ROBINSON & COLE LLP

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

July 26, 2013

David Martin
Siting Analyst
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: **EM-VER-143-120924 – Cellco Partnership d/b/a Verizon Wireless**
1925 East Main Street, Torrington, Connecticut

Dear Mr. Martin:

On October 24, 2012, the Siting Council acknowledged receipt of Cellco's notice of intent to modify its telecommunications facility at 1925 East Main Street in Torrington. The modification involved the replacement of certain antennas and the installation of additional coax cables.

As a condition of the acknowledgement, Cellco was required to provide the Council with a letter stating that the recommendations specified in the structural report were implemented. Attached is a Tower Modification Certification Letter verifying that these conditions have been satisfied. All construction associated with these modifications has now been completed.

If you have any questions please do not hesitate to contact me or Rachel Mayo.

Sincerely,

Kenneth C. Baldwin

Attachment
Copy to:
Sandy M. Carter
Brian Ragozzine
Mark Gauger

CENTEK engineering

Centered on Solutions℠

July 22, 2013

Mr. Mark Gauger
Verizon Wireless
99 East River Drive
East Hartford, Connecticut 06108

Re: Existing Telecommunications Facility Tower Modification Certification Letter

Project:	**Verizon ~Torrington East** 1925- 1930 East Main Street Torrington, CT
Tower Owner:	**SBA Communications Corporation** 5900 Broken Sound Parkway NW Boca Raton, Florida 33487
Engineer:	**FDH Engineering** 2730 Rowland Ave Raleigh, NC 27615

Centek Project No.: 13008.013

Dear Mr. Gauger,

We are providing this "Existing Telecommunications Facility Tower Modification Certification Letter" with regard to the antenna upgrade by Verizon Wireless at the above referenced project.

The following are the basis for substantiating compliance with the FDH Engineering Structural Analysis Report (FDH Project No. 12-04781E S2 (R1)) dated 09/11/2012 :

- Review of the FDH Structural Analysis Report dated 09/11/2012.
- Field observations by Centek personnel of the coax installation on 07/19/2013 which determined all coax lines were installed in general compliance with the recommendations of the structural analysis report prepared by FDH on 09/11/2012.

The work under this Contract has been reviewed and found, to the Engineer's best knowledge, information and belief, to be completed in general compliance with the documents referenced above.

Sincerely,

Carlo F. Centore, PE
Principal ~Structural Engineer

STATE OF CONNECTICUT
CARLO F. CENTORE
No.16694
LICENSED
PROFESSIONAL ENGINEER

CC: Rachel Mayo, Tim Parks, Tom Nolan, Brian Ragozzine

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

October 24, 2012

Kenneth C. Baldwin, Esq.
Robinson & Cole LLP
280 Trumbull Street
Hartford, CT 06103

RE: **EM-VER-143-120924**- Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 1925 East Main Street, Torrington, Connecticut.

Dear Attorney Baldwin:

The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the following conditions:

- The coax lines shall be installed in accordance with the recommendations made in the Structural Analysis Report prepared by FDH Engineering dated September 11, 2012 and stamped by Christopher Murphy;
- Following the installation of the proposed equipment, Verizon shall provide documentation certifying that the installation complied with the engineer's recommendation;
- Any deviation from the proposed modification as specified in this notice and supporting materials with Council shall render this acknowledgement invalid;
- Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
- Not less than 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
- The validity of this action shall expire one year from the date of this letter; and
- The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration;

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated September 20, 2012. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Thank you for your attention and cooperation.

Very truly yours,

LRoberts

Linda Roberts
Executive Director

LR/CDM/jbw

c: The Honorable Ryan J. Bingham, Mayor, City of Torrington
Martin Connor, City Planner, City of Torrington
Sean Gormley, SBA

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

October 3, 2012

The Honorable Ryan J. Bingham
Mayor
City of Torrington
Municipal Building
140 Main Street
Torrington, CT 06790-5245

RE: **EM-VER-143-120924**- Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 1925 East Main Street, Torrington, Connecticut.

Dear Mayor Bingham:

The Connecticut Siting Council (Council) received this request to modify an existing telecommunications facility, pursuant to Regulations of Connecticut State Agencies Section 16-50j-72.

If you have any questions or comments regarding this proposal, please call me or inform the Council by October 18, 2012.

