

280 Trumbull Street
Hartford, CT 06103-3597
Main (860) 275-8200
Fax (860) 275-8299
kbaldwin@rc.com
Direct (860) 275-8345

Also admitted in Massachusetts

May 8, 2014

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

Re: **Notice of Exempt Modification – Facility Modification
106 Willenbrock Road, Oxford, Connecticut**

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless (“Cellco”) currently maintains twelve (12) antennas at the 137-foot level of the existing 150-foot tower at 106 Willenbrock Road in Oxford, Connecticut (the “Property”). The tower is owned by SBA. The Council approved Cellco’s use of this tower in 2001. Cellco now intends to replace six (6) of its existing antennas with three (3) model LNX-6514DS-VTM, 850 MHz antennas and three (3) model HBX-6517DS-VTM, 2100 MHz antennas, all at the same 137-foot level on the tower. Cellco also intends to install three (3) remote radio heads (“RRHs”) behind its 2100 MHz antennas and one (1) HYBRIFLEX™ antenna cable inside the monopole. 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 George R. Temple, First Selectman of the Town of Oxford. A copy of this letter is also being sent to Tower Business Park LLC, the owner of the Property.

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



Law Offices

BOSTON

HARTFORD

NEW YORK

PROVIDENCE

STAMFORD

ALBANY

LOS ANGELES

NEW LONDON

SARASOTA

www.rc.com

12871593-v1

ROBINSON & COLE_{LLP}

Melanie A. Bachman

May 8, 2014

Page 2

1. The proposed modifications will not result in an increase in the height of the existing tower. Cellco's six (6) replacement antennas and RRHs will be located at the 137-foot level on the 150-foot tower.

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

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

4. The operation of the 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 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 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:

George R. Temple, Oxford First Selectman
Tower Business Park LLC
Sandy M. Carter



ATTACHMENT 1

Product Specifications

COMMSCOPE®

POWERED BY



LNX-6514DS-VTM

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

- Great solution to maximize network coverage and capacity
- Excellent gain, VSWR, front-to-back ratio, and PIM specifications for robust network performance
- Ideal choice for site collocations and tough zoning restrictions
- Excellent solution for site sharing and maximizing capacity
- Fully compatible with Andrew remote electrical tilt system for greater OpEx savings
- The RF connectors are designed for IP67 rating and the radome for IP56 rating

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°
Impedance	50 ohm	50 ohm

General Specifications

Antenna Brand	Andrew®
Antenna Type	DualPol®
Band	Single band
Brand	DualPol® Teletilt®
Operating Frequency Band	698 – 896 MHz

Mechanical Specifications

Color	Light gray
Lightning Protection	dc Ground
Radiator Material	Aluminum
Radome Material	Fiberglass, UV resistant
RF Connector Interface	7-16 DIN Female
RF Connector Location	Bottom
RF Connector Quantity, total	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

Product Specifications

COMMSCOPE®

LNX-6514DS-VTM

POWERED BY



Dimensions

Depth	181.0 mm 7.1 in
Length	1847.0 mm 72.7 in
Width	301.0 mm 11.9 in
Net Weight	17.6 kg 38.8 lb

Remote Electrical Tilt (RET) Information

Model with Factory Installed AISG 1.1 Actuator LNX-6514DS-R2M

Model with Factory Installed AISG 2.0 Actuator LNX-6514DS-A1M

RET System Teletilt®

Regulatory Compliance/Certifications

Agency

RoHS 2011/65/EU
China RoHS SJ/T 11364-2006
ISO 9001:2008

Classification

Compliant by Exemption
Above Maximum Concentration Value (MCV)
Designed, manufactured and/or distributed under this quality management system



Included Products

DB380 — Pipe Mounting Kit for 2.4"-4.5" (60-115mm) OD round members on wide panel antennas. Includes 2 clamp sets and double nuts.

DB5083 — Downtilt Mounting Kit for 2.4"-4.5" (60 - 115 mm) OD round members. Includes a heavy-duty, galvanized steel downtilt mounting bracket assembly and associated hardware. This kit is compatible with the DB380 pipe mount kit for panel antennas that are equipped with two mounting brackets.

