Robinson+Cole

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Also admitted in Massachusetts

March 25, 2015

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

Re: **Notice of Exempt Modification – Facility Modification**
331 Killingworth Road ((Route 80), Guilford, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) wireless telecommunications antennas at the 128-foot level on an existing 152-foot tower at 331 Killingworth Road in Guilford (the "Property"). The tower is owned by SBA. Cellco's use of the tower was approved by the Council in 2007. Cellco now intends to modify its facility by replacing all of its existing antennas with two (2) model LNX-6513DS-VTM, 700 MHz antennas; one (1) model LNX-6514DS-VTM, 700 MHz antenna; two (2) model LNX-6513DS-VTM, 850 MHz antennas; one (1) model LNX-6514DS-VTM, 850 MHz antenna; two (2) model HBXX-6516DS-VTM, 1900 MHz antennas; one (1) model HBXX-6517DS-VTM, 1900 MHz antenna; two (2) model HBXX-6516DS-VTM, 2100 MHz antennas; and one (1) model HBXX-6517DS-VTM, 2100 MHz antenna, 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 one (1) HYBRIFLEX™ antenna cable. Included in Attachment 1 are specifications for Cellco's replacement antennas, RRHs and HYBRIFLEX™ cable.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Joseph S. Mazza, First Selectman of the Town of Guilford. A copy of this letter is also being sent to David and Kathleen Acampora, 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).

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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 mounts at the 128-foot level on the tower.

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

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

4. The operation of the replacement antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. 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:
Joseph S. Mazza, Guilford First Selectman
David and Kathleen Acampora
Tim Parks

ATTACHMENT 1

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.

Product Specifications

COMMSCOPE®

LNX-6514DS-VTM

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

POWERED BY ANDREW.

Electrical Specifications

Frequency Band, MHz	698–806	806–896
Gain, dBi	15.7	16.3
Beamwidth, Horizontal, degrees	65	65
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°

Electrical Specifications, BASTA*

Frequency Band, MHz	698–806	806–896
Beamwidth, Horizontal Tolerance, degrees	±3	±3

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

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	14.2 kg | 31.3 lb
Model with factory installed AISG 2.0 RET	LNX-6514DS-A1M

Product Specifications

COMMSCOPE®

POWERED BY ANDREW.

HBXX-6516DS-VTM

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

- Each DualPol® array can be independently adjusted for greater flexibility
- Excellent gain, VSWR, front-to-back ratio, and PIM specifications for robust network performance
- Ideal choice for site collocations and tough zoning restrictions
- Great solution to maximize network coverage and capacity
- The values presented on this datasheet have been calculated based on N-P-BASTA White Paper version 9.6 by the NGMN Alliance

Electrical Specifications

Frequency Band, MHz	**1710–1880**	**1850–1990**	**1920–2180**
Gain by all Beam Tilts, average, dBi	17.2	17.2	17.5
Gain by all Beam Tilts Tolerance, dB	±0.3	±0.3	±0.5
Gain by Beam Tilt, average, dBi	0 ° | 17.0 5 ° | 17.3 10 ° | 17.0	0 ° | 17.1 5 ° | 17.4 10 ° | 17.0	0 ° | 17.4 5 ° | 17.7 10 ° | 17.2
Beamwidth, Horizontal, degrees	67	66	64
Beamwidth, Horizontal Tolerance, degrees	±2.7	±2.3	±3.5
Beamwidth, Vertical, degrees	7.5	7.0	6.6
Beamwidth, Vertical Tolerance, degrees	±0.5	±0.4	±0.4
Beam Tilt, degrees	0–10	0–10	0–10
USLS, dB	18	19	19
Front-to-Back Total Power at 180° ± 30°, dB	26	26	26
CPR at Boresight, dB	22	22	22
CPR at Sector, dB	9	9	9
Isolation, dB	30	30	30
VSWR | Return Loss, dB	1.4 | 15.6	1.4 | 15.6	1.4 | 15.6
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153
Input Power per Port, maximum, watts	350	350	350
Polarization	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm

General Specifications

Antenna Brand	Andrew®
Antenna Type	DualPol® single band, quad
Band	Single band
Brand	DualPol® | Teletilt®
Operating Frequency Band	1710 – 2180 MHz
Number of Ports, all types	4

Mechanical Specifications

Color	Light gray
Lightning Protection	dc Ground
Radiator Material	Low loss circuit board
Radome Material	PVC, UV resistant
RF Connector Interface	7-16 DIN Female

Product Specifications

COMMSCOPE®

HBXX-6517DS-VTM

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

POWERED BY ANDREW.

