

January 7, 2015

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

Re: **Notice of Exempt Modification – Facility Modification
131 Gifford Lane in Bozrah, Connecticut**

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless (“Cellco”) currently maintains twelve (12) antennas at the 162- foot level of the existing 193-foot tower at 131 Gifford Lane in Bozrah (the “Property”). The tower is owned by SBA. Cellco’s shared use of this tower was approved by the Council in 2000. Cellco now intends to modify its facility by replacing all of its existing antennas with three (3) model LNX-6514DS-VTM, 700 MHz antennas; three (3) model LNX-6514DS-VTM, 850 MHz antennas; three (3) model HBXX-6517DS-VTM, 1900 MHz antennas; and three (3) model HBXX-6517DS-VTM, 2100 MHz antennas, all at the same level on the tower. Cellco also intends to install six (6) remote radio heads (“RRHs”) behind its 1900 MHz and 2100 MHz antennas and two (2) HYBRIFLEX™ antenna cable. Included in Attachment 1 are specifications for the replacement antennas, RRHs and HYBRIFLEX™ cables.

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 William Ballinger, First Selectman for the Town of Bozrah. A copy of this letter is also being sent to John E. and Betty L. Orr, the owners of the Property.

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

Robinson+Cole

Melanie A. Bachman

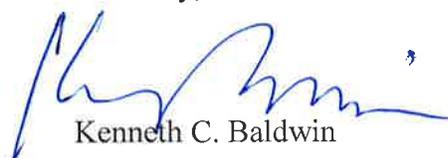
January 7, 2015

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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 installed on its existing antenna platform at the 162-foot level.
2. The proposed modifications will not involve any change to ground-mounted equipment and, therefore, will not require the extension of the site boundary.
3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the replacement antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. A cumulative General Power Density table for Cellco's modified facility is included in Attachment 2.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The tower and its foundation can support Cellco's proposed modifications. (See Structural Analysis included in Attachment 3).

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

Sincerely,



Kenneth C. Baldwin

Enclosures

Copy to:

William Ballinger, Bozrah First Selectman
John E. and Betty L. Orr
Sandy M. Carter

ATTACHMENT 1

Product Specifications

COMMSCOPE®

LNX-6514DS-VTM

Andrew® Antenna, 698–896 MHz, 65° horizontal beamwidth, RET compatible

POWERED BY



Electrical Specifications

Frequency Band, MHz	698–806	806–896
Gain, dBi	15.7	16.3
Beamwidth, Horizontal, degrees	65	65
Beamwidth, Horizontal Tolerance, degrees	±3	±3
Beamwidth, Vertical, degrees	12.5	11.2
Beam Tilt, degrees	0–10	0–10
USLS, typical, dB	17	18
Front-to-Back Ratio at 180°, dB	32	30
CPR at Boresight, dB	20	20
CPR at Sector, dB	10	10
Isolation, dB	30	30
VSWR Return Loss, dB	1.4 15.6	1.4 15.6
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153
Input Power per Port, maximum, watts	400	400
Polarization	±45°	±45°

Mechanical Specifications

Color Radome Material	Light gray Fiberglass, UV resistant
Connector Interface Location Quantity	7-16 DIN Female Bottom 2
Wind Loading, maximum	617.7 N @ 150 km/h 138.9 lbf @ 150 km/h
Wind Speed, maximum	241.0 km/h 149.8 mph
Antenna Dimensions, L x W x D	1847.0 mm x 301.0 mm x 181.0 mm 72.7 in x 11.9 in x 7.1 in
Net Weight	17.6 kg 38.8 lb
Model with factory installed AISG 2.0 RET LNX-6514DS-A1M	