Thank you for your cooperation and consideration.

Very truly yours,

LRoberts

Linda Roberts
Executive Director

LR/jbw

Enclosure: Notice of Intent

c: Martin Connor, City Planner, City of Torrington

ROBINSON & CC

EM-VER-143-120924

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

September 20, 2012

Linda Roberts
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: **Notice of Exempt Modification – Antenna Swap**
1925 East Main Street, Torrington, Connecticut

Dear Ms. Roberts:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) wireless telecommunications antennas at the 123-foot level on an existing 153-foot tower at the above-referenced address. The tower is owned by SBA. Cellco's use of the tower was approved by the Council in 2003. Cellco now intends to replace six (6) of its existing antennas with six (6) model LPA-171063-12CF PCS antennas; one (1) model APX75 866514- T6 LTE antenna; and two (2) model BXA-70063-6CF LTE antennas, all at the same 123-foot level. Cellco also intend to install six (6) additional coax cables attached to the outside of the tower. Attached behind Tab 1 are the specifications for the replacement antennas.

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 Ryan J. Bingham, Mayor of the City of Torrington. A copy of this letter is also being sent to TEP Incorporated, the owner of the property on which the tower is located.

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 will be located at the 123-foot level on the existing 153-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 boundaries.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more.

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) adopted safety standard. A cumulative General Power Density table for Cellco's modified facility is included behind Tab 2.

Also attached is a Structural Analysis confirming that the tower and foundation can support Cellco's proposed modifications. (See Tab 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

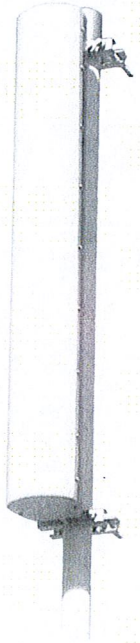
Enclosures
Copy to:
Ryan J. Bingham, Torrington Mayor
TEP Incorporated
Sandy Carter

LPA-171063-12CF-EDIN-X

V-Pol | Log Periodic | 63° | 18.5-19.0 dBi

Replace "X" with desired electrical downtilt.

Antenna is available with NE connector(s). Replace "EDIN" with "NE" in the model number when ordering.

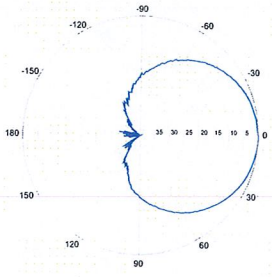


Electrical Characteristics	1710-2170 MHz		
Frequency bands	1710-1755 MHz	1850-1990 MHz	1920-2170 MHz
Polarization	Vertical		
Horizontal beamwidth	60°	63°	65°
Vertical beamwidth	3°	4°	3°
Gain	16.4 dBd (18.5 dBi)	16.9 dBd (19.0 dBi)	16.4 dBd (18.5 dBi)
Electrical downtilt (X)	0, 2		
Impedance	50Ω		
VSWR	≤ 1.5:1		
Null fill	5-10% (-26.02 to -20.0dB)		
Input power	250 W		
Lightning protection	Direct Ground		
Connector(s)	1 Port / EDIN or NE / Female / Center (Back)		

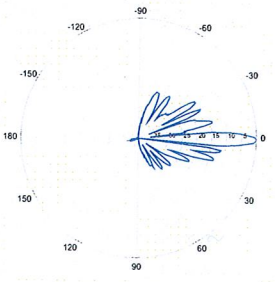
Mechanical Characteristics		
Dimensions Length x Width x Depth	1876 x 200 x 202 mm	73.9 x 7.9 x 8.0 in
Weight without mounting brackets	5.2 kg	11.5 lbs
Survival wind speed	>201 km/hr	>125 mph
Wind area	Front: 0.31 m² Side: 0.38 m²	Front: 4.0 ft² Side: 4.1 ft²
Wind load @ 161 km/hr (100 mph)	Front: 182 N Side: 586 N	Front: 41 lbf Side: 132 lbf

Mounting Options	Part Number	Fits Pipe Diameter	Weight
2-Point Mounting Bracket Kit	26799997	50-102 mm 2.0-4.0 in	2.3 kg 5.0 lbs
2-Point Mounting and Downtilt Bracket Kit	26799999	50-102 mm 2.0-4.0 in	2.3 kg 5.0 lbs

