)	96
LP 303-1 (Sprint)	112	(2) WWW063X19G00 w/ pipe mount (Verizon)	96
(2) 8' x 2" Antenna Mount Pipe (Sprint)	112	BXA-80060-6CF w/ pipe mount (Verizon)	96
(2) 8' x 2" Antenna Mount Pipe (Sprint)	112	RRH2x60 - AWS (Verizon)	96
(2) 8' x 2" Antenna Mount Pipe (Sprint)	112	RRH2x60 - AWS (Verizon)	96
APXVSP18-C (Sprint)	112	RRH2x60 - AWS (Verizon)	96
APXVSP18-C (Sprint)	112	ALU RH 2x60 700 (Verizon)	96
APXVSP18-C (Sprint)	112	ALU RH 2x60 700 (Verizon)	96
APXV9TM14-ALU-120 (Sprint)	112	ALU RH 2x60 700 (Verizon)	96
APXV9TM14-ALU-120 (Sprint)	112	ALU RH 2x60 700 (Verizon)	96
APXV9TM14-ALU-120 (Sprint)	112	ALU RH 2x60 700 (Verizon)	96
APXV9TM14-ALU-120 (Sprint)	112	ALU RH 2x60 700 (Verizon)	96
TD-RRH 8x20 (Sprint)	112	ALU RH 2x60 - PCS (Verizon)	96
TD-RRH 8x20 (Sprint)	112	ALU RH 2x60 - PCS (Verizon)	96
TD-RRH 8x20 (Sprint)	112	ALU RH 2x60 - PCS (Verizon)	96
Tri-Antenna Mount (Sprint)	105.5	ALU RH 2x60 - PCS (Verizon)	96
1900MHz 4x40W RRH (Sprint)	105.5	LP 303-1	95
1900MHz 4x40W RRH (Sprint)	105.5	10' Omni (Verizon)	92
1900MHz 4x40W RRH (Sprint)	105.5	10' Omni (Verizon)	92
1900MHz 4x40W RRH (Sprint)	105.5	LP 303-1	82
800MHz 2X50W RRH W/FILTER (Sprint)	105.5	LP 303-1	72
800MHz 2X50W RRH W/FILTER (Sprint)	105.5	15' Dipole	72
800MHz 2X50W RRH W/FILTER (Sprint)	105.5		
800MHz 2X50W RRH W/FILTER (Sprint)	105.5		

ALL REACTIONS ARE FACTORED



TORQUE 2 kip-ft
50 mph WIND - 0.7500 in μ



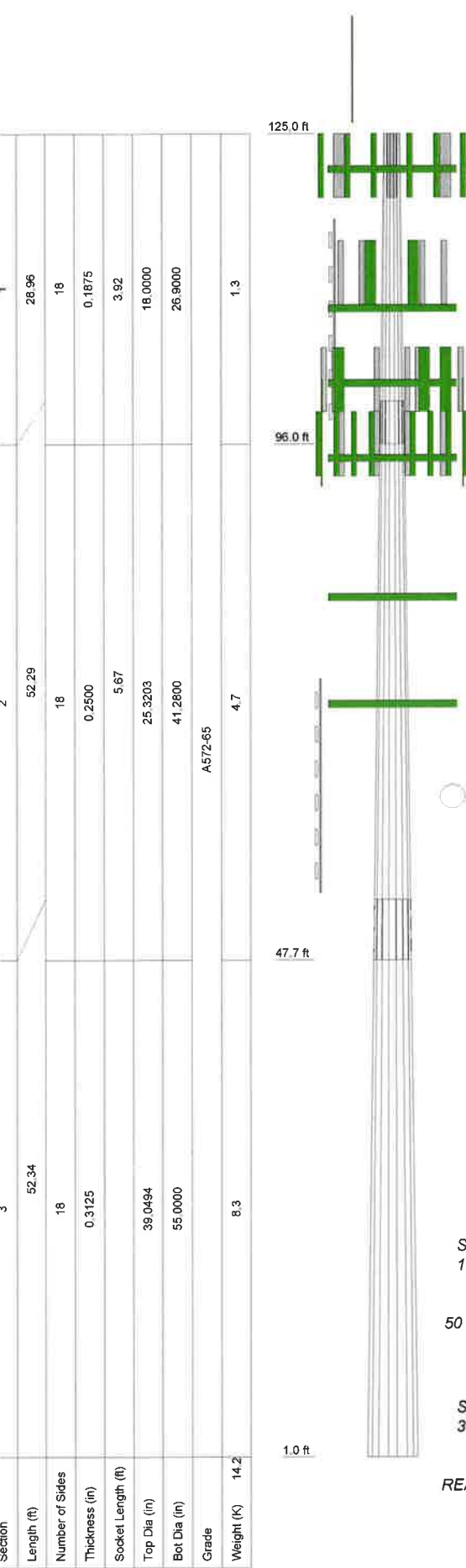
TORQUE 5 kip-ft
REACTIONS - 100 mph WIND Standards.

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 100 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
9. Welds are fabricated with ER-70S-6 electrodes.
10. TOWER RATING: 98.7%



bennett&pless | 3395 Northeast Expressway NE
Atlanta, GA 30341
Phone: 678-990-8700
FAX: 678-990-8701

Job: **CT-5003 125' Tapered Monopole**
Project: **Spring Hill, CT (Verizon)**
Client: Blue Sky Towers | Drawn by: J. Turner | App'd:
Code: TIA-222-G | Date: 05/26/15 | Scale: N
Path: | Dwg No. |

tnxTower Bennett & Pless 3395 Northeast Expressway NE Atlanta, GA 30341 Phone: 678-990-8700 FAX: 678-990-8701	Job CT-5003 125' Tapered Monopole	Page 1 of 22
	Project Spring Hill, CT (Verizon)	Date 10:06:35 05/26/15
	Client Blue Sky Towers	Designed by J. Turner

Tower Input Data

There is a pole section.

This tower is designed using the TIA-222-G standard.

The following design criteria apply:

Tower is located in Fairfield County, Connecticut.

Basic wind speed of 100 mph.

Structure Class II.

Exposure Category C.

Topographic Category 1.

Crest Height 0.00 ft.

Nominal ice thickness of 0.7500 in.

Ice thickness is considered to increase with height.

Ice density of 56 pcf.

A wind speed of 50 mph is used in combination with ice.

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 60 mph.

Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards..

Welds are fabricated with ER-70S-6 electrodes..

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

Pressures are calculated at each section.

Stress ratio used in pole design is 1.

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

Options

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

Tapered Pole Section Geometry

Section	Elevation	Section Length	Splice Length	Number of Sides	Top Diameter	Bottom Diameter	Wall Thickness	Bend Radius	Pole Grade
	ft	ft	ft		in	in	in	in	
L1	125.00-96.04	28.96	3.92	18	18.0000	26.9000	0.1875	0.7500	A572-65 (65 ksi)

tnxTower Bennett & Pless 3395 Northeast Expressway NE Atlanta, GA 30341 Phone: 678-990-8700 FAX: 678-990-8701	Job CT-5003 125' Tapered Monopole	Page 2 of 22
	Project Spring Hill, CT (Verizon)	Date 10:06:35 05/26/15
	Client Blue Sky Towers	Designed by J. Turner

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
L2	96.04-47.67	52.29	5.67	18	25.3203	41.2800	0.2500	1.0000	A572-65 (65 ksi)
L3	47.67-1.00	52.34		18	39.0494	55.0000	0.3125	1.2500	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	It/Q in ²	w in	w/t
L1	18.2777	10.6007	424.9328	6.3234	9.1440	46.4712	850.4248	5.3013	2.8380	15.136
	27.3150	15.8973	1433.1421	9.4829	13.6652	104.8753	2868.1699	7.9501	4.4044	23.49
L2	26.9258	19.8933	1579.6584	8.9000	12.8627	122.8091	3161.3954	9.9485	4.0164	16.065
	41.9168	32.5573	6924.5082	14.5657	20.9702	330.2064	13858.1278	16.2817	6.8253	27.301
L3	41.4064	38.4222	7284.0015	13.7516	19.8371	367.1906	14577.5874	19.2147	6.3227	20.233
	55.8485	54.2432	20495.5041	19.4141	27.9400	733.5542	41017.9768	27.1267	9.1300	29.216

