

# 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](mailto:siting.council@ct.gov)

[www.ct.gov/csc](http://www.ct.gov/csc)

April 25, 2011

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

RE: **EM-VER-013-110408** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 131 Gifford Lane, Bozrah, 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:

- 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 April 7, 2011. 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,

Linda Roberts  
Executive Director

LR/CDM/laf

c: The Honorable William E. Ballinger, First Selectman, Town of Bozrah  
Seymour Adelman, Planning and Zoning Chairman, Town of Bozrah  
SBA





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CONNECTICUT SITING COUNCIL

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E-Mail: [siting.council@ct.gov](mailto:siting.council@ct.gov)

[www.ct.gov/csc](http://www.ct.gov/csc)

April 11, 2011

The Honorable William E. Ballinger  
First Selectman  
Town of Bozrah  
Town Hall  
1 River Road  
Bozrah, CT 06334-0158

RE: **EM-VER-013-110408** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 131 Gifford Lane, Bozrah, Connecticut.

Dear First Selectman Ballinger:

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 April 25, 2011.

Thank you for your cooperation and consideration.

Very truly yours,

Linda Roberts  
Executive Director

LR/jbw

Enclosure: Notice of Intent

c: Seymour Adelman, Planning and Zoning Chairman, Town of Bozrah

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

ORIGINAL

April 7, 2011

*Via Hand Delivery*

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

RECEIVED  
 APR - 8 2011  
 CONNECTICUT  
 SITING COUNCIL

Re: **Notice of Exempt Modification – Antenna Swap  
 131 Gifford Lane, Bozrah, Connecticut**

Dear Ms. Roberts:

Cellco Partnership d/b/a Verizon Wireless (“Cellco”) currently maintains twelve (12) wireless telecommunications antennas at the 162-foot level on the existing 193-foot tower at the above-referenced address. The tower is owned by SBA. The Connecticut Siting Council (“Council”) approved Cellco’s use of this tower in 2000. Cellco intends to remove all of its existing antennas and replace them with twelve (12) new antennas (six (6) model LPA-80080/6CF cellular antennas; three (3) model BXA-185090/8CF PCS antennas; and three (3) model APX75-866514-CT0 LTE antennas). All new antennas will be installed at the same 162-foot level on the tower. Cellco will also install six (6) coax cable diplexers on the existing T-arm support structures. Attached behind Tab 1 of this filing are the specifications for each of the proposed replacement antennas and cable diplexers.

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 William Ballinger, First Selectman for the Town of Bozrah. A copy of this letter is also being sent to John E. and Betty L. Orr, the owners 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).

*Law Offices*

BOSTON

PROVIDENCE

HARTFORD

NEW LONDON

STAMFORD

WHITE PLAINS

NEW YORK CITY

ALBANY

SARASOTA

*www.rc.com*

10993197-v1

# ROBINSON & COLE<sup>LLP</sup>

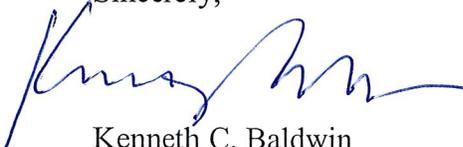
Linda Roberts  
April 7, 2011  
Page 2

1. The proposed modifications will not result in any increase in the overall height of the existing tower. Cellco's replacement antennas and diplexers will be located at the 162-foot level on the 193-foot tower.
2. The proposed modifications will not involve any modifications 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) power density levels at the facility to a level at or above the Federal Communications Commission (FCC) adopted safety standard. A cumulative General Power Density table for the modified facility is included behind Tab 2.

Also attached is a Structural Analysis Report 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:

William Ballinger, Bozrah First Selectman  
John E. and Betty L. Orr  
Sandy M. Carter



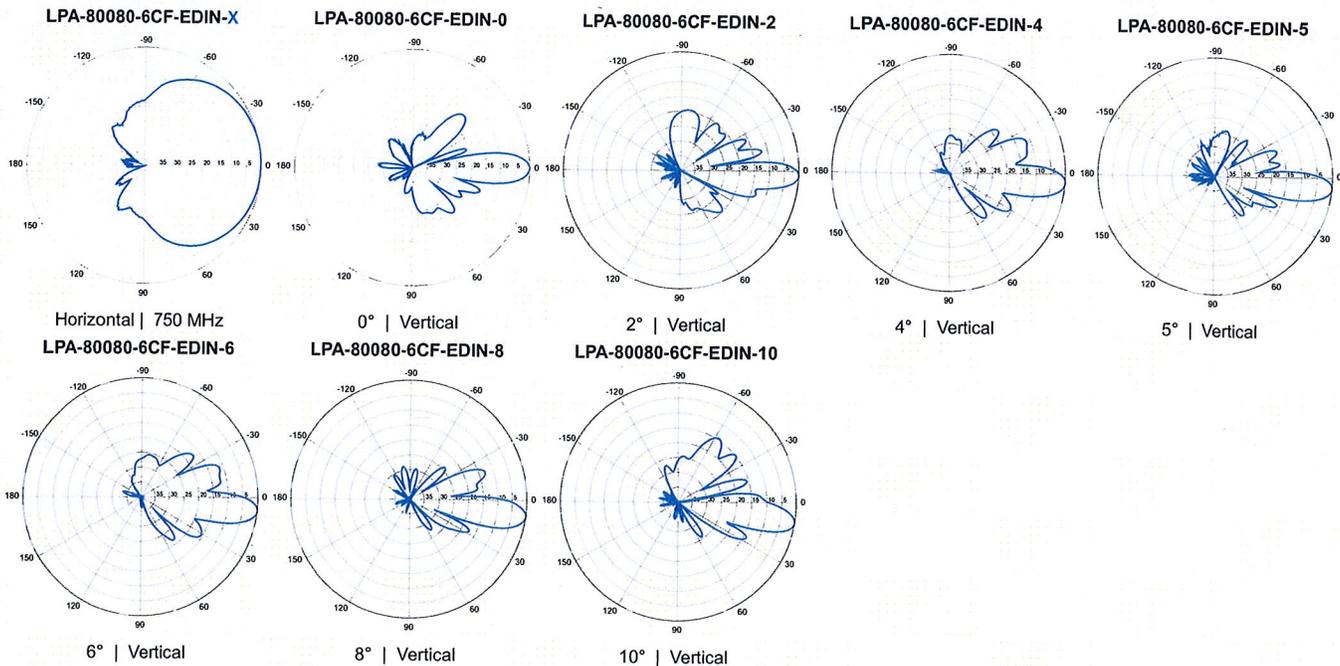
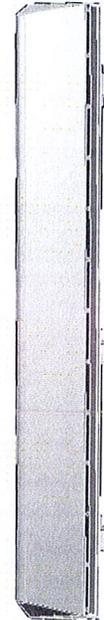
## LPA-80080-6CF-EDIN-X

