Robinson+Cole

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Also admitted in Massachusetts

June 30, 2014

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

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

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) wireless telecommunications antennas at the 122.5-foot level on an existing 160-foot tower at 500 Highland Avenue in Cheshire, Connecticut (the "Property"). The tower is owned by SBA. Cellco's use of the tower was approved by the Council in 2005. Cellco now intends to modify its facility by removing six (6) of its 850 MHz antennas and replacing them with three (3) model LNX-6514DS-VTM, 850 MHz antennas and three (3) model WBX-6517DS-VTM, 2100 MHz antennas. Cellco also intends to install three (3) remote radio heads ("RRHs") behind its new 2100 MHz antennas and one (1) HYBRIFLEX™ antenna cable installed 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 notice is being sent to Michael A. Milone, Town Manager for the Town of Cheshire. The Town of Cheshire is 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).

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 the same antenna platform at the 122.5-foot level of the 160-foot tower.

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

3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and 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:
Michael A. Milone, Cheshire Town Manager
Sandy M. Carter

ATTACHMENT 1

Product Specifications

COMMSCOPE®

POWERED BY ANDREW.

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

LNX-6514DS-VTM

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	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

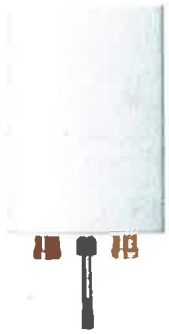
DB380 — Pipe Mounting Kit for 2.4"-4.5" (60-115mm) OD round members on wide panel antennas. Includes 2 clamp sets and double nuts.

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®

POWERED BY ANDREW.



HBX-6517DS-VTM

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

- Superior azimuth tracking and pattern symmetry to minimize any sector overlap
- Rugged, reliable design with excellent passive intermodulation suppression
- 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	18.5	18.6	18.9
Gain by all Beam Tilts Tolerance, dB	±0.2	±0.3	±0.4
Gain by Beam Tilt, average, dBi	0 ° | 18.3	0 ° | 18.4	0 ° | 18.8
	3 ° | 18.6	3 ° | 18.7	3 ° | 19.1
	6 ° | 18.4	6 ° | 18.6	6 ° | 18.7
Beamwidth, Horizontal, degrees	67	66	64
Beamwidth, Horizontal Tolerance, degrees	±1.8	±0.9	±2.8
Beamwidth, Vertical, degrees	5.0	4.7	4.4
Beamwidth, Vertical Tolerance, degrees	±0.2	±0.2	±0.3
Beam Tilt, degrees	0–6	0–6	0–6
USLS, dB	19	19	18
Front-to-Back Total Power at 180° ± 30°, dB	26	26	26
CPR at Boresight, dB	22	22	22
CPR at Sector, dB	11	11	9
Isolation, dB	30	30	30
VSWR | Return Loss, dB	1.4 | 15.6	1.4 | 15.6	1.4 | 15.6
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153
Input Power per Port, maximum, watts	350	350	350
Polarization	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm

General Specifications

Antenna Brand	Andrew®
Antenna Type	DualPol®
Band	Single band
Brand	DualPol® | Teletilt®
Operating Frequency Band	1710 – 2180 MHz
Number of Ports, all types	2

Mechanical Specifications

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

Product Specifications

HBX-6517DS-VTM

RF Connector Quantity, total	2
Wind Loading, maximum	393.0 N @ 150 km/h 88.3 lbf @ 150 km/h
Wind Speed, maximum	241.0 km/h | 149.8 mph

Dimensions

Depth	83.0 mm | 3.3 in
Length	1902.0 mm | 74.9 in
Width	166.0 mm | 6.5 in
Net Weight	6.2 kg | 13.7 lb

Remote Electrical Tilt (RET) Information

Model with Factory Installed AISG 1.1 Actuator	HBX-6517DS-R2M
Model with Factory Installed AISG 2.0 Actuator	HBX-6517DS-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

DB390 — Pipe Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members. Use for narrow panel antennas. Includes two pipe mounts.

