Robinson+Cole

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Also admitted in Massachusetts

December 9, 2015

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

Re: **Notice of Exempt Modification – Facility Modification**
500 Highland Avenue, Cheshire, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) wireless telecommunications antennas at the 122.5-foot level of the existing 160-foot tower at 500 Highland Avenue in Cheshire, Connecticut (the "Property"). The tower is owned by SBA Communications Corporation ("SBA"). The Council approved Cellco's use of the tower in 2005. Cellco now intends to modify its facility by replacing nine (9) of its existing antennas with three (3) model SBNHH-1D65B, 700 MHz antennas; three (3) model HBXX6517DS, 1900 MHz antennas; and three (3) model SBNHH-1D65B, 2100 MHz antennas, all at the same level on the tower. Cellco also intends to replace three (3) remote radio heads ("RRHs") and install six (6) new RRHs and one (1) HYBRIFLEX™ fiber optic antenna cable. Included in Attachment 1 are specifications for Cellco's replacement antennas, RRHs and HYBRIFLEX™ cable.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Michael A. Milone, Town Manager for the Town of Cheshire. The Town of Cheshire is the owner of the Property. A copy of this letter is also being sent to SBA, the tower owner.

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

1. The proposed modifications will not result in an increase in the height of the existing tower. Cellco's replacement antennas and RRHs will be located at the 122.5-foot level on the 160-foot tower.

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

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

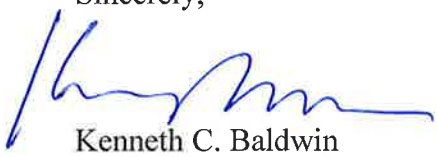
4. The operation of the modified facility will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. A cumulative General Power Density table for Cellco's modified facility is included behind Attachment 2.

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

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

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

Sincerely,



Kenneth C. Baldwin

Enclosures
Copy to:
Michael A. Milone, Cheshire Town Manager
SBA
Tim Parks

ATTACHMENT 1

Product Specifications

COMMSCOPE®

POWERED BY ANDREW.

SBNHH-1D65B

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

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

Electrical Specifications

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

Electrical Specifications, BASTA*

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

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

General Specifications

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

Product Specifications

SBNHH-1D65B

Mechanical Specifications

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

Dimensions

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

Remote Electrical Tilt (RET) Information

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

Packed Dimensions

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

Regulatory Compliance/Certifications

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

Included Products

Product Specifications

SBNHH-1D65B

BSAMNT-1 — Wide Profile Antenna Downtilt Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members. Kit contains one scissor top bracket set and one bottom bracket set.

* Footnotes

Performance Note	Severe environmental conditions may degrade optimum performance

Product Specifications

COMMSCOPE®

POWERED BY ANDREW.

HBXX-6517DS-VTM

Andrew® Quad Port Antenna, 1710–2180 MHz, 65° horizontal beamwidth, RET compatible

- Superior azimuth tracking and pattern symmetry with excellent passive intermodulation suppression

Electrical Specifications

Frequency Band, MHz	1710–1880	1850–1990	1920–2180
Gain, dBi	19.0	19.1	19.2
Beamwidth, Horizontal, degrees	67	66	65
Beamwidth, Vertical, degrees	5.0	4.7	4.4
Beam Tilt, degrees	0–6	0–6	0–6
USLS, dB	18	18	18
Front-to-Back Ratio at 180°, dB	30	30	30
CPR at Boresight, dB	21	22	21
CPR at Sector, dB	10	11	9
Isolation, dB	30	30	30
VSWR | Return Loss, dB	1.4 | 15.6	1.4 | 15.6	1.4 | 15.6
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153
Input Power per Port, maximum, watts	350	350	350
Polarization	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm

Electrical Specifications, BASTA*

Frequency Band, MHz	1710–1880	1850–1990	1920–2180
Gain by all Beam Tilts, average, dBi	18.5	18.6	18.8
Gain by all Beam Tilts Tolerance, dB	±0.4	±0.3	±0.4
Gain by Beam Tilt, average, dBi	0 ° | 18.4	0 ° | 18.4	0 ° | 18.7
	3 ° | 18.7	3 ° | 18.7	3 ° | 18.9
	6 ° | 18.4	6 ° | 18.5	6 ° | 18.6
Beamwidth, Horizontal Tolerance, degrees	±2.4	±1.7	±2.9
Beamwidth, Vertical Tolerance, degrees	±0.3	±0.3	±0.3
USLS, dB	18	19	19
Front-to-Back Total Power at 180° ± 30°, dB	25	26	26
CPR at Boresight, dB	22	23	22
CPR at Sector, dB	10	10	9

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

General Specifications

Antenna Brand	Andrew®
Antenna Type	DualPol® quad
Band	Single band
Brand	DualPol® | Teletilt®
Operating Frequency Band	1710 – 2180 MHz

Product Specifications

HBXX-6517DS-VTM

Performance Note	Outdoor usage

Mechanical Specifications

Color	Light gray
Lightning Protection	dc Ground
Radiator Material	Low loss circuit board
Radome Material	PVC, UV resistant
RF Connector Interface	7-16 DIN Female
RF Connector Location	Bottom
RF Connector Quantity, total	4
Wind Loading, maximum	668.0 N @ 150 km/h 150.2 lbf @ 150 km/h
Wind Speed, maximum	241 km/h | 150 mph

Dimensions

Depth	166.0 mm | 6.5 in
Length	1903.0 mm | 74.9 in
Width	305.0 mm | 12.0 in
Net Weight	19.5 kg | 43.0 lb

Remote Electrical Tilt (RET) Information

Model with Factory Installed AISG 2.0 Actuator	HBXX-6517DS-A2M
RET System	Teletilt®

Packed Dimensions

Depth	292.0 mm | 11.5 in
Length	2219.0 mm | 87.4 in
Width	409.0 mm | 16.1 in
Shipping Weight	29.3 kg | 64.6 lb

Regulatory Compliance/Certifications

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

Included Products

600899A-2 — Downtilt Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members. Kit contains one scissor top bracket set and one bottom bracket set.

Product Specifications

HBXX-6517DS-VTM

* Footnotes

Performance Note	Severe environmental conditions may degrade optimum performance

ALCATEL-LUCENT B13 RRH4X30-4R

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

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

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

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

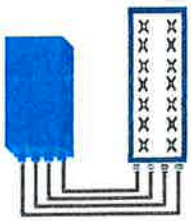
Its compactness and slim design makes the Alcatel-Lucent B13 RRH4x30-4R easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the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

FEATURES

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

BENEFITS

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



4x30W with 4T4R
or
2x60W with 2T4R

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

Alcatel·Lucent

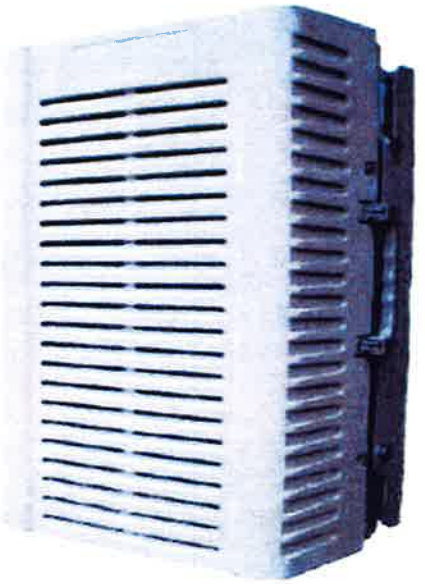
Features & performance	
Number of TX/RX paths	4 duplexed (either 4T4R or 2T4R by SW)
Frequency band	U700 (C) (3GPP bands 13): DL: 746 - 756 MHz / UL: 777 - 787 MHz
Instantaneous bandwidth - #carriers	10MHz – 1 LTE carrier (in 10MHz occupied bandwidth)
LTE carrier bandwidth	10 MHz
RF output power	2x60W 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.) Volume in L Weight in kg (lb) (w/o mounting HW)	550 x 305 x 230 (21.6" x 12.0" x 9") (with solar shield) 38 (with solar shield) 26 (57.2) (with solar shield)
DC voltage range DC power consumption	-40.5 to -57V at full performance, -38 to -57V with relaxation on power consumption 550W typical @100% RF load (in 2Tx or 4TX mode)
Environmental conditions Wind load (@150km/h or 93mph)	-40°C (-40°F) /+55°C (+131°F) 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