V-Pol | Log Periodic | 80° | 14.0 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		
Frequency bands	806-960 MHz	
Polarization	Vertical	
Horizontal beamwidth	80°	
Vertical beamwidth	10°	
Gain	14.0 dBd (16.1 dBi)	
Electrical downtilt (X)	0, 2, 4, 5, 6, 8, 10	
Impedance	50Ω	
VSWR	≤1.4:1	
Upper sidelobe suppression (0°)	-22.6 dB	
Null fill	10% (-20.0 dB)	
Input power	500 W	
Lightning protection	Direct Ground	
Connector(s)	1 Port / EDIN or NE / Female / Center (Back)	
Mechanical Characteristics		
Dimensions Length x Width x Depth	1800 x 140 x 335 mm      70.9 x 5.5 x 13.2 in	
Depth of antenna with z-bracket	375 mm      14.8 in	
Weight without mounting brackets	9.5 kg      21.0 lbs	
Survival wind speed	> 201 km/hr      > 125 mph	
Wind area	Front: 0.25 m <sup>2</sup> Side: 0.61 m <sup>2</sup> Front: 2.7 ft <sup>2</sup> Side: 6.6 ft <sup>2</sup>	
Wind load @ 161 km/hr (100 mph)	Front: 415 N    Side: 878 N      Front: 93 lbf    Side: 198 lbf	
Mounting Options		
	Part Number      Fits Pipe Diameter      Weight	
3-Point Mounting & Downtilt Bracket Kit (0-20°)	21700000      50-102 mm    2.0-4.0 in      11 kg    25 lbs	
Lock-Down Brace	If the lock-down brace is used, the maximum diameter of the mounting pipe is 88.9 mm or 3.5 in.	



Quoted performance parameters are provided to offer typical or range values only and may vary as a result of normal manufacturing and operational conditions. Extreme operational conditions and/or stress on structural supports is beyond our control. Such conditions may result in damage to this product. Improvements to product may be made without notice.

# BXA-185090/8CF

When ordering replace "\_\_\_" with connector type.

## Mechanical specifications

Length	1225 mm	48.2 in
Width	154 mm	6.1 in
Depth	105 mm	4.1 in
Depth with t-bracket	133 mm	5.2 in
4) Weight	5.0 kg	11.0 lbs
Wind Area		
Fore/Aft	0.19 m <sup>2</sup>	2.0 ft <sup>2</sup>
Side	0.13 m <sup>2</sup>	1.4 ft <sup>2</sup>
Rated Wind Velocity (Safety factor 2.0)		
	>322 km/hr	>200 mph
Wind Load @ 100 mph (161 km/hr)		
Fore/Aft	283 N	64.0 lbs
Side	211 N	47.5 lbs

Antenna consisting of aluminum alloy with brass feedlines covered by a UV safe fiberglass radome.

## Mounting and Downtilting

Mounting brackets attach to a pipe diameter of Ø50-102 mm (2.0-4.0 in).

Mounting bracket kit #26799997  
Downtilt bracket kit #26799999

The downtilt bracket kit includes the mounting bracket kit.

## Electrical specifications

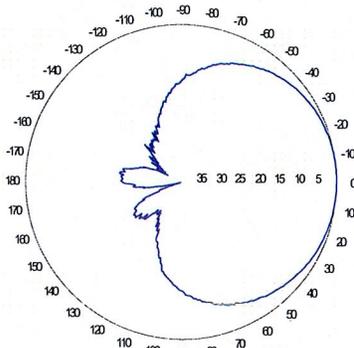
Frequency Range	1850-1990 MHz
Impedance	50Ω
3) Connector(s)	NE or E-DIN 2 ports / center
1) VSWR	≤ 1.4:1
Polarization	Slant ± 45°
1) Isolation Between Ports	< -30 dB
1) Gain	16.5 dBi
2) Power Rating	250 W
1) Half Power Angle	
H-Plane	90°
E-Plane	7°
1) Electrical Downtilt	0°
1) Null Fill	5%
Lightning Protection	Direct Ground

Patented Dipole Design: U.S. Patent No. 6,597,324 B2

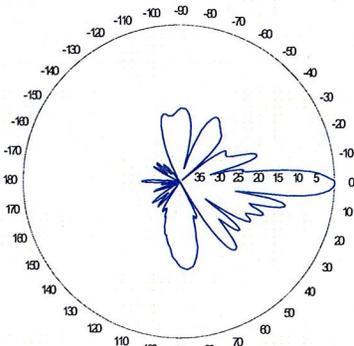
- 1) Typical values.
- 2) Power rating limited by connector only.
- 3) NE indicates an elongated N connector.  
E-DIN indicates an elongated DIN connector.
- 4) The antenna weight listed above does not include the bracket weight.