Product Specifications

COMMSCOPE®

HBX-6517DS-VTM

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

POWERED BY



Electrical Specifications

Frequency Band, MHz	1710–1880	1850–1990	1920–2180
Gain, dBi	19.0	19.1	19.2
Beamwidth, Horizontal, degrees	65	65	65
Beamwidth, Vertical, degrees	5.0	4.7	4.4
Beam Tilt, degrees	0–6	0–6	0–6
USLS, typical, dB	18	18	18
Front-to-Back Ratio at 180°, dB	30	30	30
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°

Mechanical Specifications

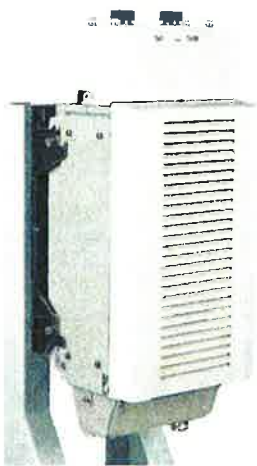
Color Radome Material	Light gray PVC, UV resistant
Connector Interface Location Quantity	7-16 DIN Female Bottom 2
Wind Loading, maximum	393.2 N @ 150 km/h 88.4 lbf @ 150 km/h
Wind Speed, maximum	241.0 km/h 149.8 mph
Antenna Dimensions, L x W x D	1902.0 mm x 166.0 mm x 83.0 mm 74.9 in x 6.5 in x 3.3 in
Net Weight	6.2 kg 13.7 lb
Model with factory installed AISG 2.0 RET	HBX-6517DS-A1M



Alcatel-Lucent RRH2x40-AWS

REMOTE RADIO HEAD

The Alcatel-Lucent RRH2x40-AWS is a high-power, small form-factor Remote Radio Head (RRH) operating in the AWS frequency band (1700/2100MHz - 3GPP Band 4). The Alcatel-Lucent RRH2x40-AWS is designed with an eco-efficient approach, providing operators with the means to achieve high quality and capacity coverage with minimum site requirements.



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

The Alcatel-Lucent RRH2x40-AWS is linked to the BBU by an optical-fiber connection carrying downlink and uplink digital radio signals along with operations, administration and maintenance (OA&M) information. The Alcatel-Lucent RRH2x40-AWS has two transmit RF paths, 40 W RF output power per transmit path, and is designed to manage up to four-way receive diversity. The device is ideally suited to support macro coverage, with multiple-input multiple-output (MIMO) 2x2 operation in up to 20 MHz of bandwidth.

The Alcatel-Lucent RRH2x40-AWS is designed to make available all the benefits of a distributed eNodeB, with excellent RF characteristics, with low

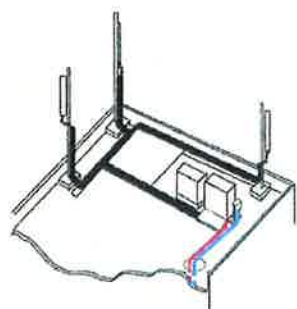
capital expenditures (CAPEX) and low operating expenditures (OPEX). The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment or require costly cranes to be employed, leaving coverage holes. However, many of these sites can host an Alcatel-Lucent RRH2x40-AWS installation, providing more flexible site selection and improved network quality along with greatly reduced installation time and costs.

Fast, low-cost installation and deployment

The Alcatel-Lucent RRH2x40-AWS is a zero-footprint solution and operates noise-free, simplifying negotiations with site property owners and minimizing environmental impacts. Installation can easily be done by a single person because the Alcatel-Lucent RRH2x40-AWS is compact and weighs less than 20 kg (44 lb), eliminating the need for a crane to hoist the BTS cabinet to the rooftop. A site can be in operation in less than one day — a fraction of the time required for a traditional BTS.