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

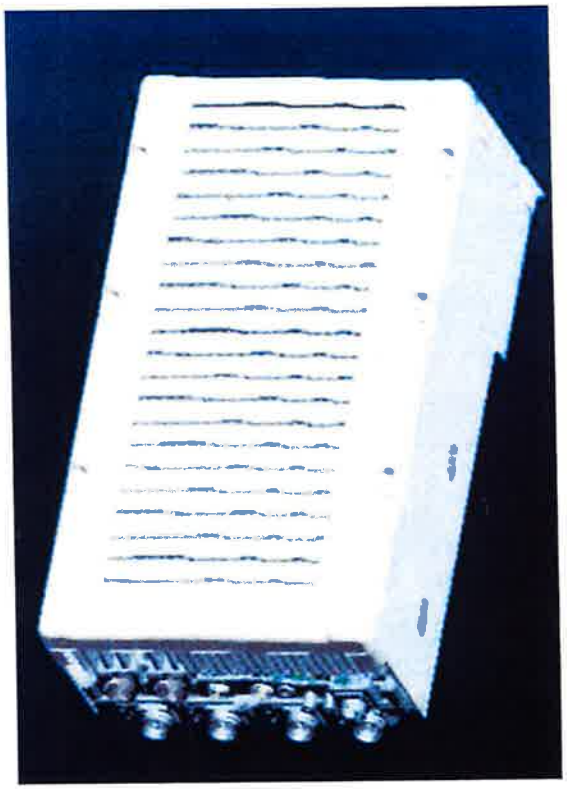


** Not a Verizon Wireless deployed product

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

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.

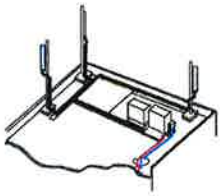
EASY INSTALLATION

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.

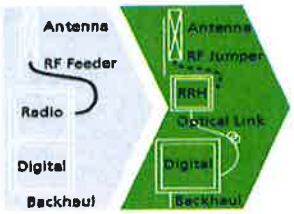
The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment. However, many of these sites can host an Alcatel-Lucent RRH2x60-AWS installation, providing more flexible site selection and improved network quality along with greatly reduced installation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

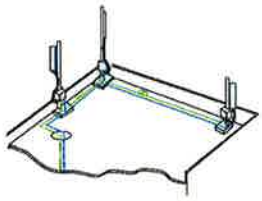
Installation can easily be done by a single person as the Alcatel–Lucent RRH2x60-AWS is compact and weighs about 20 kg, eliminating the need for a crane to hoist the BTS cabinet to the rooftop. A site can be in operation in less than one day.



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 daisychaining 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)

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)

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

Alcatel·Lucent

AT THE SPEED OF IDEAS™

Product Data Sheet HB158-1-08U8-S8J18

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

Product Description

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

It was developed to reduce installation complexity and costs at Cellular sites. HYBRIFLEX allows mobile operators deploying an RRH architecture to standardize the RRH installation process and eliminate the need for and cost of cable grounding. HYBRIFLEX combines optical fiber (multi-mode or single-mode) and power in a single corrugated cable. It eliminates the need for junction boxes and can connect multiple RRHs with a single feeder. Standard RFS CELLFLEX² accessories can be used with HYBRIFLEX cable. Both pre-connectorized and on-site options are available.

Figure 1: HYBRIFLEX Series

Features/Benefits

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

Technical Specifications

Outer Conductor Armor	Corrugated Aluminum	[mm (in)]	46.5 (1.83)
Jacket	Polyethylene, PE	[mm (in)]	50.3 (1.98)
UV-Protection	Individual and External Jacket		Yes
Weight, Approximate		[kg/m (lb/ft)]	1.9 (1.30)
Minimum Bending Radius, Single Bending		[mm (in)]	200 (8)
Minimum Bending Radius, Repeated Bending		[mm (in)]	500 (20)
Recommended/Maximum Clamp Spacing		[m (ft)]	1.0 / 1.2 (3.25 / 4.0)
DC-Resistance Outer Conductor Armor		[Ω/km (Ω/1000ft)]	068 (0.205)
DC-Resistance Power Cable, 8.4mm² (8AWG)		[Ω/km (Ω/1000ft)]	2.1 (0.307)
Version			Single-mode OM3
Quantity, Fiber Count			16 (8 pairs)
Core/Clad		[µm]	50/125
Primary Coating (Acrylate)		[µm]	245
Buffer Diameter, Nominal		[µm]	900
Secondary Protection, Jacket, Nominal		[mm (in)]	2.0 (0.08)
Minimum Bending Radius		[mm (in)]	104 (4.1)
Insertion Loss @ wavelength 850nm		dB/km	3.0
Insertion Loss @ wavelength 1310nm		dB/km	1.0
Standards (Meets or exceeds)			UL94-V0, UL1666 RoHS Compliant
Size (Power)		[mm² (AWG)]	8.4 (8)
Quantity, Wire Count (Power)			16 (8 pairs)
Size (Alarm)		[mm² (AWG)]	0.8 (18)
Quantity, Wire Count (Alarm)			4 (2 pairs)
Type			UV protected
Strands			19
Primary Jacket Diameter, Nominal		[mm (in)]	6.8 (0.27)
Standards (Meets or exceeds)			NFPA 130, ICEA S-95-658 UL Type XHHW-2, UL 44 UL-LS Limited Smoke, UL VW-1 IEEE-383 (1974), IEEE1202/FT4 RoHS Compliant
Installation Temperature		[°C (°F)]	-40 to +65 (-40 to149)
Operation Temperature		[°C (°F)]	-40 to +65 (-40 to149)

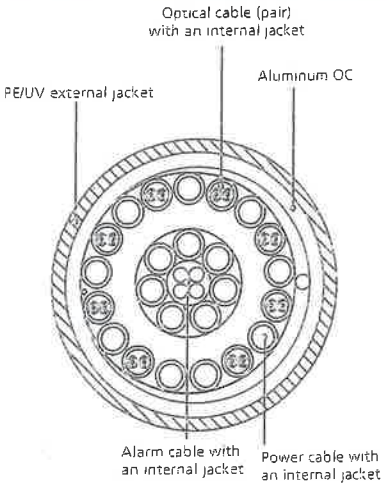


Figure 2: Construction Detail

* This data is provisional and subject to change

ATTACHMENT 2

	General	Power	Density					
Site Name: Cheshire NE								
Tower Height: 160'								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*Sprint microwave antenna	2	4	157.5	0.0001	22500	1.0000	0.00%	
*Sprint WiMAX	3	562	157.5	0.0264	2657	1.0000	0.26%	
*Sprint CDMA/LTE	2	693	158	0.0216	1900	1.0000	0.22%	
*Sprint CDMA/LTE	1	390	158	0.0061	850	0.5667	0.11%	
*Sprint CDMA/LTE	2	693	158	0.0216	2500	1.0000	0.22%	
*MetroPCS CDMA	3	727	137.5	0.0454	2135	1.0000	0.45%	
*MetroPCS LTE	1	1200	137.5	0.0250	2130	1.0000	0.25%	
*Town Emergency Svcs	1	1200	167.5	0.0165	450	0.3000	0.55%	
*T-Mobile 1900/2100MHz	2	2334	147	0.0844	1900	1.0000	0.84%	
*T-Mobile 1900/2100MHz	4	1167	147	0.0844	1900	1.0000	0.84%	
*T-Mobile 700 MHz	1	865	147	0.0157	700	0.4667	0.34%	
*AT&T UMTS	2	565	128	0.0273	880	0.5867	0.47%	
*AT&T UMTS	2	1077	128	0.0520	1900	1.0000	0.52%	
*AT&T GSM	1	647	128	0.0156	880	0.5867	0.27%	
*AT&T GSM	4	934	128	0.0903	1900	1.0000	0.90%	
*AT&T LTE	1	1615	128	0.0390	734	0.4893	0.80%	
Verizon	**1**	**2410**	**122.5**	**0.0577**	**1970**	**1.0000**	**5.77%**	
Verizon	**9**	**375**	**122.5**	**0.0809**	**869**	**0.5793**	**13.96%**	
Verizon	**1**	**2306**	**122.5**	**0.0553**	**2145**	**1.0000**	**5.53%**	
Verizon	**1**	**1050**	**122.5**	**0.0252**	**746**	**0.4973**	**5.06%**	
								37.4%
* Source: Siting Council								