Improvements to mechanical and/or electrical performance of the antenna may be made without notice.

## Radiation pattern<sup>1)</sup>



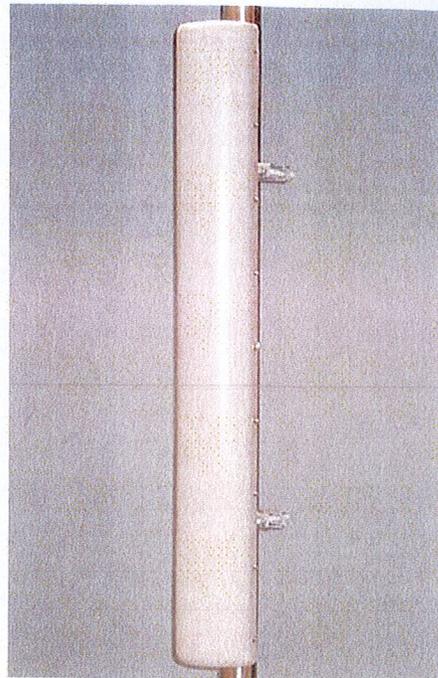
Horizontal



Vertical

Radiation patterns for all antennas are measured with the antenna mounted on a fiberglass pole.

Mounting on a metal pole will typically improve the Front-to-Back ratio.



**Amphenol Antel's Exclusive 3T (True Transmission Line Technology) Antenna Design:**

- Watercut brass feedline assembly for consistent performance.
- Unique feedline design eliminates the need for conventional solder joints in the signal path.
- A non-collinear system with access to every radiating element for broad bandwidth and superior performance.
- Air as insulation for virtually no internal signal loss.

*This Amphenol Antel antenna is under a five-year limited warranty for repair or replacement.*

**Antenna available with center-fed connectors only.**

CF Denotes a Center-Fed Connector.

**1850-1990 MHz**



Revision Date: 7/11/07



Optimizer® Dual Polarized Antenna, 698-896, 65deg, 16.1dBi, 2m, FET, 0deg

**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**

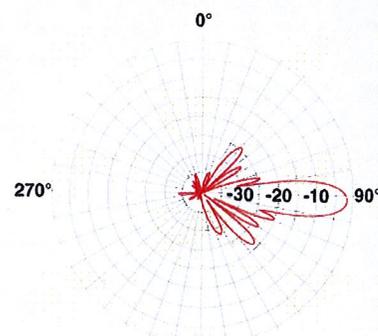
Frequency Range, MHz	698-896
Horizontal Beamwidth, deg	66 +/-5
Vertical Beamwidth, deg	9-12
Electrical Downtilt, deg	0
Gain, dBi (dBd)	16.1 (14)
1st Upper Sidelobe Suppression, dB	>18
Upper Sidelobe Suppression, dB	>18
Front-To-Back Ratio, dB	>30
Polarization	Slant +/-45 degrees
VSWR	1.40:1
Isolation 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	(2) 7-16 Long Neck DIN Female

**Mechanical Specifications**

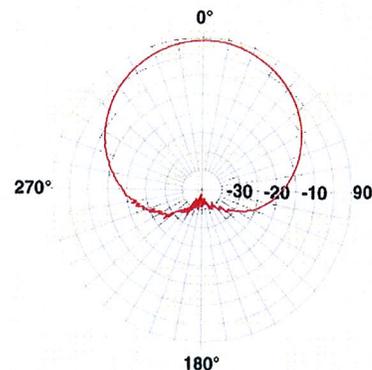
Dimensions - HxWxD, mm (in)	2082.8 x 311.2 x 120.7 (82 x 12.25 x 4.75)
Weight w/o Mtg Hardware, kg (lb)	14.0 (30.8)
Survival Wind Speed, km/h (mph)	200 (125)
Rated Wind Speed, km/h (mph)	160 (100)
Max Wind Loading Area, m <sup>2</sup> (ft <sup>2</sup> )	0.65 (6.95)
Radome Material	ASA Plastic
Radome Color	Light Grey RAL7035
Mounting Hardware Material	Diecasted 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)



Vertical Pattern



Horizontal Pattern

**Other Documentation**

- APM40 Series Datasheet
- APM40 Series Installation Instructions

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



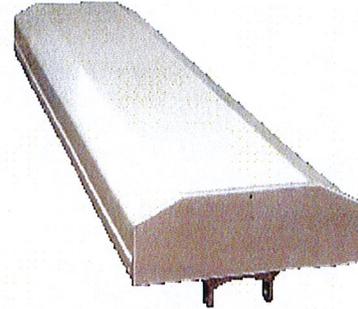
Optimizer® Dual Polarized Antenna, 698-896, 65deg, 16.1dBi, 2m, FET, 0deg

**Product Description**

Wideband antenna for dense networks where site aspect is essential.

