STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

IN RE:	:	
	:	
A PETITION OF CELLCO PARTNERSHIP D/B/A VERIZON WIRELESS FOR A DECLARATORY RULING FOR APPROVAL OF AN ELIGIBLE FACILITY REQUEST FOR MODIFICATIONS TO AN EXISTING TELECOMMUNICATIONS TOWER AT 237 SANDY HOLLOW ROAD, MYSTIC, CONNECTICUT	:	SUB-PETITION NO. 1133 237 SANDY HOLLOW ROAD MYSTIC, CONNECTICUT
	:	NOVEMBER 3, 2015

SUB-PETITION FOR DECLARATORY RULING:
ELIGIBLE FACILITIES REQUEST FOR MODIFICATIONS
THAT WILL NOT SUBSTANTIALLY CHANGE THE
PHYSICAL DIMENSIONS OF AN EXISTING TOWER

I. Introduction

Pursuant to Section 6409(a) of the Middle Class Tax Relief and Job Creation Act of 2012, codified at 47 U.S.C. § 1455(a) ("Section 6409(a)") and the October 21, 2014 Report and Order (FCC-14-533) issued by the Federal Communications Commission ("FCC") (the "FCC Order"), Cellco Partnership d/b/a Verizon Wireless ("Cellco") hereby petitions the Connecticut Siting Council (the "Council") for a declaratory ruling ("Sub-Petition") that the proposed modifications to the existing SBA Network Services, Inc. ("SBA") telecommunications facility at 237 Sandy Hollow Road in Mystic (City of Groton), Connecticut (the "Property") constitutes an Eligible Facilities Request ("EFR") under the FCC Order. The Property is owned by the Mystic River Ambulance Association ("MRAA"). Cellco has designated this cell site as its Mystic West Facility.

II. Factual Background

SBA maintains an existing 130-foot monopole tower on the Property. The Property, a

3.35-acre parcel, is surrounded by residential uses, undeveloped land and Interstate 95. *See* Attachment 1 – Site Vicinity and Site Schematic Maps (Aerial Photograph). The tower is currently shared by T-Mobile, with antennas at the 127-foot level. Equipment associated with the T-Mobile antennas is located on the ground to the south of the tower. The Council's database also lists Metro PCS as a carrier with antennas at the 117-foot level on the tower. As referenced in the attached Structural Analysis, the Metro PCS site will be decommissioned and its antennas will be removed from the tower.

Cellco is licensed to provide wireless telecommunications services in the 850 MHz, 1900 MHz, 700 MHz and 2100 MHz frequency ranges in Mystic and throughout the State of Connecticut. Initially, the proposed Mystic West Facility described above will provide wireless service in Cellco's 2100 MHz frequency range only. The Mystic West Facility is designed to provide additional coverage and off-load network capacity from Cellco's existing cell sites in the area.

III. Proposed Mystic West Facility

Cellco will install four (4) panel antennas (Model LNX-6513DS) and four (4) remote radio heads ("RRHs") (Model RRH2x60-AWS) at a height of 117 feet above ground level ("AGL") on the existing tower. Cellco will install two (2) equipment cabinets on an existing 10' x 16' concrete pad to the south of the tower. Power and telephone service will extend from the existing utility service at the tower site. Project Plans for the Mystic West Facility are included in Attachment 2. Specifications for Cellco's antennas and RRHs are included in Attachment 3. A Structural Analysis confirming that the tower can accommodate Cellco's proposed facility modifications is included in Attachment 4.

IV. Discussion

A. The Proposed Modification Will Not Cause a Substantial Change to the Physical Dimensions of the Existing Base Station

Section 6409(a) provides, in relevant part, that "a State or local government may not deny, and shall approve, any eligible facilities request for a modification of an existing wireless tower or base station that does not substantially change the physical dimensions of such tower or base station." Pursuant to the FCC Order, the proposed modification does not substantially change the physical dimensions of the base station if the following criteria are satisfied.

1. *The proposed modified facility will not increase the height of the base station by more than ten (10) percent or ten (10) feet, whichever is greater.* Cellco proposes to install its antennas at the 117-foot level on the existing 130-foot monopole tower.

2. *The proposed facility will not protrude from the edge of the structure more than six (6) feet.* The proposed antennas and mounting structures will not protrude more than six (6) feet from the existing tower structure.

3. *The proposed facility does not involve installation of more than the standard number of new equipment cabinets for the technology involved, but not to exceed four cabinets.* Cellco intends to install two (2) small equipment cabinets on an existing concrete pad.

4. *The proposed facility does not entail any excavation or deployment outside the current site of the base station.* No excavation or site development activity will occur outside the limits of the Property.

5. *The proposed facility does not defeat the existing concealment elements of the base station.* No concealment elements have been incorporated into the existing tower structure.

6. *The proposed facility complies with conditions associated with the prior approval of construction or modification of the base station.* None of the elements of Cellco's proposed facility conflict with any of the existing facility improvements or prior approvals for the shared use of the tower.

B. FCC Compliance

Radio frequency ("RF") emissions from Cellco's proposed installation will be below the standards adopted by the FCC. Included in Attachment 5 is a worst-case General Power Density table for Cellco's proposed base station modifications.

C. Notice to the Town, Property Owner and Abutting Landowners

On November 3, 2015, a copy of this Sub-Petition was sent to the Mayor of the City of Groton Marian K. Galbraith, MRAA the Owner of the Property and SBA, the tower owner. *See* Attachment 6. Copies of this Sub-Petition were also sent to the owners of land that abuts the Property. A sample abutter's cover letter and the list of those abutting landowners who were sent notice of the filing of the Sub-Petition is included in Attachment 7.

V. Conclusion

Based on the information provided above, Cellco respectfully submits that the proposed modification of the existing base station at the Property constitutes an "eligible facilities request" under Section 6409(a) and the FCC Order.