ATTACHMENT 3

GPD Engineering and Architecture
Professional Corporation

STRUCTURAL ANALYSIS REPORT

160' Monopole Tower

500 Highland Avenue
Cheshire, CT 06410

SBA Site Name: Cheshire
SBA Site Number: CT33762-M

Verizon Site Name: Cheshire NE

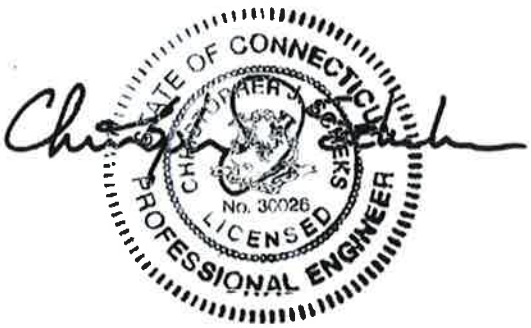
GPD Project Number: 2016778.33762.07

Analysis Results

Tower Components	94.9%	Sufficient
Foundation	56.1%	Sufficient

November 17, 2015

Respectfully submitted by:



11/17/2015
Christopher J. Scheks, P.E.
Connecticut #: 30026

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Executive Summary

The purpose of this analysis is to verify whether the existing monopole tower is structurally capable of carrying the proposed antenna and coax loads as specified by Verizon to SBA. This report was commissioned by Mr. Robert Robeski of SBA Site Management.

The existing structure and its foundations have been analyzed using the following requirements:

Governing Code/s	TIA-222-G, & 2005 CTBC
Wind Speed	100 MPH 3-Second Gust
Wind Speed w/ Ice	50 MPH 3-Second Gust
Radial Ice Thickness	3/4"
Structure Class	III
Exposure Class	B
Topographic Category	1

Conclusions & Recommendations

The designs of the tower and its foundation are sufficient for the proposed loading configuration considering the above analysis criteria and will not require modification.

Tower Description

The existing 160' Monopole Tower is located in Cheshire, Connecticut. The tower was originally designed by Sabre in September of 2003. All structural information was obtained from a previous analysis performed by URS. The original design load for the tower was not available at the time of analysis.

Documents Provided:

Document Type	Remarks	Source
Previous Structural Analysis	Hudson Design Group dated 05/06/2013	SBA
Previous Structural Analysis	GPD Job #: 2015778.33762.06, dated 7/23/2015	SBA
Foundation Calculations	URS Corporation Job #: 36917370, dated 10/10/2012	SBA
Construction Drawings	Hudson Design Group, reviewed by SBA 7/10/2014	SBA

Tower Materials:

Structural Components	Material Strength
Pole	ASTM A572 (65 KSI Yield Strength)
Base Plate	ASTM A572 (60 KSI Yield Strength)
Anchor Rods	ASTM A615 (75 KSI Yield Strength)

Tower Loading

The following data shows the major loading that the tower supports. All existing/leased and proposed loading was provided by SBA or taken from the previous analysis.

Existing/Leased Loading

Carrier	Mounting Level (ft)	Center Line Elevation (ft)	# of Antennas	Antenna Manufact.	Antenna/Mount Model	# of Coax	Coax Size (in)	Note
Town of Cheshire	160	170	1		20' Omni	4	1/2	
		168	2	Decibel	DB224			
		166.17	1		6' Omni			
		160	3		T-Arm			
Sprint	160	160	1		LP Platform	6	1-1/4	
		158	3	RFS	APXVSPP18-C-A20			
			3	RFS	APXVTM14-C-I20			
			4	RFS	ACU-A20-N			
			3	ALU	1900 MHz RRH			
			3	ALU	800 MHz RRH			
			3	ALU	2500 MHz RRH			
			3	ALU	800 MHz Filter			
T-Mobile	152	152	1		LP Platform	18 12	1-5/8 1/2	
		149	3	Ericsson	AIR21 B2A/B4P			
			3	Ericsson	AIR21 B4A/B2P			
			3	Commscope	LNX-6515DS-VTM			
			3	Ericsson	KRY 112 144			
			3	RFS	ATMAA1412D1A20			
			3	Ericsson	S11B12			
Pocket	141.08	141.08	3	RFS	APXV18-206517S-C	6	1-5/8	
			3		T-Arm			
AT&T	128	128	6	Kathrein	800 10121	12 1 4	1-5/8" 10mm 19.7mm	
			2	CCI	OPA-65R-LCUU-H8			
			1	CCI	OPA-65R-LCUU-H6			
			3	Powerwave	TT19-08BP111-001 TMA			
			6	Powerwave	LGP 21401 TMA			
			6	Kathrein	860-10025			
			3	Ericsson	RRUS-11			
			3	Ericsson	RRUS-12			
			3	Ericsson	A2 Module			
			2	Raycap	DC6-48-60-18-8F			
			1	Commscope	MTC3607			
Verizon	122.5	122.5	3	Antel	BXA 70063/6CF	12 1	1-5/8 1-5/8 Fiber	
			3	Antel	BXA 185063/8CF			
			3	Andrew	HBX-6517DS-VTM			
			3	Andrew	LNX-6514DS-VTM			
			6	RFS	FD9R6004/2C-3L			
			3	ALU	RRH2x40-AWS			
			1		DB-T1-6Z-8AB-0Z			
			1		LP Platform			

Carrier	Mounting Level (ft)	Center Line Elevation (ft)	# of Antennas	Antenna Manufact.	Antenna/Mount Model	# of Coax	Coax Size (in)	Note
Town of Cheshire	89.08	89.08	1		Dipole Antenna	5	1/2	
			1		Collar Mount			
		81.25	1		Yagi Antenna			
		79.33	1		Yagi Antenna			
	83.17	83.17	1	PCTEL	GPS-TMG-HR-26N			
			1		Collar Mount			
		81.17	1		Yagi Antenna			

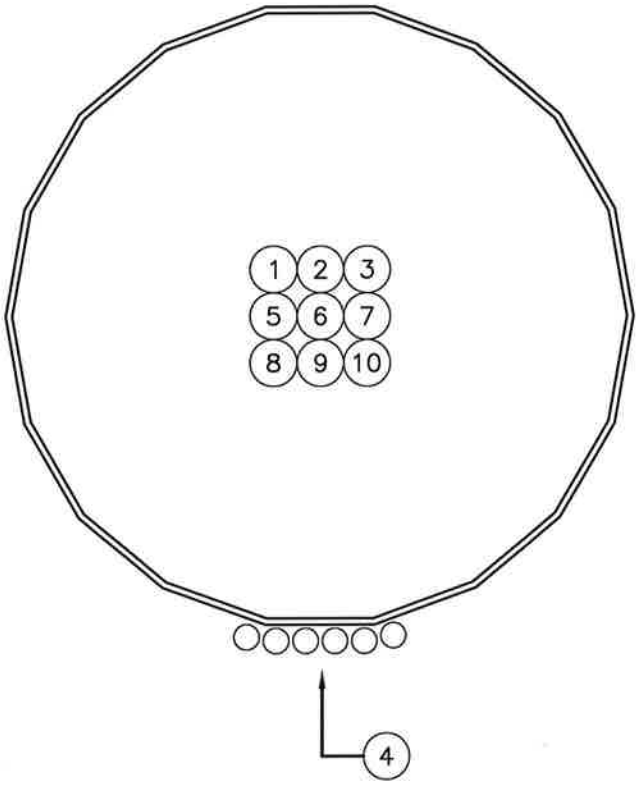
Final Proposed Loading Configuration

Carrier	Mounting Level (ft)	Center Line Elevation (ft)	# of Antennas	Antenna Manufact.	Antenna/Mount Model	# of Coax	Coax Size	Note
Verizon	122.5	122.5	6	Andrew	SBNHH 1D65B	11 2	1-5/8 1-5/8 Fiber	1
			3	Andrew	LNX 6514DS-VTM			
			3	Andrew	HBXX 6517DS-A2M			
			3	ALU	RRH 4x45 AWS			
			3	ALU	RRH 2x60 PCS			
			3	ALU	RRH 2x60 700			
			6	RFS	FD9R6004/2C-3L			
			2		DB-T1-6Z-8AB-0Z			
			1		LP Platform			

Notes:

1)This loading represents the final configuration for Verizon. See the next page for the proposed coax layout.