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 125.00-96.04				1	1	1		
L2 96.04-47.67				1	1	1		
L3 47.67-1.00				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C _{AA} ft ² /ft	Weight plf
1 5/8" coax (ATT)	A	No	Inside Pole	123.00 - 2.00	12	No Ice	1.04
						1/2" Ice	1.04
						1" Ice	1.04
1 5/8" coax (Sprint)	B	No	Inside Pole	117.00 - 2.00	6	No Ice	1.04
						1/2" Ice	1.04
						1" Ice	1.04
HB058-M12-XXXF(5/8") (Sprint)	B	No	Inside Pole	117.00 - 2.00	1	No Ice	0.24
						1/2" Ice	0.24
						1" Ice	0.24
1 5/8" coax (T-Mobile)	C	No	Inside Pole	102.00 - 2.00	12	No Ice	1.04
						1/2" Ice	1.04
						1" Ice	1.04
1 7/16" Coax (T-Mobile)	C	No	Inside Pole	102.00 - 2.00	1	No Ice	0.82
						1/2" Ice	0.82
						1" Ice	0.82
1 5/8" (1.63", 41.3 mm) Fiber (T-Mobile)	C	No	Inside Pole	102.00 - 2.00	2	No Ice	0.82
						1/2" Ice	0.82
						1" Ice	0.82
1 5/8" coax (Verizon)	C	No	Inside Pole	92.00 - 2.00	14	No Ice	1.04
						1/2" Ice	1.04
						1" Ice	1.04

tnxTower Bennett & Pless 3395 Northeast Expressway NE Atlanta, GA 30341 Phone: 678-990-8700 FAX: 678-990-8701	Job		CT-5003 125' Tapered Monopole		Page	4 of 22
	Project		Spring Hill, CT (Verizon)		Date	10:06:35 05/26/15
	Client		Blue Sky Towers		Designed by	J. Turner

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Lateral					
15' Omni (tower)	C	From Leg	3.50	0.0000	123.00	No Ice	3.75	3.75	0.10
			0.00			1/2" Ice	5.28	5.28	0.13
			8.00			1" Ice	6.83	6.83	0.17
LP 303-1 (ATT)	C	None		0.0000	122.00	No Ice	17.46	17.46	1.35
						1/2" Ice	22.44	22.44	1.62
						1" Ice	27.42	27.42	1.90
8' x 2" Antenna Mount Pipe (ATT)	A	From Face	4.00	0.0000	122.00	No Ice	1.90	1.90	0.03
			0.00			1/2" Ice	2.73	2.73	0.04
			0.00			1" Ice	3.38	3.38	0.05
8' x 2" Antenna Mount Pipe (ATT)	B	From Face	4.00	0.0000	122.00	No Ice	1.90	1.90	0.03
			0.00			1/2" Ice	2.73	2.73	0.04
			0.00			1" Ice	3.38	3.38	0.05
8' x 2" Antenna Mount Pipe (ATT)	C	From Face	4.00	0.0000	122.00	No Ice	1.90	1.90	0.03
			0.00			1/2" Ice	2.73	2.73	0.04
			0.00			1" Ice	3.38	3.38	0.05
7770 w/ Mount Pipe (ATT)	A	From Leg	4.00	0.0000	122.00	No Ice	6.86	5.23	0.08
			0.00			1/2" Ice	7.65	6.41	0.14
			0.00			1" Ice	8.44	7.59	0.20
7770 w/ Mount Pipe (ATT)	B	From Leg	4.00	0.0000	122.00	No Ice	6.86	5.23	0.08
			0.00			1/2" Ice	7.65	6.41	0.14
			0.00			1" Ice	8.44	7.59	0.20
7770 w/ Mount Pipe (ATT)	C	From Leg	4.00	0.0000	122.00	No Ice	6.86	5.23	0.08
			0.00			1/2" Ice	7.65	6.41	0.14
			0.00			1" Ice	8.44	7.59	0.20
AM-X-CD-16-65-00T-RET w/ Mount Pipe (ATT)	A	From Leg	4.00	0.0000	122.00	No Ice	8.50	6.30	0.07
			0.00			1/2" Ice	9.15	7.48	0.14
			0.00			1" Ice	9.77	8.37	0.21
AM-X-CD-16-65-00T-RET w/ Mount Pipe (ATT)	B	From Leg	4.00	0.0000	122.00	No Ice	8.50	6.30	0.07
			0.00			1/2" Ice	9.15	7.48	0.14
			0.00			1" Ice	9.77	8.37	0.21
AM-X-CD-16-65-00T-RET w/ Mount Pipe (ATT)	C	From Leg	4.00	0.0000	122.00	No Ice	8.50	6.30	0.07
			0.00			1/2" Ice	9.15	7.48	0.14
			0.00			1" Ice	9.77	8.37	0.21
P65-16-XLH-RR w/Mount Pipe (ATT)	A	From Leg	4.00	0.0000	122.00	No Ice	8.40	5.95	0.07
			0.00			1/2" Ice	8.95	6.75	0.13
			0.00			1" Ice	9.51	7.53	0.20
P65-16-XLH-RR w/Mount Pipe (ATT)	B	From Leg	4.00	0.0000	122.00	No Ice	8.40	5.95	0.07
			0.00			1/2" Ice	8.95	6.75	0.13
			0.00			1" Ice	9.51	7.53	0.20
P90-15-XLPP-RR w/ Mount Pipe (ATT)	C	From Leg	4.00	0.0000	122.00	No Ice	8.64	6.36	0.07
			0.00			1/2" Ice	9.29	7.54	0.13
			0.00			1" Ice	9.91	8.43	0.21
LGP21401 (ATT)	A	None		0.0000	122.00	No Ice	1.29	0.36	0.01
						1/2" Ice	1.45	0.48	0.02
						1" Ice	1.61	0.60	0.03
LGP21401 (ATT)	A	None		0.0000	122.00	No Ice	1.29	0.36	0.01
						1/2" Ice	1.45	0.48	0.02
						1" Ice	1.61	0.60	0.03
LGP21401 (ATT)	B	None		0.0000	122.00	No Ice	1.29	0.36	0.01
						1/2" Ice	1.45	0.48	0.02
						1" Ice	1.61	0.60	0.03
LGP21401 (ATT)	B	None		0.0000	122.00	No Ice	1.29	0.36	0.01
						1/2" Ice	1.45	0.48	0.02
						1" Ice	1.61	0.60	0.03
LGP21401 (ATT)	C	None		0.0000	122.00	No Ice	1.29	0.36	0.01
						1/2" Ice	1.45	0.48	0.02
						1" Ice	1.61	0.60	0.03

tnxTower Bennett & Pless 3395 Northeast Expressway NE Atlanta, GA 30341 Phone: 678-990-8700 FAX: 678-990-8701	Job	CT-5003 125' Tapered Monopole	Page	5 of 22
	Project	Spring Hill, CT (Verizon)	Date	10:06:35 05/26/15
	Client	Blue Sky Towers	Designed by	J. Turner

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
LGP21401 (ATT)	C	None			0.0000	122.00	No Ice 1.29 1/2" Ice 1.45 1" Ice 1.61	0.36 0.48 0.60	0.01 0.02 0.03
TT08-19DB111-001 (ATT)	A	None			0.0000	122.00	No Ice 0.92 1/2" Ice 1.06 1" Ice 1.21	0.75 0.88 1.02	0.02 0.03 0.04
TT08-19DB111-001 (ATT)	B	None			0.0000	122.00	No Ice 0.92 1/2" Ice 1.06 1" Ice 1.21	0.75 0.88 1.02	0.02 0.03 0.04
TT08-19DB111-001 (ATT)	C	None			0.0000	122.00	No Ice 0.92 1/2" Ice 1.06 1" Ice 1.21	0.75 0.88 1.02	0.02 0.03 0.04
DC6-48-60-18-8F (ATT)	A	None			0.0000	122.00	No Ice 2.57 1/2" Ice 2.80 1" Ice 3.04	2.57 2.80 3.04	0.02 0.04 0.07
Tri-Antenna Mount (ATT)	A	From Leg	0.50 0.00 0.00		0.0000	118.50	No Ice 5.00 1/2" Ice 6.00 1" Ice 7.00	5.00 6.00 7.00	0.27 0.29 0.31
(2) RRUS-11 (ATT)	A	None			0.0000	118.50	No Ice 2.94 1/2" Ice 3.17 1" Ice 3.40	1.25 1.41 1.57	0.06 0.07 0.09
(2) RRUS-11 (ATT)	B	None			0.0000	118.50	No Ice 2.94 1/2" Ice 3.17 1" Ice 3.40	1.25 1.41 1.57	0.06 0.07 0.09
(2) RRUS-11 (ATT)	C	None			0.0000	118.50	No Ice 2.94 1/2" Ice 3.17 1" Ice 3.40	1.25 1.41 1.57	0.06 0.07 0.09

