ROBINSON & COLE LLP

KENNETH C. BALDWIN

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ORIGINAL

September 20, 2011

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

11288192-v1

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ORIGINAL

August 4, 2011

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

Re: **Notice of Completion of Construction Activity**

EM-VER-166-110203A – 347 East Street, Wolcott, Connecticut
EM-VER-137-110415 – 86 Voluntown Road, Stonington, Connecticut
EM-VER-137-110322 – 7 Broadway Avenue Extension, Mystic (Groton), Connecticut

Dear Ms. Roberts:

This letter will serve as notice that construction activity associated with the above-referenced facility modifications has 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

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

May 9, 2011

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

RE: **EM-VER-137-110415** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 86 Voluntown Road, Stonington, 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 14, 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

Linda Roberts
Executive Director

LR/CDM/laf

c: The Honorable Ed Haberek Jr., First Selectman, Town of Stonington
Jason Vincent, Town Planner, Town of Stonington
SBA, Inc.

CSC
CONNECTICUT SITING COUNCIL

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

April 18, 2011

The Honorable Ed Haberek Jr.
First Selectman
Town of Stonington
Town Hall
152 Elm Street
P. O. Box 352
Stonington, CT 06378

RE: **EM-VER-137-110415** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 86 Voluntown Road, Stonington, Connecticut.

Dear First Selectman Haberek:

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 May 3, 2011.

Thank you for your cooperation and consideration.

Very truly yours,

Linda Roberts

Linda Roberts
Executive Director

LR/jbw

Enclosure: Notice of Intent

c: Jason Vincent, Town Planner, Town of Stonington

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EM-VER-137-110415

April 14, 2011

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

Re: **Notice of Exempt Modification – Antenna Swap**
86 Voluntown Road, Stonington, Connecticut

Dear Ms. Roberts:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) wireless telecommunications antennas at the 140-foot level on the existing 196-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 2007. Cellco intends to remove six (6) of its existing antennas and replace them with six (6) new antennas (three (3) model MG D5-800T2 PCS antennas and three (3) model BXA 70063/6CF LTE antennas). All new antennas will be installed at the same 140-foot level on the tower. Cellco will also install six (6) coax cable diplexers on its existing platform. 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 Edward Haberek, Jr., First Selectman for the Town of Stonington. A copy of this letter is also being sent to Blackrock Properties II, LLC, 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 overall height of the existing tower. Cellco's replacement antennas will be located at the 140-foot level on the 196-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 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:
Edward Haberek, Jr., Stonington First Selectman
Blackrock Properties II, LLC
Sandy M. Carter

Amphenol ANTENNA SOLUTIONS

WPA-80080-4CF-EDIN-X

V-Pol | FET Panel | 80° | 12.0 dBd

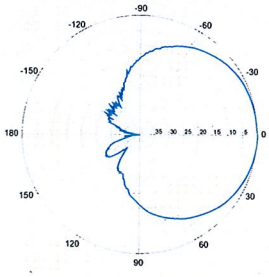
Replace "X" with desired electrical downtilt.

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	15°			
Gain	12.0 dBd (14.1 dBi)			
Electrical downtilt (X)	0, 2, 3, 4, 5, 6, 8, 9, 10, 12, 14			
Impedance	50Ω			
VSWR	≤1.4:1			
Upper sidelobe suppression (0°)	-20.9 dB			
Front-to-back ratio (+/-30°)	-33.1 dB			
Null fill	5% (-26.02 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	1204 x 285 x 130 mm		47.4 x 11.2 x 5.1 in	
Depth of antenna with z-bracket	170 mm		6.7 in	
Weight without mounting brackets	4.5 kg		9.9 lbs	
Survival wind speed	> 201 km/hr		> 125 mph	
Wind area	Front: 0.34 m²	Side: 0.16 m²	Front: 3.7 ft²	Side: 1.7 ft²
Wind load @ 161 km/hr (100 mph)	Front: 505 N	Side: 277 N	Front: 114 lbf	Side: 62 lbf