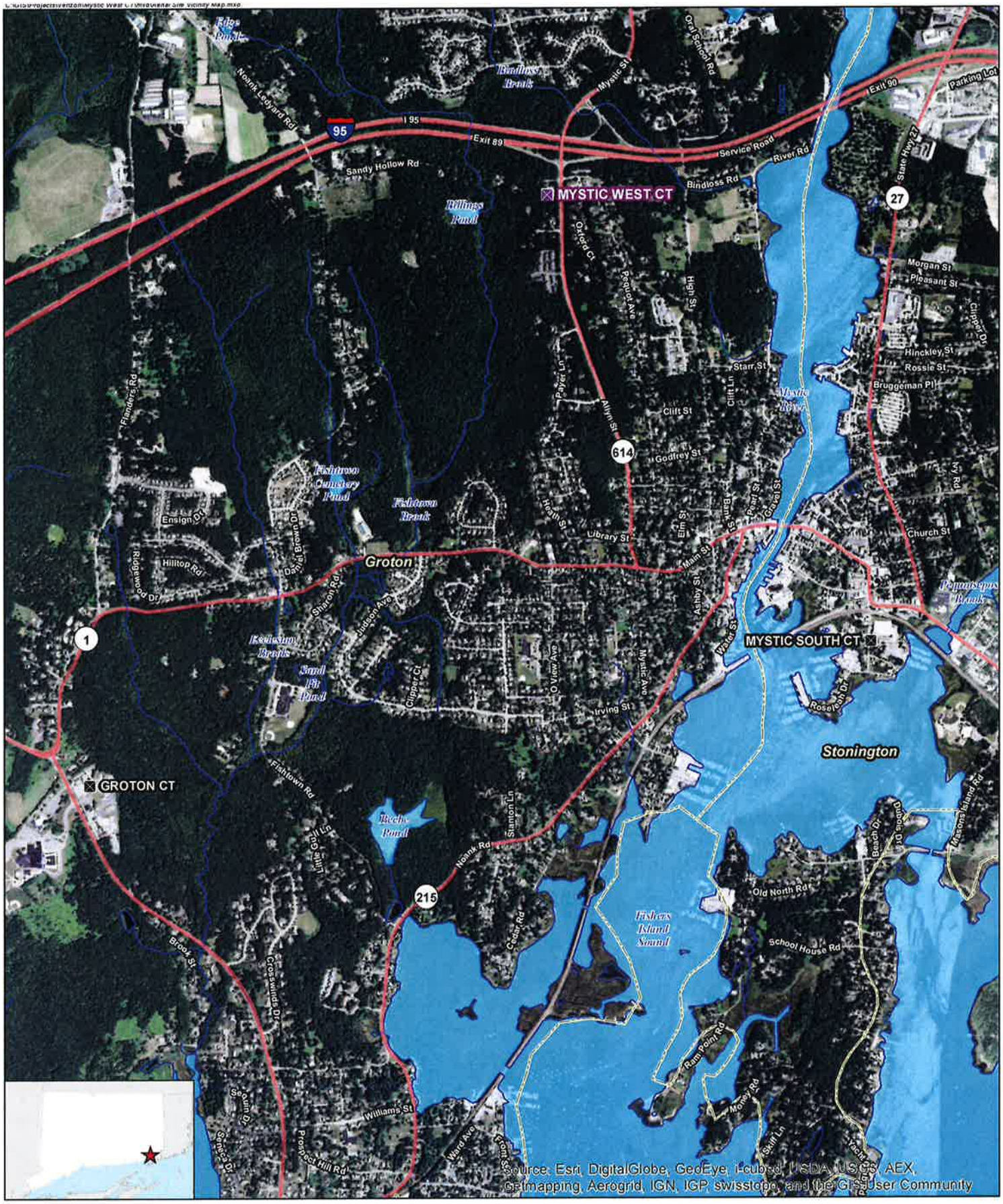
Respectfully submitted,

CELLCO PARTNERSHIP d/b/a VERIZON WIRELESS

By _____

Kenneth C. Baldwin, Esq.
Robinson & Cole LLP
280 Trumbull Street
Hartford, CT 06103-3597
(860) 275-8200
Its Attorneys

ATTACHMENT 1



Legend

- Proposed Verizon Wireless Facility
- Surrounding Verizon Wireless Facilities
- Municipal Boundary
- Watercourse
- Waterbody

Base Map Source: ESRI World Imagery, NAIP 7/12/2014
Map Scale: 1 inch = 2,083 feet
Map Date: August 2015

2,000 1,000 0 2,000 Feet

Site Vicinity Map

Proposed Wireless
Telecommunications Facility
Mystic West CT
237 Sandy Hollow Road
Groton, Connecticut

Legend

Subject Property

Existing Fenced Facility Compound (by others)

Site Schematic

Proposed Wireless
Telecommunications Facility
Mystic West CT
237 Sandy Hollow Road
Groton, Connecticut

verizonwireless

ALL-POINTS

N
W E
S

100 50 0 100 Feet

Map Notes:
Base Map Source: ESRI World Imagery, NAIP 7/12/2014
Map Scale: 1 inch = 100 feet
Map Date: August 2015

ATTACHMENT 2

Cellco Partnership

d.b.a. verizon wireless

WIRELESS COMMUNICATIONS FACILITY

MYSTIC WEST CT
237 SANDY HOLLOW ROAD
MYSTIC, CT 06355

SITE DIRECTIONS

FROM: 99 EAST RIVER DRIVE, EAST HARTFORD, CONNECTICUT **TO:** 237 SANDY HOLLOW ROAD, MYSTIC, CT 06355

1. Start out going northeast on E River Dr	0.9 mi
2. Merge onto I-84 E/US-6 via the ramp on the left toward CT-2 E/Norwich	0.2 mi
3. Merge onto CT-2 E via EXIT 55 toward Norwich/New London	23.8 mi
4. Keep right to take CT-11 S via EXIT 19 toward New London	7.6 mi
5. Take E Haddam Rd/CT-82 toward Salem/Montville/Norwich/New London	1.2 mi
6. Enter next roundabout and take the 1st exit onto CT-85	10.4 mi
7. Take I-95 N	3.8 mi
8. Merge onto CT-349/Clarence B Sharp HWY via EXIT 87	1.8 mi
9. Turn right onto Rainville Ave/CT-349 continue to follow CT-349	0.5 mi