LP 303-1 (Sprint)	C	From Leg	0.00 0.00 -3.00		0.0000	112.00	No Ice 17.46 1/2" Ice 22.44 1" Ice 27.42	17.46 22.44 27.42	1.35 1.62 1.90
(2) 8' x 2" Antenna Mount Pipe (Sprint)	A	From Face	3.50 0.00 -3.00		0.0000	112.00	No Ice 1.90 1/2" Ice 2.73 1" Ice 3.38	1.90 2.73 3.38	0.03 0.04 0.05
(2) 8' x 2" Antenna Mount Pipe (Sprint)	B	From Face	3.50 0.00 -3.00		0.0000	112.00	No Ice 1.90 1/2" Ice 2.73 1" Ice 3.38	1.90 2.73 3.38	0.03 0.04 0.05
(2) 8' x 2" Antenna Mount Pipe (Sprint)	C	From Face	3.50 0.00 -3.00		0.0000	112.00	No Ice 1.90 1/2" Ice 2.73 1" Ice 3.38	1.90 2.73 3.38	0.03 0.04 0.05
APXVSPP18-C (Sprint)	A	From Face	3.50 2.00 0.00		0.0000	112.00	No Ice 8.26 1/2" Ice 8.81 1" Ice 9.36	5.28 5.74 6.20	0.06 0.11 0.16
APXVSPP18-C (Sprint)	B	From Face	3.50 2.00 0.00		0.0000	112.00	No Ice 8.26 1/2" Ice 8.81 1" Ice 9.36	5.28 5.74 6.20	0.06 0.11 0.16
APXVSPP18-C (Sprint)	C	From Face	3.50 2.00 0.00		0.0000	112.00	No Ice 8.26 1/2" Ice 8.81 1" Ice 9.36	5.28 5.74 6.20	0.06 0.11 0.16
APXV9TM14-ALU-120 (Sprint)	A	From Face	3.50 -2.00 0.00		0.0000	112.00	No Ice 6.90 1/2" Ice 7.35 1" Ice 7.80	3.61 3.97 4.33	0.06 0.09 0.13
APXV9TM14-ALU-120 (Sprint)	B	From Face	3.50 -2.00 0.00		0.0000	112.00	No Ice 6.90 1/2" Ice 7.35 1" Ice 7.80	3.61 3.97 4.33	0.06 0.09 0.13
APXV9TM14-ALU-120 (Sprint)	C	From Face	3.50 -2.00		0.0000	112.00	No Ice 6.90 1/2" Ice 7.35	3.61 3.97	0.06 0.09

tnxTower Bennett & Pless 3395 Northeast Expressway NE Atlanta, GA 30341 Phone: 678-990-8700 FAX: 678-990-8701	Job CT-5003 125' Tapered Monopole	Page 6 of 22
	Project Spring Hill, CT (Verizon)	Date 10:06:35 05/26/15
	Client Blue Sky Towers	Designed by J. Turner

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Vert	Lateral					
			0.00							
			3.50			0.0000	112.00	1" Ice 7.80	4.33	0.13
			-2.00					No Ice 4.32	1.41	0.07
			0.00					1/2" Ice 4.60	1.61	0.09
			0.00					1" Ice 4.88	1.81	0.12
			3.50			0.0000	112.00	No Ice 4.32	1.41	0.07
			-2.00					1/2" Ice 4.60	1.61	0.09
			0.00					1" Ice 4.88	1.81	0.12
			3.50			0.0000	112.00	No Ice 4.32	1.41	0.07
			-2.00					1/2" Ice 4.60	1.61	0.09
			0.00					1" Ice 4.88	1.81	0.12
			0.50			0.0000	105.50	No Ice 5.00	5.00	0.27
			0.00					1/2" Ice 6.00	6.00	0.29
			-1.00					1" Ice 7.00	7.00	0.31
			1.00			0.0000	105.50	No Ice 2.71	2.61	0.06
			-1.00					1/2" Ice 2.95	2.84	0.08
			-1.00					1" Ice 3.19	3.07	0.11
			1.00			0.0000	105.50	No Ice 2.71	2.61	0.06
			1.00					1/2" Ice 2.95	2.84	0.08
			-1.00					1" Ice 3.19	3.07	0.11
			1.00			0.0000	105.50	No Ice 2.71	2.61	0.06
			-1.00					1/2" Ice 2.95	2.84	0.08
			-1.00					1" Ice 3.19	3.07	0.11
			1.00			0.0000	105.50	No Ice 2.71	2.61	0.06
			1.00					1/2" Ice 2.95	2.84	0.08
			-1.00					1" Ice 3.19	3.07	0.11
			1.00			0.0000	105.50	No Ice 2.71	2.61	0.06
			-1.00					1/2" Ice 2.95	2.84	0.08
			-1.00					1" Ice 3.19	3.07	0.11
			1.00			0.0000	105.50	No Ice 2.40	2.25	0.06
			1.00					1/2" Ice 2.61	2.46	0.09
			2.00					1" Ice 2.83	2.68	0.11
			1.00			0.0000	105.50	No Ice 2.40	2.25	0.06
			1.00					1/2" Ice 2.61	2.46	0.09
			2.00					1" Ice 2.83	2.68	0.11
			1.00			0.0000	105.50	No Ice 2.40	2.25	0.06
			1.00					1/2" Ice 2.61	2.46	0.09
			2.00					1" Ice 2.83	2.68	0.11
						0.0000	105.50	No Ice 1.31	0.79	0.04
								1/2" Ice 1.48	0.94	0.05
								1" Ice 1.66	1.10	0.06
						0.0000	105.50	No Ice 1.31	0.79	0.04
								1/2" Ice 1.48	0.94	0.05
								1" Ice 1.66	1.10	0.06
						0.0000	105.50	No Ice 1.31	0.79	0.04
								1/2" Ice 1.48	0.94	0.05
								1" Ice 1.66	1.10	0.06
						0.0000	102.00	No Ice 17.46	17.46	1.35
								1/2" Ice 22.44	22.44	1.62
								1" Ice 27.42	27.42	1.90
						0.0000	102.00	No Ice 1.90	1.90	0.03
								1/2" Ice 2.73	2.73	0.04
								1" Ice 3.38	3.38	0.05
						0.0000	102.00	No Ice 1.90	1.90	0.03

tnxTower Bennett & Pless 3395 Northeast Expressway NE Atlanta, GA 30341 Phone: 678-990-8700 FAX: 678-990-8701	Job		CT-5003 125' Tapered Monopole		Page	7 of 22
	Project		Spring Hill, CT (Verizon)		Date	10:06:35 05/26/15
	Client		Blue Sky Towers		Designed by	J. Turner

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 (T-Mobile)			0.00			1/2" Ice 2.73	2.73	0.04
(2) 8' x 2" Antenna Mount Pipe (T-Mobile)	C	From Face	0.00 3.50	0.0000	102.00	1" Ice 3.38 No Ice 1.90	3.38 1.90	0.05 0.03
(2) Kathrein 81010020R4B (T-Mobile)	A	From Face	0.00 3.50	0.0000	102.00	1" Ice 3.38 No Ice 8.40	3.38 4.70	0.05 0.04
(2) Kathrein 81010020R4B (T-Mobile)	B	From Face	0.00 3.50	0.0000	102.00	1/2" Ice 8.95 1" Ice 9.51 No Ice 8.40	5.15 5.60 4.70	0.09 0.14 0.04
(2) Kathrein 81010020R4B (T-Mobile)	C	From Face	0.00 3.50	0.0000	102.00	1/2" Ice 8.95 1" Ice 9.51 No Ice 8.40	5.15 5.60 4.70	0.09 0.14 0.04
14' 16 element dipole (T-Mobile)	A	From Face	0.00 3.50 -3.00 5.00	0.0000	102.00	No Ice 5.25 1/2" Ice 6.50 1" Ice 7.75	5.25 6.50 7.75	0.08 0.10 0.13
LNx6515DS-VTM w/Pipe (T-Mobile)	A	From Face	3.50 -3.00 0.00	0.0000	102.00	No Ice 11.80 1/2" Ice 0.00 1" Ice 0.00	11.30 0.00 0.00	0.13 0.17 0.21
LNx6515DS-VTM w/Pipe (T-Mobile)	B	From Face	3.50 -3.00 0.00	0.0000	102.00	No Ice 11.80 1/2" Ice 0.00 1" Ice 0.00	11.30 0.00 0.00	0.13 0.17 0.21
LNx6515DS-VTM w/Pipe (T-Mobile)	C	From Face	3.50 -3.00 0.00	0.0000	102.00	No Ice 11.80 1/2" Ice 0.00 1" Ice 0.00	11.30 0.00 0.00	0.13 0.17 0.21
RRUS 11 (T-Mobile)	A	From Face	2.50 -3.00 0.00	0.0000	102.00	No Ice 3.25 1/2" Ice 3.49 1" Ice 3.74	1.37 1.55 1.74	0.05 0.07 0.10
RRUS 11 (T-Mobile)	B	From Face	2.50 -3.00 0.00	0.0000	102.00	No Ice 3.25 1/2" Ice 3.49 1" Ice 3.74	1.37 1.55 1.74	0.05 0.07 0.10
RRUS 11 (T-Mobile)	C	From Face	2.50 -3.00 0.00	0.0000	102.00	No Ice 3.25 1/2" Ice 3.49 1" Ice 3.74	1.37 1.55 1.74	0.05 0.07 0.10
***** LP 303-1	C	None		0.0000	95.00	No Ice 17.46 1/2" Ice 22.44 1" Ice 27.42	17.46 22.44 27.42	1.35 1.62 1.90
*****Antennas*****								
X7C-FRO-660-VR0 w/ pipe mount (Verizon)	A	From Leg	4.00 0.00 0.00	0.0000	96.00	No Ice 10.51 1/2" Ice 11.16 1" Ice 11.79	7.88 8.91 9.81	0.09 0.17 0.26
(2) WWX063X19G00 w/ pipe mount (Verizon)	A	From Leg	4.00 0.00 0.00	0.0000	96.00	No Ice 9.04 1/2" Ice 9.67 1" Ice 10.29	7.57 8.61 9.52	0.07 0.15 0.23
BXA-80063-6CF w/ pipe mount (Verizon)	A	From Leg	4.00 0.00 0.00	0.0000	96.00	No Ice 8.04 1/2" Ice 8.67 1" Ice 9.28	6.17 7.18 8.06	0.06 0.12 0.19
800 10736V01 w/ Mount Pipe (Verizon)	B	From Leg	4.00 0.00 0.00	0.0000	96.00	No Ice 11.63 1/2" Ice 12.35 1" Ice 13.07	7.30 8.81 10.33	0.07 0.15 0.24
(2) WWX063X19G00 w/ pipe mount (Verizon)	B	From Leg	4.00 0.00 0.00	0.0000	96.00	No Ice 9.04 1/2" Ice 9.67 1" Ice 10.29	7.57 8.61 9.52	0.07 0.15 0.23
BXA-80080-6CF w/ pipe mount	B	From Leg	4.00 0.00	0.0000	96.00	No Ice 6.08 1/2" Ice 6.62	6.57 7.59	0.06 0.12