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

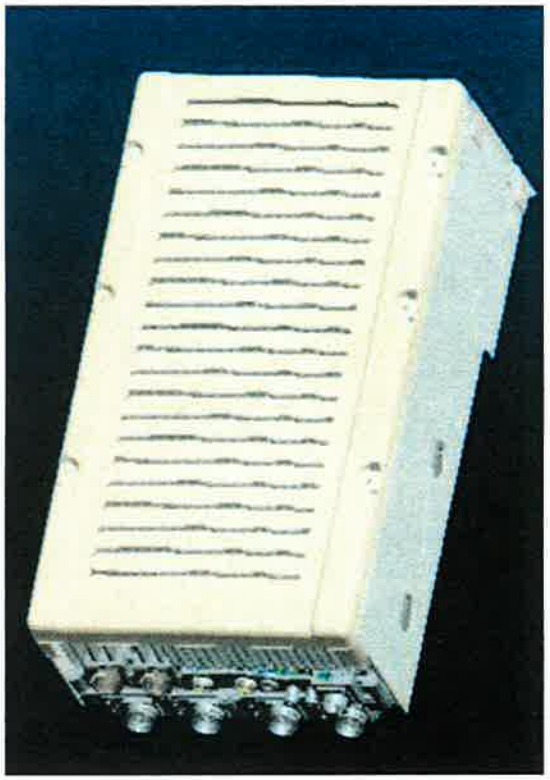
		RRH2x60
RF Output Power		2x60W
Instantaneous Bandwidth		20MHz
Transmitter		2 TX
Receiver	1900 HW version	2 Branch RX – LA6.0.1
	1900A HW version	4 Branch RX – LR13.3
Features		AISG 2.0 for RET/TMA
		Internal Smart Bias-T
Power		-48VDC
CPRI Ports		2 CPRI Rate 3 Ports
External Alarms		4 External User Alarms
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.

[illegible]

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.

[illegible]

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.

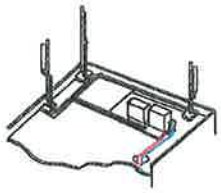
[illegible]

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.

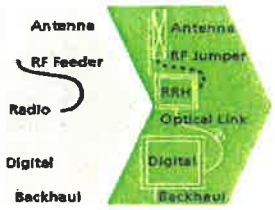
The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment. However, many of these sites can host an Alcatel-Lucent RRH2x60-AWS installation, providing more flexible site selection and improved network quality along with greatly reduced installation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

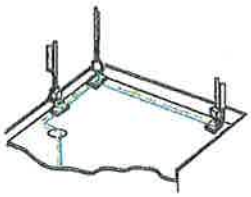
Installation can easily be done by a single person as the Alcatel-Lucent RRH2x60-AWS is compact and weighs about 20 kg, eliminating the need for a crane to hoist the BTS cabinet to the rooftop. A site can be in operation in less than one day.



Macro



RRH for space-constrained cell sites



Distributed

- 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

- 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.

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

AT THE SPEED OF IDEAS™

Alcatel·Lucent

Product Data Sheet HB158-1-08U8-S8J18

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

Product Description

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

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

Figure 1: HYBRIFLEX Series

Features/Benefits

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

Technical Specifications

Outer Conductor Armor	Corrugated Aluminum	[mm (in)]	46.5 (1.83)
Jacket:	Polyethylene, PE	[mm (in)]	50.3 (1.98)
UV-Protection	Individual and External Jacket		Yes
Mechanical Properties			
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)
Electrical Properties			
DC-Resistance Outer Conductor Armor		[Ω/km (Ω/1000ft)]	.068 (0.205)
DC-Resistance Power Cable, 8.4mm² (8AWG)		[Ω/km (Ω/1000ft)]	2.1 (0.307)
Fiber Optical Properties			
Version			Single-mode OM3
Quantity, Fiber Count			16 (8 pairs)
Core/Clad		[µm]	50/125
Primary Coating (Acrylate)		[µm]	245
Buffer Diameter, Nominal		[µm]	900
Secondary Protection, Jacket, Nominal		[mm (in)]	2.0 (0.08)
Minimum Bending Radius		[mm (in)]	104 (4.1)
Insertion Loss @ wavelength 850nm		dB/km	3.0
Insertion Loss @ wavelength 1310nm		dB/km	1.0
Standards (Meets or exceeds)			UL94-V0, UL1666 RoHS Compliant
DC Power Cable Properties			
Size (Power)		[mm² (AWG)]	8.4 (8)
Quantity, Wire Count (Power)			16 (8 pairs)
Size (Alarm)		[mm² (AWG)]	0.8 (18)
Quantity, Wire Count (Alarm)			4 (2 pairs)
Type			UV protected
Strands			19
Primary Jacket Diameter, Nominal		[mm (in)]	6.8 (0.27)
Standards (Meets or exceeds)			NFPA 130, ICEA S-93-638 UL Type XHHW-2, UL 44 UL-LS Limited Smoke, UL VW-1 IEEE-383 (1974), IEEE1202/FT4 RoHS Compliant
Environmental			
Installation Temperature		[°C (°F)]	-40 to +65 (-40 to149)
Operation Temperature		[°C (°F)]	-40 to +65 (-40 to149)