1710-1880 MHz

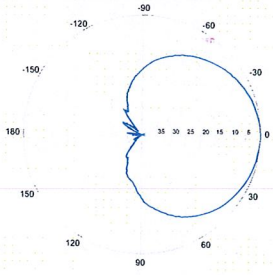


Horizontal

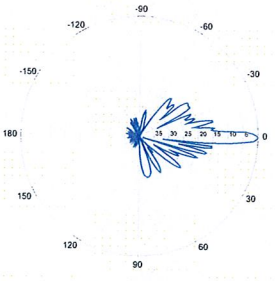


0° | Vertical

1850-1990 MHz

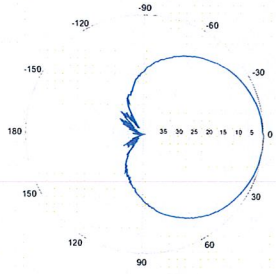


Horizontal

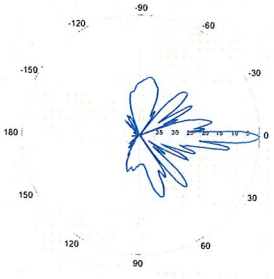


0° | Vertical

1920-2170 MHz



Horizontal

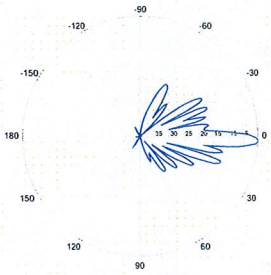


0° | Vertical

LPA-171063-12CF-EDIN-X

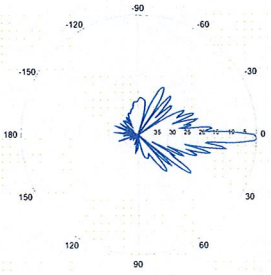
V-Pol | Log Periodic | 63° | 18.5-19.0 dBi

1710-1880 MHz



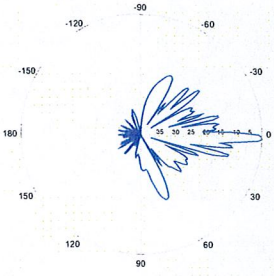
2° | Vertical

1850-1990 MHz



2° | Vertical

1920-2170 MHz



2° | Vertical

Amphenol ANTENNA SOLUTIONS

BXA-70063-6CF-EDIN-X

X-Pol | FET Panel | 63° | 14.5 dBd

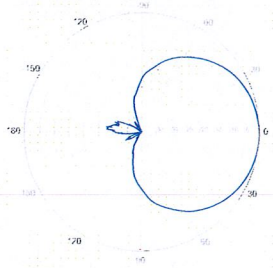
Replace "X" with desired electrical downtilt.

Antenna is also available with NE connector(s). Replace "EDIN" with "NE" in the model number when ordering.

Electrical Characteristics	696-900 MHz	
Frequency bands	696-806 MHz	806-900 MHz
Polarization	±45°	
Horizontal beamwidth	65°	63°
Vertical beamwidth	13°	11°
Gain	14.0 dBd (16.1 dBi)	14.5 dBd (16.6 dBi)
Electrical downtilt (X)	0, 2, 3, 4, 5, 6, 8, 10	
Impedance	50Ω	
VSWR	≤1.35:1	
Upper sidelobe suppression (0°)	-18.3 dB	-18.2 dB
Front-to-back ratio (+/-30°)	-33.4 dB	-36.3 dB
Null fill	5% (-26.02 dB)	
Isolation between ports	< -25 dB	
Input power with EDIN connectors	500 W	
Input power with NE connectors	300 W	
Lightning protection	Direct Ground	
Connector(s)	2 Ports / EDIN or NE / Female / Center (Back)	
Mechanical Characteristics		
Dimensions Length x Width x Depth	1804 x 285 x 132 mm	71.0 x 11.2 x 5.2 in
Depth with z-brackets	172 mm	6.8 in
Weight without mounting brackets	7.9 kg	17 lbs
Survival wind speed	> 201 km/hr	> 125 mph
Wind area	Front: 0.51 m² Side: 0.24 m²	Front: 5.5 ft² Side: 2.6 ft²
Wind load @ 161 km/hr (100 mph)	Front: 759 N Side: 391 N	Front: 169 lbf Side: 89 lbf