tnxTower Bennett & Pless 3395 Northeast Expressway NE Atlanta, GA 30341 Phone: 678-990-8700 FAX: 678-990-8701	Job CT-5003 125' Tapered Monopole	Page 8 of 22
	Project Spring Hill, CT (Verizon)	Date 10:06:35 05/26/15
	Client Blue Sky Towers	Designed by J. Turner

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
(Verizon)			0.00			1" Ice	7.15	8.47	0.18
800 10736V01 w/ Mount	C	From Leg	4.00	0.0000	96.00	No Ice	11.63	7.30	0.07
Pipe			0.00			1/2" Ice	12.35	8.81	0.15
(Verizon)			0.00			1" Ice	13.07	10.33	0.24
(2) WWX063X19G00 w/	C	From Leg	4.00	0.0000	96.00	No Ice	9.04	7.57	0.07
pipe mount			0.00			1/2" Ice	9.67	8.61	0.15
(Verizon)			0.00			1" Ice	10.29	9.52	0.23
BXA-80080-6CF w/ pipe	C	From Leg	4.00	0.0000	96.00	No Ice	6.08	6.57	0.06
mount			0.00			1/2" Ice	6.62	7.59	0.12
(Verizon)			0.00			1" Ice	7.15	8.47	0.18

RRH2x60 - AWS	A	None		0.0000	96.00	No Ice	3.96	2.16	0.06
(Verizon)						1/2" Ice	4.27	2.44	0.08
						1" Ice	4.58	2.72	0.10
RRH2x60 - AWS	B	None		0.0000	96.00	No Ice	3.96	2.16	0.06
(Verizon)						1/2" Ice	4.27	2.44	0.08
						1" Ice	4.58	2.72	0.10
RRH2x60 - AWS	C	None		0.0000	96.00	No Ice	3.96	2.16	0.06
(Verizon)						1/2" Ice	4.27	2.44	0.08
						1" Ice	4.58	2.72	0.10
ALU RH 2x60 700	A	None		0.0000	96.00	No Ice	2.29	1.21	0.05
(Verizon)						1/2" Ice	2.49	1.36	0.07
						1" Ice	2.70	1.53	0.09
ALU RH 2x60 700	B	None		0.0000	96.00	No Ice	2.29	1.21	0.05
(Verizon)						1/2" Ice	2.49	1.36	0.07
						1" Ice	2.70	1.53	0.09
ALU RH 2x60 700	C	None		0.0000	96.00	No Ice	2.29	1.21	0.05
(Verizon)						1/2" Ice	2.49	1.36	0.07
						1" Ice	2.70	1.53	0.09
ALU RH 2x60 - PCS	A	None		0.0000	96.00	No Ice	2.94	1.25	0.06
(Verizon)						1/2" Ice	3.17	1.41	0.07
						1" Ice	3.41	1.59	0.10
ALU RH 2x60 - PCS	B	None		0.0000	96.00	No Ice	2.94	1.25	0.06
(Verizon)						1/2" Ice	3.17	1.41	0.07
						1" Ice	3.41	1.59	0.10
ALU RH 2x60 - PCS	C	None		0.0000	96.00	No Ice	2.94	1.25	0.06
(Verizon)						1/2" Ice	3.17	1.41	0.07
						1" Ice	3.41	1.59	0.10
Raycap DB-T1-6Z-8AB-0Z	A	None		0.0000	96.00	No Ice	5.60	5.60	0.04
(Verizon)						1/2" Ice	6.60	6.60	0.06
						1" Ice	7.60	7.60	0.08
Raycap DB-T1-6Z-8AB-0Z	A	None		0.0000	96.00	No Ice	5.60	5.60	0.04
(Verizon)						1/2" Ice	6.60	6.60	0.06
						1" Ice	7.60	7.60	0.08
10' Omni	B	From Leg	6.50	0.0000	92.00	No Ice	2.50	2.50	0.08
(Verizon)			0.00			1/2" Ice	3.53	3.53	0.09
			5.00			1" Ice	4.58	4.58	0.12
10' Omni	C	From Leg	6.50	0.0000	92.00	No Ice	2.50	2.50	0.08
(Verizon)			0.00			1/2" Ice	3.53	3.53	0.09
			5.00			1" Ice	4.58	4.58	0.12

LP 303-1	C	None		0.0000	82.00	No Ice	17.46	17.46	1.35
						1/2" Ice	22.44	22.44	1.62
						1" Ice	27.42	27.42	1.90

LP 303-1	C	None		0.0000	72.00	No Ice	17.46	17.46	1.35
						1/2" Ice	22.44	22.44	1.62

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			ft ft ft	°	ft	ft ²	ft ²	K	
15' Dipole	A	From Face	3.50	0.0000	72.00	1" Ice	27.42	27.42	1.90
			-5.00			No Ice	3.50	3.50	0.04
			-8.00			1/2" Ice	5.50	5.50	0.07
						1" Ice	7.50	7.50	0.10

Tower Pressures - No Ice

$G_H = 1.100$

Section Elevation	z	K _Z	q _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _{AA} In Face	C _{AA} Out Face
ft	ft		psf	ft ²		ft ²	ft ²	ft ²		ft ²	ft ²
L1 125.00-96.04	109.56	1.29	31	55.015	A	0.000	55.015	55.015	100.00	0.000	0.000
					B	0.000	55.015	100.00	0.000	0.000	
					C	0.000	55.015	100.00	0.000	0.000	
L2 96.04-47.67	70.53	1.176	28	138.747	A	0.000	138.747	138.747	100.00	0.000	0.000
					B	0.000	138.747	100.00	0.000	0.000	
					C	0.000	138.747	100.00	0.000	0.000	
L3 47.67-1.00	24.23	0.939	23	189.120	A	0.000	189.120	189.120	100.00	0.000	0.000
					B	0.000	189.120	100.00	0.000	0.000	
					C	0.000	189.120	100.00	0.000	0.000	

Tower Pressure - With Ice

$G_H = 1.100$

Section Elevation	z	K _Z	q _z	t _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _{AA} In Face	C _{AA} Out Face
ft	ft		psf	in	ft ²		ft ²	ft ²	ft ²		ft ²	ft ²
L1 125.00-96.04	109.56	1.29	8	1.6912	63.178	A	0.000	63.178	63.178	100.00	0.000	0.000
						B	0.000	63.178	100.00	0.000	0.000	
						C	0.000	63.178	100.00	0.000	0.000	
L2 96.04-47.67	70.53	1.176	7	1.6184	152.381	A	0.000	152.381	152.381	100.00	0.000	0.000
						B	0.000	152.381	100.00	0.000	0.000	
						C	0.000	152.381	100.00	0.000	0.000	
L3 47.67-1.00	24.23	0.939	6	1.4544	201.708	A	0.000	201.708	201.708	100.00	0.000	0.000
						B	0.000	201.708	100.00	0.000	0.000	
						C	0.000	201.708	100.00	0.000	0.000	