GENERAL NOTES

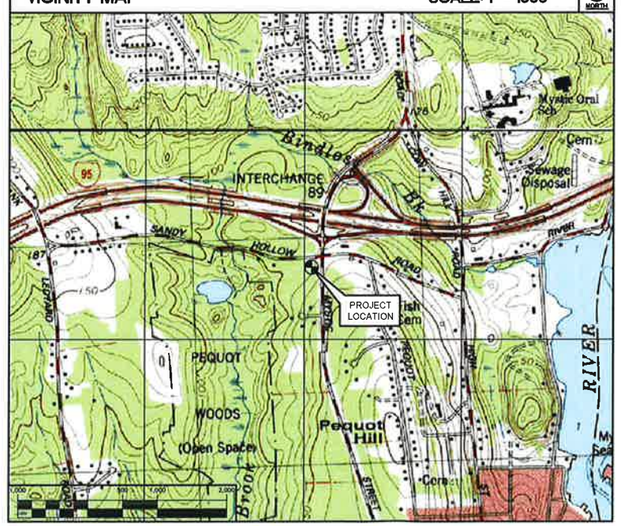
1. PROPOSED ANTENNA LOCATIONS AND HEIGHTS PROVIDED BY CELLCO PARTNERSHIP.

PROJECT SCOPE

1. THE PROPOSED SCOPE OF WORK GENERALLY INCLUDES INSTALLATION OF CELLCO PARTNERSHIP EQUIPMENT CABINETS ON AN ABANDONED 10'x16' CONCRETE PAD.
2. A TOTAL OF (4) PANEL ANTENNAS AND (4) RRH'S ARE PROPOSED TO BE MOUNTED ON EXISTING MONOPOLE WITH AN ANTENNA CENTERLINE ELEVATION OF 117' A.G.L.
3. ELECTRIC AND TELCO UTILITIES SHALL BE ROUTED FROM EXISTING/PROPOSED DEMARCS TO PROPOSED EQUIPMENT.
4. THE PROPOSED WIRELESS FACILITY INSTALLATION WILL BE DESIGNED IN ACCORDANCE WITH THE 2003 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2009 CONNECTICUT SUPPLEMENT.

VICINITY MAP

SCALE: 1" = 1000'



PROJECT SUMMARY

SITE NAME:	MYSTIC WEST CT
SITE ADDRESS:	237 SANDY HOLLOW ROAD MYSTIC, CT 06355
LESSEE/TENANT:	CELLCO PARTNERSHIP d.b.a. VERIZON WIRELESS 99 EAST RIVER DRIVE EAST HARTFORD, CT 06108
VERIZON SITE ACQUISITION CONTACT:	HOLLIS REDDING CELLCO PARTNERSHIP (860) 966-0989
LEGAL/REGULATORY COUNSEL:	KENNETH C. BALDWIN, ESQ. ROBINSON & COLE LLP (860) 257-8345
SITE COORDINATES:	LAT.: 41°-22'-9.4" N LNG.: 71°-58'-56.7" W
GROUND ELEVATION:	127'± A.M.S.L. SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM THE CONNECTICUT SITING COUNCIL DATABASE.

SHEET INDEX

SHT. NO.	DESCRIPTION	REV. NO.
T-1	TITLE SHEET	1
C-1	ABUTTERS MAP	1
C-2	PARTIAL SITE PLAN, TOWER ELEVATION AND ANTENNA CONFIGURATION	1

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
1	11/02/15	KAMJR	DMD	CSC
0	09/29/15	KAMJR	DMD	CSC - ISSUED FOR CLIENT REVIEW

PROFESSIONAL ENGINEER SEAL

Cellco Partnership d.b.a. verizon wireless

CENTEK engineering
Centered on Solutions
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

Cellco Partnership d/b/a Verizon Wireless
WIRELESS COMMUNICATIONS FACILITY
MYSTIC WEST
237 SANDY HOLLOW ROAD
MYSTIC, CT 06355

DATE: 09/02/15
SCALE: AS NOTED
JOB NO. 15108.000

TITLE SHEET

T-1

Sheet No. 1 of 3

MUNICIPALITY NOTIFICATION LIMIT MAP

1 / C-1 ABUTTERS MAP
SCALE: 1" = 100'

APPROXIMATE NORTH

GRAPHIC SCALE
100 0 50 100 200 400
(IN FEET)
1 inch = 100 ft.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
1	11/02/15	KAMJR	DMD	CSC
0	09/29/15	KAMJR	DMD	CSC - ISSUED FOR CLIENT REVIEW

PROFESSIONAL ENGINEER SEAL

Cellco Partnership d/b/a Verizon wireless

CENTEK engineering
Centered on Solutions℠
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

Cellco Partnership d/b/a Verizon Wireless

WIRELESS COMMUNICATIONS FACILITY

MYSTIC WEST

237 SANDY HOLLOW ROAD
MYSTIC, CT 06355

DATE: 09/02/15
SCALE: AS NOTED
JOB NO. 15108.000

ABUTTERS MAP

C-1

Sheet No. 2 of 3

PROPOSED AWS ANTENNA
MODEL: MODEL HBX-6513DS
TYP. OF (4) 2 ANTENNAS PER SECTOR
(DIMS: 27.4"L x 6.5 x 3.3")

PROPOSED AWS RRH
MODEL: MODEL RRH-2X60 AWS
TYP. OF (4) 2 RRH'S PER SECTOR
MOUNTED BEHIND ANTENNA ON ANTENNA MOUNTING MAST, TYP.
(DIMS: 24.4"L x 10.63 x 6.7")

℄ PROPOSED PROPOSED CELLCO PARTNERSHIP ANTENNAS
EL. 117'± A.G.L.

