

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

ORIGINAL

Also admitted in Massachusetts

February 26, 2013

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

RECEIVED
FEB 27 2013

Re: **EM-VER-009-120227 – Cellco Partnership, d/b/a Verizon Wireless**
11 Francis Clark Circle, Bethel, Connecticut

CONNECTICUT
SITING COUNCIL

Dear Mr. Martin:

On March 16, 2012, the Siting Council acknowledged receipt of Cellco's notice of intent to modify its telecommunications facility at 11 Francis Clark Circle in Bethel. The modification involved the replacement of certain antennas and the installation of coax cable diplexers.

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



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February 21, 2013

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

Re: Existing Telecommunications Facility Tower Modification Certification Letter

Project: Verizon ~ Bethel West
11 Francis Clark Circle
Bethel, 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.: 12005.CO60

Dear Mr. Gauger,

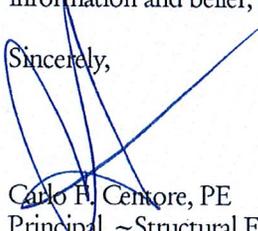
We are providing this "Existing Telecommunications Facility Tower Modification Certification Letter" with regard to the antenna upgrade by Verizon Wireless at the above referenced project.

The following are the basis for substantiating compliance with the design documents prepared by FDH Engineering:

- Review of the FDH structural analysis dated 1/11/2012.
- Field observations by Centek personnel of diplexer installation on 2/20/2013 which determined all diplexers were installed in general compliance with the recommendations of the structural analysis report prepared by FDH on 1/11/2012.

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 H. Centore, PE
Principal ~ Structural Engineer



CC: Rachel Mayo, Tim Parks, Aleksey Tyurin, 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

March 16, 2012

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

RE: **EM-VER-009-120227** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 11 Francis Clark Circle, Bethel, 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 proposed diplexers be installed in accordance with the recommendations made in the Structural Analysis Report prepared by FDH Engineering dated January 11, 2012 and stamped by Christopher Murphy; and
- 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 February 21, 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,



Linda Roberts
Executive Director

LR/CDM/laf

c: The Honorable Matthew S. Knickerbocker, First Selectman, Town of Bethel
Steve Palmer, Planning & Zoning Official, Town of Bethel
Hollis Redding, SBA

Martin, David C.

From: Mayo, Rachel <rmayo@RC.com>
Sent: Wednesday, February 29, 2012 10:26 AM
To: Martin, David C.
Subject: Bethel W- Francis Clark Circle
Attachments: revised bethel wl rf table (swap)- new calc.XLS; ATT00001..txt

Dave, I figured out what happened.

When VW sent me their table they had the rad center at 140 which made the values a little lower...so here is a revised table with the correct values at 137 foot rad ctr.

Please let me know if this is more in kind with what you came up with.

Thank you, Rachel

Rachel A. Mayo
Land Use Analyst

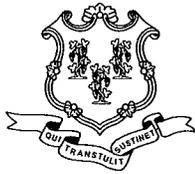
Robinson & Cole LLP
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[Bio](#) | [Contact Card](#)

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Please consider the environment before printing this email

Site Name: Bethel W		General		Power		Density											
Tower Height: Verizon @ 137ft		# OF CHAN.		WATTS ERP		HEIGHT		CALC. POWER DENS		FREQ.		MAX. PERMISS. EXP.		FRACTION MPE		Total	
*AT&T GSM	2	296	127	0.0132	880	0.5867	2.25%										
*AT&T GSM	8	427	127	0.0762	1900	1.0000	7.62%										
*AT&T UMTS	1	500	127	0.0111	880	0.5867	1.90%										
*AT&T UMTS	1	500	127	0.0111	1900	1.0000	1.11%										
*AT&T LTE	1	500	127	0.0111	740	0.4933	2.26%										
*MetroPCS	3	443.61	117	0.0350	2140	1.0000	3.50%										
*Nextel iDEN	24	100	146	0.0405	851	0.5673	7.14%										
*Clearwire	2	153	157	0.0045	2496	1.0000	0.45%										
*Clearwire	1	211	157	0.0031	11 GHz	1.0000	0.31%										
*Sprint/Nextel PCS	11	1184	157	0.1900	1962.5	1.0000	19.00%										
*Sprint/Nextel WiMAX	3	562	157	0.0246	2657	1.0000	2.46%										
*Sprint/Nextel microwave	2	4.42	157	0.0001	22500	1.0000	0.01%										
*Sprint/Nextel microwave	2	4.42	157	0.0001	22500	1.0000	0.01%										
Verizon PCS	15	274	137	0.0787	1970	1.0000	7.87%										
Verizon Cellular	9	379	137	0.0653	869	0.5793	11.28%										
Verizon AWS	1	686	137	0.0131	2145	1.0000	1.31%										
Verizon 700	1	627	137	0.0120	698	0.4653	2.58%										71.06%
* Source: Siting Council																	



STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

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www.ct.gov/csc

February 28, 2012

The Honorable Matthew S. Knickerbocker
First Selectman
Town of Bethel
1 School Street
Bethel Municipal Center
Bethel, CT 06801-2105

RE: **EM-VER-009-120227** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 11 Francis Clark Circle, Bethel, Connecticut.

Dear First Selectman Knickerbocker:

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 March 13, 2012.

Thank you for your cooperation and consideration.

Very truly yours,

Linda Roberts
Executive Director

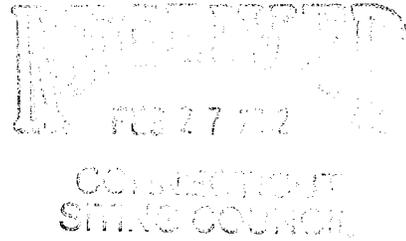
LR/jbw

Enclosure: Notice of Intent

c: Steve Palmer, Planning & Zoning Official, Town of Bethel

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

February 21, 2012



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

Re: **Notice of Exempt Modification – Antenna Swap
 11 Francis Clark Circle, Bethel, Connecticut**

Dear Ms. Roberts:

Cellco Partnership d/b/a Verizon Wireless (“Cellco”) currently maintains twelve (12) wireless telecommunications antennas at the 137-foot level on the existing 160-foot tower at the above-referenced address. The tower is owned by SBA. The Council approved Cellco’s use of the existing tower in 2005. Cellco now intends to modify its installation by replacing eight (8) of its existing antennas with two (2) model LPA-80080-4CF cellular antennas; three (3) model BXA-171063-8BF PCS antennas; one (1) model SLCP 2X6014 LTE antenna; and two (2) model BXA-70063/4CF LTE antennas, all at the same 137-foot level on the tower. Cellco also intends to install six (6) coax cable diplexers directly behind its antennas on the existing antenna platform. Attached behind Tab 1 are the specifications for 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 Matthew Knickerbocker, First Selectman of the Town of Bethel. A copy of this letter is also being sent to Costa Stergue, 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).



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11489261-v1

ROBINSON & COLE_{LLP}

Linda Roberts
February 21, 2012
Page 2

1. The proposed modifications will not result in an increase in the overall height of the existing tower. Cellco's antennas and diplexers will be located at the 137-foot level on the existing 160-foot tower.
2. The proposed modifications will not involve any change to ground-mounted equipment and, therefore, will not require the extension of the site 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 Calculated Radio Frequency Emissions Report 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:

Matthew Knickerbocker, Bethel First Selectman
Costa Stergue
Sandy M. Carter



LPA-80080-4CF-EDIN-X

V-Pol | Log Periodic | 80° | 12.5 dBd

Replace "X" with desired electrical downtilt.