Tower Pressure - Service

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$$G_H = 1.100$$

Section Elevation ft	z ft	K _Z	q _z psf	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
L1 125.00-96.04	109.56	1.29	10	55.015	A	0.000	55.015	55.015	100.00	0.000	0.000
					B	0.000	55.015	100.00	0.000	0.000	
					C	0.000	55.015	100.00	0.000	0.000	
L2 96.04-47.67	70.53	1.176	9	138.747	A	0.000	138.747	138.747	100.00	0.000	0.000
					B	0.000	138.747	100.00	0.000	0.000	
					C	0.000	138.747	100.00	0.000	0.000	
L3 47.67-1.00	24.23	0.939	7	189.120	A	0.000	189.120	189.120	100.00	0.000	0.000
					B	0.000	189.120	100.00	0.000	0.000	
					C	0.000	189.120	100.00	0.000	0.000	

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
L1 125.00-96.04	0.56	1.31	A	1	0.65	31	1	1	55.015	1.23	42.62	C
			B	1	0.65	1	1	55.015				
			C	1	0.65	1	1	55.015				
L2 96.04-47.67	2.31	4.67	A	1	0.65	28	1	1	138.747	2.83	58.44	C
			B	1	0.65	1	1	138.747				
			C	1	0.65	1	1	138.747				
L3 47.67-1.00	2.26	8.25	A	1	0.65	23	1	1	189.120	3.05	65.40	C
			B	1	0.65	1	1	189.120				
			C	1	0.65	1	1	189.120				
Sum Weight:	5.13	14.22						OTM	401.44 kip-ft	7.11		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
L1 125.00-96.04	0.56	1.31	A	1	0.65	31	1	1	55.015	1.23	42.62	C
			B	1	0.65	1	1	55.015				
			C	1	0.65	1	1	55.015				
L2 96.04-47.67	2.31	4.67	A	1	0.65	28	1	1	138.747	2.83	58.44	C
			B	1	0.65	1	1	138.747				
			C	1	0.65	1	1	138.747				
L3 47.67-1.00	2.26	8.25	A	1	0.65	23	1	1	189.120	3.05	65.40	C
			B	1	0.65	1	1	189.120				
			C	1	0.65	1	1	189.120				
Sum Weight:	5.13	14.22						OTM	401.44 kip-ft	7.11		

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Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
L1 125.00-96.04	0.56	1.31	A	1	0.65	31	1	1	55.015	1.23	42.62	C
			B	1	0.65		1	1	55.015			
			C	1	0.65		1	1	55.015			
L2 96.04-47.67	2.31	4.67	A	1	0.65	28	1	1	138.747	2.83	58.44	C
			B	1	0.65		1	1	138.747			
			C	1	0.65		1	1	138.747			
L3 47.67-1.00	2.26	8.25	A	1	0.65	23	1	1	189.120	3.05	65.40	C
			B	1	0.65		1	1	189.120			
			C	1	0.65		1	1	189.120			
Sum Weight:	5.13	14.22						OTM	401.44 kip-ft	7.11		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
L1 125.00-96.04	0.56	2.77	A	1	1.2	8	1	1	63.178	0.65	22.59	C
			B	1	1.2		1	1	63.178			
			C	1	1.2		1	1	63.178			
L2 96.04-47.67	2.31	8.10	A	1	1.2	7	1	1	152.381	1.43	29.62	C
			B	1	1.2		1	1	152.381			
			C	1	1.2		1	1	152.381			
L3 47.67-1.00	2.26	12.39	A	1	1.2	6	1	1	201.708	1.50	32.19	C
			B	1	1.2		1	1	201.708			
			C	1	1.2		1	1	201.708			
Sum Weight:	5.13	23.25						OTM	205.55 kip-ft	3.59		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
L1 125.00-96.04	0.56	2.77	A	1	1.2	8	1	1	63.178	0.65	22.59	C
			B	1	1.2		1	1	63.178			
			C	1	1.2		1	1	63.178			
L2 96.04-47.67	2.31	8.10	A	1	1.2	7	1	1	152.381	1.43	29.62	C
			B	1	1.2		1	1	152.381			
			C	1	1.2		1	1	152.381			
L3 47.67-1.00	2.26	12.39	A	1	1.2	6	1	1	201.708	1.50	32.19	C

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Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
Sum Weight:	5.13	23.25	B	1	1.2		1	1	201.708	3.59		
			C	1	1.2		1	1	201.708			
							OTM		205.55 kip-ft			

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
L1 125.00-96.04	0.56	2.77	A	1	1.2	8	1	1	63.178	0.65	22.59	C
			B	1	1.2		1	1	63.178			
			C	1	1.2		1	1	63.178			
L2 96.04-47.67	2.31	8.10	A	1	1.2	7	1	1	152.381	1.43	29.62	C
			B	1	1.2		1	1	152.381			
			C	1	1.2		1	1	152.381			
L3 47.67-1.00	2.26	12.39	A	1	1.2	6	1	1	201.708	1.50	32.19	C
			B	1	1.2		1	1	201.708			
			C	1	1.2		1	1	201.708			
Sum Weight:	5.13	23.25					OTM	205.55 kip-ft	3.59			

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
L1 125.00-96.04	0.56	1.31	A	1	0.65	10	1	1	55.015	0.40	13.73	C
			B	1	0.65		1	1	55.015			
			C	1	0.65		1	1	55.015			
L2 96.04-47.67	2.31	4.67	A	1	0.65	9	1	1	138.747	0.91	18.82	C
			B	1	0.65		1	1	138.747			
			C	1	0.65		1	1	138.747			
L3 47.67-1.00	2.26	8.25	A	1	0.65	7	1	1	189.120	0.98	21.07	C
			B	1	0.65		1	1	189.120			
			C	1	0.65		1	1	189.120			
Sum Weight:	5.13	14.22					OTM	129.31 kip-ft	2.29			

Tower Forces - Service - Wind 60 To Face

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Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
L1 125.00-96.04	0.56	1.31	A	1	0.65	10	1	1	55.015	0.40	13.73	C
			B	1	0.65		1	1	55.015			
			C	1	0.65		1	1	55.015			
L2 96.04-47.67	2.31	4.67	A	1	0.65	9	1	1	138.747	0.91	18.82	C
			B	1	0.65		1	1	138.747			
			C	1	0.65		1	1	138.747			
L3 47.67-1.00	2.26	8.25	A	1	0.65	7	1	1	189.120	0.98	21.07	C
			B	1	0.65		1	1	189.120			
			C	1	0.65		1	1	189.120			
Sum Weight:	5.13	14.22						OTM	129.31 kip-ft	2.29		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
L1 125.00-96.04	0.56	1.31	A	1	0.65	10	1	1	55.015	0.40	13.73	C
			B	1	0.65		1	1	55.015			
			C	1	0.65		1	1	55.015			
L2 96.04-47.67	2.31	4.67	A	1	0.65	9	1	1	138.747	0.91	18.82	C
			B	1	0.65		1	1	138.747			
			C	1	0.65		1	1	138.747			
L3 47.67-1.00	2.26	8.25	A	1	0.65	7	1	1	189.120	0.98	21.07	C
			B	1	0.65		1	1	189.120			
			C	1	0.65		1	1	189.120			
Sum Weight:	5.13	14.22						OTM	129.31 kip-ft	2.29		

Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M _x kip-ft	Sum of Overturning Moments, M _z kip-ft	Sum of Torques kip-ft
Leg Weight	14.22					
Bracing Weight	0.00					
Total Member Self-Weight	14.22			0.88	2.50	
Total Weight	33.37			0.88	2.50	
Wind 0 deg - No Ice		-0.00	-22.95	-2037.49	2.76	-2.91
Wind 30 deg - No Ice		11.46	-19.87	-1764.27	-1015.45	-1.93
Wind 60 deg - No Ice		19.86	-11.47	-1018.08	-1760.90	-0.43
Wind 90 deg - No Ice		22.93	0.00	1.14	-2033.86	1.18
Wind 120 deg - No Ice		19.86	11.48	1020.29	-1761.17	2.48
Wind 150 deg - No Ice		11.47	19.88	1766.29	-1015.91	3.11
Wind 180 deg - No Ice		0.00	22.95	2039.25	2.23	2.91
Wind 210 deg - No Ice		-11.46	19.87	1766.03	1020.44	1.93
Wind 240 deg - No Ice		-19.86	11.47	1019.84	1765.90	0.43