℄

ELEVATION

PROPOSED CELLCO PARTNERSHIP AWS RRH MOUNTED ANTENNA MAST.
(2) PER SECTOR, TOTAL OF (4),
MODEL: **RRH-2X60**
(DIMS: 24.4"H 10.63"W x 6.7"D)

PROPOSED CELLCO PARTNERSHIP LOW PROFILE ANTENNA MOUNTING PLATFORM.

PROPOSED CELLCO PARTNERSHIP ANTENNA, TYP. OF (2) PER SECTOR, TOTAL OF (4),
MODEL: **HBX-6513DS-A1M**
(DIMS: 27.4"L x 6.5"W x 3.3"D)

TRUE NORTH

340° BETA SECTOR

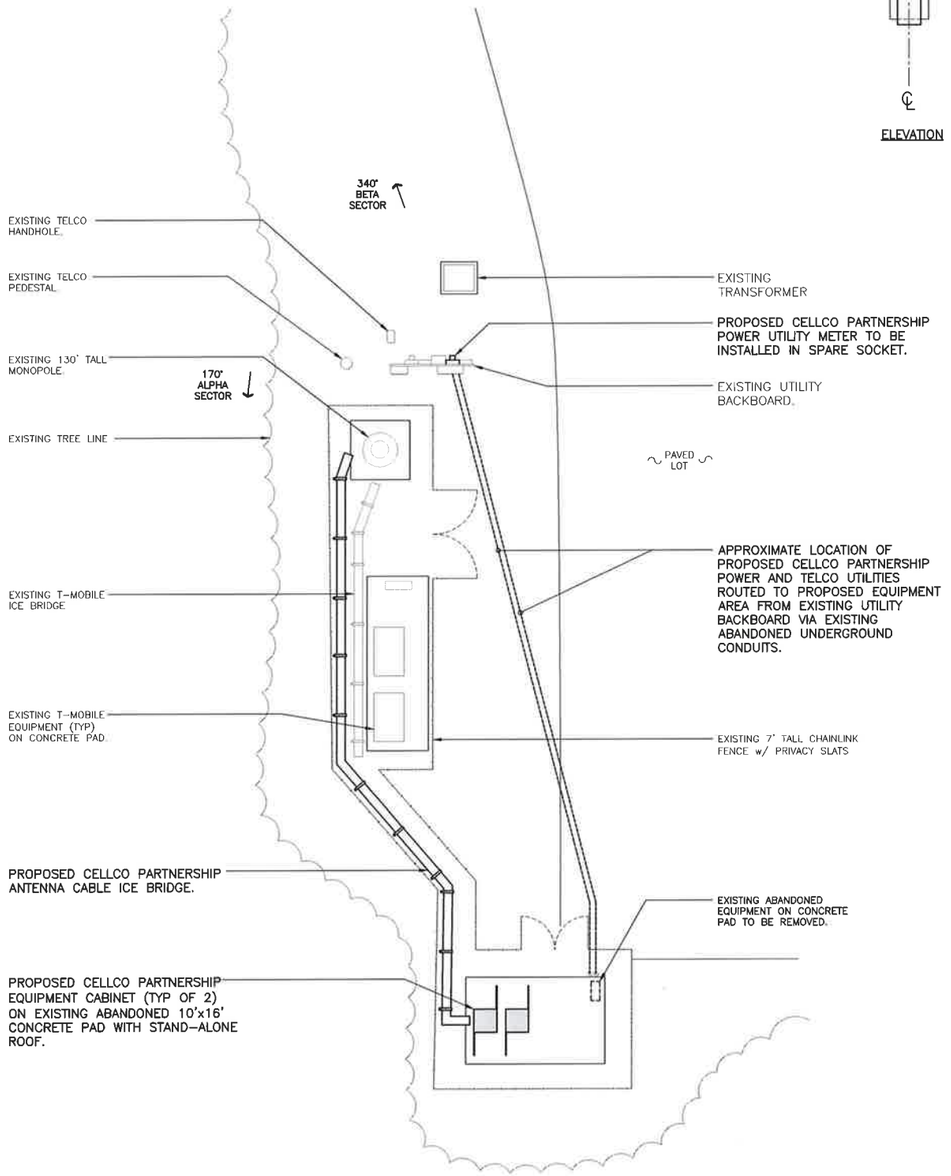
170° ALPHA SECTOR

4'±

4'±

PLAN

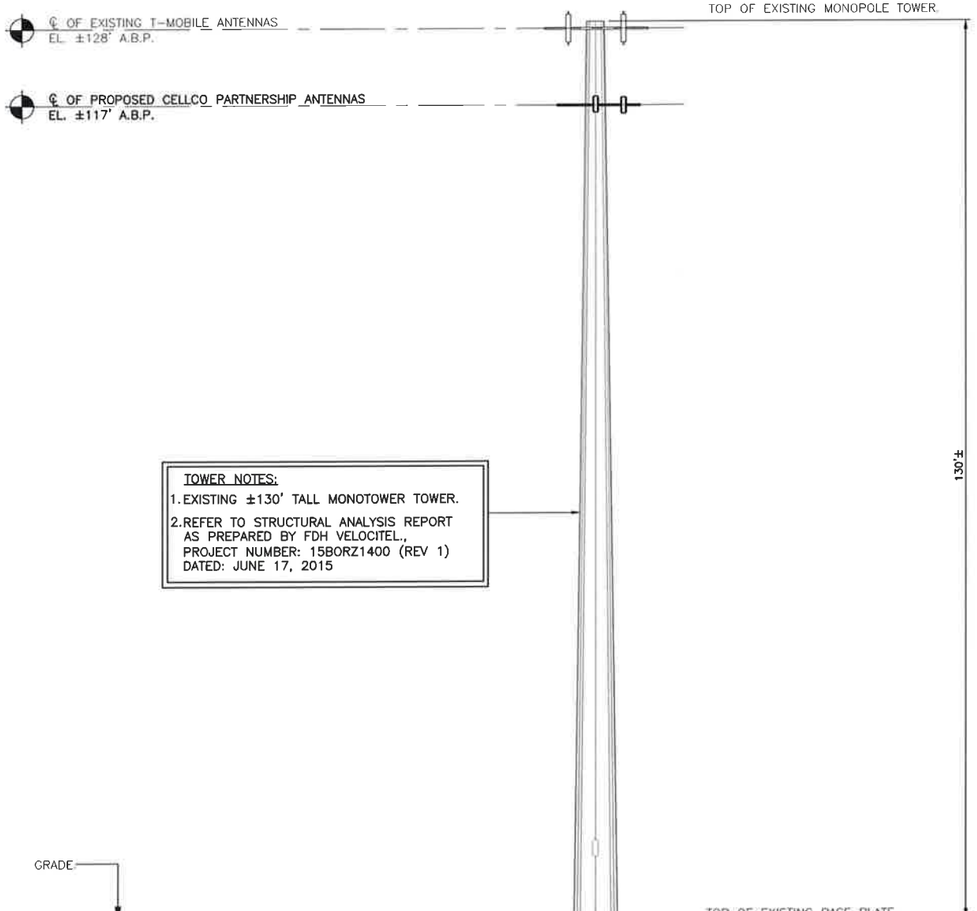
3 C-2 ANTENNA MOUNTING CONFIGURATION
SCALE N.T.S



1 C-2 PARTIAL SITE PLAN
SCALE: 1" = 10'

APPROXIMATE NORTH

GRAPHIC SCALE
(IN FEET)
1 inch = 10 ft.



TOWER NOTES:
1. EXISTING ±130' TALL MONOTOWER TOWER.
2. REFER TO STRUCTURAL ANALYSIS REPORT AS PREPARED BY FDH VELOCITEL., PROJECT NUMBER: 15BORZ1400 (REV 1) DATED: JUNE 17, 2015

2 C-2 TOWER ELEVATION
SCALE: 1" = 10'

GRAPHIC SCALE
(IN FEET)
1 inch = 10 ft.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
1	11/02/15	KAMJR	DMD	CSC
0	09/29/15	KAMJR	DMD	CSC - ISSUED FOR CLIENT REVIEW

PROFESSIONAL ENGINEER SEAL

Cellco Partnership d.b.a. Verizon Wireless

CENTEK engineering
Centered on Solutions
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

Cellco Partnership d/b/a Verizon Wireless
WIRELESS COMMUNICATIONS FACILITY
MYSTIC WEST
237 SANDY HOLLOW ROAD
MYSTIC, CT 06355

DATE: 09/02/15
SCALE: AS NOTED
JOB NO. 15108.000

PARTIAL SITE PLAN, TOWER ELEVATION & ANTENNA CONFIG.

C-2

Sheet No. 3 of 3

ATTACHMENT 3

Product Specifications

COMMSCOPE®

POWERED BY ANDREW.

LNX-6513DS-VTM

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

- Extended tilt range offers better coverage