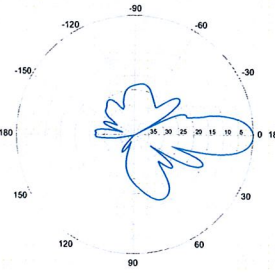
Mounting Options	Part Number	Fits Pipe Diameter	Weight
2-Point Mounting Bracket Kit	36210002	50-160 mm 2.0-6.3 in	4.5 kg 10 lbs
2-Point Downtilt Bracket Kit (0-20°)	36114003	50-160 mm 2.0-6.3 in	4.9 kg 11 lbs
Downtilt Mounting Applications	A mounting bracket and downtilt bracket kit must be ordered for downtilt applications		

WPA-80080-4CF-EDIN-X



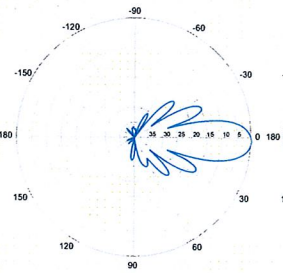
Horizontal | 750 MHz

WPA-80080-4CF-EDIN-0



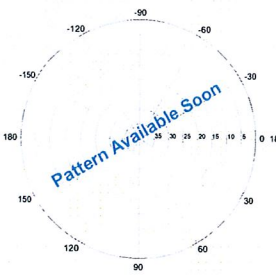
0° | Vertical

WPA-80080-4CF-EDIN-2



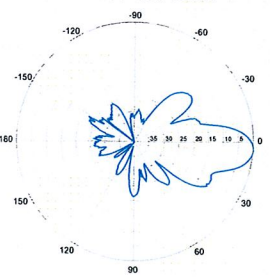
2° | Vertical

WPA-80080-4CF-EDIN-3



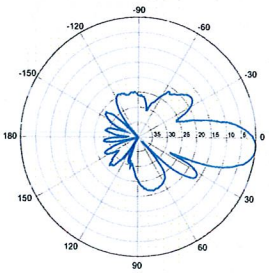
3° | Vertical

WPA-80080-4CF-EDIN-4



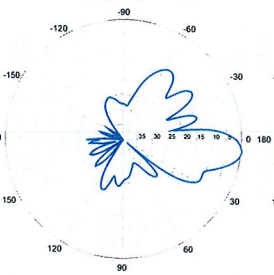
4° | Vertical

WPA-80080-4CF-EDIN-5



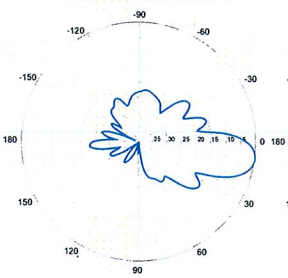
5° | Vertical

WPA-80080-4CF-EDIN-6



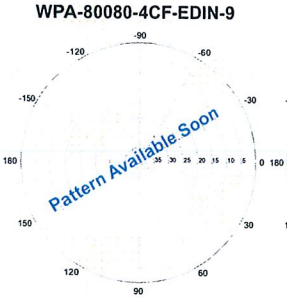
6° | Vertical

WPA-80080-4CF-EDIN-8



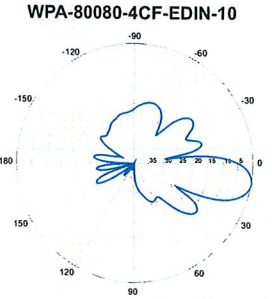
8° | Vertical

WPA-80080-4CF-EDIN-9



9° | Vertical

WPA-80080-4CF-EDIN-10

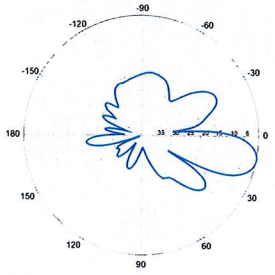


10° | Vertical

WPA-80080-4CF-EDIN-X

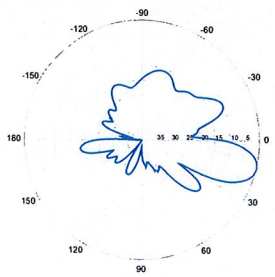
X-Pol | FET Panel | 80° | 12.0 dBd

WPA-80080-4CF-EDIN-12



12° | Vertical

WPA-80080-4CF-EDIN-14



14° | Vertical

SINGLE-BAND PANEL ANTENNA

BROADBAND 1700-2170 MHZ

MGD5-800TX

1710-1880	1850-1990	1920-2170
H84º V7.5º	H83º V7º	H83º V6.5º
Fixed Tilt 0º,2º,4º,6º	Fixed Tilt 0º,2º,4º,6º	Fixed Tilt 0º,2º,4º,6º