Product Specifications

COMMScope®

HBXX-6517DS-VTM

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



Electrical Specifications

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 3° 18.7 6° 18.4	0° 18.4 3° 18.7 6° 18.5	0° 18.7 3° 18.9 6° 18.6
Beamwidth, Horizontal, degrees	67	66	65
Beamwidth, Horizontal Tolerance, degrees	±2.4	±1.7	±2.9
Beamwidth, Vertical, degrees	5.0	4.7	4.4
Beamwidth, Vertical Tolerance, degrees	±0.3	±0.3	±0.3
Beam Tilt, degrees	0–6	0–6	0–6
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
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°

*Values calculated using NGMN Alliance N-P-BASTA v9.6

Mechanical Specifications

Color Radome Material	Light gray PVC, UV resistant
Connector Interface Location Quantity	7-16 DIN Female Bottom 4
Wind Loading, maximum	668.0 N @ 150 km/h 150.2 lbf @ 150 km/h
Wind Speed, maximum	241.0 km/h 149.8 mph
Antenna Dimensions, L x W x D	1903.0 mm x 305.0 mm x 166.0 mm 74.9 in x 12.0 in x 6.5 in
Net Weight	19.5 kg 43.0 lb
Model with factory installed AISG 2.0 RET	HBXX-6517DS-A2M

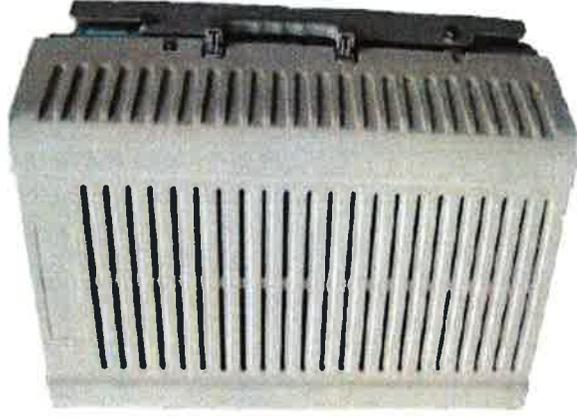


PCS RF MODULES

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)

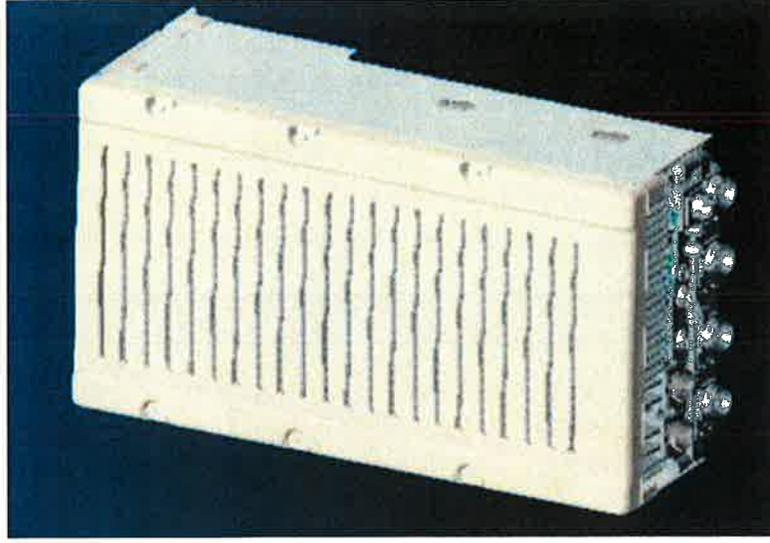


** Not a Verizon Wireless deployed product

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**



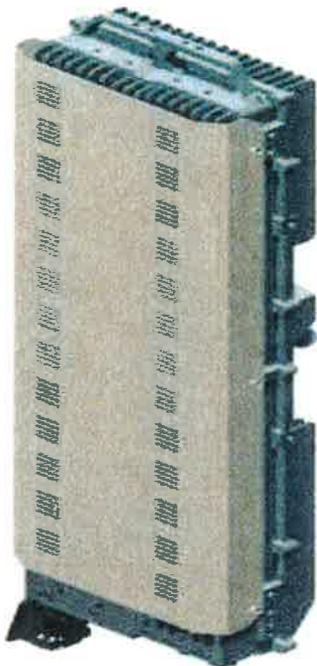
** - Includes solar shield but not mounting brackets (8 lbs.)