- Great solution to maximize network coverage and capacity
- Excellent gain, VSWR, front-to-back ratio, and PIM specifications for robust network performance
- 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	14.6	15.1
Beamwidth, Horizontal, degrees	65	65
Beamwidth, Horizontal Tolerance, degrees	±3	±3
Beamwidth, Vertical, degrees	16.0	14.5
Beam Tilt, degrees	0–10	0–10
USLS, typical, dB	20	20
Front-to-Back Ratio at 180°, dB	30	30
CPR at Boresight, dB	12	12
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
Connector Interface	7-16 DIN Female
Connector Location	Bottom
Connector Quantity, total	2
Lightning Protection	dc Ground
Radiator Material	Aluminum
Radome Material	Fiberglass, UV resistant
Wind Loading, maximum	437.9 N @ 150 km/h 98.4 lbf @ 150 km/h
Wind Speed, maximum	241.0 km/h | 149.8 mph

Dimensions

Depth	181.0 mm | 7.1 in

Product Specifications

LNX-6513DS-VTM

Length	1390.0 mm | 54.7 in
Width	301.0 mm | 11.9 in
Net Weight	14.1 kg | 31.1 lb

Remote Electrical Tilt (RET) Information

Model with Factory Installed AISG 1.1 Actuator	LNX-6513DS-R2M
Model with Factory Installed AISG 2.0 Actuator	LNX-6513DS-A1M
RET System	Teletilt®

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

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.

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	2 Branch RX – LA6.0.1
	1900A HW version	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)

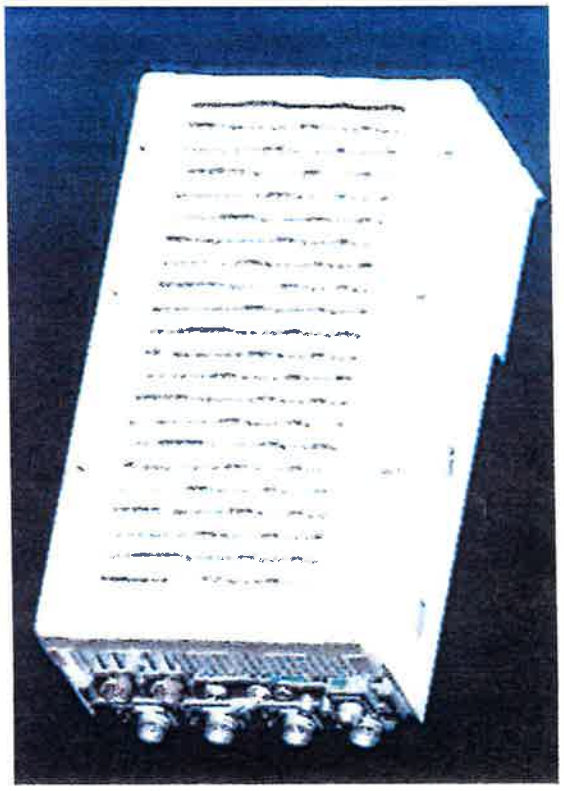
** Not a Verizon Wireless deployed product

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
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.