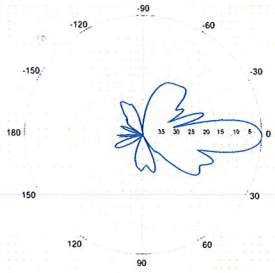
Mounting Options	Part Number	Fits Pipe Diameter	Weight
3-Point Mounting & Downtilt Bracket Kit	36210008	40-115 mm 1.57-4.5 in	6.9 kg 15.2 lbs
Concealment Configurations	For concealment configurations, order BXA-70063-6CF-EDIN-X-FP		

BXA-70063-6CF-EDIN-X



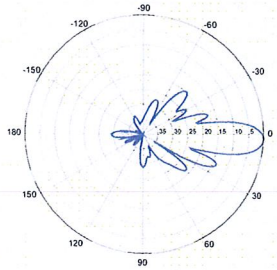
Horizontal | 750 MHz

BXA-70063-6CF-EDIN-0

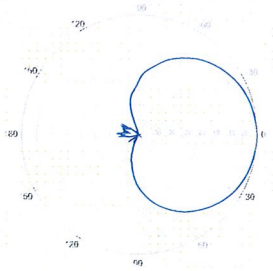


0° | Vertical | 750 MHz

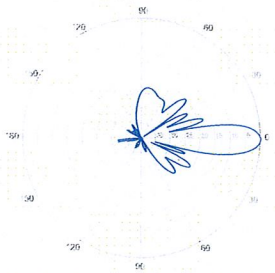
BXA-70063-6CF-EDIN-2



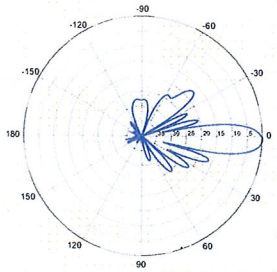
2° | Vertical | 750 MHz



Horizontal | 850 MHz



0° | Vertical | 850 MHz

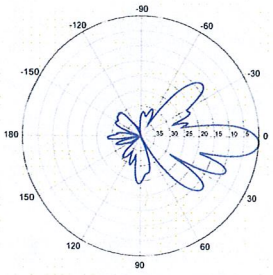


2° | Vertical | 850 MHz

BXA-70063-6CF-EDIN-X

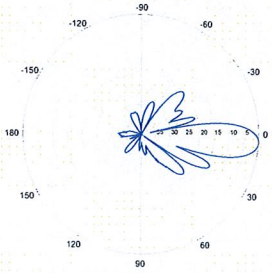
X-Pol | FET Panel | 63° | 14.5 dBd

BXA-70063-6CF-EDIN-3



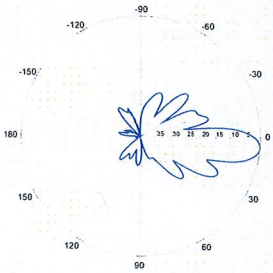
3° | Vertical | 750 MHz

BXA-70063-6CF-EDIN-4

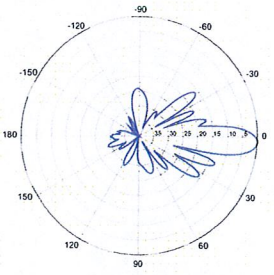


4° | Vertical | 750 MHz

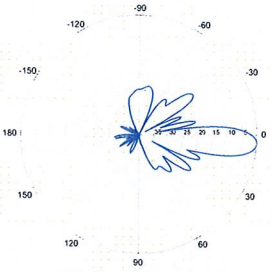
BXA-70063-6CF-EDIN-5



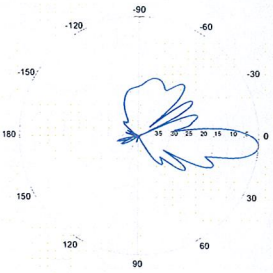
5° | Vertical | 750 MHz



3° | Vertical | 850 MHz

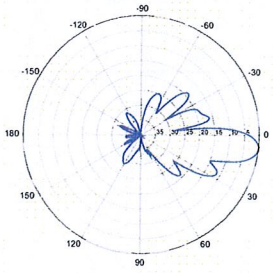


4° | Vertical | 850 MHz



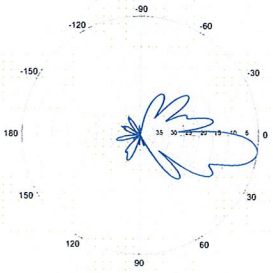
5° | Vertical | 850 MHz

BXA-70063-6CF-EDIN-6



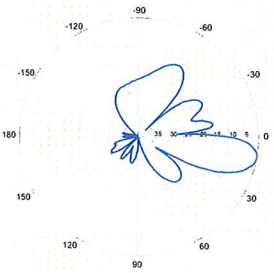
6° | Vertical | 750 MHz

BXA-70063-6CF-EDIN-8

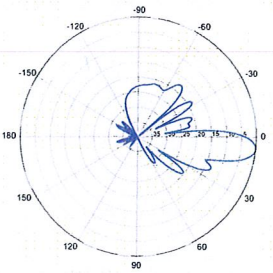


8° | Vertical | 750 MHz

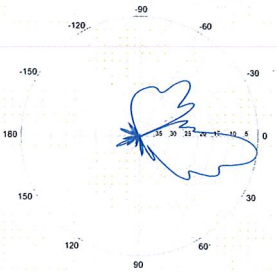
BXA-70063-6CF-EDIN-10