Proposed Coax Configuration



#	CARRIER	SIZE	QTY.	ELEVATION	NOTES
1	Town of Cheshire	1/2"	4	160'	
2	Sprint	1-1/4" Fiber	6	160'	
3	T-Mobile	1-5/8", 1/2"	18, 12	152'	
4	Pocket	1-5/8"	6	141.08'	
5	AT&T	1-5/8"	12	128'	
6	AT&T	10mm	1	128'	Fiber
7	AT&T	19.7mm	4	128'	DC Cables
8	Verizon	1-5/8"	11	122.5'	
9	Verizon	1-5/8"	2	122.5'	Fiber (1) Proposed
10	Town of Cheshire	1/2"	5	89.09'	

Assumptions

This structural analysis is based on the theoretical capacity of the members and is not a condition assessment of the tower. This analysis is from information supplied, and therefore, its results are based on and are as accurate as that supplied data. GPD has made no independent determination, nor is it required to, of its accuracy. The following assumptions were made for this structural analysis.

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in the Existing/Reserved Loading and Proposed Loading Tables, and the specified documents.
4) All mounts, if applicable, are considered adequate to support the loading. No actual analysis of the mount(s) is performed. This analysis is limited to analyzing the tower only.
5) Mount sizes, weights, and manufacturers are best estimates based on photos provided and determined without the benefit of a site visit by GPD.
6) The proposed coax shall be installed internal to the monopole.
7) All member connections and foundation steel reinforcing are assumed designed to meet or exceed the load carrying capacity of the connected member and surrounding soils respectively unless otherwise specified in this report.
8) The existing loads on the tower were modeled from the previous structural analyses.

If any of these assumptions are not valid or have been made in error, this analysis may be affected, and GPD should be allowed to review any new information to determine its effect on the structural integrity of the tower.

Tower Section Results

Capacity Summary of Structural Components

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass/ Fail
L1	160 - 146.5	Pole	TP20.91x16.75x0.1875	1	-4.48	865.69	21.4	Pass
L2	146.5 - 95.75	Pole	TP36.16x19.6876x0.25	2	-20.87	1841.20	93.7	Pass
L3	95.75 - 46.75	Pole	TP50.76x34.2745x0.3125	3	-34.30	3077.94	94.9	Pass
L4	46.75 - 0	Pole	TP64.53x48.1321x0.375	4	-54.47	4662.89	82.5	Pass
							Summary	
						Pole (L3)	94.9	Pass
						RATING =	**94.9**	**Pass**

Additional Capacities

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
	Anchor Rods	0	84.0	Pass
	Base Plate	0	52.4	Pass
	Tower Base Foundation	0	56.1	Pass

Disclaimer of Warranties

GPD has not performed a site visit to the tower to verify the member sizes or antenna/coax loading. If the existing conditions are not as represented on the tower elevation contained in this report, we should be contacted immediately to evaluate the significance of the discrepancy. This is not a condition assessment of the tower or foundation. This report does not replace a full tower inspection. The tower and foundations are assumed to have been properly fabricated, erected, maintained, in good condition, twist free, and plumb.

The engineering services rendered by GPD in connection with this Structural Analysis are limited to a computer analysis of the tower structure and theoretical capacity of its main structural members. All tower components have been assumed to only resist dead loads when no other loads are applied. No allowance was made for any damaged, bent, missing, loose, or rusted members (above and below ground). No allowance was made for loose bolts or cracked welds.

This analysis is limited to the designated maximum wind and seismic conditions per the governing tower standards and code. Wind forces resulting in tower vibrations near the structure's resonant frequencies were not considered in this analysis and are outside the scope of this analysis. Lateral loading from any dynamic response was not evaluated under a time-domain based fatigue analysis.

GPD does not analyze the fabrication of the structure (including welding). It is not possible to have all the very detailed information needed to perform a thorough analysis of every structural sub-component and connection of an existing tower. GPD provides a limited scope of service in that we cannot verify the adequacy of every weld, plate connection detail, etc. The purpose of this report is to assess the feasibility of adding appurtenances usually accompanied by transmission lines to the structure.

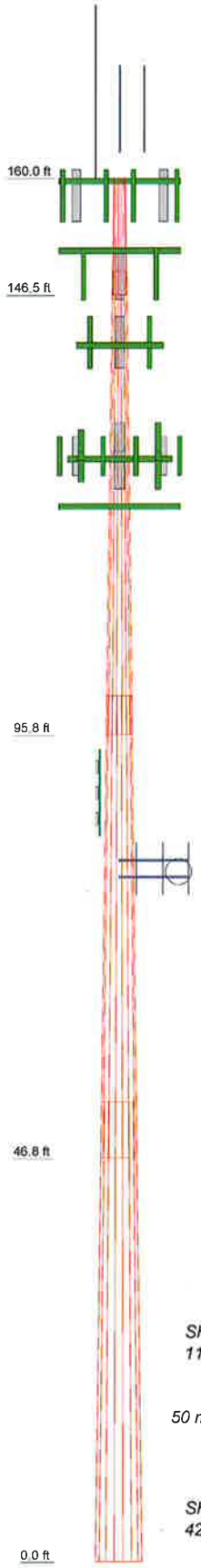
It is the owner's responsibility to determine the amount of ice accumulation in excess of the code specified amount, if any, that should be considered in the structural analysis.

The attached sketches are a schematic representation of the analyzed tower. If any material is fabricated from these sketches, the contractor shall be responsible for field verifying the existing conditions, proper fit, and clearance in the field. Any mentions of structural modifications are reasonable estimates and should not be used as a precise construction document. Precise modification drawings are obtainable from GPD , but are beyond the scope of this report. Miscellaneous items such as antenna mounts, etc., have not been designed or detailed as a part of our work. We recommend that material of adequate size and strength be purchased from a reputable tower manufacturer.

Towers are designed to carry gravity, wind, and ice loads. All members, legs, diagonals, struts, and redundant members provide structural stability to the tower with little redundancy. Absence or removal of a member can trigger catastrophic failure unless a substitute is provided before any removal. Legs carry axial loads and derive their strength from shorter unbraced lengths by the presence of redundant members and their connection to the diagonals with bolts or welds. If the bolts or welds are removed without providing any substitute to the frame, the leg is subjected to a higher unbraced length that immediately reduces its load carrying capacity. If a diagonal is also removed in addition to the connection, the unbraced length of the leg is greatly increased, jeopardizing its load carrying capacity. Failure of one leg can result in a tower collapse because there is no redundancy. Redundant members and diagonals are critical to the stability of the tower.

GPD makes no warranties, expressed and/or implied, in connection with this report and disclaims any liability arising from material, fabrication, and erection of this tower. GPD 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 GPD pursuant to this report will be limited to the total fee received for preparation of this report.

TNX TOWER OUTPUT



Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	13.50	18	0.1875	2.75	16.7500	20.9100		0.5
2	53.50	18	0.2500	4.50	19.6876	36.1600		4.0
3	53.50	18	0.3125	6.50	34.2745	50.7600	A572-65	7.6
4	53.25	18	0.3750		48.1321	64.5300		12.1
								24.2