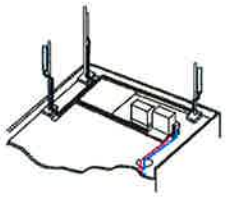
EASY INSTALLATION

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.

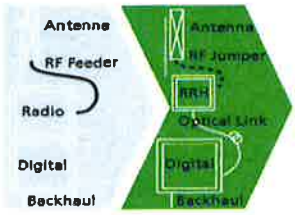
The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment. However, many of these sites can host an Alcatel-Lucent RRH2x60-AWS installation, providing more flexible site selection and improved network quality along with greatly reduced installation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

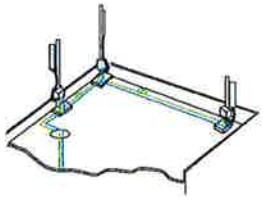
Installation can easily be done by a single person as the Alcatel–Lucent RRH2x60-AWS is compact and weighs about 20 kg, eliminating the need for a crane to hoist the BTS cabinet to the rooftop. A site can be in operation in less than one day.



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™

ATTACHMENT 4

Structural Analysis for SBA Network Services, Inc.

130' Monopole Tower

SBA Site Name: Groton 2
SBA Site ID: CT11561-A-03
Verizon Site ID: 381297

FDH Velocitel Project Number 15BORZ1400 (R1)

Analysis Results

Tower Components	41.3%	Sufficient
Foundation	33.1%	Sufficient

Prepared By:

Phylicia D. Hicks
Project Engineer

Reviewed By:

Dennis D. Abel, PE
Director of Structural Engineering
CT PE License No. 23247

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

06-17-2015

June 17, 2015

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

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 Velocitel performed a structural analysis of the monopole located in Groton, 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 the *2005 Connecticut Building Code (CBC)*. Information pertaining to the existing/proposed antenna loading, current tower geometry, geotechnical data, foundation dimensions and member sizes was obtained from:

- Fred A. Nudd Corporation (Project No. 208-13077) Design of 130' Monopole Tower dated May 9, 2008
- FDH, Inc. (Job No. 08-08060T) TIA Inspection Report dated November 6, 2008
- FDH Engineering, Inc. (Project No. 1424W71600) Geotechnical Evaluation of Subsurface Conditions dated March 26, 2014
- SBA Network Services, Inc.

The *basic design wind speed* per the *TIA/EIA-222-F* standards and the *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 proposed antennas from Verizon in place at 117 ft., the tower meets the requirements of the *TIA/EIA-222-F* standards and *2005 CBC*. Furthermore, provided the foundation was constructed per the original design drawings (see Fred A. Nudd Corporation Project No. 208-13077), and given the existing soil parameters (see FDH Engineering, Inc. Project No. 1424W71600), the foundation 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 Velocitel 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 should be installed inside the pole's shaft unless otherwise noted.
2. RRU/RRH Stipulation: The proposed equipment should be installed behind the proposed panels.

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 Velocitel 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
129	(3) Ericsson Air B2A B4P (3) Ericsson Air B4A B2P (3) Ericsson KRY112 144 TMAs	(12) 1-5/8" (1) 1-5/8" Fiber	T-Mobile	128	(1) Low Profile Platform (CaAa = 18.01 ft²)
117[2]	(6) Kathrein 800 10504	(12) 1-5/8" (1) 3/8" RET	Metro PCS	117	(1) Low Profile Platform (CaAa = 14.49 ft²)

1. Coax installed inside pole's shaft unless otherwise noted.
2. Metro PCS equipment decommissioned; to be removed.

Proposed Carrier Final Loading:

Antenna Elevation (ft)	Description	Coax and Lines[1]	Carrier	Mount Elevation (ft)	Mount Type
117	(4) Commscope HBX-6513DS-A1M (2) Alcatel-lucent RRH 2x60 PCS (2) Alcatel-lucent RRH 2x60 AWS	(2) 1-5/8" Fibers	Verizon	117	(1) Low Profile Platform [Site Pro RMQP]

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	50 ksi
Anchor Bolts	105 ksi
Flange Plate @ 90'	50 ksi
Flange Bolts @ 90'	92 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 Velocitel 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	130 - 90	Pole	TP31.5625x24x0.1875	36.4	Pass
---	90	Flange Bolts	(18) 7/8" Ø w/ BC = 36"	43.7	Pass
---	90	Flange Plate	PL 41" Ø x 1.75" thk.	15.9	Pass
L2	90 - 45	Pole	TP40.125x31.5625x0.3125	35.9	Pass
L3	45 - 0	Pole	TP48x38.5486x0.375	41.3	Pass
---	0	Anchor Bolts	(12) 2.25" Ø w/ BC = 54"	38.8	Pass
---	0	Base Plate	PL 60" Ø x 2.5" thk.	27.6	Pass

*Capacities include 1/3 allowable increase for wind.

Table 4 - Maximum Base Reactions

Base Reactions	Current Analysis* *(TIA/EIA-222-F)*	Original Design *(ANSI/TIA-222-G)*
Axial	22 k	28 k
Shear	14 k	23 k
Moment	1,170 k-ft	2,189 k-ft

* Foundation determined to be adequate per independent analysis.