ELECTRICAL SPECIFICATIONS

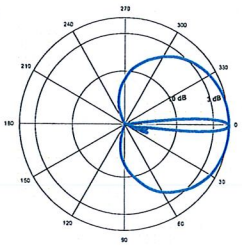
BROADBAND 1710-2170 MHz

Antenna Model	MGD5-800TX		
Polarization	± 45º		
Frequency	1710 - 1880	1850 - 1990	1920 - 2170
Horizontal Beamwidth	84º	83º	83º
Vertical Beamwidth	7.5º	7º	6.5º
Gain (dBi)	16.5	16.6	17
Vertical Electrical Tilt	FIXED 0º, 2º, 4º, 6º	FIXED 0º, 2º, 4º, 6º	FIXED 0º, 2º, 4º, 6º
Upper Sidelobe Suppression for the 1st lobe above main beam (dB)	16	16	20
Front-to-Back Ratio /Cpol @ ± 20º (dB)	> 30	> 30	> 30
VSWR	< 1,4 : 1	< 1,4 : 1	< 1,4 : 1
Cross Polar Ratio @ ± 60º (dB)	> 10	> 10	> 10
Isolation Between Ports (dB)	> 30	> 30	> 30
Maximum Power Per Input (W)	250		
Intermodulation (dBc)	< - 150		
Impedance (Ω)	50		

MECHANICAL SPECIFICATIONS

Connectors	2 X 7/16 Female
Connector Position	Bottom
Survival Wind Speed mph (km/h)	124 (200)
Front Windload @ 160 km/h (N)	83 (370)
Lateral Windload lbs (N) @ 160 km/h	38 (170)
Radome Color	Grey, paintable
Temperature Range F (ºC)	-67º to 140º (-55º to +60º)
Humidity	100%
Antenna Weight lbs (kg)	15.43 (7)
Antenna Dimension in (mm) H X W X D	53 X 6.29 X 3.54 (1340 X 160 X 90)

H&V Pattern



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Amphenol ANTENNA SOLUTIONS

BXA-70063-6CF-EDIN-X

X-Pol | FET Panel | 63° | 14.5 dBd

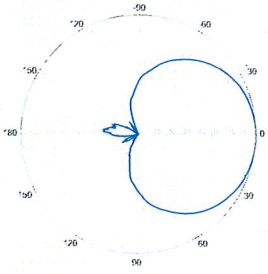
Replace "X" with desired electrical downtilt.

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	500 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

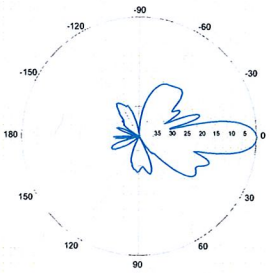
Mounting Options	Part Number	Fits Pipe Diameter	Weight
3-Point Mounting Bracket Kit	36210003	50-160 mm 2.0-6.3 in	6.3 kg 14 lbs
3-Point Downtilt Bracket Kit (0-14°)	36210004	50-160 mm 2.0-6.3 in	7.3 kg 16 lbs
Downtilt Mounting Applications	A mounting bracket and downtilt bracket kit must be ordered for downtilt applications		
Concealment Configurations	For concealment configurations, order BXA-70063-6CF-EDIN-X-FP		