**Features/Benefits**

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



**Technical Specifications**

**Electrical Specifications**

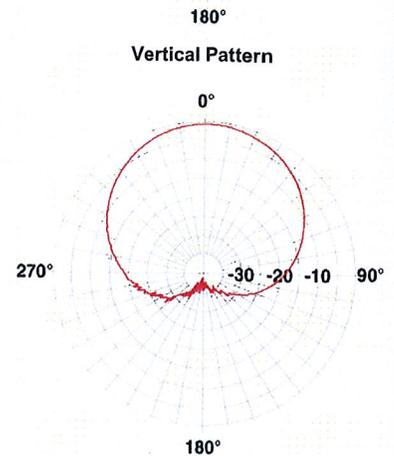
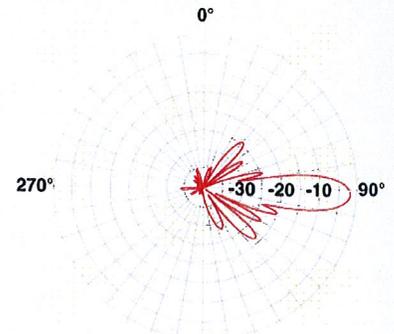
Frequency Range, MHz	698-896
Horizontal Beamwidth, deg	66 +/-5
Vertical Beamwidth, deg	9-12
Electrical Downtilt, deg	0
Gain, dBi (dBd)	16.1 (14)
1st Upper Sidelobe Suppression, dB	>18
Upper Sidelobe Suppression, dB	>18
Front-To-Back Ratio, dB	>30
Polarization	Slant +/-45 degrees
VSWR	1.40:1
Isolation 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	(2) 7-16 Long Neck DIN Female

**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 Wind Speed, km/h (mph)	200 (125)
Rated Wind Speed, km/h (mph)	160 (100)
Max Wind Loading Area, m <sup>2</sup> (ft <sup>2</sup> )	0.65 (6.95)
Radome Material	ASA Plastic
Radome Color	Light Grey RAL7035
Mounting Hardware Material	Diecasted 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)



**Other Documentation**

- APM40 Series Datasheet
- APM40 Series Installation Instructions

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

## ShareLite Wideband Diplexer – In-line 698-960 MHz/1710-2200 MHz, DC pass in high frequency path

## Product Description

The ShareLite FD9R6004 Series of diplexers are designed to enable feeder sharing between systems in the 698-960 MHz range and in the 1710-2200 MHz range. The diplexer is equipped with in-line connector placement so it can be installed in the BTS cabinet or at the tower top. This is especially valuable in crowded sites or when the feeders are not easily accessible. Due to its wideband design, the FD9R6004 Series can accommodate many combining solutions between 698-960 MHz and 1710-2200 MHz systems such as LTE 700 MHz, Cellular 800 MHz with PCS, GSM900 with GSM1800, or GSM900 with UMTS. This diplexer features a highly selective filter. It provides a high level of isolation between ports, while keeping the insertion loss on both paths at an extremely low level. The FD9R6004 diplexers are available with various DC pass options, helpful in configurations with or without the Tower Mount Amplifiers installed.



## Features/Benefits

- LTE ready design
- Extremely Low Insertion Loss
- High level of Rejection between bands – Protection against interferences
- Extremely High Power Handling Capability
- Integrated DC block/bypass versions available
- Very compact & small size design – Easy installation and reduced tower load
- In-line long-neck connectors for easy connection & waterproofing
- Exceptional reliability & environmental protection (IP 67)
- Equipped with 1 \* Breathable Vent – Prevent any humidity inside the product
- Mounting hardware for Wall and Pole mount provided (P/N SEM2-1A)
- Grounding already provided through the mounting bracket
- Kit available for easy dual mount

## Technical Specifications

Product Type	Diplexer/Cross Band Coupler
Frequency Band, MHz	698-2200
Configuration	Sharelite Single diplexer, outdoor, DC pass in the 1710-2170MHz path, with mounting hardware SEM2-1A
Mounting	Wall Mounting: With 4 screws (maximum 6mm diameter); Pole Mounting: With included clamp set 40-110mm (1.57-4.33)
Frequency Range Low Frequency Path, MHz	698-960
Frequency Range High Frequency Path, MHz	1710-2200
Return Loss All Ports Min/Typ, dB	19/23
Power Handling Continuous, Max, W	1250 at common port; 750 in low frequency path & 500 in high frequency path
Power Handling Peak, Max, W	15000 in low frequency path & 8000 in high frequency path
Impedance, Ohms	50
Insertion Loss 698-960 MHz Path, Typ, dB	0.07
Insertion Loss 1710-2200MHz path, Typ, dB	0.13
Rejection Between Bands Min/Typ, dB	58/64@698-960MHz; 60/70@1710-2200MHz
IMP Level at the COM Port, Typ, dBm	-112 @ 2x43
DC Pass in Low Frequency Path	No
DC Pass in High Frequency Path	Yes
Temperature Range, °C (°F)	-40 to +60 (-40 to +140)
Environmental	ETSI 300-019-2-4 Class 4.1E
Ingress Protection	IP 67
Lightning Protection	EN/IEC61000-4-5 Level 4
Connectors	In-line long-neck 7-16-Female
Weight, kg (lb)	1.2 (2.6)
Shipping Weight, kg (lb)	3.2 (7) for 2 * single units in 1 * box, 9.8 (21.6) for 6 * units = 3 * Boxes in 1 * overwrap
Application	LTE 700MHz, GSM900/3G/UMTS, GSM900/GSM1800, Cellular 800/PCS
Dimensions, H x W x D, mm (in)	147 x 164 x 37 (5.8 x 6.5 x 1.5)
Shipping Dimensions, H x W x D, mm (in)	254 x 406 x 82 (10 x 16 x 3.2) for 2 * Single Units in 1 * box, 280 x 406 x 241 (11 x 16 x 9.5) for 6 * units = 3 * Boxes in 1 * overwrap
Volume, L	0.43
Housing	Aluminum