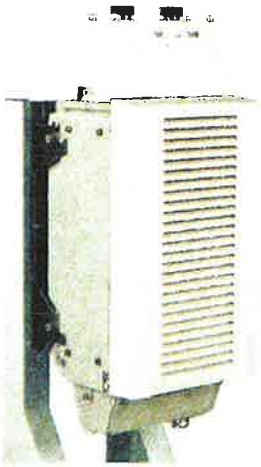
DB5098E — Downtilt Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members

Alcatel·Lucent

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

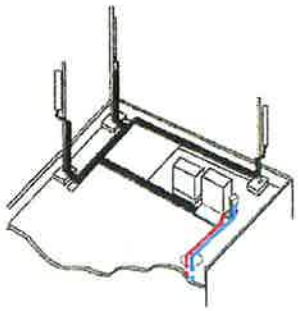
Because of its small size and weight, the Alcatel-Lucent RRH2x40-AWS can be installed close to the antenna. Operators can therefore locate the Alcatel-Lucent RRH2x40-AWS where RF engineering is deemed ideal, minimizing trade-offs between available sites and RF optimum sites. The RF feeder cost and installation 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.

Features

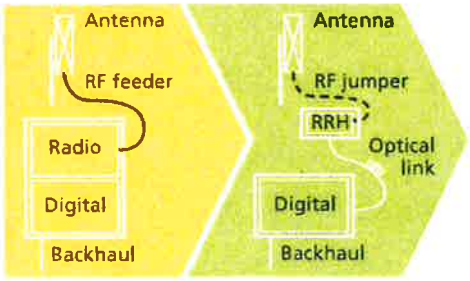
- Zero-footprint deployment
- Easy installation, with a lightweight unit can be carried and set up by one person
- Optimized RF power, with flexible site selection and elimination of a TMA
- Convection-cooled (fanless)
- Noise-free
- Best-in-class power efficiency, with significantly reduced energy consumption

Benefits

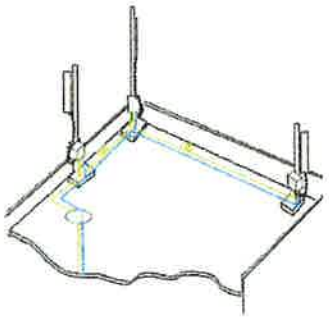
- Leverages existing real estate with lower site costs
- Reduces installation costs, with fewer installation materials and simplified logistics
- Decreases power costs and minimizes environmental impacts, with the potential for eco-sustainable power options
- Improves RF performance and adds flexibility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



Macro



RRH for space-constrained cell sites



Distributed

Technical specifications

Physical dimensions

- Height: 620 mm (24.4 in.)
- Width: 270 mm (10.63 in.)
- Depth: 170m (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

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 CELLFLEX³ accessories can be used with HYBRIFLEX cable. Both pre-connectorized and on-site options are available.