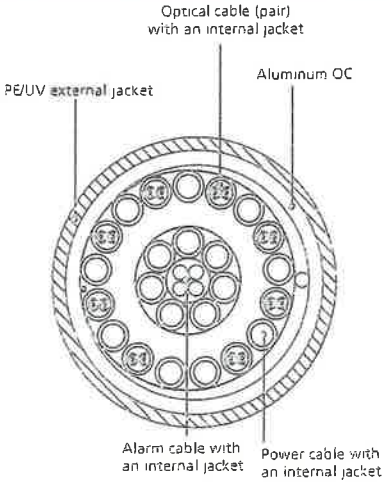


Figure 2: Construction Detail

* This data is provisional and subject to change

ATTACHMENT 2

	General	Power	Density					
Site Name: Guilford N								
Tower Height: 152Ft.								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*AT&T UMTS	2	565	148.5	0.0184	880	0.5867	3.14%	
*AT&T UMTS	2	875	148.8	0.0284	1900	1.0000	2.84%	
*AT&T GSM	1	283	148.5	0.0046	880	0.5867	0.79%	
*AT&T GSM	4	525	148.5	0.0342	1900	1.0000	3.42%	
*AT&T LTE	1	1313	148.5	0.0214	734	0.4893	4.38%	
*Sprint CDMA/LTE	3	347	138.5	0.0195	1990	1.0000	1.95%	
*Sprint CDMA/LTE	1	195	138.5	0.0037	850	0.5667	0.65%	
*Sprint CDMA/LTE	2	195	138.5	0.0073	2500	1.0000	0.73%	
*Nextel	12	100	114	0.0332	851	0.5673	5.85%	
Verizon PCS	**7**	**401**	**128**	**0.0616**	**1970**	**1.0000**	**6.16%**	
Verizon Cellular	**9**	**330**	**128**	**0.0652**	**869**	**0.5793**	**11.25%**	
Verizon AWS	**1**	**2812**	**128**	**0.0617**	**2145**	**1.0000**	**6.17%**	
Verizon 700	**1**	**681**	**128**	**0.0149**	**746**	**0.4973**	**3.01%**	
								50.34%
* 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.

152' Self-Support Tower

SBA Site Name: Guilford
SBA Site ID: CT13065-A-04
Verizon Site ID: 117641

FDH Project Number 15BEQG1400

Analysis Results

Tower Components	99.2%	Sufficient
Foundation	79.0%	Sufficient

Prepared By:

Mark S. Girgis

Mark S. Girgis, EI
Project Engineer

Reviewed By:

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

FDH Engineering, Inc.
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Raleigh, NC 27616
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info@fdh-inc.com

STATE OF CONNECTICUT
DENNIS D. ABEL
No. 23247
LICENSED
PROFESSIONAL ENGINEER

02-27-2015

February 27, 2015

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

TABLE OF CONTENTS

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 Guilford, 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 State Building Code*. Information pertaining to the existing/proposed antenna loading, current tower geometry, member sizes, geotechnical data, and foundation dimensions was obtained from:

- Rohn (File No. 21046FH) original design drawings dated August 8, 1985
- All-Points Technology Corporation, P.C. (Job No. CT200101) Tower Reinforcement Drawings dated April 28, 2005
- FDH Engineering, Inc. (Project No. 09-03151E N1) Dispersive Wave Propagation Testing of an Existing Tower Foundation dated June 10, 2009
- FDH Engineering, Inc. (Project No. 09-03151E G1) Geotechnical Evaluation of Subsurface Conditions dated June 15, 2009
- FDH Engineering, Inc. (Project No. 09-03151E S2) Modification Drawings for a 152' Self Support Tower dated July 31, 2009
- FDH Engineering, Inc. (Project No. 09-03151E S2) Post Construction Inspection Report dated April 10, 2010
- FDH Engineering, Inc. (Project No. 11-10199E S2) Modification Drawings for a 152' Self-Support Tower dated April 19, 2012
- FDH Engineering, Inc. (Project No. 11-10199E S2) Post Construction Inspection Report dated May 24, 2012
- FDH Engineering, Inc. (Project No. 12-04638E S3) Modification Drawings for a 152' Self-Support Tower dated February 6, 2013
- FDH Engineering, Inc. (Project No. 1300691700.00) Modification Inspection Report dated July 9, 2013
- FDH Engineering, Inc. (Project No. 14664X1400) Modification Drawings for a 152' Self-Support Tower dated May 29, 2014
- FDH Engineering, Inc. (Project No. 1466HY1700) TIA Inspection Report dated January 23, 2015
- FDH Engineering, Inc. (Project No. 15BEQG1400) Modification Drawings for a 152' Self-Support Tower dated February 27, 2015
- SBA Network Services, Inc.