ALCATEL-LUCENT – CONFIDENTIAL – SOLELY FOR AUTHORIZED PERSONS HAVING A NEED TO KNOW – PROPRIETARY – USE PURSUANT TO COMPANY INSTRUCTION

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.

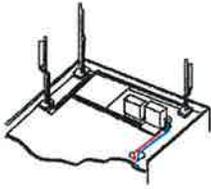
EASY INSTALLATION

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.

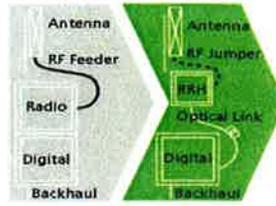
The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment. However, many of these sites can host an Alcatel-Lucent RRH2x60-AWS installation, providing more flexible site selection and improved network quality along with greatly reduced installation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

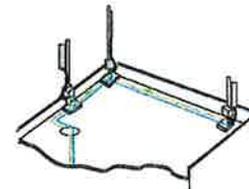
Installation can easily be done by a single person as the Alcatel-Lucent RRH2x60-AWS is compact and weighs about 20 kg, eliminating the need for a crane to hoist the BTS cabinet to the rooftop. A site can be in operation in less than one day.



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

Product Description

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

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

Features/Benefits

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

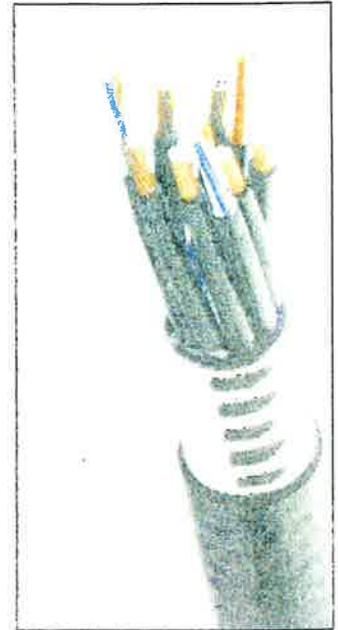


Figure 1: HYBRIFLEX Series

Technical Specifications

Outer Conductor Armor	Corrugated Aluminum	[mm (in.)]	46.5 (1.83)
Jacket	Polyethylene, PE	[mm (in.)]	50.3 (1.98)
UV-Protection	Individual and External Jacket		Yes
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)]	0.68 (0.255)
DC-Resistance Power Cable: 3.4mm ² (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 Ro-S Compliant
Size (Power)		[mm (AWG)]	8.4 (8)
Quantity, Wire Count (Power)			16 (8 pairs)
Size (Alarm)		[mm (AWG)]	0.8 (18)
Quantity, Wire Count (Alarm)			4 (2 pairs)
Type			UV protected
Strands			19
Primary Jacket Diameter, Nominal		[mm (in.)]	6.8 (0.27)
Standards (Meets or exceeds)			NFPA 130, ICEA S-95-658 UL Type XHHW-2, UL 44 UL-LS Limited Smoke, UL VW-1 IEEE-383 (1974), IEEE1292/FT4 Ro-S Compliant
Installation Temperature		[°C (°F)]	-40 to +65 (-40 to 149)
Operation Temperature		[°C (°F)]	-40 to +65 (-40 to 149)