## Notes

RFS The Clear Choice®

FD9R6004/2C-3L

Rev: --

Print Date: 16.02.2011

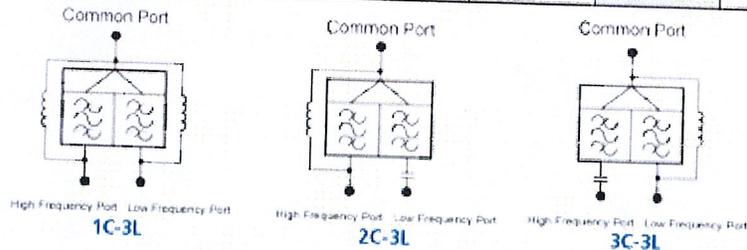
Please visit us on the internet at <http://www.rfsworld.com/>

Radio Frequency Systems



ShareLite Wideband Diplexer – In-line 698-960 MHz/1710-2200 MHz, DC pass in high frequency path

Selection Guide Diplexer 698-960 / 1710-2200MHz					
	Model Number	Full DC Pass	DC Pass High Band	DC Pass Low Band	Mounting Hardware Included
Single	FD9R6004/1C-3L				X
	FD9R6004/2C-3L				X
	FD9R6004/3C-3L				X
Dual	KIT-FD9R6004/1C-DL				X
	KIT-FD9R6004/2C-DL				X
	KIT-FD9R6004/3C-DL				X



The FD9R6004 Series is upgradeable to a Dual Diplexer kit by means of 2 diplexers and mounting hardware kits SEM2-1A and SEM2-3

Mounting Hardware and Ground Cable Ordering Information		
Model Number	Description	
SEM2-1A	Mounting Hardware, Pole mount ø40-110mm (Included with the Single and Dual Diplexer) Wall Screws M6 (Not included with the product)	
SEM2-3	Assembly kit for 2 pcs of FT9DW/xC-3L (Can be ordered separately but included with the Dual Diplexer Kit)	
CA020-2	Ground Cable, 2m, includes lugs (Optional)	
CA030-2	Ground Cable, 2m, includes lugs (Optional)	
SEM6	Mounting Hardware for 6 Diplexers, Tower Base (Optional)	

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

Site Name: Bozrah E		General	Power	Density				
Tower Height: Verizon @ 162ft								
CARRIER	# OF CHAN.	WATTS ERP	HEIGHT	CALC. POWER DENS	FREQ.	MAX. PERMISS. EXP.	FRACTION MPE	Total
*Omnipoint	2	386	195	0.0073	1930	1.0000	0.73%	
*Sprint	11	122	175	0.0158	1962.5	1.0000	1.58%	
*Cingular UMTS	1	500	182	0.0054	880	0.5867	0.93%	
*Cingular GSM	4	296	182	0.0129	880	0.5867	2.19%	
*Cingular	2	427	182	0.0093	1900	1.0000	0.93%	
Verizon	3	244	162	0.0100	1970	1.0000	1.00%	
Verizon	9	264	162	0.0326	869	0.5793	5.62%	
Verizon	1	711	162	0.0097	757	0.4973	1.96%	
* Source: Siting Council								14.93%



FDH Engineering, Inc., 2730 Rowland Rd. Raleigh, NC 27615, Ph. 919.755.1012, Fax 919.755.1031

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

**193' Self Support Tower**

**SBA Site Name: Bozrah  
SBA Site ID: CT01105-S**

FDH Project Number 11-01131E S1 (R1)

Prepared By:

*Stephanie M. Neal*  
Stephanie M. Neal, EI  
Project Engineer

Reviewed By:

*Christopher M. Murphy*

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

FDH Engineering, Inc.  
2730 Rowland Rd.  
Raleigh, NC 27615  
(919) 755-1012  
info@fdh-inc.com



January 19, 2011

*Prepared pursuant to ANSI/TIA-222-G Structural Standard for Antenna Supporting Structures and Antennas*

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## EXECUTIVE SUMMARY

At the request of SBA Network Services, Inc., FDH Engineering, Inc. performed an analysis of the existing self supported tower located in Bozrah, CT to determine whether the tower is structurally adequate to support both the existing and proposed loads, pursuant to the *Structural Standard for Antenna Supporting Structures and Antennas, ANSI/TIA-222-G*. Information pertaining to the existing/proposed antenna loading, geotechnical data, current tower geometry, and the member sizes was obtained from Pirod Inc. (Eng File No. A-115466) tower drawings dated February 23, 1999, Jaworski Geotech, Inc. (Project No. C98492G) Geotechnical Evaluation dated December 14, 1998, and SBA Network Services, Inc.

The *basic design wind speed* per the *ANSI/TIA-222-G* standard is 115 mph without ice and 50 mph with 3/4" radial ice. Ice is considered to increase in thickness with height. Furthermore, the tower was analyzed as a Class II structure in Exposure Category B.