The *basic design wind speed* per the *TIA/EIA-222-F* standards 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 128 ft, the tower meets the requirements of the *TIA/EIA-222-F* standards and *2005 Connecticut State Building Code* provided the **Recommendations** listed on the following page are satisfied. Furthermore, given the existing foundation dimensions (see FDH Engineering, Inc. Project No. 09-03151E N1), and using the existing soil parameters (see FDH Engineering, Inc. Project No. 09-03151E G1), 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 Connecticut State Building Code* are met with the existing and proposed loading in place, we have the following recommendations:

1. Feed lines must be installed as shown in **Figure 1** (see **Appendix**).
2. RRU/RRH Stipulation: The proposed equipment may be installed in any arrangement as determined by the client.
3. The modifications outlined in FDH Engineering, Inc. (Project No. 14664X1400) Modification Drawings for a 152' Self-Support Tower dated May 29, 2014 must be installed as specified in order for this analysis to be considered valid.
4. The modifications outlined in FDH Engineering, Inc. (Project No. 15BEQG1400) Modification Drawings for a 152' Self-Support Tower dated February 27, 2015 must be installed as specified in order for this analysis to be considered valid.

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	Feed Lines	Carrier	Mount Elevation (ft)	Mount Type
157	(1) Phillips Dodge 201-7 Omni	(1) 7/8"	TCI Cablevision	152	Direct
154.3	(1) Decibel DB589 Omni	(1) 7/8"	American Messaging	150	(1) Pipe Mount
148.5	(6) Powerwave 7770.00 (3) KMW AM-X-CD-16-65-00T (6) Ericsson RRUS-11 (1) Raycap DC6-48-60-18-8F	(12) 1-5/8" (1) 10mm Fiber Trunk[1] (2) DC Cables[1]	AT&T	149	(3) T-Frames
145.5	(6) Powerwave LGP21401 (6) Powerwave LGP21901				
140.4	(3) RFS APXVSPP18-C-A20 (3) RFS APXVTM14-C-I20 (3) Alcatel Lucent 1900 MHz RRHs (3) Alcatel Lucent 800 MHz RRHs (3) Alcatel Lucent 800 MHz Filters (3) Alcatel Lucent TD-RRH8x20-25 RRHs (4) RFS ACU-A20-N RETs	(4) 1-1/4" Fiber	Sprint	140	(3) 12.5' T-Frames
131	(1) DB26 GPS	(12) 1-5/8"	Verizon	132	(1) Pipe Mount
128	(4) Antel LPA-80063/4CF (2) Antel LPA-80063/6CF (2) Antel BXA-70063-4CF-EDIN-X (1) Antel BXA-70063-6CF-EDIN-4 (2) Antel BXA-171063/8BF (1) Antel BXA-171063/12BF (6) RFS FD9R6004/2C-3L			130.5	(3) 12' T-Frames
84.9	(1) Decibel DB26 GPS	(1) 1/2"	Verizon	83.9	(1) Pipe Mount
10	(1) Channel Master 6922 Dish	(1) RG-6	American Messaging	10	(1) Pipe Mount

1. (1) 10mm Fiber Trunk and (2) DC Cables for AT&T to 149' are installed inside a 3" inner duct.

Proposed Carrier Final Loading:

Antenna Elevation (ft)	Description	Feed Lines	Carrier	Mount Elevation (ft)	Mount Type
128	(4) Andrew HBXX-6516DS-A2M (2) Andrew HBXX-6517DS-A2M (4) Andrew LNX-6513DS-A1M (2) Andrew LNX-6514DS-A1M (3) Alcatel Lucent RRH2x60-AWS (3) Alcatel Lucent RRH2X60-PCS (6) RFS FD9R6004/2C-3L (1) RFS DB-T1-6Z-8AB-0Z	(13) 1-5/8"	Verizon	130.5	(3) 12' T-Frames

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	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. **Table 5** displays the maximum antenna rotations at service wind speeds (dishes only).