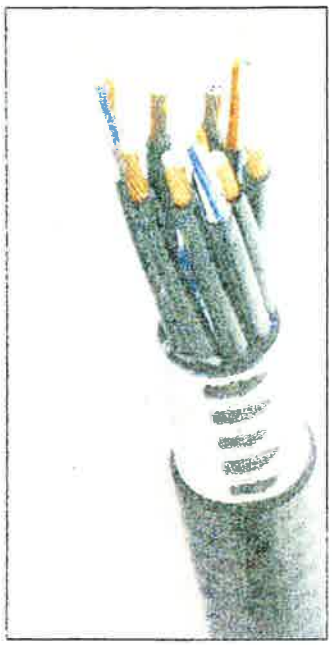


Figure 1: HYBRIFLEX Series

Features/Benefits

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

Technical Specifications

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

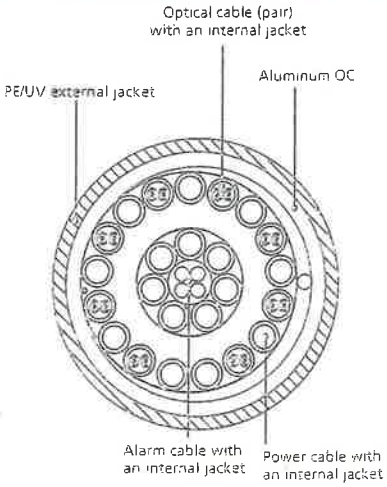


Figure 2: Construction Detail

* This data is provisional and subject to change

ATTACHMENT 2

	General	Power	Density					
Site Name: Cheshire NE								
Tower Height: 160Ft								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*Sprint microwave antenna	2	4.42	157.5	0.0001	22500	1.0000	0.01%	
*Sprint WiMAX	3	562	157.5	0.0244	2657	1.0000	2.44%	
*Sprint	2	778	158	0.0224	1900	1.0000	2.24%	
*Sprint	1	438	158	0.0063	850	0.5667	1.11%	
*MetroPCS CDMA	3	727	137.5	0.0415	2135	1.0000	4.15%	
*MetroPCS LTE	1	1200	137.5	0.0228	2130	1.0000	2.28%	
*Town Emergency Svcs	1	1200	167.5	0.0154	450	0.3000	5.13%	
*T-Mobile GSM/UMTS	2	12	149	0.0004	1950	1.0000	0.04%	
*T-Mobile UMTS	2	12	149	0.0004	2100	1.0000	0.04%	
*T-Mobile LTE	2	24	149	0.0008	2100	1.0000	0.08%	
*AT&T UMTS	2	565	132	0.0233	880	0.5867	3.97%	
*AT&T UMTS	2	1077	132	0.0445	1900	1.0000	4.45%	
*AT&T GSM	1	647	132	0.0134	880	0.5867	2.28%	
*AT&T GSM	4	934	132	0.0771	1900	1.0000	7.71%	
*AT&T LTE	1	1615	132	0.0333	734	0.4893	6.81%	
Nextel	12	100	107	0.0377	851	0.5673	6.64%	
Verizon	**7**	**423**	**122.5**	**0.0709**	**1970**	**1.0000**	**7.09%**	
Verizon	**9**	**369**	**122.5**	**0.0796**	**869**	**0.5793**	**13.74%**	
Verizon	**1**	**1918**	**122.5**	**0.0460**	**2145**	**1.0000**	**4.60%**	
Verizon	**1**	**832**	**122.5**	**0.0199**	**698**	**0.4653**	**4.28%**	
								79.09%
* Source: Siting Council								

ATTACHMENT 3

GPD GROUP
Glaus, Pyle, Schomer, Burns & DeHaven, Inc.

STRUCTURAL ANALYSIS REPORT

160' Monopole Tower

500 Highland Avenue
Cheshire, CT 06410

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

Verizon Site Name: Cheshire NE

GPD Project Number: 2014778.33762.02

Analysis Results

Tower Components	71.6%	Sufficient
Foundation	40.3%	Sufficient

March 13, 2014

Respectfully submitted by:

3/13/14

John N. Kabak, P.E.
Connecticut #: 28836

520 South Main Street . Suite 2531 . Akron, Ohio 44311 . 330-572-2100 . Fax 330-572-2101 . www.GPDGroup.com
Glaus Pyle Schomer Burns and DeHaven, Inc.

TABLE OF CONTENTS

Executive Summary

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

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

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

Conclusions & Recommendations

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

Tower Description

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

Documents Provided:

Document Type	Remarks	Source
Previous Structural Analysis	URS Corporation Job #: 36917370, dated 10/10/2012	SBA
Previous Structural Analysis	Hudson Design Group dated 05/06/2013	SBA
Previous Structural Analysis	GPD Job #: 2013778.33762.01, dated 10/1/2013	SBA
Foundation Calculations	URS Corporation Job #: 36917370, dated 10/10/2012	SBA
Construction Drawings	CenTek Engineering, reviewed by SBA 2/26/2014	SBA

Tower Materials:

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

Tower Loading

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

Existing/Leased Loading

Carrier	Mounting Level (ft)	Center Line Elevation (ft)	# of Antennas	Antenna Manufact.	Antenna/Mount Model	# of Coax	Coax Size (in)	Note
Town of Cheshire	160	170	1		20' Omni	4	1/2	
		168	2	Decibel	DB224			
		166.17	1		6' Omni			
		160	3		T-Arm			
Sprint	160	162	3	RFS	APXVSPP18-C-A20	6	1-5/8 Hybriflex	
		160	1		LP Platform	3		
		158	6		RRH			
T-Mobile	152	149	3	Ericsson	AIR21 B2A/B4P	18	1-5/8	
			3	Ericsson	AIR21 B4A/B2P			
			3	RFS	APX16-PV-6PVL-C			
			3	Ericsson	KRY 112			
			3	RFS	ATMAA1412D			
		152	1		LP Platform			
Pocket	141.08	141.08	3	RFS	APXV18-206517S-C	6	1-5/8	1
			3		T-Arm			
AT&T	132	132	3	Kathrein	800 10121	12	1-5/8	
			2	Powerwave	P65-16-XL-2			
			2	KMW	AM-X-CD-16-65-00T-RET			
			2	Andrew	SBNM-1D6565C			
			12		TMA			
			1		LP Platform			
	125	125	6		RRH	1	3" Conduit	2
			1	Raycap	DC6-48-60-18-8F			
			1		Universal Ring Mount			
Verizon	122.5	122.5	3	Antel	BXA 70063/6CF	12	1-5/8	
			4	Andrew	DB844F65ZAXY			
			2	Antel	LPA 80090/4CF			
			3	Antel	BXA 185063/8CF			
			6	RFS	FD9R6004/2C-3L			
			1		LP Platform			
Nextel	112.17	112.17	12	Andrew	844G65VTZASX	12	1-5/8	
			1		LP Platform			
Town of Cheshire	89.08	89.08	1		Dipole Antenna	5	1/2	
			1		Collar Mount			
		81.25	1		Yagi Antenna			
		79.33	1		Yagi Antenna			
	83.17	83.17	1	PCTEL	GPS-TMG-HR-26N			
			1		Collar Mount			
		81.17	1		Yagi Antenna			

Notes:

1) Coax installed outside the monopole in a single row.
2) Conduit contains DC and power cables.

Final Proposed Loading Configuration

Carrier	Mounting Level (ft)	Center Line Elevation (ft)	# of Antennas	Antenna Manufact.	Antenna/Mount Model	# of Coax	Coax Size (in)	Note
Verizon	122.5	122.5	3	Antel	BXA 70063/6CF	12 1	1-5/8 1-5/8 Fiber	1
			3	Antel	BXA 185063/8CF			
			3	Andrew	HBX-6517DS-VTM			
			3	Andrew	LNX-6514DS-VTM			
			6	RFS	FD9R6004/2C-3L			
			3	Alcatel-Lucent	RRH2x40-AWS			
			1		DB-T1-6Z-8AB-0Z			
			1		LP Platform			

Notes:

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

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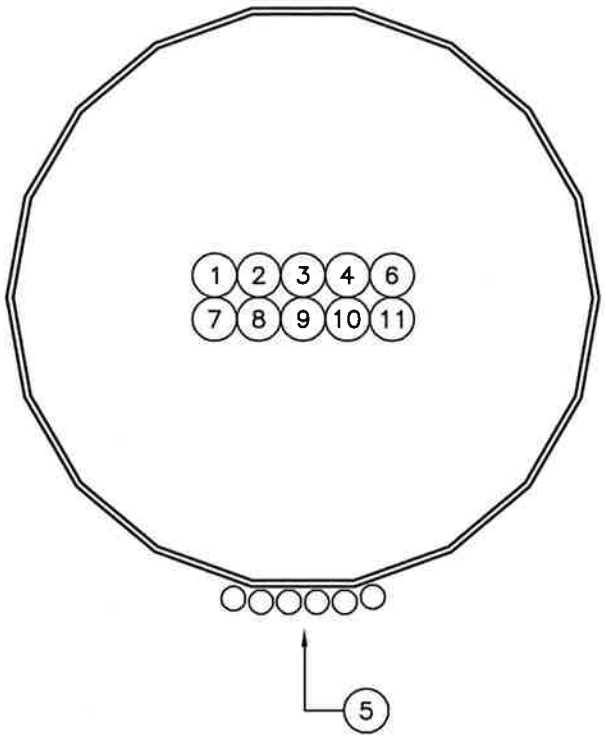
Proposed Coax Configuration