* This data is provisional and subject to change

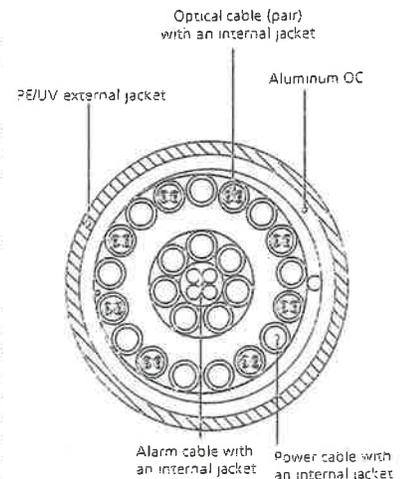


Figure 2: Construction Detail

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

ATTACHMENT 2

		General		Power		Density							
Site Name: Bozrah E Tower Height: 193ft		# OF CHAN.	WATTS ERP	HEIGHT	CALC. POWER DENS	FREQ.	MAX. PERMISS. EXP.	FRACTION MPE	Total				
*Omniport		2	386	195	0.0073	1930	1.0000	0.73%					
*Sprint CDMA/LTE		3	625	175.5	0.0219	1900	1.0000	2.19%					
*AT&T UMTS		2	565	182	0.0123	880	0.5867	2.09%					
*AT&T UMTS		2	875	182	0.0190	1900	1.0000	1.90%					
*AT&T GSM		1	283	182	0.0031	880	0.5867	0.52%					
*AT&T GSM		4	525	182	0.0228	1900	1.0000	2.28%					
*AT&T LTE		1	1375	182	0.0149	734	0.4893	3.05%					
Verizon PCS		15	438	162	0.0900	1970	1.0000	9.00%					
Verizon Cellular		9	403	162	0.0497	869	0.5793	8.58%					
Verizon AWS		1	2711	162	0.0371	2145	1.0000	3.71%					
Verizon 700		1	835	162	0.0114	746	0.4973	2.30%					
									36.36%				
* Source: Siting Council													

ATTACHMENT 3



FDH Engineering, Inc., 6521 Meridien Drive Raleigh, NC 27616, Ph. 919.755.1012

**Structural Analysis for
SBA Network Services, Inc.**

193' Self-Support Tower

**SBA Site Name: Bozrah
SBA Site ID: CT01105-S-03
Verizon Site ID: 117755
Verizon Site Name: 117755**

FDH Project Number 146GSN1400

Analysis Results

Tower Components	83.3 %	Sufficient
Foundation	77.4 %	Sufficient

Prepared By:

Morteza Ashouri, PhD, EI
Project Engineer

Reviewed By:

Christopher M Murphy, PE
President
CT PE License No. 25842

FDH Engineering, Inc.
6521 Meridien Drive
Raleigh, NC 27616
(919) 755-1012
info@fdh-inc.com



November 17, 2014

Prepared pursuant to TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures and 2005 Connecticut Building Code

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EXECUTIVE SUMMARY

At the request of SBA Network Services, Inc., FDH Engineering, Inc. performed a structural analysis of the existing self-supported tower located in Bozrah, CT to determine whether the tower is structurally adequate to support both the existing and proposed loads pursuant to the *Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, TIA/EIA-222-F* and *2005 Connecticut Building Code (CBC)*. Information pertaining to the existing/proposed antenna loading, current tower geometry, the member sizes, soil parameters, and foundation dimensions was obtained from:

- Pirod, Inc. (Eng. File No. A-115466) original design drawings dated April 1, 1999
- Jaworski Geotech, Inc. (Project No. C98492G) Geotechnical Evaluation dated December 14, 1998
- SBA Network Services, Inc.

The *basic design wind speed* per the *TIA/EIA-222-F* standards and *2005 CBC* is 85 mph without ice and 38 mph with 3/4" radial ice. Ice is considered to increase in thickness with height.

Conclusions

With the existing and proposed antennas from Verizon in place at 162 ft, the tower meets the requirements of the *TIA/EIA-222-F* standards and *2005 CBC* provided the **Recommendations** listed below are satisfied. Furthermore, provided the foundations were designed and constructed to support the original design reactions (see Pirod, Inc. Eng. File No. A-115466), the foundations should have the necessary capacity to support the existing and proposed loading. For a more detailed description of the analysis of the tower, see the **Results** section of this report.

Our structural analysis has been performed assuming all information provided to FDH Engineering, Inc. is accurate (i.e., the steel data, tower layout, existing antenna loading, and proposed antenna loading) and that the tower has been properly erected and maintained per the original design drawings.