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	152 - 140	Leg	ROHN 2 STD	19.6	Pass
		Diagonal	L1 1/2x1 1/2x1/8	57.1 61.0 (b)	Pass
		Top Girt	L2x2x1/8	19.6	Pass
T2	140 - 135	Leg	ROHN 2.5 STD	23.7	Pass
		Diagonal	L1 3/4x1 3/4x1/8	74.8 80.8 (b)	Pass
T3	135 - 130	Leg	ROHN 2.5 STD	36.7	Pass
		Diagonal	L1 3/4x1 3/4x1/8	85.6 86.6 (b)	Pass
T4	130 - 125	Leg	ROHN 2.5 STD	49.8	Pass
		Diagonal	L1 3/4x1 3/4x1/4	76.1 88.3 (b)	Pass
T5	125 - 120	Leg	ROHN 2.5 STD	67.8	Pass
		Diagonal	L1 3/4x1 3/4x1/4	80.3 86.1 (b)	Pass
T6	120 - 113.333	Leg	ROHN 2.5 X-STR	80.6	Pass
		Diagonal	L2x2x1/8 w/ L2x2x1/8	48.9 93.4 (b)	Pass
T7	113.333 - 106.667	Leg	ROHN 2.5 X-STR	70.1	Pass
		Diagonal	L2x2x1/8 w/ L2x2x1/8	53.4 93.1 (b)	Pass
		Secondary Horizontal	L2x2x1/4	10.0 10.7 (b)	Pass
T8	106.667 - 100	Leg	ROHN 2.5 X-STR	82.4	Pass
		Diagonal	L2x2x1/8 w/ L2x2x1/8	58.9 93.5 (b)	Pass
		Secondary Horizontal	L2 1/2x2 1/2x3/16	8.9 12.6 (b)	Pass
T9	100 - 93.3333	Leg	ROHN 2.5 X-STR	94.5	Pass
		Diagonal	L2x2x3/8	72.7	Pass

Section No.	Elevation (ft)	Component Type	Size	% Capacity*	Pass Fail
				94.2 (b)	
		Secondary Horizontal	L2 1/2x2 1/2x3/16	11.5 14.4 (b)	Pass
T10	93.3333 - 86.6667	Leg	2.875 OD x 0.276 + 180 deg 4 OD x 0.318 (v4.03)	87.4	Pass
		Diagonal	L2x2x3/8	78.5 94.6 (b)	Pass
T11	86.6667 - 80	Leg	2.875 OD x 0.276 + 180 deg 3.5 OD x 0.3 (v4.03)	73.0 75.8 (b)	Pass
		Diagonal	L2x2x3/8	88.5 97.1 (b)	Pass
		Secondary Horizontal	L2x2x1/4	27.8	Pass
T12	80 - 73.3333	Leg	ROHN 3 X-STR	91.7	Pass
		Diagonal	L2 1/2x2 1/2x3/16	92.9 96.4 (b)	Pass
		Secondary Horizontal	L2 1/2x2 1/2x3/16	22.1	Pass
T13	73.3333 - 66.6667	Leg	ROHN 3 X-STR	99.2	Pass
		Diagonal	L2 1/2x2 1/2x1/4	81.5	Pass
		Secondary Horizontal	L2 1/2x2 1/2x3/16	26.6	Pass
T14	66.6667 - 60	Leg	3.5 OD x 0.3 + 180 deg 4.5 OD x 0.337 (v4.03)	80.9	Pass
		Diagonal	L2 1/2x2 1/2x1/4	87.1	Pass
T15	60 - 50	Leg	ROHN 4 X-STR	81.9	Pass
		Diagonal	L3x3x1/4	79.1	Pass
		Secondary Horizontal	L2 1/2x2 1/2x3/16	38.3	Pass
T16	50 - 40	Leg	ROHN 4 X-STR	90.1	Pass
		Diagonal	L3x3x1/4	88.6	Pass
		Secondary Horizontal	L2 1/2x2 1/2x3/16	48.0	Pass
T17	40 - 30	Leg	ROHN 4 X-STR	97.7	Pass
		Diagonal	L3x3x3/8	66.9 79.2 (b)	Pass
		Secondary Horizontal	L3x3x3/16	33.7	Pass
T18	30 - 20	Leg	4.5 OD x 0.337 + 180 deg 5.563 OD x 0.375 (v4.03)	88.1	Pass
		Diagonal	L3x3x3/8	73.4 80.7 (b)	Pass
T19	20 - 10	Leg	5 SCH40 w/ 1/2 6 SCH80	73.4	Pass
		Diagonal	L3 1/2x3 1/2x1/4	73.5 83.6 (b)	Pass
T20	10 - 0	Leg	5 SCH40 w/ 1/2 6 SCH80	78.3 95.8 (b)	Pass
		Diagonal	L3 1/2x3 1/2x1/4	85.8 90.0 (b)	Pass

*Capacities include 1/3 allowable increase for wind per *TIA/EIA-222-F* standards.

Table 4 - Maximum Base Reactions

Load Type	Direction	Current Analysis* *(TIA/EIA-222-F)*	Original Design *(EIA-222-C)*
Individual Foundation	Horizontal	21 k	---
	Uplift	164 k	80 k
	Compression	187 k	95 k
Overturning Moment	---	3,203 k-ft	1,557 k-ft

*Foundations determined to be adequate per independent analysis.

Table 5 - Maximum Antenna Rotations at Service Wind Speeds (Dishes Only)

Centerline Elevation (ft)	Antenna	Tilt* (deg)	Twist* (deg)
10	(1) Channel Master 6922 Dish	0.0115	0.0014

*Allowable tilt and twist values to be determined by the client.