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Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Wind 270 deg - No Ice		-22.93	-0.00	0.62	2038.85	-1.18
Wind 300 deg - No Ice		-19.86	-11.48	-1018.53	1766.16	-2.48
Wind 330 deg - No Ice		-11.47	-19.88	-1764.53	1020.90	-3.11
Member Ice	9.03					
Total Weight Ice	59.95			2.25	5.01	
Wind 0 deg - Ice		-0.00	-9.50	-812.61	5.21	-1.60
Wind 30 deg - Ice		4.74	-8.23	-703.34	-401.46	-1.00
Wind 60 deg - Ice		8.21	-4.75	-405.00	-699.22	-0.13
Wind 90 deg - Ice		9.49	0.00	2.45	-808.28	0.77
Wind 120 deg - Ice		8.22	4.75	409.86	-699.43	1.47
Wind 150 deg - Ice		4.74	8.23	708.04	-401.82	1.77
Wind 180 deg - Ice		0.00	9.50	817.11	4.80	1.60
Wind 210 deg - Ice		-4.74	8.23	707.84	411.47	1.00
Wind 240 deg - Ice		-8.21	4.75	409.50	709.23	0.13
Wind 270 deg - Ice		-9.49	-0.00	2.05	818.29	-0.77
Wind 300 deg - Ice		-8.22	-4.75	-405.36	709.44	-1.47
Wind 330 deg - Ice		-4.74	-8.23	-703.54	411.83	-1.77
Total Weight	33.37			0.88	2.50	
Wind 0 deg - Service		-0.00	-7.39	-655.69	2.58	-0.94
Wind 30 deg - Service		3.69	-6.40	-567.68	-325.39	-0.62
Wind 60 deg - Service		6.40	-3.70	-327.33	-565.50	-0.14
Wind 90 deg - Service		7.39	0.00	0.97	-653.42	0.38
Wind 120 deg - Service		6.40	3.70	329.24	-565.59	0.80
Wind 150 deg - Service		3.69	6.40	569.53	-325.54	1.00
Wind 180 deg - Service		0.00	7.39	657.45	2.41	0.94
Wind 210 deg - Service		-3.69	6.40	569.44	330.38	0.62
Wind 240 deg - Service		-6.40	3.70	329.09	570.50	0.14
Wind 270 deg - Service		-7.39	-0.00	0.80	658.42	-0.38
Wind 300 deg - Service		-6.40	-3.70	-327.48	570.58	-0.80
Wind 330 deg - Service		-3.69	-6.40	-567.77	330.53	-1.00

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice

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Comb. No.	Description
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	125 - 96.04	Pole	Max Tension	48	0.00	-0.00	0.00
			Max. Compression	26	-23.66	4.71	-1.08
			Max. Mx	20	-10.06	223.15	-0.27
			Max. My	14	-10.06	2.38	-220.92
			Max. Vy	20	-19.05	223.15	-0.27
			Max. Vx	14	19.05	2.38	-220.92
			Max. Torque	3			3.47
L2	96.04 - 47.67	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-48.69	6.19	-2.72
			Max. Mx	20	-24.83	1563.88	-0.83
			Max. My	14	-24.83	2.84	-1563.42
			Max. Vy	20	-32.44	1563.88	-0.83
			Max. Vx	14	32.47	2.84	-1563.42
			Max. Torque	13			-4.92
L3	47.67 - 1	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-67.40	6.25	-2.74
			Max. Mx	20	-40.01	3377.73	-0.67
			Max. My	14	-40.01	2.73	-3379.00
			Max. Vy	20	-36.73	3377.73	-0.67
			Max. Vx	14	36.76	2.73	-3379.00
			Max. Torque	13			-4.91

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Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	36	67.40	9.49	0.00
	Max. H _x	20	40.05	36.69	0.00
	Max. H _z	3	30.04	0.00	36.72
	Max. M _x	2	3376.77	0.00	36.72
	Max. M _z	8	3371.37	-36.69	-0.00
	Max. Torsion	25	4.90	18.35	31.80
	Min. Vert	19	30.04	31.77	-18.36
	Min. H _x	8	40.05	-36.69	-0.00
	Min. H _z	15	30.04	-0.00	-36.72
	Min. M _x	14	-3379.00	-0.00	-36.72
	Min. M _z	20	-3377.73	36.69	0.00
	Min. Torsion	13	-4.90	-18.35	-31.80

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	33.37	0.00	0.00	0.91	2.60	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	40.05	-0.00	-36.72	-3376.77	3.60	-4.60
0.9 Dead+1.6 Wind 0 deg - No Ice	30.04	-0.00	-36.72	-3345.59	2.76	-4.60
1.2 Dead+1.6 Wind 30 deg - No Ice	40.05	18.34	-31.80	-2924.00	-1683.72	-3.07
0.9 Dead+1.6 Wind 30 deg - No Ice	30.04	18.34	-31.80	-2897.04	-1668.84	-3.06
1.2 Dead+1.6 Wind 60 deg - No Ice	40.05	31.77	-18.36	-1687.45	-2919.05	-0.72
0.9 Dead+1.6 Wind 60 deg - No Ice	30.04	31.77	-18.36	-1672.01	-2892.66	-0.71
1.2 Dead+1.6 Wind 90 deg - No Ice	40.05	36.69	0.00	1.55	-3371.37	1.82
0.9 Dead+1.6 Wind 90 deg - No Ice	30.04	36.69	0.00	1.25	-3340.77	1.83
1.2 Dead+1.6 Wind 120 deg - No Ice	40.05	31.77	18.36	1690.43	-2919.49	3.88
0.9 Dead+1.6 Wind 120 deg - No Ice	30.04	31.77	18.36	1674.40	-2893.10	3.89
1.2 Dead+1.6 Wind 150 deg - No Ice	40.05	18.35	31.80	2926.66	-1684.49	4.89
0.9 Dead+1.6 Wind 150 deg - No Ice	30.04	18.35	31.80	2899.11	-1669.60	4.90
1.2 Dead+1.6 Wind 180 deg - No Ice	40.05	0.00	36.72	3379.00	2.72	4.60
0.9 Dead+1.6 Wind 180 deg - No Ice	30.04	0.00	36.72	3347.24	1.89	4.60
1.2 Dead+1.6 Wind 210 deg - No Ice	40.05	-18.34	31.80	2926.24	1690.06	3.07
0.9 Dead+1.6 Wind 210 deg - No Ice	30.04	-18.34	31.80	2898.69	1673.51	3.06
1.2 Dead+1.6 Wind 240 deg - No Ice	40.05	-31.77	18.36	1689.68	2925.41	0.72

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Load Combination	Vertical	Shear _x	Shear _z	Overturning Moment, M _x	Overturning Moment, M _z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
0.9 Dead+1.6 Wind 240 deg - No Ice	30.04	-31.77	18.36	1673.66	2897.34	0.71
1.2 Dead+1.6 Wind 270 deg - No Ice	40.05	-36.69	-0.00	0.67	3377.73	-1.82
0.9 Dead+1.6 Wind 270 deg - No Ice	30.04	-36.69	-0.00	0.38	3345.45	-1.83
1.2 Dead+1.6 Wind 300 deg - No Ice	40.05	-31.77	-18.36	-1688.22	2925.84	-3.87
0.9 Dead+1.6 Wind 300 deg - No Ice	30.04	-31.77	-18.36	-1672.77	2897.77	-3.89
1.2 Dead+1.6 Wind 330 deg - No Ice	40.05	-18.35	-31.80	-2924.45	1690.82	-4.89
0.9 Dead+1.6 Wind 330 deg - No Ice	30.04	-18.35	-31.80	-2897.48	1674.26	-4.90
1.2 Dead+1.0 Ice+1.0 Temp	67.40	-0.00	0.00	2.74	6.25	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	67.40	-0.00	-9.50	-872.52	6.56	-1.60
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	67.40	4.74	-8.23	-755.14	-430.27	-1.01
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	67.40	8.21	-4.75	-434.67	-750.12	-0.15
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	67.40	9.49	0.00	3.01	-867.27	0.75
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	67.40	8.22	4.75	440.63	-750.34	1.45
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	67.40	4.74	8.23	760.93	-430.66	1.76
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	67.40	0.00	9.50	878.09	6.12	1.60
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	67.40	-4.74	8.23	760.71	442.96	1.01
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	67.40	-8.21	4.75	440.25	762.81	0.15
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	67.40	-9.49	-0.00	2.56	879.96	-0.75
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	67.40	-8.22	-4.75	-435.06	763.03	-1.45
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	67.40	-4.74	-8.23	-755.36	443.34	-1.76
Dead+Wind 0 deg - Service	33.37	-0.00	-7.39	-675.95	2.74	-0.94
Dead+Wind 30 deg - Service	33.37	3.69	-6.40	-585.22	-335.38	-0.62
Dead+Wind 60 deg - Service	33.37	6.40	-3.70	-337.43	-582.92	-0.15
Dead+Wind 90 deg - Service	33.37	7.39	0.00	1.02	-673.56	0.37
Dead+Wind 120 deg - Service	33.37	6.40	3.70	339.45	-583.01	0.79
Dead+Wind 150 deg - Service	33.37	3.69	6.40	587.18	-335.53	1.00
Dead+Wind 180 deg - Service	33.37	0.00	7.39	677.82	2.56	0.94
Dead+Wind 210 deg - Service	33.37	-3.69	6.40	587.09	340.68	0.63
Dead+Wind 240 deg - Service	33.37	-6.40	3.70	339.30	588.23	0.15
Dead+Wind 270 deg - Service	33.37	-7.39	-0.00	0.84	678.86	-0.37
Dead+Wind 300 deg - Service	33.37	-6.40	-3.70	-337.59	588.31	-0.79
Dead+Wind 330 deg - Service	33.37	-3.69	-6.40	-585.31	340.83	-1.00