Excellent RF performance

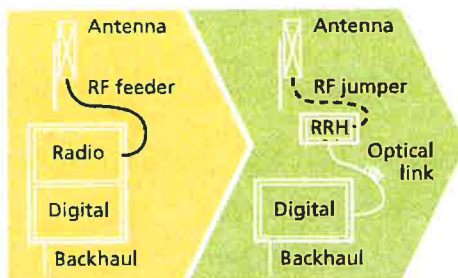
Because of its small size and weight, the Alcatel-Lucent RRH2x40-AWS can be installed close to the antenna. Operators can therefore locate the Alcatel-Lucent RRH2x40-AWS where RF engineering is deemed ideal, minimizing trade-offs between available sites and RF optimum sites. The RF feeder cost and installation costs are reduced or eliminated, and there is no need for a Tower Mounted Amplifier (TMA) because losses introduced by the RF feeder are greatly reduced. The Alcatel-Lucent RRH2x40-AWS provides more RF power while at the same time consuming less electricity.



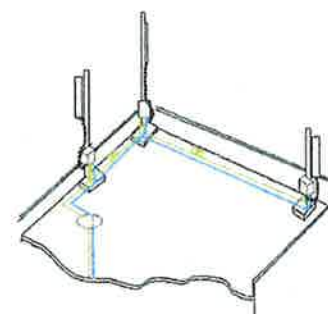
Macro

Features

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



RRH for space-constrained cell sites



Distributed

Benefits

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

Technical specifications

Physical dimensions

- Height: 620 mm (24.4 in.)
- Width: 270 mm (10.63 in.)
- Depth: 170mm (6.7 in.)
- Weight (without mounting kit): less than 20 kg (44 lb)

Power

- Power supply: -48VDC

Operating environment

- Outdoor temperature range:
 - With solar load: -40°C to +50°C (-40°F to +122°F)
 - Without solar load: -40°C to +55°C (-40°F to +131°F)

- Passive convection cooling (no fans)
- Enclosure protection
 - IP65 (International Protection rating)

RF characteristics

- Frequency band: 1700/2100 MHz (AWS); 3GPP Band 4
- Bandwidth: up to 20 MHz
- RF output power at antenna port: 40 W nominal RF power for each Tx port
- Rx diversity: 2-way or 4-way with optional Rx Diversity module
- Noise figure: below 2.0 dB typical
- Antenna Line Device features
 - TMA and Remote electrical tilt (RET) support via AISG v2.0

Optical characteristics

Type/number of fibers

- Single-mode variant
 - One Single Mode Single Fiber per RRH2x, carrying UL and DL using CWDM
 - Single mode dual fiber (SM/DF)
- Multi-mode variant
 - Two Multi-mode fibers per RRH2x: one carrying UL, the other carrying DL

Optical fiber length

- Up to 500 m (0.31 mi), using MM fiber
- Up to 20 km (12.43 mi), using SM fiber

Digital Ports and Alarms

- Two optical ports to support daisy-chaining
- Six external alarms

www.alcatel-lucent.com Alcatel, Lucent, Alcatel-Lucent and the Alcatel-Lucent logo are trademarks of Alcatel-Lucent. All other trademarks are the property of their respective owners. The information presented is subject to change without notice. Alcatel-Lucent assumes no responsibility for inaccuracies contained herein. Copyright © 2010 Alcatel-Lucent. All rights reserved. CPG2809100912 (09)



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 (0.205)
DC-Resistance Power Cable, 8.4mm 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)	UL34-V0 UL1666 RoHS 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-93-658 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 to 149)
Operation Temperature	(°C (°F))	-40 to +65 (-40 to 149)