#	CARRIER	SIZE	QTY.	ELEVATION	NOTES
1	Town of Cheshire	1/2"	4	160'	
2	Sprint	1-5/8"	6	160'	
3	Sprint	1-1/4" Hybrid	3	160'	
4	T-Mobile	18	1-5/8"	152'	
5	Pocket	1-5/8"	6	141.08'	
6	AT&T	1-5/8"	12	132'	
7	AT&T	3" Conduit	1	125'	Carries DC and power cables
8	Verizon	1-5/8"	12	122.5'	
9	Verizon	1-5/8"	1	122.5'	Proposed Fiber Cable
10	Nextel	1-5/8"	12	112.17'	
11	Town of Cheshire	1/2"	5	89.09'	

Assumptions

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

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

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

Tower Section Results

Capacity Summary of Structural Components

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass/ Fail
L1	160 - 146.5	Pole	TP20.91x16.75x0.1875	1	-4.52	865.69	17.6	Pass
L2	146.5 - 95.75	Pole	TP36.16x19.6876x0.25	2	-19.23	1841.20	68.5	Pass
L3	95.75 - 46.75	Pole	TP50.76x34.2745x0.3125	3	-32.43	3077.94	71.6	Pass
L4	46.75 - 0	Pole	TP64.53x48.1321x0.375	4	-52.49	4662.89	63.5	Pass
							Summary	
						Pole (L3)	71.6	Pass
						RATING =	**71.6**	**Pass**

Additional Capacities

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
	Anchor Rods	0	64.7	Pass
	Base Plate	0	40.3	Pass
	Tower Base Foundation	0	40.3	Pass

Disclaimer of Warranties

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

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

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

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

The attached sketches are a schematic representation of the analyzed tower. If any material is fabricated from these sketches, the contractor shall be responsible for field verifying the existing conditions, proper fit, and clearance in the field. Any mentions of structural modifications are reasonable estimates and should not be used as a precise construction document. Precise modification drawings are obtainable from GPD GROUP, but are beyond the scope of this report.

Miscellaneous items such as antenna mounts, etc., have not been designed or detailed as a part of our work. We recommend that material of adequate size and strength be purchased from a reputable tower manufacturer.

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

GPD GROUP makes no warranties, expressed and/or implied, in connection with this report and disclaims any liability arising from material, fabrication, and erection of this tower. GPD GROUP will not be responsible whatsoever for, or on account of, consequential or incidental damages sustained by any person, firm, or organization as a result of any data or conclusions contained in this report. The maximum liability of GPD GROUP pursuant to this report will be limited to the total fee received for preparation of this report.

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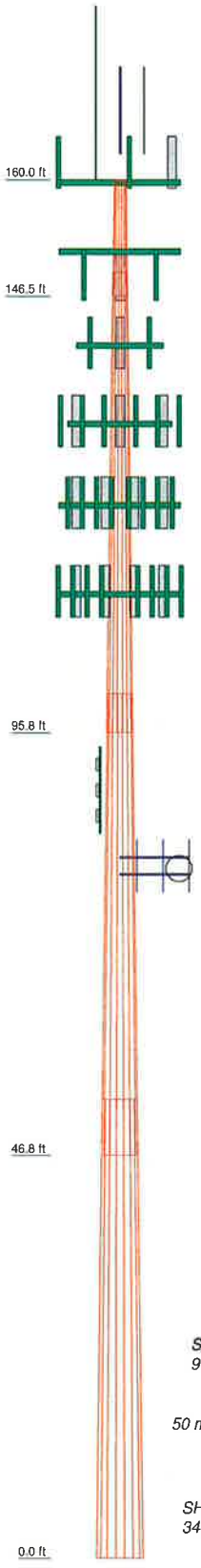
TNX TOWER OUTPUT