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
20' Omni (3" Diam)	160	TT19-08BP111-001	128
DB224	160	TT19-08BP111-001	128
DB224	160	TT19-08BP111-001	128
6' Omni	160	(2) LGP21401	128
MTS 36" Standoff (3)	160	(2) LGP21401	128
APXVSPP18-C-A20 w/ Mount Pipe	160	(2) LGP21401	128
APXVSPP18-C-A20 w/ Mount Pipe	160	Andrew Collar Mount	128
APXVSPP18-C-A20 w/ Mount Pipe	160	Platform Mount [LP 1301-1]	128
APXVTM14-C-120 w/ Mount Pipe	160	RRUS-11	128
APXVTM14-C-120 w/ Mount Pipe	160	RRUS-11	128
APXVTM14-C-120 w/ Mount Pipe	160	RRUS-11	128
(2) ACU-A20-N	160	RRUS-12	128
ACU-A20-N	160	RRUS-12	128
ACU-A20-N	160	RRUS-12	128
1900MHz RRH	160	RRUS A2 MODULE	128
1900MHz RRH	160	RRUS A2 MODULE	128
1900MHz RRH	160	RRUS A2 MODULE	128
RRH 800 MHz	160	DC6-48-60-18-8F Surge Suppression Unit	128
RRH 800 MHz	160		
RRH 800 MHz	160	DC6-48-60-18-8F Surge Suppression Unit	128
RRH 2500MHz	160	Commscope MTC3607 Platform w/ Reinforcing Kit	128
RRH 2500MHz	160		
RRH 2500MHz	160	(2) SBNHH-1D65B w/ Mount Pipe	122.5
800 MHz Filter	160	(2) SBNHH-1D65B w/ Mount Pipe	122.5
800 MHz Filter	160	(2) SBNHH-1D65B w/ Mount Pipe	122.5
800 MHz Filter	160	LNX-6514DS-VTM w/ Mount Pipe	122.5
Sabre 12' LP Platform	160	LNX-6514DS-VTM w/ Mount Pipe	122.5
AIR21 B2A/B4P w/ mount pipe	152	LNX-6514DS-VTM w/ Mount Pipe	122.5
AIR21 B4A/B2P w/ mount pipe	152	HBXX-6517DS-A2M w/ Mount Pipe	122.5
LNX-6515DS-VTM w/ mount pipe	152	HBXX-6517DS-A2M w/ Mount Pipe	122.5
AIR21 B2A/B4P w/ mount pipe	152	HBXX-6517DS-A2M w/ Mount Pipe	122.5
AIR21 B4A/B2P w/ mount pipe	152	RRH4X45-AWS	122.5
LNX-6515DS-VTM w/ mount pipe	152	RRH4X45-AWS	122.5
AIR21 B2A/B4P w/ mount pipe	152	RRH4X45-AWS	122.5
AIR21 B4A/B2P w/ mount pipe	152	RRH2X60-PCS	122.5
LNX-6515DS-VTM w/ mount pipe	152	RRH2X60-PCS	122.5
KRY 112 144/1 (G-Code)	152	RRH2X60-PCS	122.5
ATMAA1412D	152	RRH2x60-700	122.5
KRY 112 144/1 (G-Code)	152	RRH2x60-700	122.5
ATMAA1412D	152	RRH2x60-700	122.5
KRY 112 144/1 (G-Code)	152	(2) FD9R6004/2C-3L	122.5
ATMAA1412D	152	(2) FD9R6004/2C-3L	122.5
S11B12	152	(2) FD9R6004/2C-3L	122.5
S11B12	152	DB-T1-6Z-8AB-0Z	122.5
S11B12	152	DB-T1-6Z-8AB-0Z	122.5
Sabre 12' LP Platform	152	MTS 14.5' LP Platform	122.5
APXV18-206517S-C w/ Mount Pipe	141.08	3' Yagi	89.08
APXV18-206517S-C w/ Mount Pipe	141.08	3' Yagi	89.08
APXV18-206517S-C w/ Mount Pipe	141.08	Andrew Collar Mount	89.08
MTS 36" Standoff (3)	141.08	14' Dipole	89.08
(2) 800 10121 w/ Mount Pipe	128	3' Yagi	83.17
(2) 800 10121 w/ Mount Pipe	128	Andrew Collar Mount	83.17
(2) 800 10121 w/ Mount Pipe	128	GPS-TMG-HR-26N	83.17
OPA-65R-LCUU-H8 w/ Mount Pipe	128	3' Yagi	83.17
OPA-65R-LCUU-H8 w/ Mount Pipe	128		
OPA-65R-LCUU-H6 w/ Mount Pipe	128		

ALL REACTIONS ARE FACTORED

AXIAL 108 K

SHEAR 11 K *MOM 1378*

TORQUE 1 kip-ft

50 mph WIND - 0.7500 in ICE

AXIAL 55 K

SHEAR 42 K *MOME 5013 k*

TORQUE 1 kip-ft

REACTIONS - 100 mph WIND

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure B 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 III.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 94.9%

GPD
520 South Main Street, Suite 2531
Akron, OH 44311
Phone: 330.572.2100
FAX: 330.572.2101

Job: CT33762-M Cheshire, CT			
Project: 2015778.33762.07			
Client: SBA	Drawn by: Roberto D'Angelo	App'd:	
Code: TIA-222-G	Date: 11/16/15	Scale: N	
Path: T:\SBA\33762\07 SA\tnx\CT33762-M.eri		Dwg No.	

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 New Haven County, Connecticut.
- Basic wind speed of 100 mph.
- Structure Class III.
- Exposure Category B.
- 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.
- 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

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

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
LDF7-50A (1-5/8 FOAM)	C	Surface Ar (CaAa)	141.08 - 8.00	6	6	0.000 0.000	1.9800		0.82
Step Pegs	B	Surface Ar (CaAa)	160.00 - 0.00	1	1	0.000 0.000	0.8000		2.72

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
20' Omni (3" Diam)	C	From Leg	2.50	0.0000	160.00	No Ice	6.00	6.00	0.05
			0.00			1/2" Ice	8.03	8.03	0.09
			10.00			1" Ice	10.08	10.08	0.14
DB224	A	From Leg	2.50	0.0000	160.00	No Ice	3.15	3.15	0.03
			0.00			1/2" Ice	5.67	5.67	0.04
			8.00			1" Ice	8.19	8.19	0.05
DB224	B	From Leg	2.50	0.0000	160.00	No Ice	3.15	3.15	0.03
			0.00			1/2" Ice	5.67	5.67	0.04
			8.00			1" Ice	8.19	8.19	0.05
6' Omni	C	From Leg	2.50	0.0000	160.00	No Ice	1.77	1.77	0.03
			0.00			1/2" Ice	2.13	2.13	0.04
			6.17			1" Ice	2.50	2.50	0.06
MTS 36" Standoff (3)	C	None		0.0000	160.00	No Ice	2.64	2.64	0.09
						1/2" Ice	4.10	4.10	0.13
						1" Ice	5.56	5.56	0.17
***									
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.00	0.0000	160.00	No Ice	8.26	6.71	0.08
			0.00			1/2" Ice	8.81	7.66	0.14
			-2.00			1" Ice	9.36	8.49	0.22
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.00	0.0000	160.00	No Ice	8.26	6.71	0.08
			0.00			1/2" Ice	8.81	7.66	0.14
			-2.00			1" Ice	9.36	8.49	0.22
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.00	0.0000	160.00	No Ice	8.26	6.71	0.08
			0.00			1/2" Ice	8.81	7.66	0.14
			-2.00			1" Ice	9.36	8.49	0.22
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.00	0.0000	160.00	No Ice	7.13	4.96	0.08
			0.00			1/2" Ice	7.66	5.75	0.13
			-2.00			1" Ice	8.18	6.47	0.19
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.00	0.0000	160.00	No Ice	7.13	4.96	0.08
			0.00			1/2" Ice	7.66	5.75	0.13
			-2.00			1" Ice	8.18	6.47	0.19
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.00	0.0000	160.00	No Ice	7.13	4.96	0.08
			0.00			1/2" Ice	7.66	5.75	0.13
			-2.00			1" Ice	8.18	6.47	0.19
(2) ACU-A20-N	A	From Leg	4.00	0.0000	160.00	No Ice	0.08	0.14	0.00
			0.00			1/2" Ice	0.12	0.19	0.00
			-2.00			1" Ice	0.17	0.25	0.00
ACU-A20-N	B	From Leg	4.00	0.0000	160.00	No Ice	0.08	0.14	0.00
			0.00			1/2" Ice	0.12	0.19	0.00
			-2.00			1" Ice	0.17	0.25	0.00
ACU-A20-N	C	From Leg	4.00	0.0000	160.00	No Ice	0.08	0.14	0.00
			0.00			1/2" Ice	0.12	0.19	0.00
			-2.00			1" Ice	0.17	0.25	0.00
1900MHz RRH	A	From Leg	4.00	0.0000	160.00	No Ice	2.94	1.19	0.06
			0.00			1/2" Ice	3.17	1.35	0.08
			-2.00			1" Ice	3.41	1.52	0.11
1900MHz RRH	B	From Leg	4.00	0.0000	160.00	No Ice	2.94	1.19	0.06
			0.00			1/2" Ice	3.17	1.35	0.08
			-2.00			1" Ice	3.41	1.52	0.11
1900MHz RRH	C	From Leg	4.00	0.0000	160.00	No Ice	2.94	1.19	0.06
			0.00			1/2" Ice	3.17	1.35	0.08