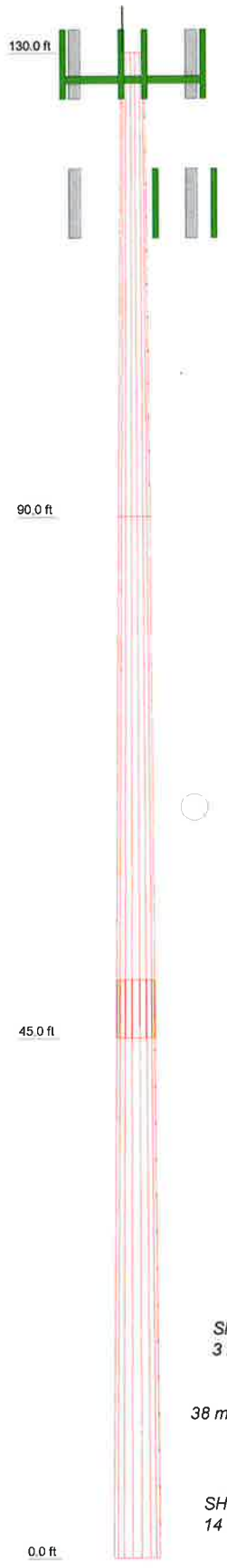
GENERAL COMMENTS

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 Velocitel 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 Velocitel.

APPENDIX



Section	1	2	3
Length (ft)	40.00	45.00	50.00
Number of Sides	18	18	18
Thickness (in)	0.1875	0.3125	0.3750
Socket Length (ft)		5.00	
Top Dia (in)	24.0000	31.5625	38.5486
Bot Dia (in)	31.5625	40.1250	48.0000
Grade		A572-65	
Weight (K)	2.2	5.4	8.7

Total Weight: 16.3

DESIGNED APPURTENANCE LOADING

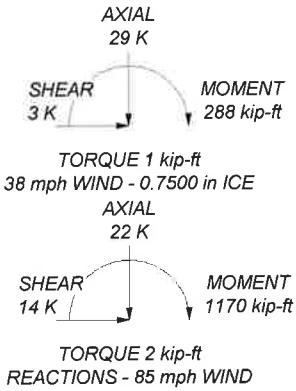
TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod	130	Pipe Mount	128
AIR B2A B4P w/Mount Pipe	128	Pipe Mount	128
AIR B2A B4P w/Mount Pipe	128	Pipe Mount	128
AIR B4A B2P w/Mount Pipe	128	AIR B2A B4P w/Mount Pipe	128
AIR B4A B2P w/Mount Pipe	128	(2) HBX-6513DS-A1M w/ Mount Pipe	117
AIR B4A B2P w/Mount Pipe	128	(2) HBX-6513DS-A1M w/ Mount Pipe	117
KRY112 144	128	(2) RRH-2x60-PCS	117
KRY112 144	128	(2) RRH 2x60-AWS	117
KRY112 144	128	Site Pro RMQP	117
12.5' Low Profile Platform	128		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 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: 41.3%



FDH VELOCITEL
Tower Analysis

Velocitel, Inc., d.b.a. FDH Velocitel
6521 Meridien Drive
Raleigh, North Carolina 27616
Phone: 9197551012
FAX: 9197551031

Job:	***Groton 2, CT11561-A-03***		
Project:	***15BORZ1400 (R1)***		
Client:	SBA Network Services, Inc.	Drawn by: PHicks	App'd:
Code:	TIA/EIA-222-F	Date: 06/17/15	Scale: N
Path:			Dwg No.

ATTACHMENT 5

	General	Power	Density					
Site Name: Mystic W CT								
Tower Height: 130ft								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*T-Mobile GSM/UMTS	2	12	129	0.0006	1950	1.0000	0.01%	
*T-Mobile UMTS	2	16	129	0.0008	2100	1.0000	0.01%	
*T-Mobile LTE	2	24	129	0.0011	2100	1.0000	0.01%	
Verizon PCS	**0**	**1676**	**117**	**0.0000**	**1970**	**1.0000**	**0.00%**	
Verizon Cellular	**0**	**252**	**117**	**0.0000**	**869**	**0.5793**	**0.00%**	
Verizon AWS	**1**	**1057**	**117**	**0.0278**	**2145**	**1.0000**	**2.78%**	
Verizon 700	**0**	**1078**	**117**	**0.0000**	**746**	**0.4973**	**0.00%**	
								2.81%
* Source: Siting Council								

ATTACHMENT 6

Robinson + Cole

KENNETH C. BALDWIN

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

November 3, 2015

Via Certificate of Mailing

Marian K. Galbraith, Mayor
City of Groton
295 Meridian Street
Groton, CT 06340

Re: **Proposed Installation of a "Small Cell" Telecommunications Facility on Property at 237 Sandy Hollow Road, Mystic, Connecticut**

Dear Mayor Galbraith:

This firm represents Cellco Partnership d/b/a Verizon Wireless ("Cellco"). Today, Cellco filed a Sub-Petition for Declaratory Ruling ("Sub-Petition") with the Connecticut Siting Council ("Council") seeking approval to install antennas and related equipment on the existing tower at 237 Sandy Hollow Road in Mystic (City of Groton) (the "Property"). Cellco intends to install four (4) antennas and four (4) remote radio heads at the 117-foot level on the tower. Two (2) equipment cabinets will be installed on an existing 10' x 16' concrete pad near the base of the tower.

As presented in the Sub-Petition, the proposed facility improvements at the Property constitute an eligible facility request pursuant to Section 6409(a) of the Federal Middle Class Tax Relief and Job Creation act of 2012 (47 U.S.C. § 1455(a)) and the October 21, 2014 Order of the Federal Communications Commission (FCC-14-533). A copy of the full Sub-Petition is attached for your review. Landowners whose property abuts the Property were also sent notice of this filing along with a copy of the Sub-Petition.

Pursuant to its decision in Petition No. 1133, comments or concerns regarding this proposal should be submitted to the Council within thirty (30) days of the date of the attached Sub-Petition.

Please contact me if you have any questions regarding this proposal.