* This data is provisional and subject to change

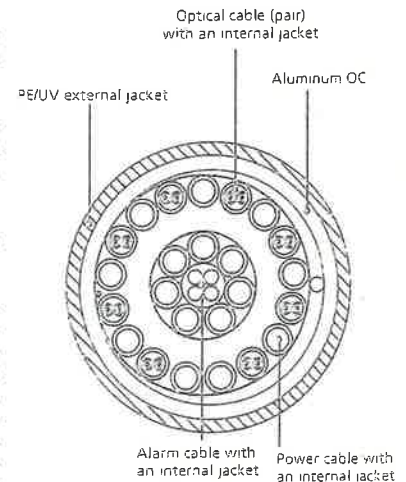


Figure 2: Construction Detail

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

ATTACHMENT 2

		General		Power		Density							
Site Name: Southford (Oxford)													
Tower Height: 150Ft													
CARRIER	# OF CHAN.	WATTS ERP	HEIGHT	CALC. POWER DENS	FREQ.	MAX. PERMISS. EXP.	FRACTION MPE	Total					
*AT&T UMTS	2	565	117	0.0297	880	0.5867	5.06%						
*AT&T UMTS	2	875	117	0.0460	1900	1.0000	4.60%						
*AT&T GSM	1	283	117	0.0074	880	0.5867	1.27%						
*AT&T GSM	4	525	117	0.0552	1900	1.0000	5.52%						
*AT&T LTE	1	1313	117	0.0345	734	0.4893	7.05%						
*Nextel	9	100	127	0.0201	851	0.5673	3.54%						
*Sprint	2	778	147.4	0.0258	1900	1.0000	2.58%						
*Sprint	1	438	147.4	0.0072	850	0.5667	1.28%						
Verizon	7	272	137	0.0365	1970	1.0000	3.65%						
Verizon	9	351	137	0.0605	869	0.5793	10.45%						
Verizon	1	1914	137	0.0367	2145	1.0000	3.67%						
Verizon	1	786	137	0.0151	698	0.4653	3.24%						
								51.88%					
* Source: Siting Council													

ATTACHMENT 3



FDH Engineering, Inc., 6521 Meridien Drive, Raleigh, NC 27616, Ph. 919.755.1012, Fax 919.755.1031

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

150' Monopole Tower

**SBA Site Name: Oxford 3
SBA Site ID: CT03109-S-00
Verizon Site Name: Southford CT
Verizon Site ID: 2-187**

FDH Project Number 1422J21400

Analysis Results

Tower Components	42.9%	Sufficient
Foundation	46.3%	Sufficient

Prepared By:

Jarel Duncan

Jarel Duncan, EI
Project Engineer

Reviewed By:

Bradley R. Newman

Bradley R. Newman, PE
Senior Project Engineer
CT PE License No. 29630

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



February 12, 2014

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

TABLE OF CONTENTS

EXECUTIVE SUMMARY 3

 Conclusions..... 3

 Recommendations 3

APPURTENANCE LISTING 4

RESULTS 5

GENERAL COMMENTS 6

LIMITATIONS..... 6

APPENDIX 7

EXECUTIVE SUMMARY

At the request of SBA Network Services, Inc., FDH Engineering, Inc. performed a structural analysis of the monopole located in Oxford, 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*. Information pertaining to the existing/proposed antenna loading, foundation dimensions, current tower geometry, and member sizes was obtained from:

- Paul J. Ford and Company (Job No. 29200-1055) original design drawings dated July 19, 2000
- SBA Network Services, Inc.

The *basic design wind speed* per the *TIA/EIA-222-F* standards and *2005 Connecticut Building Code* 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 137 ft, the tower meets the requirements of the *TIA/EIA-222-F* standards and *2005 Connecticut Building Code* provided the **Recommendation** listed below is satisfied. Furthermore, provided the foundation was designed and constructed to support the original design reactions (see Paul J. Ford and Company Job No. 29200-1055), the foundation should have the necessary capacity to support both 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.