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			-2.00			1" Ice	3.41	1.52	0.11
RRH 800 MHz	A	From Leg	4.00	0.0000	160.00	No Ice	2.01	1.67	0.05
			0.00			1/2" Ice	2.21	1.86	0.06
			-2.00			1" Ice	2.42	2.06	0.08
RRH 800 MHz	B	From Leg	4.00	0.0000	160.00	No Ice	2.01	1.67	0.05
			0.00			1/2" Ice	2.21	1.86	0.06
			-2.00			1" Ice	2.42	2.06	0.08
RRH 800 MHz	C	From Leg	4.00	0.0000	160.00	No Ice	2.01	1.67	0.05
			0.00			1/2" Ice	2.21	1.86	0.06
			-2.00			1" Ice	2.42	2.06	0.08
RRH 2500MHz	A	From Leg	4.00	0.0000	160.00	No Ice	3.76	2.23	0.06
			0.00			1/2" Ice	4.03	2.46	0.08
			-2.00			1" Ice	4.30	2.69	0.11
RRH 2500MHz	B	From Leg	4.00	0.0000	160.00	No Ice	3.76	2.23	0.06
			0.00			1/2" Ice	4.03	2.46	0.08
			-2.00			1" Ice	4.30	2.69	0.11
RRH 2500MHz	C	From Leg	4.00	0.0000	160.00	No Ice	3.76	2.23	0.06
			0.00			1/2" Ice	4.03	2.46	0.08
			-2.00			1" Ice	4.30	2.69	0.11
800 MHz Filter	A	From Leg	4.00	0.0000	160.00	No Ice	0.49	0.48	0.01
			0.00			1/2" Ice	0.60	0.59	0.01
			-2.00			1" Ice	0.71	0.70	0.02
800 MHz Filter	B	From Leg	4.00	0.0000	160.00	No Ice	0.49	0.48	0.01
			0.00			1/2" Ice	0.60	0.59	0.01
			-2.00			1" Ice	0.71	0.70	0.02
800 MHz Filter	C	From Leg	4.00	0.0000	160.00	No Ice	0.49	0.48	0.01
			0.00			1/2" Ice	0.60	0.59	0.01
			-2.00			1" Ice	0.71	0.70	0.02
Sabre 12' LP Platform	A	None		0.0000	160.00	No Ice	28.47	28.47	1.12
						1/2" Ice	33.59	33.59	1.51
						1" Ice	38.71	38.71	1.91
***									
AIR21 B2A/B4P w/ mount pipe	A	From Leg	4.00	0.0000	152.00	No Ice	6.61	5.54	0.09
			0.00			1/2" Ice	7.08	6.27	0.14
			-3.00			1" Ice	7.55	7.01	0.21
AIR21 B4A/B2P w/ mount pipe	A	From Leg	4.00	0.0000	152.00	No Ice	6.61	5.54	0.10
			0.00			1/2" Ice	7.08	6.27	0.16
			-3.00			1" Ice	7.55	7.01	0.22
LNX-6515DS-VTM w/ mount pipe	A	From Leg	4.00	0.0000	152.00	No Ice	11.43	9.35	0.08
			0.00			1/2" Ice	12.05	10.67	0.16
			-3.00			1" Ice	12.67	11.70	0.25
AIR21 B2A/B4P w/ mount pipe	B	From Leg	4.00	0.0000	152.00	No Ice	6.61	5.54	0.09
			0.00			1/2" Ice	7.08	6.27	0.14
			-3.00			1" Ice	7.55	7.01	0.21
AIR21 B4A/B2P w/ mount pipe	B	From Leg	4.00	0.0000	152.00	No Ice	6.61	5.54	0.10
			0.00			1/2" Ice	7.08	6.27	0.16
			-3.00			1" Ice	7.55	7.01	0.22
LNX-6515DS-VTM w/ mount pipe	B	From Leg	4.00	0.0000	152.00	No Ice	11.43	9.35	0.08
			0.00			1/2" Ice	12.05	10.67	0.16
			-3.00			1" Ice	12.67	11.70	0.25
AIR21 B2A/B4P w/ mount pipe	C	From Leg	4.00	0.0000	152.00	No Ice	6.61	5.54	0.09
			0.00			1/2" Ice	7.08	6.27	0.14
			-3.00			1" Ice	7.55	7.01	0.21
AIR21 B4A/B2P w/ mount pipe	C	From Leg	4.00	0.0000	152.00	No Ice	6.61	5.54	0.10
			0.00			1/2" Ice	7.08	6.27	0.16
			-3.00			1" Ice	7.55	7.01	0.22
LNX-6515DS-VTM w/	C	From Leg	4.00	0.0000	152.00	No Ice	11.43	9.35	0.08

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
mount pipe			0.00			1/2" Ice	12.05	10.67	0.16
			-3.00			1" Ice	12.67	11.70	0.25
KRY 112 144/1 (G-Code)	A	From Leg	4.00	0.0000	152.00	No Ice	0.35	0.17	0.01
			0.00			1/2" Ice	0.42	0.23	0.01
			-3.00			1" Ice	0.49	0.28	0.02
ATMAA1412D	A	From Leg	4.00	0.0000	152.00	No Ice	1.17	0.47	0.02
			0.00			1/2" Ice	1.31	0.57	0.02
			-3.00			1" Ice	1.47	0.69	0.03
KRY 112 144/1 (G-Code)	B	From Leg	4.00	0.0000	152.00	No Ice	0.35	0.17	0.01
			0.00			1/2" Ice	0.42	0.23	0.01
			-3.00			1" Ice	0.49	0.28	0.02
ATMAA1412D	B	From Leg	4.00	0.0000	152.00	No Ice	1.17	0.47	0.02
			0.00			1/2" Ice	1.31	0.57	0.02
			-3.00			1" Ice	1.47	0.69	0.03
KRY 112 144/1 (G-Code)	C	From Leg	4.00	0.0000	152.00	No Ice	0.35	0.17	0.01
			0.00			1/2" Ice	0.42	0.23	0.01
			-3.00			1" Ice	0.49	0.28	0.02
ATMAA1412D	C	From Leg	4.00	0.0000	152.00	No Ice	1.17	0.47	0.02
			0.00			1/2" Ice	1.31	0.57	0.02
			-3.00			1" Ice	1.47	0.69	0.03
S11B12	A	From Leg	4.00	0.0000	152.00	No Ice	3.31	1.36	0.05
			0.00			1/2" Ice	3.55	1.54	0.07
			-3.00			1" Ice	3.80	1.73	0.10
S11B12	B	From Leg	4.00	0.0000	152.00	No Ice	3.31	1.36	0.05
			0.00			1/2" Ice	3.55	1.54	0.07
			-3.00			1" Ice	3.80	1.73	0.10
S11B12	C	From Leg	4.00	0.0000	152.00	No Ice	3.31	1.36	0.05
			0.00			1/2" Ice	3.55	1.54	0.07
			-3.00			1" Ice	3.80	1.73	0.10
Sabre 12' LP Platform	C	None		0.0000	152.00	No Ice	28.47	28.47	1.12
						1/2" Ice	33.59	33.59	1.51
						1" Ice	38.71	38.71	1.91
***									
APXV18-206517S-C w/ Mount Pipe	A	From Leg	3.00	0.0000	141.08	No Ice	5.17	4.46	0.05
			0.00			1/2" Ice	5.62	5.39	0.09
			0.00			1" Ice	6.08	6.20	0.14
APXV18-206517S-C w/ Mount Pipe	B	From Leg	3.00	0.0000	141.08	No Ice	5.17	4.46	0.05
			0.00			1/2" Ice	5.62	5.39	0.09
			0.00			1" Ice	6.08	6.20	0.14
APXV18-206517S-C w/ Mount Pipe	C	From Leg	3.00	0.0000	141.08	No Ice	5.17	4.46	0.05
			0.00			1/2" Ice	5.62	5.39	0.09
			0.00			1" Ice	6.08	6.20	0.14
MTS 36" Standoff (3)	B	None		0.0000	141.08	No Ice	2.64	2.64	0.09
						1/2" Ice	4.10	4.10	0.13
						1" Ice	5.56	5.56	0.17
***									
(2) 800 10121 w/ Mount Pipe	A	From Leg	4.00	0.0000	128.00	No Ice	5.56	4.47	0.06
			0.00			1/2" Ice	6.01	5.13	0.11
			0.00			1" Ice	6.47	5.79	0.16
(2) 800 10121 w/ Mount Pipe	B	From Leg	4.00	0.0000	128.00	No Ice	5.56	4.47	0.06
			0.00			1/2" Ice	6.01	5.13	0.11
			0.00			1" Ice	6.47	5.79	0.16
(2) 800 10121 w/ Mount Pipe	C	From Leg	4.00	0.0000	128.00	No Ice	5.56	4.47	0.06
			0.00			1/2" Ice	6.01	5.13	0.11
			0.00			1" Ice	6.47	5.79	0.16
OPA-65R-LCUU-H8 w/ Mount Pipe	A	From Leg	4.00	0.0000	128.00	No Ice	13.22	9.32	0.12
			0.00			1/2" Ice	14.02	10.79	0.21