Recommendations

To ensure the requirements of the *TIA/EIA-222-F* standards and *2005 CBC* are met with the existing and proposed loading in place, we have the following recommendations:

1. The coax must be installed as shown in **Figure 1**.
2. The existing TMAs and diplexers should be installed directly behind the proposed and existing panel antennas.
3. RRU/RRH Stipulation: The proposed equipment may be installed in any configuration determined by the client.

APPURTENANCE LISTING

The proposed and existing antennas with their corresponding cables/coax lines are shown in **Table 1**. *If the actual layout determined in the field deviates from the layout, FDH Engineering, Inc. should be contacted to perform a revised analysis.*

Table 1 - Appurtenance Loading

Existing Loading:

Antenna Elevation (ft)	Description	Coax and Lines	Carrier	Mount Elevation (ft)	Mount Type
195	(9) EMS RR90-17-02DP	(12) 1-5/8"	T-Mobile	193	(1) Low Profile Platform
182	(3) Andrew SBNH-1D6565C (6) Powerwave 7770 (6) Powerwave LGP21401 (6) Powerwave LGP21903 (6) Ericsson RRUS-11 RRUs (1) Raycap DC6-48-60-18-8F	(12) 1-5/8" (1) 3/8" Fiber (2) 3/4" DC Power	New Cingular	182	(3) T-Frames
175	(6) 6'x1' panels (assumed)	(6) 1-5/8"	Sprint	175	(3) T-Frames
162	(3) RFS APX75-866514-CT0 (6) Antel LPA-80080/6CF (3) Antel BXA-185090/8CF (6) RFS FD9R6004/2C-3L	(12) 1-5/8"	Verizon	162	(3) T-Frames
30	(2) Andrew PC1N0F-0190B-002M E911	(2) 1/2"	T-Mobile	30	Direct Mount

Proposed Loading:

Antenna Elevation (ft)	Description	Coax and Lines	Carrier	Mount Elevation (ft)	Mount Type
162	(6) Commscope HBXX-6517DS-A2M (6) Commscope LNX-6514DS-VTM (3) Alcatel Lucent 1900 RRH 2x60W (3) Alu RRH2x60 RRUs (2) RFS DB-T1-6Z-8AB-0Z (6) RFS FD9R6004/2C-3L	(12) 1-5/8" (2) 1-5/8" Fiber	Verizon	162	(3) T-Frames
100	(1) Lucent KS24019-L112A	(1) GPS Line	Verizon	100	Direct Mount