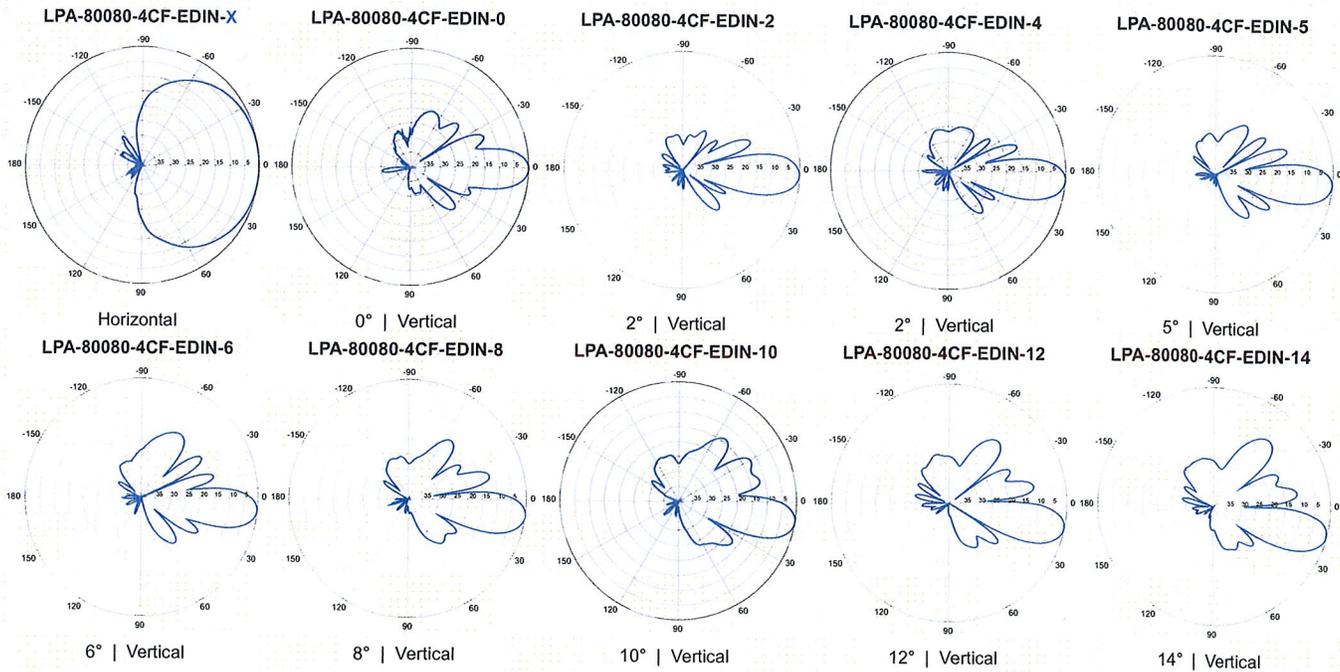
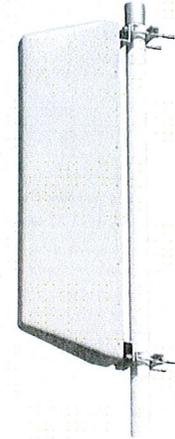
Antenna is also available with NE connector(s). Replace "EDIN" with "NE" in the model number when ordering.

Electrical Characteristics	
Frequency bands	806-960 MHz
Polarization	Vertical
Horizontal beamwidth	80°
Vertical beamwidth	15°
Gain	12.5 dBd (14.6 dBi)
Electrical downtilt (X)	0, 2, 4, 5, 6, 8, 10, 12, 14
Impedance	50Ω
VSWR	≤1.4:1
Upper sidelobe suppression (0°)	-14.2 dB
Front-to-back ratio (+/-30°)	-34.7 dB
Null fill	15% (-16.48 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	1200 x 140 x 335 mm	47.2 x 5.5 x 13.2 in	
Depth of antenna with z-bracket	375 mm	14.8 in	
Weight without mounting brackets	5.4 kg	12 lbs	
Survival wind speed	> 201 km/hr	> 125 mph	
Wind area	Front: 0.17 m ² Side: 0.40 m ²	Front: 1.8 ft ² Side: 4.3 ft ²	
Wind load @ 161 km/hr (100 mph)	Front: 254 N Side: 574 N	Front: 57 lbf Side: 129 lbf	

Mounting Options	Part Number	Fits Pipe Diameter		Weight	
2-Point Mounting & Downtilt Bracket Kit (0-20°)	21699999	50-102 mm	2.0-4.0 in	5.4 kg	12 lbs

If the lock-down brace is used, the maximum diameter of the mounting pipe is 88.9 mm or 3.5 in.