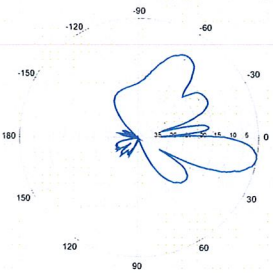
10° | Vertical | 750 MHz



6° | Vertical | 850 MHz



8° | Vertical | 850 MHz



10° | Vertical | 850 MHz

Optimizer® Dual Polarized Antenna, 698-896, 65deg, 16.1dBi, 2m, FET, 6deg

Product Description

Wideband antenna for dense networks where site aspect is essential.

Features/Benefits

- **Wideband performance 698-896 MHz**
- **High sidelobe suppression**
- **Null fill**
- **Dual polarization**
- **High front-to-back ratio**

Technical Specifications

Electrical Specifications

Frequency Range, MHz	698-896
Horizontal Beamwidth, deg	66 +/-5
Vertical Beamwidth, deg	9-12
Electrical Downtilt Range, deg	6
Gain, dBi (dBd)	16.1 (14)
1st Upper Sidelobe Suppression, dB	>18
Upper Sidelobe Suppression, dB	>18
Front-To-Back Ratio, dB	>30
Polarization	Slant +/-45 degrees
VSWR	1.40:1
Isolation between Ports, dB	>30
3rd Order IMP @ 2 x 43 dBm, dBc	>150
Impedance, Ohms	50
Maximum Power Input, W	500
Lightning Protection	Chassis Ground
Connector Type/Location	(2) 7-16 Long Neck DIN Female/Bottom

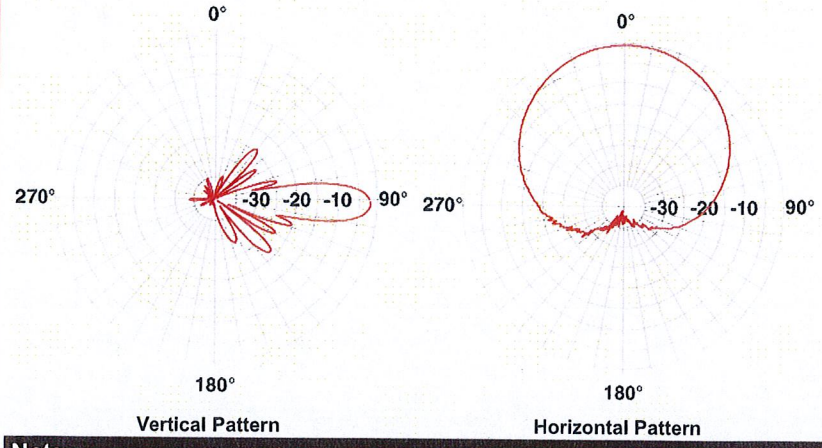
Mechanical Specifications

Dimensions - HxWxD, mm (in)	2082.8 x 311.2 x 120.7 (82 x 12.25 x 4.75)
Weight w/o Mtg Hardware, kg (lb)	14.0 (30.8)
Survival/Rated Wind Speed, km/h (mph)	200 (125) / 160 (100)
Operation temperature, °C (°F)	-40 to +60 (-40 to +140)
Radome Material/Color	ASA Plastic/Light Grey RAL7035
Mounting Hardware Material	Diecasted Aluminum
Radiating Element Material	Brass
Reflector Material	Aluminum