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1" Ice	14.82	12.24	0.32
OPA-65R-LCUU-H8 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice	13.22 14.02 14.82	9.32 10.79 12.24	0.12 0.21 0.32
OPA-65R-LCUU-H6 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice	10.36 10.93 11.50	7.24 8.06 8.89	0.11 0.18 0.27
TT19-08BP111-001	A	From Leg	4.00 0.00 0.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice	0.64 0.76 0.88	0.52 0.62 0.74	0.02 0.02 0.03
TT19-08BP111-001	B	From Leg	4.00 0.00 0.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice	0.64 0.76 0.88	0.52 0.62 0.74	0.02 0.02 0.03
TT19-08BP111-001	C	From Leg	4.00 0.00 0.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice	0.64 0.76 0.88	0.52 0.62 0.74	0.02 0.02 0.03
(2) LGP21401	A	From Leg	4.00 0.00 0.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice	1.29 1.45 1.61	0.23 0.31 0.40	0.01 0.02 0.03
(2) LGP21401	B	From Leg	4.00 0.00 0.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice	1.29 1.45 1.61	0.23 0.31 0.40	0.01 0.02 0.03
(2) LGP21401	C	From Leg	4.00 0.00 0.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice	1.29 1.45 1.61	0.23 0.31 0.40	0.01 0.02 0.03
Andrew Collar Mount	C	None		0.0000	128.00	No Ice 1/2" Ice 1" Ice	2.14 2.35 2.57	2.14 2.35 2.57	0.19 0.25 0.30
Platform Mount [LP 1301-1]	C	None		0.0000	128.00	No Ice 1/2" Ice 1" Ice	51.70 62.70 73.70	51.70 62.70 73.70	2.26 2.94 3.61
***									
RRUS-11	A	From Leg	1.00 0.00 0.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice	3.25 3.49 3.74	1.37 1.55 1.74	0.05 0.07 0.09
RRUS-11	B	From Leg	1.00 0.00 0.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice	3.25 3.49 3.74	1.37 1.55 1.74	0.05 0.07 0.09
RRUS-11	C	From Leg	1.00 0.00 0.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice	3.25 3.49 3.74	1.37 1.55 1.74	0.05 0.07 0.09
RRUS-12	A	From Leg	1.00 0.00 0.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice	3.67 3.93 4.19	1.49 1.67 1.87	0.06 0.08 0.11
RRUS-12	B	From Leg	1.00 0.00 0.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice	3.67 3.93 4.19	1.49 1.67 1.87	0.06 0.08 0.11
RRUS-12	C	From Leg	1.00 0.00 0.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice	3.67 3.93 4.19	1.49 1.67 1.87	0.06 0.08 0.11
RRUS A2 MODULE	A	From Leg	4.00 0.00 0.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice	1.87 2.05 2.24	0.42 0.53 0.65	0.02 0.03 0.04
RRUS A2 MODULE	B	From Leg	4.00 0.00 0.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice	1.87 2.05 2.24	0.42 0.53 0.65	0.02 0.03 0.04
RRUS A2 MODULE	C	From Leg	4.00	0.0000	128.00	No Ice	1.87	0.42	0.02

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2" Ice	2.05	0.53	0.03
			0.00			1" Ice	2.24	0.65	0.04
DC6-48-60-18-8F Surge Suppression Unit	A	From Leg	1.00 0.00 0.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice	1.47 1.67 1.88	1.47 1.67 1.88	0.02 0.04 0.06
DC6-48-60-18-8F Surge Suppression Unit	B	From Leg	1.00 0.00 0.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice	1.47 1.67 1.88	1.47 1.67 1.88	0.02 0.04 0.06
Commscope MTC3607 Platform w/ Reinforcing Kit	C	None		0.0000	128.00	No Ice 1/2" Ice 1" Ice	51.70 62.70 73.70	51.70 62.70 73.70	2.26 2.94 3.61
***									
(2) SBNHH-1D65B w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	122.50	No Ice 1/2" Ice 1" Ice	8.40 8.95 9.51	6.16 6.82 7.51	0.06 0.12 0.19
(2) SBNHH-1D65B w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	122.50	No Ice 1/2" Ice 1" Ice	8.40 8.95 9.51	6.16 6.82 7.51	0.06 0.12 0.19
(2) SBNHH-1D65B w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	122.50	No Ice 1/2" Ice 1" Ice	8.40 8.95 9.51	6.16 6.82 7.51	0.06 0.12 0.19
LNX-6514DS-VTM w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	122.50	No Ice 1/2" Ice 1" Ice	8.41 8.96 9.52	6.83 7.79 8.62	0.06 0.13 0.20
LNX-6514DS-VTM w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	122.50	No Ice 1/2" Ice 1" Ice	8.41 8.96 9.52	6.83 7.79 8.62	0.06 0.13 0.20
LNX-6514DS-VTM w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	122.50	No Ice 1/2" Ice 1" Ice	8.41 8.96 9.52	6.83 7.79 8.62	0.06 0.13 0.20
HBXX-6517DS-A2M w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	122.50	No Ice 1/2" Ice 1" Ice	9.16 9.91 10.63	7.14 8.44 9.58	0.07 0.14 0.22
HBXX-6517DS-A2M w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	122.50	No Ice 1/2" Ice 1" Ice	9.16 9.91 10.63	7.14 8.44 9.58	0.07 0.14 0.22
HBXX-6517DS-A2M w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	122.50	No Ice 1/2" Ice 1" Ice	9.16 9.91 10.63	7.14 8.44 9.58	0.07 0.14 0.22
RRH4X45-AWS	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	122.50	No Ice 1/2" Ice 1" Ice	3.10 3.36 3.62	1.76 1.98 2.21	0.06 0.08 0.11
RRH4X45-AWS	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	122.50	No Ice 1/2" Ice 1" Ice	3.10 3.36 3.62	1.76 1.98 2.21	0.06 0.08 0.11
RRH4X45-AWS	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	122.50	No Ice 1/2" Ice 1" Ice	3.10 3.36 3.62	1.76 1.98 2.21	0.06 0.08 0.11
RRH2X60-PCS	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	122.50	No Ice 1/2" Ice 1" Ice	2.57 2.79 3.02	1.55 1.74 1.95	0.06 0.07 0.09
RRH2X60-PCS	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	122.50	No Ice 1/2" Ice 1" Ice	2.57 2.79 3.02	1.55 1.74 1.95	0.06 0.07 0.09
RRH2X60-PCS	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	122.50	No Ice 1/2" Ice 1" Ice	2.57 2.79 3.02	1.55 1.74 1.95	0.06 0.07 0.09