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

Total Weight (K) 24.2



ALL REACTIONS ARE FACTORED

AXIAL 90 K

SHEAR 9 K *MOMENT 1067 kip-ft*

TORQUE 0 kip-ft
50 mph WIND - 0.7500 in ICE

AXIAL 53 K

SHEAR 34 K *MOMENT 3841 kip-ft*

TORQUE 1 kip-ft
REACTIONS - 100 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
20' Omni (3" Diam)	160	(4) TMA	132
DB224	160	(4) TMA	132
DB224	160	(4) TMA	132
6' Omni	160	Mount Pipe	132
MTS 36" Standoff (3)	160	Mount Pipe	132
APXVSPP18-C-A20 w/ Mount Pipe	160	Mount Pipe	132
APXVSPP18-C-A20 w/ Mount Pipe	160	Sabre 12' LP Platform	132
APXVSPP18-C-A20 w/ Mount Pipe	160	(2) RRH	125
(2) RRH	160	(2) RRH	125
(2) RRH	160	(2) RRH	125
(2) RRH	160	DC6-48-60-18-8F	125
Mount Pipe	160	Universal Ring Mount w/8" Standoff	125
Mount Pipe	160	BXA-70063/6CF w/ Mount Pipe	122.5
Mount Pipe	160	BXA-70063/6CF w/ Mount Pipe	122.5
Sabre 12' LP Platform	160	BXA-70063/6CF w/ Mount Pipe	122.5
AIR21 B2A/B4P w/ mount pipe	152	BXA-185063/8CF w/ Mount Pipe	122.5
AIR21 B4A/B2P w/ mount pipe	152	BXA-185063/8CF w/ Mount Pipe	122.5
APX16-PV-6PVL-C w/ Mount Pipe	152	BXA-185063/8CF w/ Mount Pipe	122.5
AIR21 B2A/B4P w/ mount pipe	152	(2) FD9R6004/2C-3L	122.5
AIR21 B4A/B2P w/ mount pipe	152	(2) FD9R6004/2C-3L	122.5
APX16-PV-6PVL-C w/ Mount Pipe	152	(2) FD9R6004/2C-3L	122.5
AIR21 B2A/B4P w/ mount pipe	152	HBX-6517DS-VTM w/ Mount Pipe	122.5
AIR21 B4A/B2P w/ mount pipe	152	HBX-6517DS-VTM w/ Mount Pipe	122.5
APX16-PV-6PVL-C w/ Mount Pipe	152	HBX-6517DS-VTM w/ Mount Pipe	122.5
KRY 112	152	LNX-6514DS-VTM w/ Mount Pipe	122.5
ATMAA1412D	152	LNX-6514DS-VTM w/ Mount Pipe	122.5
KRY 112	152	LNX-6514DS-VTM w/ Mount Pipe	122.5
ATMAA1412D	152	RRH2x40-AWS	122.5
KRY 112	152	RRH2x40-AWS	122.5
ATMAA1412D	152	RRH2x40-AWS	122.5
Sabre 12' LP Platform	152	DB-T1-6Z-8AB-0Z	122.5
APXV18-206517S-C w/ Mount Pipe	141.08	MTS 14.5' LP Platform	122.5
APXV18-206517S-C w/ Mount Pipe	141.08	(4) 844G65VTZASX w/ Mount Pipe	112.17
APXV18-206517S-C w/ Mount Pipe	141.08	(4) 844G65VTZASX w/ Mount Pipe	112.17
MTS 36" Standoff (3)	141.08	(4) 844G65VTZASX w/ Mount Pipe	112.17
800 10121 w/ Mount Pipe	132	MTS 14.5' LP Platform	112.17
SBNH-1D6565C w/ Mount Pipe	132	3' Yagi	89.08
P65-15-XLH-RR w/ Mount Pipe	132	3' Yagi	89.08
800 10121 w/ Mount Pipe	132	Andrew Collar Mount	89.08
SBNH-1D6565C w/ Mount Pipe	132	14' Dipole	89.08
AM-X-CD-16-65-00T-RET w/ Mount Pipe	132	3' Yagi	83.17
800 10121 w/ Mount Pipe	132	Andrew Collar Mount	83.17
AM-X-CD-16-65-00T-RET w/ Mount Pipe	132	GPS-TMG-HR-26N	83.17
P65-15-XLH-RR w/ Mount Pipe	132		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 100 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 71.6%

GPD GROUP
Consulting Engineers

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Job: *CT33762-M Cheshire, CT*			
Project: *2014778.33762.02*			
Client: SBA	Drawn by: dgoodwin	App'd:	
Code: TIA-222-G	Date: 03/13/14	Scale: NTS	
Path: T:\SBA\33762\02 SA VZN\tnx\CT33762_G Code.eri		Dwg No. E-1	