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

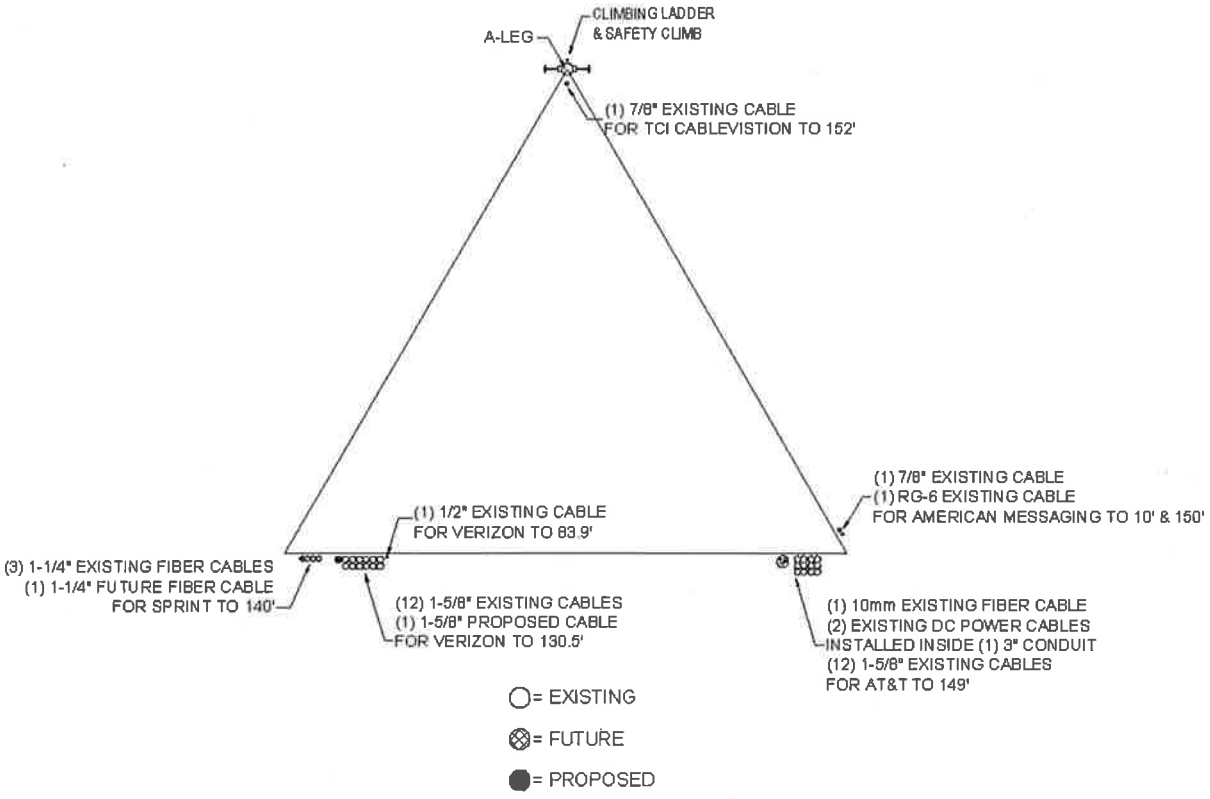
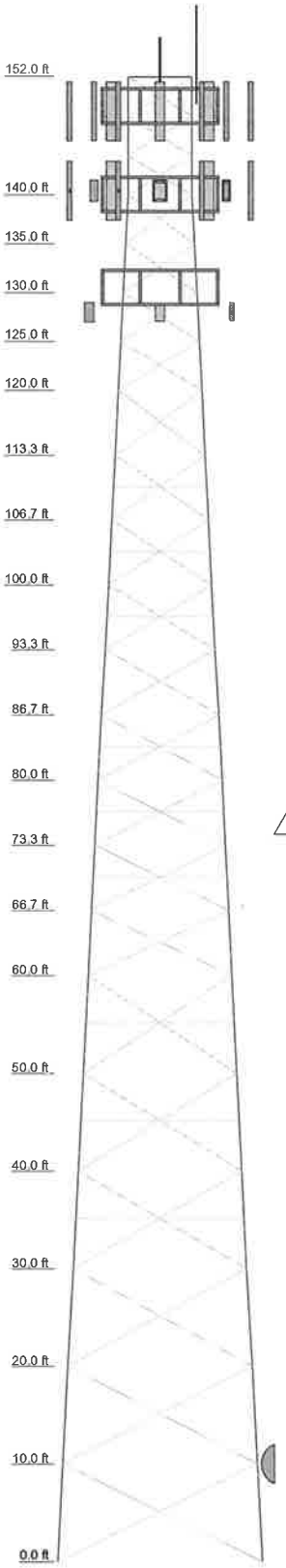