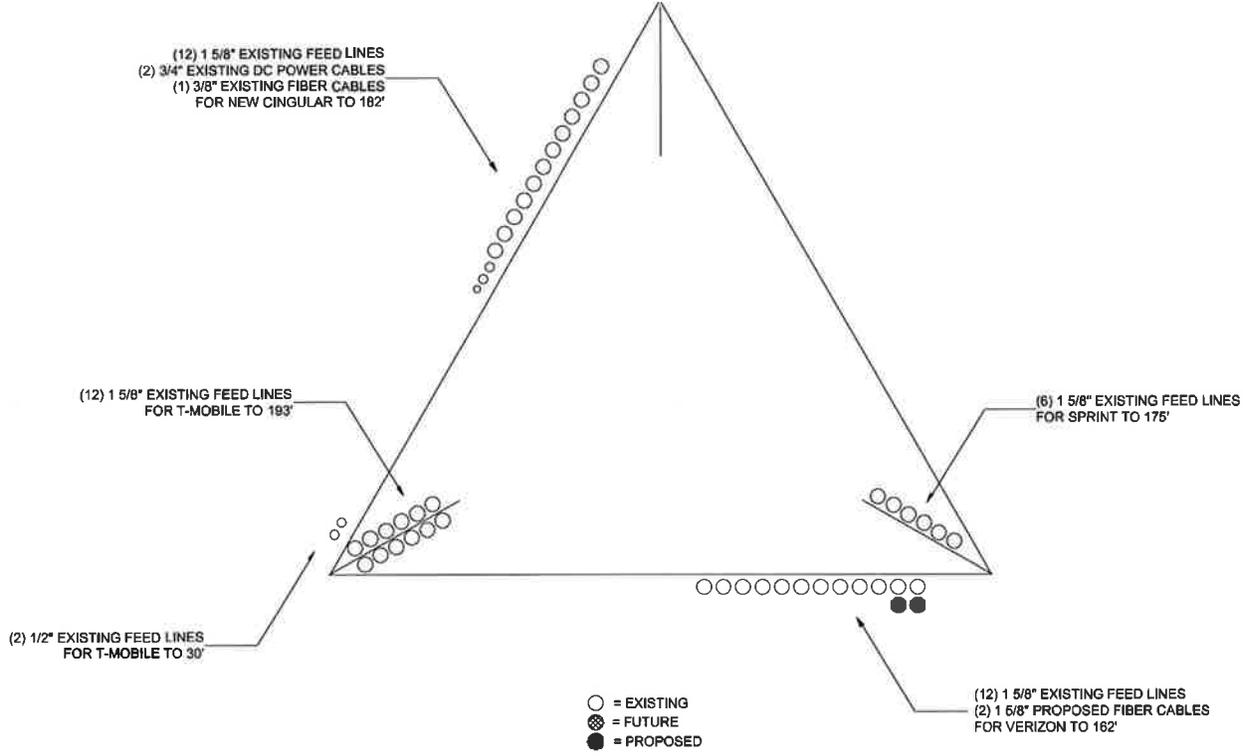


Figure 1 – Coax Layout

RESULTS

The following yield strength of steel for individual members was used for analysis:

Table 2 - Material Strength

Member Type	Yield Strength
Legs	50 ksi
Bracing	50 ksi & 36 ksi

Table 3 displays the summary of the ratio (as a percentage) of force in the member to their capacities. Values greater than 100% indicate locations where the maximum force in the member exceeds its capacity. **Table 4** displays the maximum foundation reactions.

If the assumptions outlined in this report differ from actual field conditions, FDH Engineering, Inc. should be contacted to perform a revised analysis. Furthermore, as no information pertaining to the allowable twist and sway requirements for the existing or proposed appurtenances was provided, deflection and rotation were not taken into consideration when performing this analysis.

See the **Appendix** for detailed modeling information

Table 3 - Summary of Working Percentage of Structural Components

Section No.	Elevation ft	Component Type	Size	% Capacity*	Pass Fail
T1	193 - 185	Leg	2	6.6	Pass
		Diagonal	1	7.5 (b)	
		Horizontal	3/4	8.5	
		Top Girt	1 1/4	7.8	
		Bottom Girt	1 1/4	4.6	
T2	185 - 170	Leg	2	5.0	Pass
		Diagonal	1	35.2	
		Horizontal	3/4	26.9	
		Top Girt	1 1/4	12.5	
		Bottom Girt	1 1/4	2.4	
		Mid Girt	1 1/4	5.3	
T3	170 - 160	Leg	Pirol 105244	1.9	Pass
		Diagonal	L2 1/2x2 1/2x3/16	53.7	
T4	160 - 140	Leg	Pirol 105217	59.2	Pass
		Diagonal	L3x3x3/16	65.1 (b)	
				77.6 (b)	
T5	140 - 120	Leg	Pirol 105217	72.5	Pass
		Diagonal	L3x3x3/16	60.4	
T6	120 - 100	Leg	Pirol 105218	70.3 (b)	Pass
		Diagonal	L3x3x5/16	48.8	
T7	100 - 80	Leg	Pirol 105219	61.6	Pass
		Diagonal	L3x3x5/16	61.8	
T8	80 - 60	Leg	Pirol 105219	72.1	Pass