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
RRH2x60-700	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	122.50	No Ice 1/2" Ice 1" Ice	3.96 4.27 4.60	1.82 2.08 2.36	0.06 0.08 0.11
RRH2x60-700	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	122.50	No Ice 1/2" Ice 1" Ice	3.96 4.27 4.60	1.82 2.08 2.36	0.06 0.08 0.11
RRH2x60-700	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	122.50	No Ice 1/2" Ice 1" Ice	3.96 4.27 4.60	1.82 2.08 2.36	0.06 0.08 0.11
(2) FD9R6004/2C-3L	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	122.50	No Ice 1/2" Ice 1" Ice	0.37 0.45 0.54	0.08 0.14 0.20	0.00 0.01 0.01
(2) FD9R6004/2C-3L	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	122.50	No Ice 1/2" Ice 1" Ice	0.37 0.45 0.54	0.08 0.14 0.20	0.00 0.01 0.01
(2) FD9R6004/2C-3L	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	122.50	No Ice 1/2" Ice 1" Ice	0.37 0.45 0.54	0.08 0.14 0.20	0.00 0.01 0.01
DB-T1-6Z-8AB-0Z	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	122.50	No Ice 1/2" Ice 1" Ice	5.60 5.92 6.24	2.33 2.56 2.79	0.05 0.09 0.13
DB-T1-6Z-8AB-0Z	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	122.50	No Ice 1/2" Ice 1" Ice	5.60 5.92 6.24	2.33 2.56 2.79	0.05 0.09 0.13
MTS 14.5' LP Platform	C	None		0.0000	122.50	No Ice 1/2" Ice 1" Ice	17.46 22.44 27.42	17.46 22.44 27.42	1.35 1.62 1.90
***									
***									
3' Yagi	A	From Leg	1.50 0.00 -7.83	0.0000	89.08	No Ice 1/2" Ice 1" Ice	0.52 0.71 0.90	0.52 0.71 0.90	0.02 0.02 0.03
3' Yagi	A	From Leg	1.50 0.00 -9.75	0.0000	89.08	No Ice 1/2" Ice 1" Ice	0.52 0.71 0.90	0.52 0.71 0.90	0.02 0.02 0.03
3' Yagi	A	From Leg	1.50 0.00 -1.92	0.0000	83.17	No Ice 1/2" Ice 1" Ice	0.52 0.71 0.90	0.52 0.71 0.90	0.02 0.02 0.03
Andrew Collar Mount	C	None		0.0000	83.17	No Ice 1/2" Ice 1" Ice	2.14 2.35 2.57	2.14 2.35 2.57	0.19 0.25 0.30
Andrew Collar Mount	C	None		0.0000	89.08	No Ice 1/2" Ice 1" Ice	2.14 2.35 2.57	2.14 2.35 2.57	0.19 0.25 0.30
14' Dipole	C	From Leg	1.00 0.00 0.00	0.0000	89.08	No Ice 1/2" Ice 1" Ice	2.80 4.22 5.67	2.80 4.22 5.67	0.03 0.05 0.08
GPS-TMG-HR-26N	B	From Leg	1.00 0.00 0.00	0.0000	83.17	No Ice 1/2" Ice 1" Ice	0.16 0.21 0.28	0.16 0.21 0.28	0.00 0.00 0.01
3' Yagi	A	From Leg	1.50 0.00 -1.92	0.0000	83.17	No Ice 1/2" Ice 1" Ice	0.52 0.71 0.90	0.52 0.71 0.90	0.02 0.02 0.03

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
160.00	20' Omni (3" Diam)	43	23.544	1.4434	0.0028	17374
152.00	AIR21 B2A/B4P w/ mount pipe	43	21.139	1.4192	0.0018	10943
141.08	APXV18-206517S-C w/ Mount Pipe	43	17.973	1.3550	0.0008	7070
128.00	(2) 800 10121 w/ Mount Pipe	43	14.448	1.2277	0.0003	5891
122.50	(2) SBNHH-1D65B w/ Mount Pipe	43	13.066	1.1627	0.0003	5504
89.08	3' Yagi	42	6.238	0.7358	0.0003	4601
83.17	3' Yagi	42	5.336	0.6671	0.0003	4754

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	160 - 146.5	Pole	TP20.91x16.75x0.1875	1	-4.48	865.69	21.4	Pass
L2	146.5 - 95.75	Pole	TP36.16x19.6876x0.25	2	-20.87	1841.20	93.7	Pass
L3	95.75 - 46.75	Pole	TP50.76x34.2745x0.3125	3	-34.30	3077.94	94.9	Pass
L4	46.75 - 0	Pole	TP64.53x48.1321x0.375	4	-54.47	4662.89	82.5	Pass
							Summary	
						Pole (L3)	94.9	Pass
						RATING =	**94.9**	**Pass**

ADDITIONAL CALCULATIONS

Mat Foundation Analysis
CT33762-M/Cheshire, CT
2015778.33762.07

General Info	
Code	TIA-222-G
Bearing On	Soil
Foundation Type	Mono Pad
Pier Type	Round
Reinforcing Known	Yes
Max Capacity	1

Tower Reactions		
Moment, M	5013	k-ft
Axial, P	55	k
Shear, V	42	k

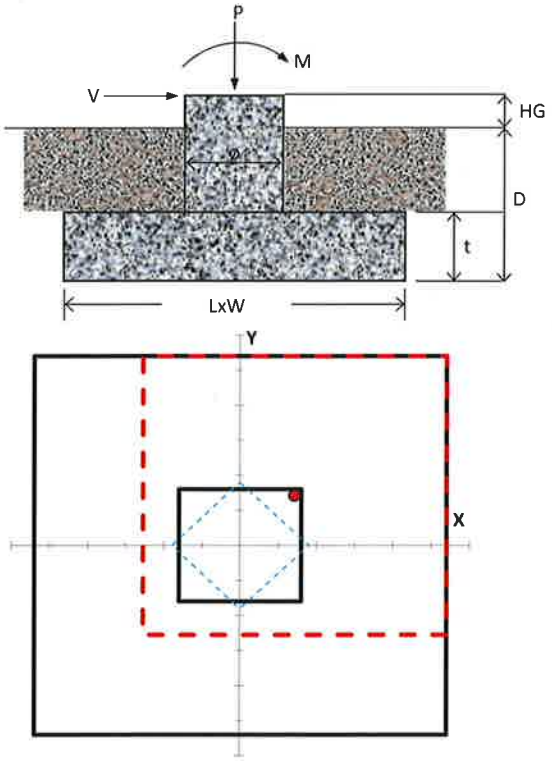
Pad & Pier Geometry		
Pier Diameter, ø	8	ft
Pad Length, L	27	ft
Pad Width, W	27	ft
Pad Thickness, t	5	ft
Depth, D	13.25	ft
Height Above Grade, HG	0	ft

Pad & Pier Reinforcing		
Rebar Fy	60	ksi
Concrete Fc'	4	ksi
Clear Cover	3	in
Reinforced Top & Bottom?	Yes	
Pad Reinforcing Size	# 8	
Pad Quantity Per Layer	42	
Pier Rebar Size	# 9	
Pier Quantity of Rebar	38	

Soil Properties		
Soil Type	Granular	
Soil Unit Weight	100	pcf
Angle of Friction, ø	35	°
Bearing Type	Gross	
Ultimate Bearing	8	ksf
Water Table Depth	0	ft
Frost Depth	3.33333	ft

Bearing Summary			Load Case
Qxmax	1.76	ksf	1.2D+1.6W
Qymax	1.76	ksf	1.2D+1.6W
Qmax @ 45°	1.86	ksf	1.2D+1.6W
$Q_{(all)\ Gross}$	6.00	ksf	
Controlling Capacity	**31.0%**	**Pass**	

Overturning Summary (Required FS=1.0)			Load Case
FS(ot)x	1.78	≥1.0	0.9D+1.6W
FS(ot)y	1.78	≥1.0	0.9D+1.6W
Controlling Capacity	**56.1%**	**Pass**	



Anchor Rod and Base Plate Stresses, TIA-222-G-1
CT33762-M/Cheshire, CT
2015778.33762.07

Overturning Moment =	5013.00	k*ft
Axial Force =	55.00	k
Shear Force =	42.00	k

Acceptable Stress Ratio =	100.0%

Anchor Rods		
Pole Diameter =	64.53	in
Number of Rods =	16	
ϕ =	0.8	
Rod Ultimate Strength (F_u) =	100	ksi
Base Plate Detail Type* =	d	
Rod Circle =	71.651	in
Rod Diameter =	2.25	in
Net Tensile Area =	3.25	in^2
Max Tension on Rod =	206.35	kips
Max Compression on Rod =	213.23	kips
P_u =	213.23	kips
V_u =	2.63	kips
η =	0.50	
φR_{nt} =	260.00	kips
Anchor Rod Capacity =	**84.0%**	**OK**

(Section 4.9.9, TIA-222-G-1)

Base Plate		
Plate Strength (Fy) =	60	ksi
ϕ =	0.9	
Plate Thickness =	3	in
Plate Width =	73	in
Est. Dist. b/w ea. Rod =	6	in
w_{calc} =	47.83	in
w_{max} =	38.71	in
w =	38.71	in
Z =	87.09	in^3
M_u =	2465.24	k-in
φM_n =	4702.97	k-in
Base Plate Capacity =	**52.4%**	**OK**

***This analysis assumes the clear distance from the top of the concrete to the bottom of the leveling nut is less than the diameter of the anchor rod. Notify GPD Group immediately if existing field conditions do not meet this assumption.**