BXA-70063-6CF-EDIN-X



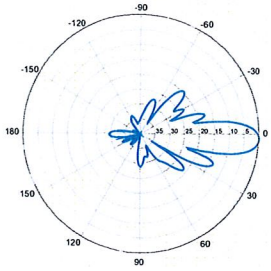
Horizontal | 750 MHz

BXA-70063-6CF-EDIN-0

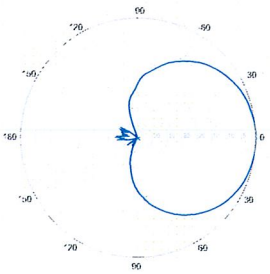


0° | Vertical | 750 MHz

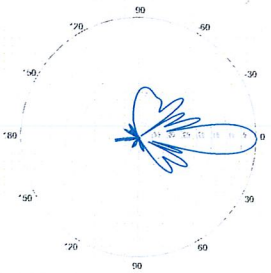
BXA-70063-6CF-EDIN-2



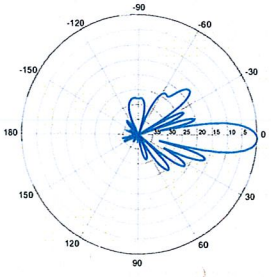
2° | Vertical | 750 MHz



Horizontal | 850 MHz



0° | Vertical | 850 MHz

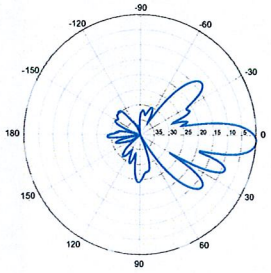


2° | Vertical | 850 MHz

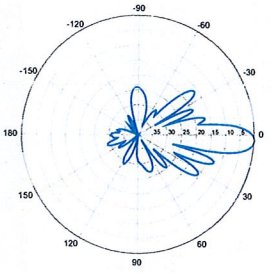
BXA-70063-6CF-EDIN-X

X-Pol | FET Panel | 63° | 14.5 dBd

BXA-70063-6CF-EDIN-3

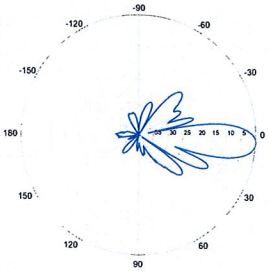


3° | Vertical | 750 MHz

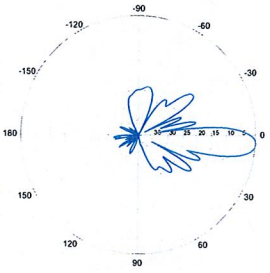


3° | Vertical | 850 MHz

BXA-70063-6CF-EDIN-4

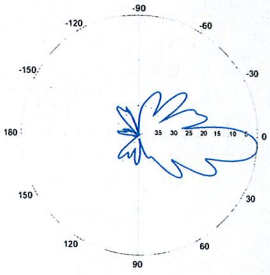


4° | Vertical | 750 MHz

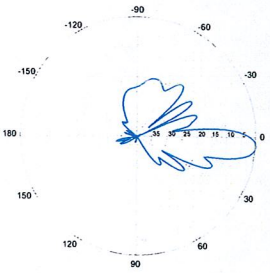


4° | Vertical | 850 MHz

BXA-70063-6CF-EDIN-5



5° | Vertical | 750 MHz



5° | Vertical | 850 MHz

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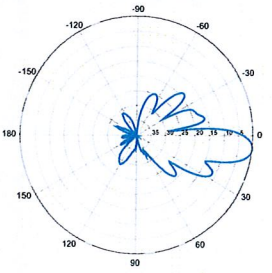
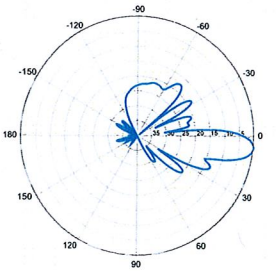


6° | Vertical | 750 MHz



6° | Vertical | 850 MHz

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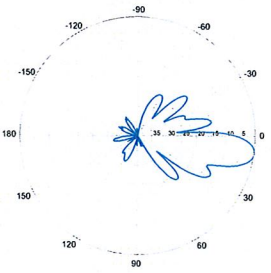
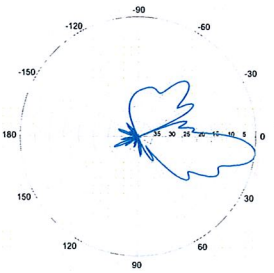
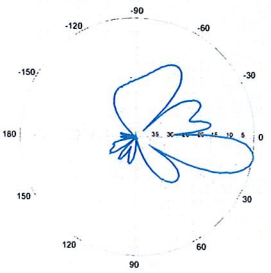