Section No.	Elevation ft	Component Type	Size	% Capacity*	Pass Fail
		Diagonal	L3 1/2x3 1/2x5/16	50.0	Pass
T9	60 - 40	Leg	Pirod 105220	64.2 74.5 (b)	Pass
		Diagonal	L3 1/2x3 1/2x5/16	62.1	Pass
T10	40 - 20	Leg	Pirod 105220	72.3 83.3 (b)	Pass
		Diagonal	L3 1/2x3 1/2x5/16	75.6	Pass
T11	20 - 0	Leg	Pirod 112738	63.3	Pass
		Diagonal	2L3 1/2x3 1/2x5/16x1	49.8	Pass

*Capacities include a 1/3 allowable stress increase for wind.

Table 4 - Maximum Base Reactions

Load Type	Direction	Current Analysis (TIA/EIA-222-F)	Original Design (TIA/EIA-222-F)
Individual Foundation	Horizontal	42 k	-
	Uplift	315 k	414 k
	Compression	358 k	462 k
Overturning Moment	---	6,458 k-ft	8,348 k-ft

GENERAL COMMENTS

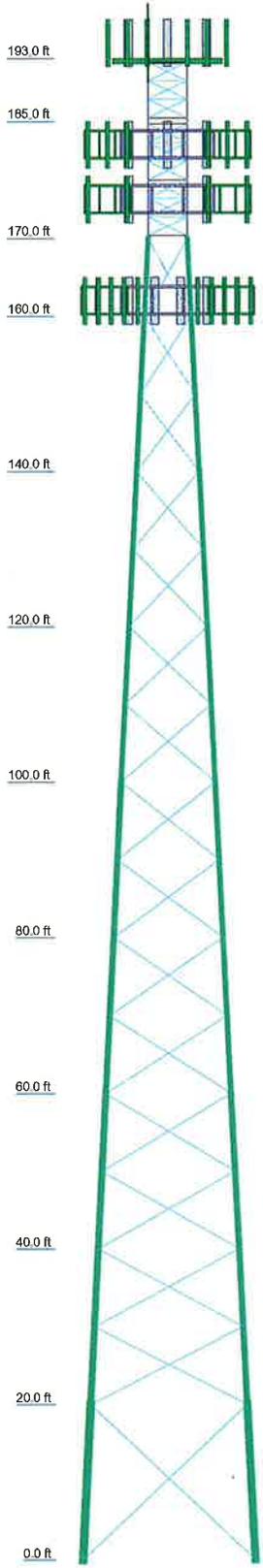
This engineering analysis is based upon the theoretical capacity of the structure. It is not a condition assessment of the tower and its foundation. It is the responsibility of SBA Network Services, Inc. to verify that the tower modeled and analyzed is the correct structure (with accurate antenna loading information) modeled. If there are substantial modifications to be made or the assumptions made in this analysis are not accurate, FDH Engineering, Inc. should be notified immediately to perform a revised analysis.

LIMITATIONS

All opinions and conclusions are considered accurate to a reasonable degree of engineering certainty based upon the evidence available at the time of this report. All opinions and conclusions are subject to revision based upon receipt of new or additional/updated information. All services are provided exercising a level of care and diligence equivalent to the standard and care of our profession. No other warranty or guarantee, expressed or implied, is offered. Our services are confidential in nature and we will not release this report to any other party without the client's consent. The use of this engineering work is limited to the express purpose for which it was commissioned and it may not be reused, copied, or distributed for any other purpose without the written consent of FDH Engineering, Inc.