Figure 1 - Feed Line Layout

Section		T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20
Legs		ROHN 2 STD		ROHN 2.5 STD			ROHN 2.5 X-STR				A	B	G	ROHN 3 X-STR	C		ROHN 4 X-STR		D		5 SCH40 w/ 1/2 6 SCH80
Leg Grade		A572-50																			
Diagonals		L1 1/2x1 1/2x1/8		E		F		L2x2x1/8 w/ L2x2x1/8			L2x2x3/8			L2 1/2x2 1/2x1/4		L3x3x1/4		L3x3x3/8		L3 1/2x3 1/2x1/4	
Diagonal Grade		A36																			
Top Girts		L2x2x1/8												N.A.							
Sec. Horizontals		N.A.						L2x2x1/4	L2 1/2x2 1/2x3/16		N.A.	L2x2x1/4	L2 1/2x2 1/2x3/16	L2 1/2x2 1/2x1/4	N.A.	L2 1/2x2 1/2x3/16		L3x3x3/16		N.A.	
Face Width (ft)	20.7813	6.52083	6.5625	7.0625	7.5625	8.0625	8.5625	9.22917	9.89583	10.5625	11.2431	11.9236	12.6042	13.3021	14	14.6979	15.6979	16.6979	17.7344	18.7708	19.776
# Panels @ (ft)		3 @ 4		4 @ 5							9 @ 6.66667							6 @ 10			
Weight (K)	15.3	0.3	0.2	0.2	0.2	0.2	0.4	0.5	0.5	0.6	0.7	0.8	0.6	0.7	0.7	1.1	1.2	1.5	1.7	1.6	1.6



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	2.875 OD x 0.276 + 180 deg 4 OD x 0.318 (v4.03)	E	L1 3/4x1 3/4x1/8
B	2.875 OD x 0.276 + 180 deg 3.5 OD x 0.3 (v4.03)	F	L1 3/4x1 3/4x1/4
C	3.5 OD x 0.3 + 180 deg 4.5 OD x 0.337 (v4.03)	G	L2 1/2x2 1/2x3/16
D	4.5 OD x 0.337 + 180 deg 5.563 OD x 0.375		

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 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: 99.2%

MAX. CORNER REACTIONS AT BASE:
DOWN: 187 K
SHEAR: 21 K

UPLIFT: -164 K
SHEAR: 19 K

AXIAL
55 K
SHEAR
10 K
MOMENT
947 kip-ft

TORQUE 4 kip-ft
38 mph WIND - 0.7500 in ICE

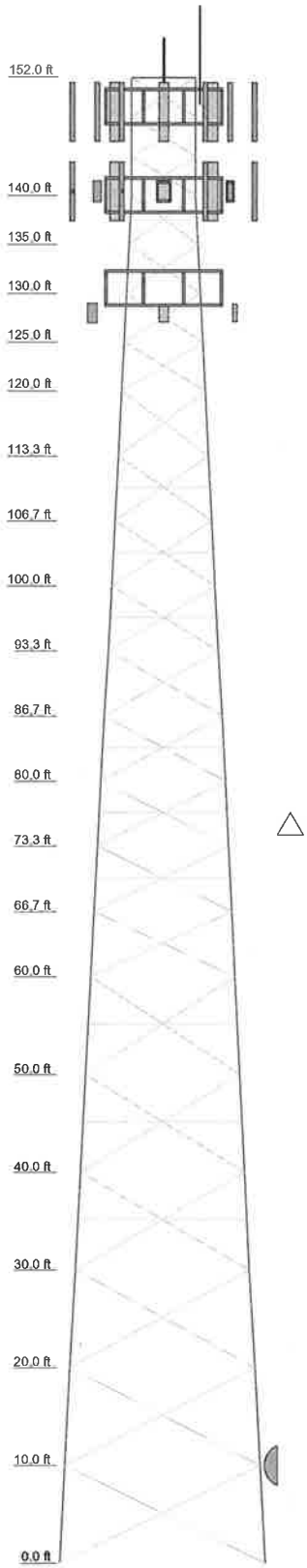
AXIAL
27 K
SHEAR
35 K
MOMENT
3203 kip-ft

TORQUE 25 kip-ft
REACTIONS - 85 mph WIND

FDH Engineering, Inc.
6521 Meridien Drive
Raleigh, NC 27616
Phone: (919) 755-1012
FAX: (919) 755-1031

Job: Guilford, CT13065-A-04			
Project: 15BEQG1400			
Client: SBA Communications Corporation	Drawn by: Mark S. Girgis	App'd:	
Code: TIA/EIA-222-F	Date: 02/27/15	Scale: NTS	
Path:		Dwg No. E-1	