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-33.37	0.00	0.00	33.37	0.00	0.000%

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Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
2	-0.00	-40.05	-36.72	0.00	40.05	36.72	0.000%
3	-0.00	-30.04	-36.72	0.00	30.04	36.72	0.000%
4	18.34	-40.05	-31.80	-18.34	40.05	31.80	0.000%
5	18.34	-30.04	-31.80	-18.34	30.04	31.80	0.000%
6	31.77	-40.05	-18.36	-31.77	40.05	18.36	0.000%
7	31.77	-30.04	-18.36	-31.77	30.04	18.36	0.000%
8	36.69	-40.05	0.00	-36.69	40.05	-0.00	0.000%
9	36.69	-30.04	0.00	-36.69	30.04	-0.00	0.000%
10	31.77	-40.05	18.36	-31.77	40.05	-18.36	0.000%
11	31.77	-30.04	18.36	-31.77	30.04	-18.36	0.000%
12	18.35	-40.05	31.80	-18.35	40.05	-31.80	0.000%
13	18.35	-30.04	31.80	-18.35	30.04	-31.80	0.000%
14	0.00	-40.05	36.72	-0.00	40.05	-36.72	0.000%
15	0.00	-30.04	36.72	-0.00	30.04	-36.72	0.000%
16	-18.34	-40.05	31.80	18.34	40.05	-31.80	0.000%
17	-18.34	-30.04	31.80	18.34	30.04	-31.80	0.000%
18	-31.77	-40.05	18.36	31.77	40.05	-18.36	0.000%
19	-31.77	-30.04	18.36	31.77	30.04	-18.36	0.000%
20	-36.69	-40.05	-0.00	36.69	40.05	0.00	0.000%
21	-36.69	-30.04	-0.00	36.69	30.04	0.00	0.000%
22	-31.77	-40.05	-18.36	31.77	40.05	18.36	0.000%
23	-31.77	-30.04	-18.36	31.77	30.04	18.36	0.000%
24	-18.35	-40.05	-31.80	18.35	40.05	31.80	0.000%
25	-18.35	-30.04	-31.80	18.35	30.04	31.80	0.000%
26	0.00	-67.40	0.00	0.00	67.40	-0.00	0.000%
27	-0.00	-67.40	-9.50	0.00	67.40	9.50	0.000%
28	4.74	-67.40	-8.23	-4.74	67.40	8.23	0.000%
29	8.21	-67.40	-4.75	-8.21	67.40	4.75	0.000%
30	9.49	-67.40	0.00	-9.49	67.40	-0.00	0.000%
31	8.22	-67.40	4.75	-8.22	67.40	-4.75	0.000%
32	4.74	-67.40	8.23	-4.74	67.40	-8.23	0.000%
33	0.00	-67.40	9.50	-0.00	67.40	-9.50	0.000%
34	-4.74	-67.40	8.23	4.74	67.40	-8.23	0.000%
35	-8.21	-67.40	4.75	8.21	67.40	-4.75	0.000%
36	-9.49	-67.40	-0.00	9.49	67.40	0.00	0.000%
37	-8.22	-67.40	-4.75	8.22	67.40	4.75	0.000%
38	-4.74	-67.40	-8.23	4.74	67.40	8.23	0.000%
39	-0.00	-33.37	-7.39	0.00	33.37	7.39	0.000%
40	3.69	-33.37	-6.40	-3.69	33.37	6.40	0.000%
41	6.40	-33.37	-3.70	-6.40	33.37	3.70	0.000%
42	7.39	-33.37	0.00	-7.39	33.37	-0.00	0.000%
43	6.40	-33.37	3.70	-6.40	33.37	-3.70	0.000%
44	3.69	-33.37	6.40	-3.69	33.37	-6.40	0.000%
45	0.00	-33.37	7.39	-0.00	33.37	-7.39	0.000%
46	-3.69	-33.37	6.40	3.69	33.37	-6.40	0.000%
47	-6.40	-33.37	3.70	6.40	33.37	-3.70	0.000%
48	-7.39	-33.37	-0.00	7.39	33.37	0.00	0.000%
49	-6.40	-33.37	-3.70	6.40	33.37	3.70	0.000%
50	-3.69	-33.37	-6.40	3.69	33.37	6.40	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	6	0.00000001	0.00000515

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3	Yes	5	0.00000001	0.00005042
4	Yes	6	0.00000001	0.00003201
5	Yes	6	0.00000001	0.00000903
6	Yes	6	0.00000001	0.00003456
7	Yes	6	0.00000001	0.00000990
8	Yes	5	0.00000001	0.00004209
9	Yes	5	0.00000001	0.00001825
10	Yes	6	0.00000001	0.00003672
11	Yes	6	0.00000001	0.00001063
12	Yes	6	0.00000001	0.00003118
13	Yes	6	0.00000001	0.00000873
14	Yes	6	0.00000001	0.00000512
15	Yes	5	0.00000001	0.00005010
16	Yes	6	0.00000001	0.00003648
17	Yes	6	0.00000001	0.00001050
18	Yes	6	0.00000001	0.00003366
19	Yes	6	0.00000001	0.00000955
20	Yes	5	0.00000001	0.00004141
21	Yes	5	0.00000001	0.00001794
22	Yes	6	0.00000001	0.00003191
23	Yes	6	0.00000001	0.00000895
24	Yes	6	0.00000001	0.00003773
25	Yes	6	0.00000001	0.00001094
26	Yes	4	0.00000001	0.00003216
27	Yes	6	0.00000001	0.00001860
28	Yes	6	0.00000001	0.00002557
29	Yes	6	0.00000001	0.00002642
30	Yes	6	0.00000001	0.00001717
31	Yes	6	0.00000001	0.00002873
32	Yes	6	0.00000001	0.00002602
33	Yes	6	0.00000001	0.00001884
34	Yes	6	0.00000001	0.00002946
35	Yes	6	0.00000001	0.00002788
36	Yes	6	0.00000001	0.00001771
37	Yes	6	0.00000001	0.00002673
38	Yes	6	0.00000001	0.00003017
39	Yes	5	0.00000001	0.00000630
40	Yes	5	0.00000001	0.00000887
41	Yes	5	0.00000001	0.00001071
42	Yes	4	0.00000001	0.00005738
43	Yes	5	0.00000001	0.00001327
44	Yes	5	0.00000001	0.00000902
45	Yes	5	0.00000001	0.00000633
46	Yes	5	0.00000001	0.00001327
47	Yes	5	0.00000001	0.00001028
48	Yes	4	0.00000001	0.00005828
49	Yes	5	0.00000001	0.00000928
50	Yes	5	0.00000001	0.00001470

Maximum Tower Deflections - Service Wind

Section No.	Elevation <i>ft</i>	Horz. Deflection <i>in</i>	Gov. Load Comb.	Tilt °	Twist °
L1	125 - 96.04	17.994	47	1.2741	0.0085
L2	99.96 - 47.67	11.518	47	1.1502	0.0056
L3	53.34 - 1	2.974	47	0.5401	0.0015

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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
123.00	15' Omni	47	17.460	1.2675	0.0083	29062
122.00	LP 303-1	47	17.193	1.2641	0.0082	29062
118.50	Tri-Antenna Mount	47	16.261	1.2520	0.0078	22355
112.00	LP 303-1	47	14.550	1.2256	0.0070	11177
105.50	Tri-Antenna Mount	47	12.884	1.1904	0.0063	7451
102.00	LP 303-1	47	12.014	1.1663	0.0059	6349
96.00	X7C-FRO-660-VR0 w/ pipe mount	47	10.578	1.1145	0.0052	5515
95.00	LP 303-1	47	10.347	1.1045	0.0051	5445
92.00	10' Omni	47	9.664	1.0728	0.0048	5250
82.00	LP 303-1	47	7.542	0.9493	0.0037	4688
72.00	LP 303-1	47	5.676	0.8081	0.0028	4235

Maximum Tower Deflections - Design Wind

Section No.	Elevation	Horz. Deflection	Gov. Load Comb.	Tilt	Twist
	ft	in		°	°
L1	125 - 96.04	89.096	20	6.2883	0.0422
L2	99.96 - 47.67	57.149	20	5.6979	0.0278
L3	53.34 - 1	14.791	16	2.6865	0.0072