Recommendation

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

1. Proposed coax should be installed inside the pole's shaft.
2. The existing diplexers should be installed directly behind the existing/proposed panel antennas.
3. RRU/RRH Stipulation: The proposed equipment may be installed in any arrangement as 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 ¹	Carrier	Mount Elevation (ft)	Mount Type
147	(3) RFS APXVSP18-C-A20 (3) ALU 1900 RRUs (3) ALU 800 RRUs (3) ALU 800 Filters (4) RFS ACU-A20-N RETs	(3) 1-1/4"	Sprint	147	(1) Low Profile Platform
137	(6) Antel LPA-80063/6CF (3) Antel BXA 70063/6CF (3) Antel BXA - 171063-8BF (6) RFS FD9R6004/2C-3L Diplexers (1) GPS	(12) 1-5/8"	Verizon	137	(1) Low Profile Platform
129	(12) Andrew DB844H90E-XY	(12) 1-5/8"	Nextel	127	(1) Low Profile Platform
119.5	(6) Ericsson RRU11 RRUs (1) Raycap DC6-48-60-18-8-F Surge Arrestor	(9) 1-5/8" (2) DC (1) Fiber	AT&T	119.5	(1) Collar Mount
117	(3) Powerwave 7770.00 (3) KMW AM-X-CD-16-65-00T (6) Powerwave LGP21401 TMAs			117	(3) T-Arms
80	(1) GPS	(1) 1/2"	Sprint	80	Direct Mount

1. Coax installed inside the pole's shaft unless otherwise noted.

Proposed Loading:

Antenna Elevation (ft)	Description	Coax and Lines	Carrier	Mount Elevation (ft)	Mount Type
137	(3) Antel BXA 70063/6CF (3) Antel BXA - 171063-8BF (3) Andrew HBX-6517DS (3) Andrew LNX-6514DS (3) Alcatel Lucent RRH 2x40-AWS RRUs (6) RFS FD9R6004/2C-3L Diplexers (1) RFS DB-T1-6Z-8AB-0Z Distribution Box (1) GPS	(12) 1-5/8" (1) Hybriflex	Verizon	137	(1) Low Profile Platform

RESULTS

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

Table 2 - Material Strength

Member Type	Yield Strength
Tower Shaft Sections	65 ksi
Base Plate	55 ksi
Anchor Bolts	75 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. *Note: Capacities up to 100% are considered acceptable.* **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
L1	150 - 111.25	Pole	TP40.934x31.103x0.2813	21.7	Pass
L2	111.25 - 76.5	Pole	TP49.187x39.0395x0.375	35.5	Pass
L3	76.5 - 37.75	Pole	TP58.268x46.8514x0.4375	41.3	Pass
L4	37.75 - 0	Pole	TP66.97x55.5537x0.5	42.9	Pass
		Anchor Bolts	(28) 2.25" Ø on 75" BC	36.1	Pass
		Base Plate	PL 77" Sq. x 3" Thk.	32.0	Pass

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

Table 4 - Maximum Base Reactions

Base Reactions	Current Analysis (TIA/EIA-222-F)	Original Design (TIA/EIA-222-F)
Axial	47 k	55 k
Shear	30 k	53 k
Moment	3,151 k-ft	6,800 k-ft

GENERAL COMMENTS

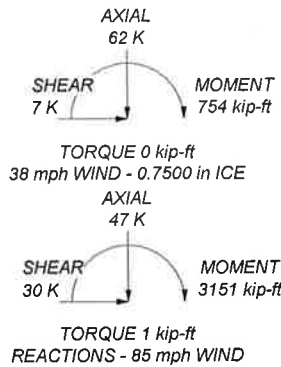
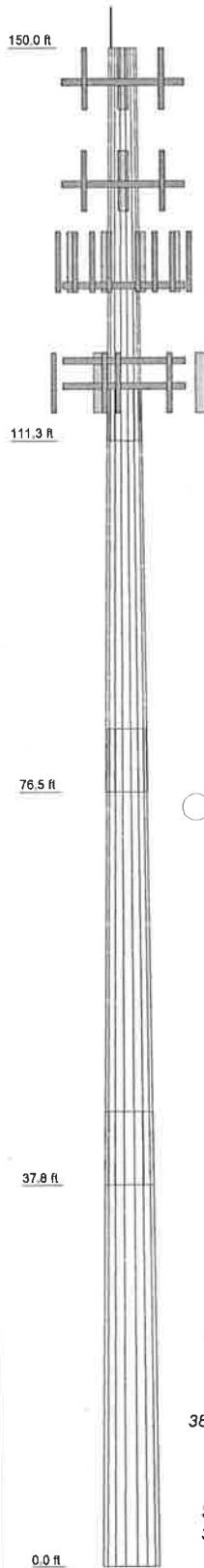
This engineering analysis is based upon the theoretical capacity of the structure. It is not a condition assessment of the tower and its foundation. It is the responsibility of SBA Network Services, Inc. to verify that the tower modeled and analyzed is the correct structure (with accurate antenna loading 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	Length (ft)	Number of Skies	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	38.75	18	0.2813	5.25	31.1080	40.9340	A607-55	4.2
2	40.00	18	0.3750	6.25	39.0395	49.1870	A607-55	7.1
3	45.00	18	0.4375	7.25	46.8514	58.2680	A607-55	11.1
4	45.00	18	0.5000	55.5537	66.9700		A607-55	14.8
								37.1