Sincerely,

Kenneth C. Baldwin

Attachment

Robinson + Cole

KENNETH C. BALDWIN

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

November 3, 2015

Via Certificate of Mailing

Mystic River Ambulance Association
237 Sandy Hollow Road
Mystic, CT 06355

Re: **Proposed Installation of a "Small Cell" Telecommunications Facility on Property at 237 Sandy Hollow Road, Mystic, Connecticut**

Dear Sir or Madam:

This firm represents Cellco Partnership d/b/a Verizon Wireless ("Cellco"). Today, Cellco filed a Sub-Petition for Declaratory Ruling ("Sub-Petition") with the Connecticut Siting Council ("Council") seeking approval to install antennas and related equipment on the existing tower at 237 Sandy Hollow Road in Mystic (City of Groton) (the "Property"). Cellco intends to install four (4) antennas and four (4) remote radio heads at the 117-foot level on the tower. Two (2) equipment cabinets will be installed on an existing 10' x 16' concrete pad near the base of the tower.

As presented in the Sub-Petition, the proposed facility improvements at the Property constitute an eligible facility request pursuant to Section 6409(a) of the Federal Middle Class Tax Relief and Job Creation act of 2012 (47 U.S.C. § 1455(a)) and the October 21, 2014 Order of the Federal Communications Commission (FCC-14-533). A copy of the full Sub-Petition is attached for your review. Landowners whose property abuts the Property were also sent notice of this filing along with a copy of the Sub-Petition.

Pursuant to its decision in Petition No. 1133, comments or concerns regarding this proposal should be submitted to the Council within thirty (30) days of the date of the attached Sub-Petition.

Robinson + Cole

Please contact me if you have any questions regarding this proposal.

Sincerely,

Kenneth C. Baldwin

Attachment

Robinson + Cole

KENNETH C. BALDWIN

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

November 3, 2015

Via Certificate of Mailing

Michael Villa
SBA Communications Corporation
8051 Congress Avenue
Boca Raton, FL 33487-1307

Re: **Proposed Installation of a "Small Cell" Telecommunications Facility on Property at 237 Sandy Hollow Road, Mystic, Connecticut**

Dear Mr. Villa:

This firm represents Cellco Partnership d/b/a Verizon Wireless ("Cellco"). Today, Cellco filed a Sub-Petition for Declaratory Ruling ("Sub-Petition") with the Connecticut Siting Council ("Council") seeking approval to install antennas and related equipment on the existing tower at 237 Sandy Hollow Road in Mystic (City of Groton) (the "Property"). Cellco intends to install four (4) antennas and four (4) remote radio heads at the 117-foot level on the tower. Two (2) equipment cabinets will be installed on an existing 10' x 16' concrete pad near the base of the tower.

As presented in the Sub-Petition, the proposed facility improvements at the Property constitute an eligible facility request pursuant to Section 6409(a) of the Federal Middle Class Tax Relief and Job Creation act of 2012 (47 U.S.C. § 1455(a)) and the October 21, 2014 Order of the Federal Communications Commission (FCC-14-533). A copy of the full Sub-Petition is attached for your review. Landowners whose property abuts the Property were also sent notice of this filing along with a copy of the Sub-Petition.

Pursuant to its decision in Petition No. 1133, comments or concerns regarding this proposal should be submitted to the Council within thirty (30) days of the date of the attached Sub-Petition.

Robinson + Cole

Please contact me if you have any questions regarding this proposal.

Sincerely,

Kenneth C. Baldwin

Attachment

ATTACHMENT 7

KENNETH C. BALDWIN

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

November 3, 2015

Via Certificate of Mailing

«Name_and_Address»

Re: **Proposed Installation of a "Small Cell) Telecommunications Facility at 237 Sandy Hollow Road, Mystic, Connecticut**

Dear «Salutation»:

This firm represents Cellco Partnership d/b/a Verizon Wireless ("Cellco"). Today, Cellco filed a Sub-Petition for Declaratory Ruling ("Sub-Petition") with the Connecticut Siting Council ("Council") seeking approval to install antennas and related equipment on the existing tower at 237 Sandy Hollow Road in Mystic (City of Groton) (the "Property"). Cellco intends to install four (4) antennas and four (4) remote radio heads at the 117-foot level on the tower. Two (2) equipment cabinets will be installed on an existing 10' x 16' concrete pad near the base of the tower.

As presented in the Sub-Petition, the proposed facility improvements at the Property constitute an eligible facility request pursuant to Section 6409(a) of the Federal Middle Class Tax Relief and Job Creation act of 2012 (47 U.S.C. § 1455(a)) and the October 21, 2014 Order of the Federal Communications Commission (FCC-14-533). A copy of the full Sub-Petition is attached for your review.

Pursuant to its decision in Petition No. 1133, comments or concerns regarding this proposal should be submitted to the Council within thirty (30) days of the date of the attached Sub-Petition.

This notice is being sent to you because you are listed as an owner of land that abuts the Property. If you have any questions regarding the Sub-Petition, the Council's process for reviewing the Sub-Petition or the details of the filing itself, please feel free to contact me at the number listed above. You may also contact the Council directly at 860-827-2935.

Sincerely,

Kenneth C. Baldwin

Attachment

CELLCO PARTNERSHIP D/B/A VERIZON WIRELESS

ABUTTING PROPERTY OWNERS

237 SANDY HOLLOW ROAD, GROTON, CONNECTICUT

	Property Address	Owner's and Mailing Address
1.	289 Sandy Hollow Road	Linda A. and Walter J. Roderick 289 Sandy Hollow Road Mystic, CT 06355
2.	Sandy Hollow Road	John A. Leuba, Et Al. 585 High Street Mystic, CT 06355
3.	200 Sandy Hollow Road	Mystic Professional Associates 200 Sandy Hollow Road Mystic, CT 06355
4.	195 Sandy Hollow Road	Bohonowicz & Eckersley LLC 195 Sandy Hollow Road Mystic, CT 06355
5.	71 Oxford Court	Christopher J. and Marlynn Odonnell 71 Oxford Court Mystic, CT 06355
6.	12 Stone Hill Drive	Charles E. and Marilyn H. Stevens 12 Stone Hill Drive Mystic, CT 06355
7.	20 Stone Hill Drive	Allison Johnson 20 Stone Hill Drive Mystic, CT 06355
8.	30 Stone Hill Drive	Virginia D. Bitting 30 Stone Hill Drive Mystic, CT 06355