Critical Deflections and Radius of Curvature - Design Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
123.00	15' Omni	20	86.462	6.2577	0.0410	6142
122.00	LP 303-1	20	85.146	6.2422	0.0404	6142
118.50	Tri-Antenna Mount	20	80.551	6.1857	0.0384	4724
112.00	LP 303-1	20	72.116	6.0611	0.0346	2360
105.50	Tri-Antenna Mount	20	63.899	5.8926	0.0309	1572
102.00	LP 303-1	20	59.603	5.7760	0.0289	1338
96.00	X7C-FRO-660-VR0 w/ pipe mount	20	52.506	5.5233	0.0256	1156
95.00	LP 303-1	20	51.359	5.4747	0.0251	1140
92.00	10' Omni	20	47.983	5.3189	0.0235	1095
82.00	LP 303-1	14	37.478	4.7110	0.0184	967
72.00	LP 303-1	14	28.223	4.0139	0.0139	866

Compression Checks

Pole Design Data

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio P _u φP _n
L1	125 - 96.04 (1)	TP26.9x18x0.1875	28.96	0.00	0.0	15.1803	-10.06	1026.07	0.010
L2	96.04 - 47.67 (2)	TP41.28x25.3203x0.25	52.29	0.00	0.0	31.1841	-24.83	1984.88	0.013
L3	47.67 - 1 (3)	TP55x39.0494x0.3125	52.34	0.00	0.0	54.2432	-40.01	3272.70	0.012

Pole Bending Design Data

Section No.	Elevation ft	Size	M _{ux} kip-ft	φM _{ux} kip-ft	Ratio M _{ux} φM _{ux}	M _{uy} kip-ft	φM _{uy} kip-ft	Ratio M _{uy} φM _{uy}
L1	125 - 96.04 (1)	TP26.9x18x0.1875	223.15	538.47	0.414	0.00	538.47	0.000
L2	96.04 - 47.67 (2)	TP41.28x25.3203x0.25	1564.23	1606.43	0.974	0.00	1606.43	0.000
L3	47.67 - 1 (3)	TP55x39.0494x0.3125	3379.23	3688.18	0.916	0.00	3688.18	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V _u K	φV _n K	Ratio V _u φV _n	Actual T _u kip-ft	φT _n kip-ft	Ratio T _u φT _n
L1	125 - 96.04 (1)	TP26.9x18x0.1875	19.05	513.03	0.037	0.55	1078.26	0.001
L2	96.04 - 47.67 (2)	TP41.28x25.3203x0.25	32.46	992.44	0.033	3.08	3216.78	0.001
L3	47.67 - 1 (3)	TP55x39.0494x0.3125	36.75	1636.35	0.022	3.07	7385.38	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio P _u φP _n	Ratio M _{ux} φM _{ux}	Ratio M _{uy} φM _{uy}	Ratio V _u φV _n	Ratio T _u φT _n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	125 - 96.04 (1)	0.010	0.414	0.000	0.037	0.001	0.426	1.000	4.8.2 ✓
L2	96.04 - 47.67 (2)	0.013	0.974	0.000	0.033	0.001	0.987	1.000	4.8.2 ✓
L3	47.67 - 1 (3)	0.012	0.916	0.000	0.022	0.000	0.929	1.000	4.8.2 ✓

Section Capacity Table

tnxTower Bennett & Pless 3395 Northeast Expressway NE Atlanta, GA 30341 Phone: 678-990-8700 FAX: 678-990-8701	Job CT-5003 125' Tapered Monopole	Page 22 of 22
	Project Spring Hill, CT (Verizon)	Date 10:06:35 05/26/15
	Client Blue Sky Towers	Designed by J. Turner

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	θP_{allow} K	% Capacity	Pass Fail	
L1	125 - 96.04	Pole	TP26.9x18x0.1875	1	-10.06	1026.07	42.6	Pass	
L2	96.04 - 47.67	Pole	TP41.28x25.3203x0.25	2	-24.83	1984.88	98.7	Pass	
L3	47.67 - 1	Pole	TP55x39.0494x0.3125	3	-40.01	3272.70	92.9	Pass	
							Summary		
							Pole (L2)	98.7	Pass
							RATING =	98.7	Pass

Element Map

Section No.	Section Elevation ft	Component Type	Element List
L1	125.00-96.04	Pole	1
L2	96.04-47.67	Pole	2
L3	47.67-1.00	Pole	3
			Total number of elements: 3

Appendix B
Collocation Application



Collocation Application

Installation Type: Anchor [] Collocation [X] Add to Existing [X]
Contact: Keshia DeJesus
Email: kcollos@blueskytower.com
Office: 508-530-3580
Fax: 508-530-3564
Site Number: CT-5003
Site Name: Spring Hill Lane
Submission Date: 4/8/2015
Revision Date(s): 5/20/2015

APPROVED
By Keshia DeJesus at 12:54 pm, May 20, 2015

EASE SUBMIT THIS APPLICATION VIA E-MAIL

Applicant Information

Applicant Name: Verizon Wireless
Applicant Site Name: Bethel CT
Applicant Site Number: 161629
Proposed ON AIR Date:
Applicant Legal Entity: Cellco Partnership D/B/A Verizon Wireless
Primary Contact/Agent Name: Christopher Bisson
Contact/Agent Company Name: Vital Site Services Inc.
Contact/Agent Number: 203-217-6200
Contact/Agent Fax:
Contact Email: cbisson@vssinc.net

Applicant Contact Information

Billing Contact Name: Chris Bisson
Billing Contact Name: Ryan Ulanday
Instruction Contact Name: John Tierney
Emergency Contact Name:
Account Payable Contact Name:
Email: cbisson@vssinc.net
Email: ryan.ulanay@verizonwireless.com
Email: JTierney@structureconsulting.net
Number: 203-217-6200

Tower Information

Latitude: 41-21-43.44 N
Longitude: 73-23-45.30 W
ISL: 739 FT
Structure Type: Monopole
Structure Height: 125'

EQUIPMENT SPECIFICATIONS

Summary of Work to be Completed: Replacing (9) existing panel antennas with (9) new panel antennas, Replacing (6) existing RRHs with (6) New RRHs, adding (3) new RRHs and adding (1) main distribution box.

Table with columns: Sector, Equipment Type, Installation Status, Sited RAD Center (Ft AGL), Tower Mount Mounting Height, Equipment Manufacturer, Equipment Model#, Equipment Dimensions (WxHxD) (Feet Or Inches), Equipment Weight (Per Item, In Lbs.), Equipment Quantity, Orientation/Azimuth (Degrees), Transmit Frequency (Mhz), Receive Frequency (Mhz), Antenna Gain (Db), Total# Of Lines For Equipment In Column, Cable Type, Diameter Of Coax Cables (In), Moving Equipment (If Applicable), Transmitter/Receiver Type, Qty Of Transmitters/Receivers, Manufacturer, Type & Model, Type of Technology, Power Output, Power (Watts), Electric Service Required (Amps/Volts), Will RRUs be located behind antennas: Yes

GROUND SPACE REQUIREMENTS

Existing Lease Area: DIMS: L(ft) 12 W(ft) 30 OR Square footage
New/Add'l Lease Area being requested: DIMS: L(ft) W(ft) OR Square footage
W/Add'l Rooftop Lease Area being requested if space is needed on both ground and rooftop: DIMS: L(ft) W(ft) OR Square footage
Shelter: DIMS: L(ft) W(ft) H(ft)
Concrete Pad for Shelter: DIMS: L(ft) W(ft) H(ft)
Cabinets: DIMS: L(ft) W(ft) H(ft)
Concrete Pad for Cabinets: DIMS: L(ft) W(ft) H(ft)
Cabinet/Shelter Manufacturer/Model:

POWER REQUIREMENTS

Electrical Service Provider:
Average Monthly Power Consumption: KWH units
Electrical Service Telephone Number:
Is a multi-tenant meter rack present:
How many, if any, empty meter banks are present:
Telco/Interconnect Requirements: POTS [] T1 [] MICROWAVE [] FIBER OPTICS []
Fiber Provider:

BACK-UP POWER INFORMATION

Generator Required: Yes
Generator Ground Space Requirement: DIMS: L(ft) W(ft) H(ft) Fuel Type:
Generator Capacity: KW
Generator Owner: Verizon Shared Generator Peak Usage: KW
Generator Make:
Generator Model:
Fuel Tank Location: Inside Lease Area Fuel Tank Size: DIMS: L(ft) W(ft) Fuel Tank Size: Gallons
Location for Fuel Tank (if required) DIMS: L(ft) W(ft)
Comments: Generator located inside Verizon Shelter

Attach manufacturer's equipment specifications for antennas, mounts, cabinets, shelters if available
Final Configuration after work is completed: (12) panel antennas, (9) RRHs, (2) Main distribution boxes, (12) 1 5/8" coax, (1) fiber lines.