## Conclusions

With the existing and proposed antennas from Verizon in place at 162' (see **Table 1**), the tower meets the requirements of the *ANSI/TIA-222-G* standard provided the **Recommendations** listed below are satisfied. Furthermore, provided the foundations were designed and constructed to support the original design reactions (see Pirod Inc. Eng File No. A-115466), 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 *ANSI/TIA-222-G* standard are met with the existing and proposed loading in place, we have the following recommendations:

1. Coax lines must be installed as shown in **Figure 1**.
2. The proposed diplexers should be installed directly behind the proposed panel antennas.

## 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 this layout, FDH Engineering, Inc. should be contacted to perform a revised analysis.*

**Table 1 – Appurtenance Loading**

### Existing Loading:

Antenna No.	Antenna Elevation (ft)	Description	Coax and Lines <sup>1</sup>	Carrier	Mount Elevation (ft)	Mount Type
1-9	195 <sup>2</sup>	(9) EMS RR90-17-02DP	(12) 1-5/8"	T-Mobile	193	(1) Low Profile Platform
10-15	182	(6) Powerwave 7770 (6) Powerwave LGP21401 TMA's (6) Diplexers (6) TMA's	(12) 1-5/8"	Cingular	182	(3) T-Frames
16-21	175	(6) 6'x1' panels (assumed)	(6) 1-5/8"	Sprint	175	(3) T-Frames
22-31	162 <sup>3</sup>	(6) Decibel DB948F85E-M (2) Antel LPA-80063/4CF (4) Decibel DB846H80E-SX	(12) 1-5/8"	Verizon	162	(3) T-Frames
32-33	30 <sup>4</sup>	(2) Andrew PC1N0F-0190B-002M E911	(2) 1/2"	T-Mobile	30	Direct (assumed)

<sup>1</sup> See **Figure 1** for coax location.

<sup>2</sup> Currently, T-Mobile has (6) EMS RR90-17-02DP antennas and (12) 1-5/8" coax installed at 195'. According to information provided by SBA, T-Mobile may install up to (9) EMS RR90-17-02DP and (12) coax at 195'. Analysis performed with total leased loading in place.

<sup>3</sup> The loading for Verizon at 162' will be altered. See the proposed loading below.

<sup>4</sup> Currently, there is no loading at 30'. According to information provided by SBA, T-Mobile may install up to (2) Andrew PC1N0F-0190B-002M E911 antennas and (2) 1/2" coax at 30'. Analysis performed with total leased loading in place.

### Proposed Loading:

Antenna No.	Antenna Elevation (ft)	Description	Coax and Lines	Carrier	Mount Elevation (ft)	Mount Type
1-12	162	(3) RFS APX75-866514-CTO (6) Antel LPA-80080/6CF (3) Antel BXA-185090/8CF (6) RFS FD9R6004/2C-3L Diplexers	(12) 1-5/8"	Verizon	162	(3) T-Frames

<sup>1</sup> This represents the final configuration for Verizon at 162'. According to information provided by SBA, Verizon will remove all existing panels and install (3) RFS APX75-866514-CTO panels, (6) Antel LPA-80080/6CF panels, (3) Antel BXA-185090/8CF panels, (6) RFS FD9R6004/2C-3L diplexers at 162'.