Ordering Information

Mounting Hardware	APM40-3
Mounting Pipe Diameter, mm (in)	60-120 (2.36-4.72)
Mounting Hardware Weight, kg (lb)	5.4 (11.9)

Optimizer® Dual Polarized Antenna, 698-896, 65deg, 16.1dBi, 2m, FET, 6deg



Vertical Pattern | Horizontal Pattern

Notes

For additional mounting information please click "External Document Link" below.

External Document Links

APM40 Series Datasheet
APM40 Series Installation Instructions

	General	Power	Density					
Site Name: Torrington E								
Tower Height: Verizon @ 123Ft.								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*Nextel	9	100	143	0.0158	851	0.5673	2.79%	
*VoiceStream	4	294	133	0.0239	1930	1.0000	2.39%	
*Sprint	11	349	153	0.0590	1962.5	1.0000	5.90%	
*Pocket	3	631	85	0.0942	2130	1.0000	9.42%	
*Town	tion available %MPE estimated						5.00%	
*Cingular UMTS	1	500	95	0.0199	880	0.5867	3.40%	
*Cingular GSM	4	296	95	0.0472	880	0.5867	8.04%	
*Cingular GSM	2	427	95	0.0340	1930	1.0000	3.40%	
Verizon PCS	**7**	**256**	**123**	**0.0426**	**1970**	**1.0000**	**4.26%**	
Verizon Cellular	**9**	**261**	**123**	**0.0558**	**869**	**0.5793**	**9.64%**	
Verizon AWS	**1**	**621**	**123**	**0.0148**	**2145**	**1.0000**	**1.48%**	
Verizon 700	**1**	**852**	**123**	**0.0202**	**698**	**0.4653**	**4.35%**	
								60.06%
* Source: Siting Council								

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

Structural Analysis for SBA Network Services, Inc.

153' Monopole Tower

SBA Site Name: Torrington
SBA Site ID: CT01499-S
Verizon Site Name: Torrington East

FDH Project Number 12-04781E S2 (R1)

Analysis Results

Tower Components	92.7%	Sufficient
Foundation	95.8%	Sufficient

Prepared By:

David Zambrano
Project Engineer

Reviewed By:

Christopher M. Murphy

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

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

September 11, 2012

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

TABLE OF CONTENTS

EXECUTIVE SUMMARY

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

- Fred A. Nudd Corporation (Project No. 7783) original design drawings dated August 18, 2000
- Vertical Structures, Inc. (Job No. 2003-007-015) structural analysis and modification drawings dated September 9, 2003
- SBA Network Services, Inc.

The *basic design wind speed* per the *TIA/EIA-222-F* standards & 2005 Connecticut Building Code is 80 mph without ice and 37 mph with 1" radial ice. Ice is considered to increase in thickness with height.

Conclusions

With the existing and proposed antennas from Verizon in place at 123 ft, the tower meets the requirements of the *TIA/EIA-222-F* standards and 2005 Connecticut Building Code provided the **Recommendation** listed below is satisfied. Furthermore, provided the foundation was designed and constructed to support the original design reactions (see Fred A. Nudd Project No. 7783), 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 Engineering, Inc. is accurate (i.e., the steel data, tower layout, existing antenna loading, and proposed antenna loading) and that the tower has been properly erected and maintained per the original design drawings.

Recommendation

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

1. The proposed coax should be installed inside the pole's shaft but may be installed on the exterior of the monopole shaft in a single row.