APPENDIX

Section	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11
Legs	SR 2	SR 1	A	Pirolod 105217	Pirolod 105218	Pirolod 105219	Pirolod 105220				
Leg Grade	A572-50	A572-50	B	L3x3x5/16	L3x3x5/16	A36	L3 1/2x3 1/2x5/16				
Diagonals	SR 1 1/4	SR 1 1/4				N.A.					
Diagonal Grade	SR 1 1/4	SR 1 1/4				N.A.					
Top Girts	SR 3/4					N.A.					
Mid Girts						N.A.					
Bottom Girts						N.A.					
Horizontals						N.A.					
Face Width (ft)	5	6	6	8	10	12	14	16	18	20	22
# Panels @ (ft)	9 @ 2.375	12	10	8	6	15 @ 10	14	16	18	20	1 @ 20
Weight (K)	0.7	1.2	1.0	2.2	2.3	3.2	4.3	4.7	5.3	5.5	7.5



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(3) RR90-17-02DP w/ Mount Pipe	193	(2) 6' Panel w/ Mount Pipe	175
(3) RR90-17-02DP w/ Mount Pipe	193	(2) 6' Panel w/ Mount Pipe	175
(3) RR90-17-02DP w/ Mount Pipe	193	(2) 6' Panel w/ Mount Pipe	175
Low-Pro Platform Mount	193	(3) T-Frames	175
(1) Lightning Rod	193	(2) HBXX-6517DS-A2M w/ Mount Pipe	162
Empty Mount Pipe	193	(2) HBXX-6517DS-A2M w/ Mount Pipe	162
Empty Mount Pipe	193	(2) HBXX-6517DS-A2M w/ Mount Pipe	162
Empty Mount Pipe	193	(2) LNX-6514DS-VTM	162
(2) TMA - Powerwave LGP21401	182	(2) LNX-6514DS-VTM	162
(2) TMA - Powerwave LGP21401	182	(2) LNX-6514DS-VTM	162
(2) LGP21903 Diplexer	182	1900 RRH 2x60W	162
(2) LGP21903 Diplexer	182	1900 RRH 2x60W	162
(2) LGP21903 Diplexer	182	1900 RRH 2x60W	162
SBNH-1D6565C w/ Mount Pipe	182	RRH2x60 RRUs	162
SBNH-1D6565C w/ Mount Pipe	182	RRH2x60 RRUs	162
SBNH-1D6565C w/ Mount Pipe	182	RRH2x60 RRUs	162
(2) RRUS-11	182	DB-T1-6Z-8AB-0Z	162
(2) RRUS-11	182	DB-T1-6Z-8AB-0Z	162
(2) RRUS-11	182	(2) FD9R6004/2C-3L Diplexer	162
DC6-48-60-18-8F Surge Arrestor	182	(2) FD9R6004/2C-3L Diplexer	162
(3) T-Frames	182	(2) FD9R6004/2C-3L Diplexer	162
(2) Powerwave 7770 w/ Mount Pipe	182	(3) T-Frames	162
(2) Powerwave 7770 w/ Mount Pipe	182	KS24019-L112A	100
(2) Powerwave 7770 w/ Mount Pipe	182	PC1N0F-0190B-002M	30
(2) TMA - Powerwave LGP21401	182	PC1N0F-0190B-002M	30

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	Pirolod 105244	B	L2 1/2x2 1/2x3/16

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

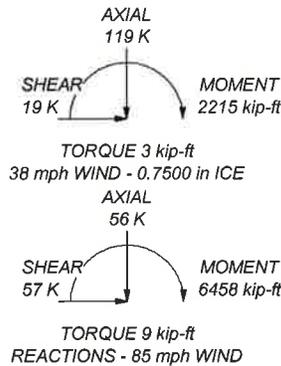
TOWER DESIGN NOTES

1. Tower is located in New London County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 83.3%

MAX. CORNER REACTIONS AT BASE:

DOWN: 358 K
SHEAR: 42 K

UPLIFT: -315 K
SHEAR: 37 K



	FDH Engineering		Job: Bozrah, CT01105-S-03		
	6521 Meridien Drive		Project: 146GSN1400		
	Raleigh, NC 27616		Client: SBA Network Services, Inc.	Drawn by: MA	App'd:
	Phone: (919) 755 1012		Code: TIA/EIA-222-F	Date: 11/17/14	Scale: NTS
	FAX: (919) 755 1031		Path:		Dwg No. E-1