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod	150	HBX-6517DS w/ Mount Pipe	137
APXVSP18-C-A20 w/Mount Pipe	147	LNX-6514DS w/ Mount Pipe	137
APXVSP18-C-A20 w/Mount Pipe	147	LNX-6514DS w/ Mount Pipe	137
APXVSP18-C-A20 w/Mount Pipe	147	LNX-6514DS w/ Mount Pipe	137
ALU 1900 RRU	147	RRH2X40-AWS	137
ALU 1900 RRU	147	RRH2X40-AWS	137
ALU 1900 RRU	147	RRH2X40-AWS	137
ALU 800 RRU	147	(4) DB844H90E-XY w/Mount Pipe	127
ALU 800 RRU	147	(4) DB844H90E-XY w/Mount Pipe	127
ALU 800 RRU	147	(4) DB844H90E-XY w/Mount Pipe	127
ALU 800 Filter	147	(1) Low Profile Platform	127
ALU 800 Filter	147	(2) RRU-11	119.5
ALU 800 Filter	147	DC8-48-80-18-8F Surge Arrestor	119.5
(2) ACU-A20-N RET	147	(1) Collar Mount	119.5
ACU-A20-N RET	147	(2) RRU-11	119.5
ACU-A20-N RET	147	(2) RRU-11	119.5
(1) Low Profile Platform	147	7770.00 w/Mount Pipe	117
(2) FD9R6004/2C-3L Diplexer	137	7770.00 w/Mount Pipe	117
(2) FD9R6004/2C-3L Diplexer	137	AM-X-CD-16-65-00T-RET w/ Mount Pipe	117
(2) FD9R6004/2C-3L Diplexer	137	AM-X-CD-16-65-00T-RET w/ Mount Pipe	117
DB-T1-6Z-8AB-0Z Distribution Box	137	AM-X-CD-16-65-00T-RET w/ Mount Pipe	117
(1) Low Profile Platform	137	AM-X-CD-16-65-00T-RET w/ Mount Pipe	117
GPS	137	AM-X-CD-16-65-00T-RET w/ Mount Pipe	117
BXA-70063/6CF w/ Mount Pipe	137	(2) LGP21401 TMA	117
BXA-70063/6CF w/ Mount Pipe	137	(2) LGP21401 TMA	117
BXA-70063/6CF w/ Mount Pipe	137	(2) LGP21401 TMA	117
BXA-171063/8BF w/ Mount Pipe	137	(3) T-Arms	117
BXA-171063/8BF w/ Mount Pipe	137	7770.00 w/Mount Pipe	117
BXA-171063/8BF w/ Mount Pipe	137	(1) GPS	80
HBX-6517DS w/ Mount Pipe	137		
HBX-6517DS w/ Mount Pipe	137		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 42.9%

 Tower Analysis	FDH Engineering, Inc. 6521 Meridien Drive Raleigh, NC 27616 Phone: (919) 755-1012 FAX: (919) 755-1031	Job: Oxford 3, CT03109-S-00
		Project: 1422J21400 Client: SBA Network Services, Inc. Code: TIA/EIA-222-F Path:
		Drawn by: Jarel Duncan Date: 02/12/14 Scale: NTS Dwg No. E-1