Section	T20	T19	T18	T17	T16	T15	T14	T13	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	5 SCH40 w/ 1/2 6 SCH80		D		ROHN 4 X-STR		C	ROHN 3 X-STR		B	A		ROHN 2.5 X-STR				ROHN 2.5 STD			ROHN 2 STD
Leg Grade										A572-50										
Diagonals	L3 1/2x3 1/2x1/4			L3x3x3/8		L3x3x1/4	L2 1/2x2 1/2x1/4		G		L2x2x3/8			L2x2x1/8 w/ L2x2x1/8		F		E		L1 1/2x1 1/2x1/8
Diagonal Grade									A36											
Top Girts									N.A.							L2x2x1/8				
Sec. Horizontals		N.A.		L3x3x3/16	L2 1/2x2 1/2x3/16		N.A.	L2 1/2x2 1/2x3/16		L2x2x1/4	N.A.	L2 1/2x2 1/2x3/16		L2x2x1/4	N.A.					
Face Width (ft)	20.7813	19.776	18.7706	17.7344	16.6979	15.6979	14.6979	14	13.3021	12.6042	11.9236	11.2431	10.5625	9.89583	9.22917	8.5625	8.0625	7.5625	7.0625	6.5625	6.52083
# Panels @ (ft)				6 @ 10							9 @ 6.66667						4 @ 5			3 @ 4	
Weight (K)	15.3	1.6	1.6	1.7	1.5	1.2	1.1	0.7	0.7	0.6	0.8	0.7	0.6	0.5	0.6	0.4	0.2	0.2	0.2	0.2	0.3



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
201-7	152 - 150	800 MHz Filter	140
DB589	150	ACU-A20-N RET	140
(1) Pipe Mount	150	ACU-A20-N RET	140
(3) 12.5' T-Frames	149	(2) ACU-A20-N RET	140
(2) 7770.00 w/ Mount Pipe	149	APXVTM14-C-I20 w/Mount Pipe	140
(2) 7770.00 w/ Mount Pipe	149	APXVTM14-C-I20 w/Mount Pipe	140
(2) 7770.00 w/ Mount Pipe	149	APXVTM14-C-I20 w/Mount Pipe	140
AM-X-CD-16-65-00T-RET w/ Mount Pipe	149	TD-RRH8x20-25	140
		TD-RRH8x20-25	140
AM-X-CD-16-65-00T-RET w/ Mount Pipe	149	TD-RRH8x20-25	140
		(1) Pipe Mount	132
AM-X-CD-16-65-00T-RET w/ Mount Pipe	149	DB26 GPS	132
		(3) 12' T-Frames	130.5
(2) RRUS-11	149	(2) FD9R6004/2C-3L Diplexer	130.5
(2) RRUS-11	149	(2) FD9R6004/2C-3L Diplexer	130.5
(2) RRUS-11	149	(2) FD9R6004/2C-3L Diplexer	130.5
DC6-48-60-18-8F	149	(2) HBXX-6516DS-A2M w/ Mount Pipe	130.5
(2) LGP21401 TMA	149		
(2) LGP21401 TMA	149	(2) HBXX-6516DS-A2M w/ Mount Pipe	130.5
(2) LGP21401 TMA	149		
(2) LGP21901 Diplexer	149	(2) HBXX-6517DS-A2M w/Mount Pipe	130.5
(2) LGP21901 Diplexer	149	(2) LNX-6513DS-A1M w/ Mount Pipe	130.5
(2) LGP21901 Diplexer	149	(2) LNX-6513DS-A1M w/ Mount Pipe	130.5
(3) 13' T-Frames	140	(2) LNX-6514DS-A1M w/ Mount Pipe	130.5
APXVSPP18-C-A20 w/Mount Pipe	140	RRH2x60-AWS	130.5
APXVSPP18-C-A20 w/Mount Pipe	140	RRH2x60-AWS	130.5
APXVSPP18-C-A20 w/Mount Pipe	140	RRH2x60-AWS	130.5
1900 MHz RRH	140	RRH2X60-PCS	130.5
1900 MHz RRH	140	RRH2X60-PCS	130.5
1900 MHz RRH	140	RRH2X60-PCS	130.5
800 MHz RRH	140	DB-T1-6Z-8AB-0Z	130.5
800 MHz RRH	140	DB26 GPS	83.9
800 MHz RRH	140	(1) Pipe Mount	83.9
800 MHz Filter	140	(1) Pipe Mount	10
800 MHz Filter	140	Channel Master 6922 Dish	10

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	2.875 OD x 0.276 + 180 deg 4 OD x 0.318 (v4.03)	E	L1 3/4x1 3/4x1/8
B	2.875 OD x 0.276 + 180 deg 3.5 OD x 0.3 (v4.03)	F	L1 3/4x1 3/4x1/4
C	3.5 OD x 0.3 + 180 deg 4.5 OD x 0.337 (v4.03)	G	L2 1/2x2 1/2x3/16
D	4.5 OD x 0.337 + 180 deg 5.563 OD x 0.375		

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 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.
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