8° | Vertical | 750 MHz

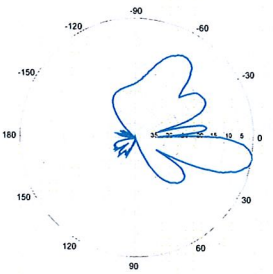


8° | Vertical | 850 MHz

BXA-70063-6CF-EDIN-10



10° | Vertical | 750 MHz



10° | Vertical | 850 MHz

Product Data Sheet | **FD9R6004/2C-3L**

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**

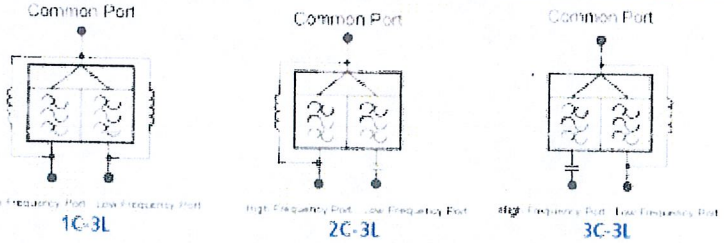
Technical Specifications

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

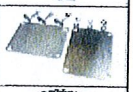
ShareLite Wideband Diplexer – In-line 698-960 MHz/1710-2200 MHz, DC pass in high frequency path

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



1C-3L 2C-3L 3C-3L

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)	

	General	Power	Density					
Site Name: Stonington E								
Tower Height: Verizon @ 140'								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*Sprint	11	123.03	195	0.0128	1900	1.0000	1.28%	
*Nextel	9	100	180	0.0100	851	0.5673	1.76%	
*VoiceStream	8	123.03	165	0.0130	1900	1.0000	1.30%	
*MetroPCS	3	727	130	0.0464	2140	1.0000	4.64%	
*Cingular GSM	2	676	150	0.0216	1900	1.0000	2.16%	
*Cingular UMTS	1	500	150	0.0080	880	0.5867	1.36%	
Verizon	**3**	**362**	**140**	**0.0199**	**1970**	**1.0000**	**1.99%**	
Verizon	**9**	**216**	**140**	**0.0357**	**869**	**0.5793**	**6.16%**	
Verizon	**1**	**800**	**140**	**0.0147**	**757**	**0.4973**	**2.95%**	
								23.6%
* Source: Siting Council								

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

Structural Analysis for SBA Network Services, Inc.

196 ft Monopole

SBA Site Name: Stonington East
SBA Site ID: CT00595-S

FDH Project Number 11-01355E S1

Prepared By:

Brandon Compton, EI
Project Engineer

Reviewed By:

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

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February 1, 2011

STATE OF CONNECTICUT
Christopher Michael Murphy
No. 25842
LICENSED
PROFESSIONAL ENGINEER
2/1/11

Prepared pursuant to TIA/EIA-222-F June 1996 Structural Standards for Steel Antenna Towers and Antenna Supporting Structures

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 Stonington, 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.* Information pertaining to the existing/proposed antenna loading, current tower geometry, and member sizes was obtained from Valmont Industries, Inc. (Order No. 17507-98) Communication Pole Record Drawings dated June 23, 1998 and SBA Network Services, Inc.

The *basic design wind speed* per *TIA/EIA-222-F* standards is 85 mph without ice and 38 mph with 3/4" of radial ice. Ice is considered to increase in thickness with height.

Conclusions

With the current and proposed antennas from Verizon at 140 ft., the tower meets the requirements of the *TIA/EIA-222-F* standards provided the **Recommendation** listed below is satisfied. Furthermore, provided the foundation was designed and constructed to support the original design reactions (see Valmont Order No. 17507-98), 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 are met with the existing and proposed loading in place, we have the following recommendation:

1. Proposed diplexers should be installed directly behind the proposed 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 [1]	Carrier	Mount Elevation (ft)	Mount Type
1-6	193	(6) Decibel DB980H90E-M	(6) 1-5/8"	Sprint	193	(1) LP Platform
7-15	180	(9) Swedcom ALP9212	(9) 1-5/8"	Nextel	180	(3) T-Arms w/ Grating
16-21	165	(6) EMS RV65-18-XXDPL2 (6) TMAs	(12) 1-5/8"	T-Mobile	165	(1) LP Platform
22-33	150[2]	(6) Allgon 7184 (6) Powerwave 7770 (6) Powerwave LGP 21401 TMAs (6) Powerwave LGP 13519 Diplexers	(12) 1-5/8"	AT&T	150	(1) LP Platform
34-45	140[3,4]	(6) Antel RWA-80014 (6) Antel LPA-185063/8CF	(12) 1-5/8"	Verizon	140	(1) LP Platform
46-51	130[5]	(6) Kathrein 742 351	(12) 1-5/8"	Metro PCS	130	(1) LP Platform
---	30	(1) GPS	---	Sprint	30	(1) Standoff

1. Coax installed inside the pole's shaft unless otherwise noted.
2. Currently, AT&T has (6) antennas, (6) TMAs, (6) Diplexers, and (12) coax installed at 150'. According to the information provided by SBA, AT&T may install up to (12) antennas, (6) TMAs, (6) Diplexers, and (12) coax at 150'. Analysis performed with total leased loading in place.
3. Verizon's loading will be altered at 140'. See the proposed loading below.
4. Verizon's coax are installed outside the pole's shaft in a single row.
5. Metro PCS's coax are installed outside the pole's shaft in a single row.

Proposed Loading:

Antenna No.	Antenna Elevation (ft)	Description	Coax and Lines	Carrier	Mount Elevation (ft)	Mount Type
1-12	140[1]	(6) Antel RWA-80014 (3) Antel BXA-70063/CF (3) Rymsa MG D5-800T2 (6) RFS FD9R6004/2C-3L Diplexers	(12) 1-5/8"	Verizon	140	(1) LP Platform

1. This represents the final configuration for Verizon at 140'. According to the information provided by SBA, Verizon will remove (6) Antel LPA-185063/8CF and install (3) Antel BXA-70063/CF, (3) Rymsa MG D5-800T2, and (6) RFS FD9R6004/2C-3L Diplexers at 140'.

RESULTS

Based on information obtained from the original design drawings, the yield strength of steel for individual members was as follows:

Table 2 - Material Strength

Member Type	Yield Strength
Tower Shaft Sections	65 ksi
Base Plate	60 ksi
Anchor Bolts	75 ksi (assumed)

Table 3 displays the summary of the ratio (as a percentage) of actual force in the member to their allowable capacities. Values greater than 100% indicate locations where the maximum force in the member exceeds its allowable capacity. *Note: Capacities up to 105% 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	196 - 154.75	Pole	TP27.76x17.39x0.1875	76.1	Pass
L2	154.75 - 118.75	Pole	TP36.42x26.3166x0.3125	87.2	Pass
L3	118.75 - 74.5	Pole	TP46.91x34.4772x0.375	99.0	Pass
L4	74.5 - 35.5	Pole	TP55.97x44.5274x0.4375	95.8	Pass
L5	35.5 - 0	Pole	TP64x53.2089x0.4688	100.0	Pass
		Anchor Bolts	(24) 2.5" Ø w/ BC = 72.75" Ø	81.4	Pass
		Base Plate	78.75" Ø PL x 2.5" thk.	OK**	Pass

*Capacities include 1/3 allowable increase for wind.
**Based on the design methodology of the manufacturer, the base plate has been sufficiently designed to resist the full capacity of the bolts and shaft.

Table 4 – Maximum Base Reactions

Base Reactions	Current Analysis *(TIA/EIA-222-F)*	Original Design *(TIA/EIA-222-F)*
Axial	58 k*	50 k
Shear	49 k**	45 k
Moment	5,860k-ft	5,768 k-ft

*Given our experience with similar projects, the vertical load will not control the analysis of the foundation.
**Given our experience with similar projects, the horizontal load will not control the analysis of the foundation.

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.