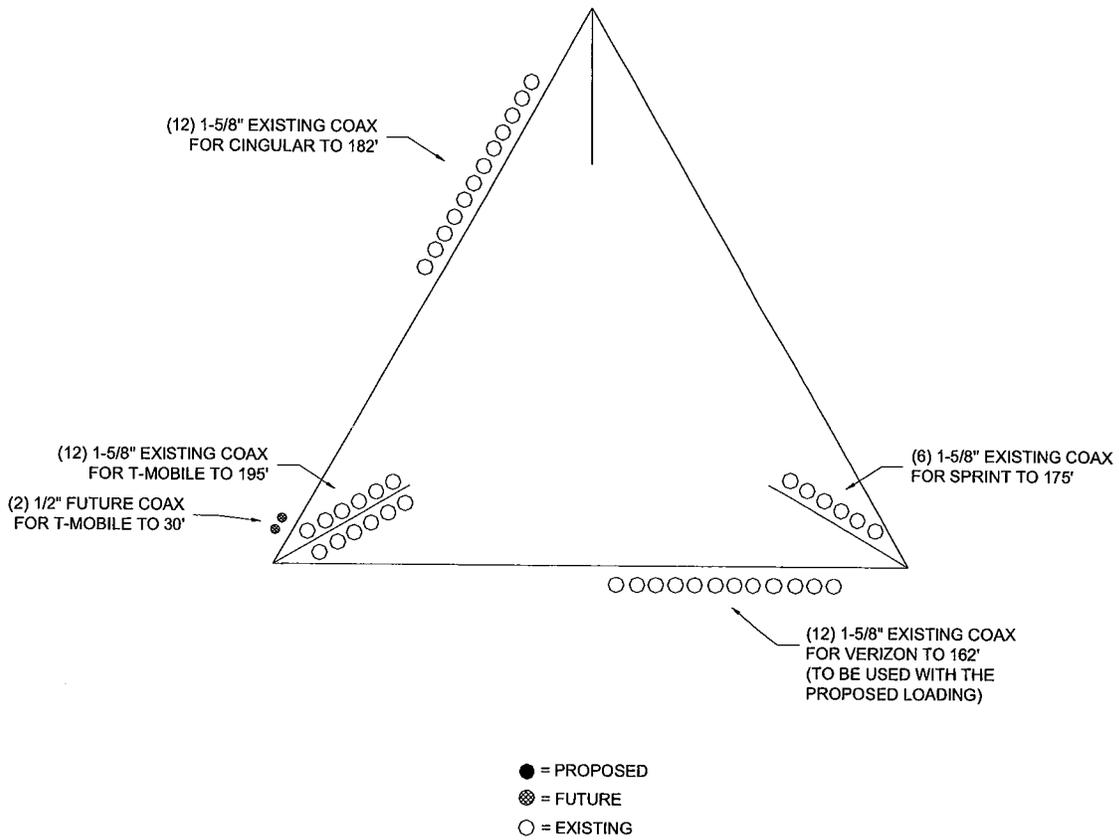


Figure 1 – Coax Layout

## 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
Diagonals	36 & 50 ksi
Horizontals	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. Values less than 1.0 indicate overstressing. **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
T1	193 - 185	Leg	1 3/4	11.6	Pass
		Diagonal	7/8	19.5	Pass
		Top Girt	1	10.9	Pass
		Bottom Girt	1	12.6	Pass
T2	185 - 170	Leg	1 3/4	77.0	Pass
		Diagonal	7/8	61.4	Pass
		Top Girt	1	6.7	Pass
		Bottom Girt	1	30.5	Pass
T3	170 - 150	Leg	2 1/4	82.0	Pass
		Diagonal	1	59.6	Pass
		Top Girt	1	32.9	Pass
		Bottom Girt	1	37.1	Pass
T4	150 - 140	Leg	Pirod 105244	91.2	Pass
		Diagonal	L2 1/2x2 1/2x3/16	79.0	Pass
T5	140 - 120	Leg	Pirod 105217	85.5	Pass
		Diagonal	L3x3x3/16	52.7 57.8 (b)	Pass
T6	120 - 100	Leg	Pirod 105218	75.8	Pass
		Diagonal	L3x3x3/16	59.9	Pass
T7	100 - 80	Leg	Pirod 105219	67.6	Pass
		Diagonal	L3x3x5/16	48.4	Pass
T8	80 - 60	Leg	Pirod 105219	77.6	Pass
		Diagonal	L3x3x5/16	64.2	Pass
T9	60 - 40	Leg	Pirod 105220	68.2	Pass
		Diagonal	L3x3x5/16	81.3	Pass
T10	40 - 20	Leg	Pirod 105220	75.5	Pass
		Diagonal	L3 1/2x3 1/2x5/16	65.2	Pass
T11	20 - 0	Leg	Pirod 105220	82.5	Pass

Section No.	Elevation ft	Component Type	Size	% Capacity	Pass Fail
		Diagonal	L3 1/2x3 1/2x5/16	88.8	Pass

**Table 4 – Maximum Base Reactions**

Load Type	Direction	Current Analysis * (ANSI/TIA-222-G)	Original Design (TIA/EIA-222-F)
Individual Foundation	Horizontal	42 k	---
	Uplift	388 k	405 k
	Compression	433 k	449 k
Overturning Moment	---	7,385 k-ft	7,388 k-ft

\* Current analysis reactions are within an allowable factor of 1.35 when the original design reactions are based on an allowable stress design per ANSI/TIA-222-G.

## GENERAL COMMENTS

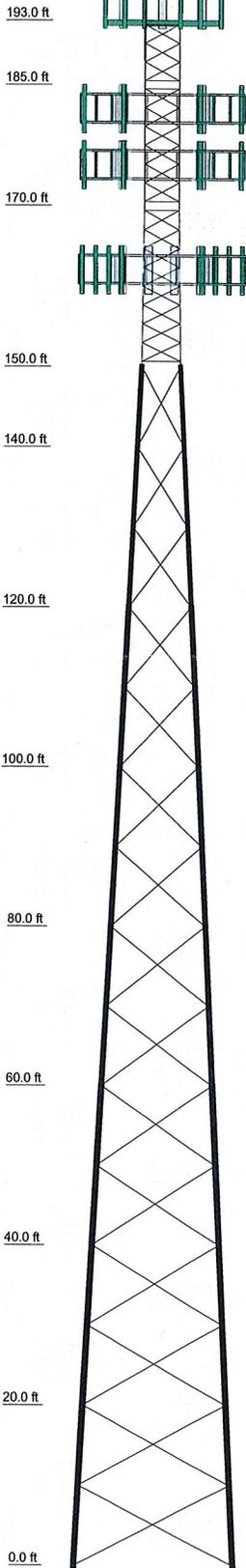
This engineering analysis is based upon the theoretical capacity of the structure. It is not a condition assessment of the tower and its foundation. It is the responsibility of SBA Network Services, Inc. to verify that the tower modeled and analyzed is the correct structure (with accurate antenna loading 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	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	Pirod 105220	Pirod 105219	Pirod 105218	Pirod 105217	A	SR 2 1/4	SR 1 3/4	SR 1	SR 1	SR 1	SR 1 3/4
Leg Grade	L3 1/2x3 1/2x5/16	L3 3x5/16	L3 3x5/16	L3 3x3/16	B	SR 1	SR 7/8	A572-50	SR 1	SR 1	SR 1
Diagonals											
Diagonal Grade											
Top Girts											
Bottom Girts											
Face Width (ft)	20	18	16	14	12	10	8	6	5		4.5
# Panels @ (ft)											9 @ 2.33333
Weight (K)	31.1	5.0	4.9	4.5	3.9	3.8	2.3	1.0	1.6	0.8	0.5



### DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(3) RR90-17-02DP w/Mount Pipe (T-Mobile)	193	(3) T-Frames (Sprint)	175
(3) RR90-17-02DP w/Mount Pipe (T-Mobile)	193	(2) 6' Panel w/ Mount Pipe (Sprint)	175
(3) RR90-17-02DP w/Mount Pipe (T-Mobile)	193	RFS APX75-866514-CT0 w/ Mount Pipe (Verizon)	162
(3) RR90-17-02DP w/Mount Pipe (T-Mobile)	193	RFS APX75-866514-CT0 w/ Mount Pipe (Verizon)	162
Low-Pro Platform Mount (T-Mobile)	193	(2) Antel LPA-80080/ 6CF w/ Mount Pipe (Verizon)	162
(1) Lightning Rod	193	(2) Antel LPA-80080/ 6CF w/ Mount Pipe (Verizon)	162
(2) Powerwave 7770 w/ Mount Pipe (Cingular)	182	(2) Antel LPA-80080/ 6CF w/ Mount Pipe (Verizon)	162
(2) Powerwave 7770 w/ Mount Pipe (Cingular)	182	(2) Antel LPA-80080/ 6CF w/ Mount Pipe (Verizon)	162
(2) TMA - Powerwave LGP21401 (Cingular)	182	Antel BXA-185090/8CF w/ Mount Pipe (Verizon)	162
(2) TMA - Powerwave LGP21401 (Cingular)	182	Antel BXA-185090/8CF w/ Mount Pipe (Verizon)	162
(2) TMA - Powerwave LGP21401 (Cingular)	182	Antel BXA-185090/8CF w/ Mount Pipe (Verizon)	162
(2) Diplexer (Cingular)	182	(2) Diplexer - RFS FD9R6004/2C-3L (Verizon)	162
(2) Diplexer (Cingular)	182	(2) Diplexer - RFS FD9R6004/2C-3L (Verizon)	162
(2) Diplexer (Cingular)	182	(2) Diplexer - RFS FD9R6004/2C-3L (Verizon)	162
(2) TMA (Cingular)	182	(2) Diplexer - RFS FD9R6004/2C-3L (Verizon)	162
(2) TMA (Cingular)	182	(3) T-Frames (Verizon)	162
(3) T-Frames (Cingular)	182	RFS APX75-866514-CT0 w/ Mount Pipe (Verizon)	162
(2) Powerwave 7770 w/ Mount Pipe (Cingular)	182	PC1N0F-0190B-002M (T-Mobile)	30
(2) 6' Panel w/ Mount Pipe (Sprint)	175	PC1N0F-0190B-002M (T-Mobile)	30
(2) 6' Panel w/ Mount Pipe (Sprint)	175		

### SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	Pirod 105244	B	L2 1/2x2 1/2x3/16

### MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

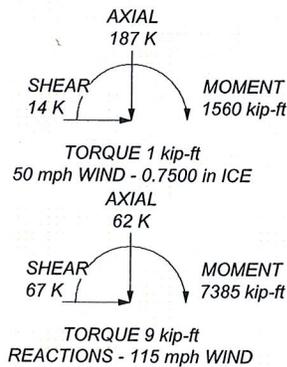
### TOWER DESIGN NOTES

1. Tower is located in New London County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 115 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: 91.2%

ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:

DOWN: 433 K  
 UPLIFT: -388 K  
 SHEAR: 42 K



 Tower Analysis	<b>FDH Engineering, Inc.</b> 2730 Rowland Road Raleigh, North Carolina Phone: (919) 755-1012 FAX: (919) 755-1031	<b>Job: Bozrah, CT01105-S</b> Project: <b>11-01131E S1 (R1)</b> Client: SBA Network Services, Inc. Code: TIA-222-G Path:	Drawn by: SMN Date: 01/24/11 Scale: NTS Dwg No. E-1
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280 Trumbull Street  
Hartford, CT 06103-3597  
Main (860) 275-8200  
Fax (860) 275-8299  
kbaldwin@rc.com  
Direct (860) 275-8345

ORIGINAL

September 20, 2011

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CONNECTICUT  
SITING COUNCIL

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

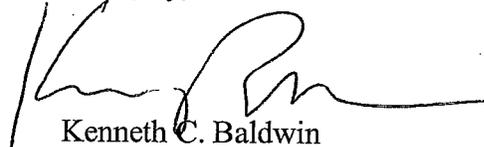
Re: **Notice of Completion of Construction Activity**  
**EM-VER-088-100105 – 585 South Main Street, Naugatuck, Connecticut**  
**EM-VER-013-110408 – 131 Gifford Lane, Bozrah, Connecticut**  
**EM-VER-059-110415 – 68 Groton Long Point, Groton, Connecticut**  
**EM-VER-152-110613 – 45 Fargo Road, Waterford, Connecticut**  
**EM-VER-137-110415 – 86 Volunteer Road, Stonington, Connecticut**  
**EM-VER-047-110126 – 15 Chamberlain Road, East Windsor, Connecticut**  
**EM-VER-006-100107 – 60 Rice Lane, Beacon Falls, Connecticut**  
**EM-VER-008-100127 – 719 Amity Road, Bethany, Connecticut**

Dear Ms. Roberts:

The purpose of this letter is to notify the Council that construction activity associated with the above-referenced facility modifications have been completed.

If you have any questions or need any additional information regarding any of these facilities, please do not hesitate to contact me.

Sincerely,



Kenneth C. Baldwin

Copy to:  
Sandy M. Carter



Law Offices

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