APPURTENANCE LISTING

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

Table 1 - Appurtenance Loading

Existing Loading:

Antenna Elevation (ft)	Description	Coax and Lines[1]	Carrier	Mount Elevation (ft)	Mount Type
153	(3) RFS APXVSPP18-C-A20 (3) ALU 1900 MHz RRUs (3) ALU 800 MHz RRUs (3) ALU 800 MHz Filters (4) RFS ACU-A20-N RETs	(3) 1-1/4"	Sprint	153	(1) Low Profile Platform
143	(12) Decibel DB844H90E-XY	(12) 1-1/4"	Nextel	143	(1) Low Profile Platform
133	(6) EMS RR90-17-02DP	(12) 1-5/8"	T-Mobile	133	(1) Low Profile Platform
123	(6) Decibel DB950F65E-M (6) Antel LPA-80063/6CF	(12) 1-5/8"	Verizon	123	(1) Low Profile Platform
110	(1) 10' Omni	(1) 1/2"	Torrington PD	105	(1) Standoff
95	(3) CSS DUO1417-8686 (6) Powerwave 7770 (6) Powerwave LGP17201 TMAs (6) Powerwave LGP21903 Diplexers	(12) 1-5/8"[2]	Cingular	95	(1) Low Profile Platform
85	(3) RFS APXV18-206517S-C	(6) 1-5/8"[3]	Pocket	85	(1) Standoff
70	(1) GPS	(1) 1/2		70	(1) Standoff

1. The existing coax are located inside the pole's shaft, unless otherwise noted
2. Cingular's coax to 95 ft are installed outside the pole's shaft in a single row
3. Pocket's coax to 85 ft are installed outside the pole's shaft in a single row

Proposed Loading:

Antenna Elevation (ft)	Description	Coax and Lines	Carrier	Mount Elevation (ft)	Mount Type
123	(6) Antel LPA-80063/6CF (6) Antel LPA-171063-12CF (2) Antel BXA-70063-6CF-2 (1) RFS APX75-866514-T6	(12) 1-5/8" (6) 1-5/8"[1]	Verizon	123	(1) Low Profile Platform

1. Verizon's coax to 123 ft are installed outside the pole's shaft in a single row

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
Flange Plate	50 ksi
Flange Bolts	Fu = 125 ksi
Base Plate	50 ksi
Anchor Bolts	Fu = 125 ksi

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

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

See the **Appendix** for detailed modeling information

Table 3 - Summary of Working Percentage of Structural Components

Section No.	Elevation ft	Component Type	Size	% Capacity	Pass Fail
L1	153 - 150	Pole	TP26.25x24x0.25	1.9	Pass
		Flange Bolts	(18) 1/2" Φ w/ 27" BC	7.4	Pass
		Flange Plate	30" Φ x 1/2" thk.	3.8	Pass
L2	150 - 110	Pole	TP35.25x26.25x0.25	36.6	Pass
L3	110 - 65	Pole	TP45.375x33.625x0.3125	66.6	Pass
L4	65 - 21	Pole	TP55.275x43.34x0.3125	92.7	Pass
L5	21 - 0	Pole	TP60x52.9791x0.375	81.3	Pass
		Anchor Bolts	(18) 2" Φ w/ 67" BC	80.2	Pass
		Base Plate	73" Φ x 1.5" thk. PL w/ Stiffeners	63.3	Pass

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

Table 4 - Maximum Base Reactions

Base Reactions	Current Analysis *(TIA/EIA-222-F)*	Original Design *(TIA/EIA-222-F)*
Axial	42 k	---
Shear	35 k	31 k
Moment	3,538 k	3,692 k

GENERAL COMMENTS

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

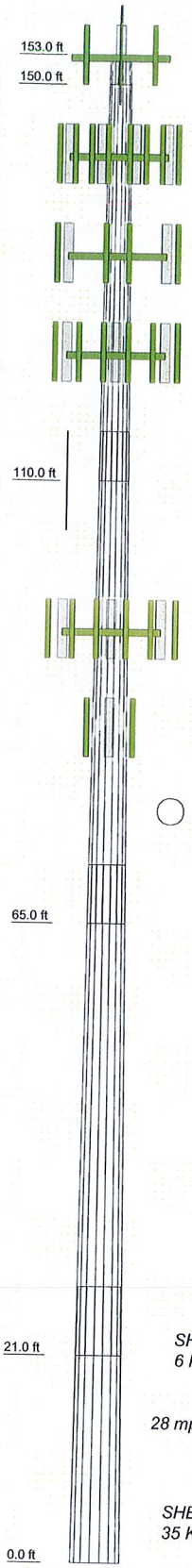
LIMITATIONS

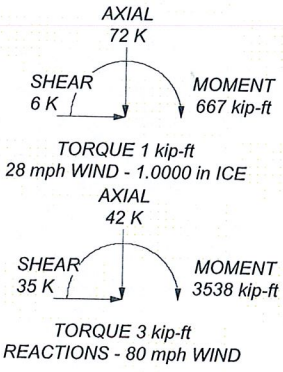
All opinions and conclusions are considered accurate to a reasonable degree of engineering certainty based upon the evidence available at the time of this report. All opinions and conclusions are subject to revision based upon receipt of new or additional/updated information. All services are provided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