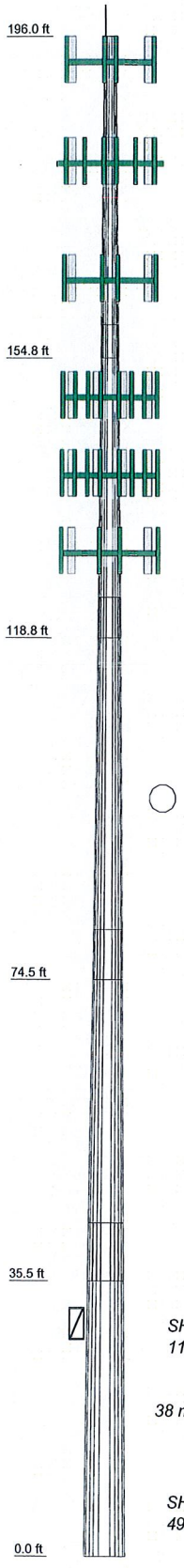
LIMITATIONS

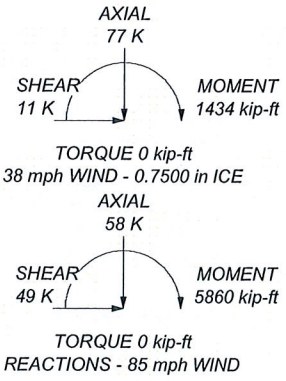
All opinions and conclusions are considered accurate to a reasonable degree of engineering certainty based upon the evidence available at the time of this report. All opinions and conclusions are subject to revision based upon receipt of new or additional/updated information. All services are provided 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)	41.25	40.25	49.50	45.50	43.00
Number of Sides	12	12	12	12	12
Thickness (in)	0.1875	0.3125	0.3750	0.4375	0.4688
Socket Length (ft)	4.25	5.25	6.50	7.50	
Top Dia (in)	17.3900	26.3166	34.4772	44.5274	53.2089
Bot Dia (in)	27.7600	36.4200	46.9100	55.9700	64.0000
Grade			A572-65		
Weight (K)	1.9	4.3	8.2	10.9	12.8

38.1





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod	196	(2) LGP 21401 TMA	150
(2) DB980H90E-M w/Mount Pipe	193	(2) LGP 13519 Diplexor	150
(2) DB980H90E-M w/Mount Pipe	193	(2) LGP 13519 Diplexor	150
(2) DB980H90E-M w/Mount Pipe	193	(2) LGP 13519 Diplexor	150
LP Platform	193	LP Platform	150
(3) ALP 9212 w/Mount Pipe	180	(2) RWA-80014 w/Mount Pipe	140
(3) ALP 9212 w/Mount Pipe	180	(2) RWA-80014 w/Mount Pipe	140
(3) ALP 9212 w/Mount Pipe	180	(2) RWA-80014 w/Mount Pipe	140
(3) T-Arms w/ Grating	180	BXA-70063/6CF W/Mount Pipe	140
(2) RV65-18-XXDPL2 w/Mount Pipe	165	BXA-70063/6CF W/Mount Pipe	140
(2) RV65-18-XXDPL2 w/Mount Pipe	165	BXA-70063/6CF W/Mount Pipe	140
(2) RV65-18-XXDPL2 w/Mount Pipe	165	MG D5-800T2 w/Mount Pipe	140
(2) TMA	165	MG D5-800T2 w/Mount Pipe	140
(2) TMA	165	MG D5-800T2 w/Mount Pipe	140
(2) TMA	165	(2) FD9R6004/2C-3L Diplexer	140
LP Platform	165	(2) FD9R6004/2C-3L Diplexer	140
(2) 7184 w/Mount Pipe	150	(2) FD9R6004/2C-3L Diplexer	140
(2) 7184 w/Mount Pipe	150	LP Platform	140
(2) 7184 w/Mount Pipe	150	(2) 742 351 W/Mount Pipe	130
(2) 7770 W/Mount Pipe	150	(2) 742 351 W/Mount Pipe	130
(2) 7770 W/Mount Pipe	150	(2) 742 351 W/Mount Pipe	130
(2) 7770 W/Mount Pipe	150	LP Platform	130
(2) LGP 21401 TMA	150	GPS	30
(2) LGP 21401 TMA	150	Standoff	30

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in New London County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 100%

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Tower Analysis

Job: STONINGTON EAST, CT - CT00595-S			
Project: 11-01355E S1			
Client: SBA Network Services, Inc.	Drawn by: Brandon Compton	App'd:	
Code: TIA/EIA-222-F	Date: 02/01/11	Scale: NTS	
Path:		Dwg No. E-1	