APPENDIX

Section	1	2	3	4	5
Length (ft)	3.00	40.00	50.00	50.00	28.00
Number of Sides	18	18	18	18	18
Thickness (in)	0.2500	0.2500	0.3125	0.3125	0.3750
Socket Length (ft)		5.00	6.00	7.00	
Top Dia (in)	24.0000	26.2500	33.6250	43.3400	52.9791
Bot Dia (in)	26.2500	35.2500	45.3750	55.2750	60.0000
Grade			A572-65		
Weight (K)	0.2	3.3	6.6	8.3	6.4

24.7





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(1) Low Profile Platform	153	(2) Antel LPA-80063/6CF w/ Mount Pipe	123
Lightning Rod	153	(1) Low Profile Platform	123
(2) Empty Pipe Mount	153	(2) LPA-171063-12CF	123
(2) Empty Pipe Mount	153	(2) LPA-171063-12CF	123
(2) Empty Pipe Mount	153	(2) LPA-171063-12CF	123
RFS APXVSPP18-C-A20 w/Mount Pipe	153	BXA-70063-6CF-2 w/ Mount Pipe	123
RFS APXVSPP18-C-A20 w/Mount Pipe	153	BXA-70063-6CF-2 w/ Mount Pipe	123
RFS APXVSPP18-C-A20 w/Mount Pipe	153	APX75-866514-T6	123
ALU 1900 RRU	153	(2) Empty Mount Pipe	123
ALU 1900 RRU	153	(2) Empty Mount Pipe	123
ALU 1900 RRU	153	(2) Empty Mount Pipe	123
ALU 800 RRU	153	Empty Mount Pipe	123
ALU 800 RRU	153	10' whip	105
ALU 800 RRU	153	(1) Standoff	105
ALU 800 Filter	153	(2) Powerwave 7770 w/ Mount Pipe	95
ALU 800 Filter	153	(2) Powerwave 7770 w/ Mount Pipe	95
ALU 800 Filter	153	(2) Powerwave 7770 w/ Mount Pipe	95
RFS ACU-A20-N RET	153	(2) TMA - Powerwave LGP17201	95
(2) RFS ACU-A20-N RET	153	(2) TMA - Powerwave LGP17201	95
RFS ACU-A20-N RET	153	(2) TMA - Powerwave LGP17201	95
(4) DB844H90E-XY w/Mount Pipe	143	(2) Diplexer - Powerwave LGP21903	95
(4) DB844H90E-XY w/Mount Pipe	143	(2) Diplexer - Powerwave LGP21903	95
(4) DB844H90E-XY w/Mount Pipe	143	(2) Diplexer - Powerwave LGP21903	95
(1) Low Profile Platform	143	(1) Low Profile Platform	95
(2) RR90-17-02DP w/Mount Pipe	133	DUO1417-8686 w/Mount Pipe	95
(2) RR90-17-02DP w/Mount Pipe	133	DUO1417-8686 w/Mount Pipe	95
(2) RR90-17-02DP w/Mount Pipe	133	DUO1417-8686 w/Mount Pipe	95
(1) Low Profile Platform	133	RFS APXV18-206517S-C w/ Mount Pipe	85
(2) Antel LPA-80063/6CF w/ Mount Pipe	123	RFS APXV18-206517S-C w/ Mount Pipe	85
(2) Antel LPA-80063/6CF w/ Mount Pipe	123	RFS APXV18-206517S-C w/ Mount Pipe	85
		GPS	70

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Litchfield County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 28 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. TOWER RATING: 92.7%

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

Job: Torrington CT01499-S			
Project: 12-04781E S2 (R1)			
Client: SBA	Drawn by: John Wood	App'd:	
Code: TIA/EIA-222-F	Date: 09/11/12	Scale: NTS	
Path: \\fdh-server\Projects\2012 Projects\4 - Apps\12-04781E\Torrington, CT\S2 - SA Version\Analysis\R1\Torrington CT CT01499-S.eri		Dwg No. E-1	