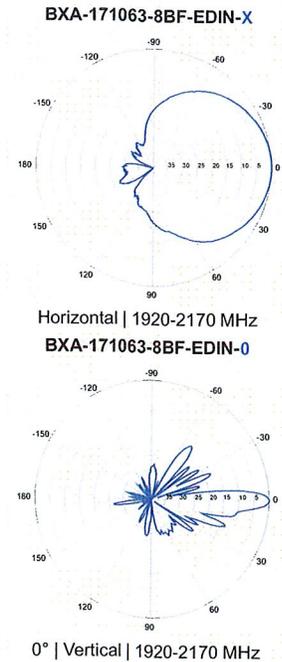
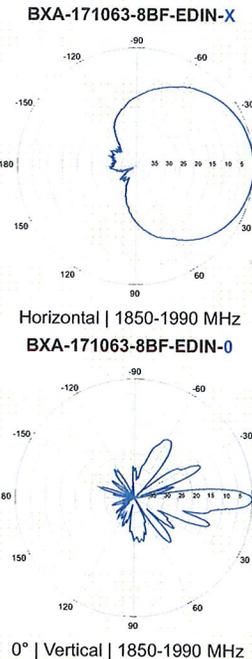
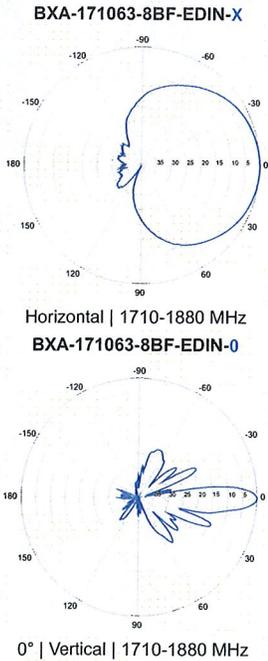
Quoted performance parameters are provided to offer typical or range values only and may vary as a result of normal manufacturing and operational conditions. Extreme operational conditions and/or stress on structural supports is beyond our control. Such conditions may result in damage to this product.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

BXA-171063-8BF-EDIN-X

Replace "X" with desired electrical downtilt

X-Pol | FET Panel | 63° | 17.4 dBi

Electrical Characteristics	1710-2170 MHz		
Frequency bands	1710-1880 MHz	1850-1990 MHz	1920-2170 MHz
Polarization	±45°		
Horizontal beamwidth	68°	65°	60°
Vertical beamwidth	7°		
Gain	14.5 dBd / 16.6 dBi	14.9 dBd / 17.0 dBi	15.3 dBd / 17.4 dBi
Electrical downtilt (X)	0, 2, 4, 8		
Impedance	50Ω		
VSWR	≤1.5:1		
First upper sidelobe	< -17 dB		
Front-to-back isolation	> 30 dB		
In-band isolation	> 28 dB		
IM3 (20W carrier)	< -150 dBc		
Input power	300 W		
Lightning protection	Direct Ground		
Connector(s)	2 Ports / EDIN / Female / Bottom		
Operating temperature	-40° to +60° C / -40° to +140° F		
Mechanical Characteristics			
Dimensions Length x Width x Depth	1232 x 154 x 105 mm		48.5 x 6.1 x 4.1 in
Depth with l-brackets	133 mm		5.2 in
Weight without mounting brackets	4.8 kg		10.5 lbs
Survival wind speed	296 km/hr		184 mph
Wind area	Front: 0.19 m ² Side: 0.14 m ²	Front: 2.0 ft ² Side: 1.5 ft ²	
Wind load @ 161 km/hr (100 mph)	Front: 281 N Side: 223 N	Front: 63 lbf Side: 50 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 lbs
2-Point Mounting & Downtilt Bracket Kit	26799999	50-102 mm 2.0-4.0 in	3.6 kg 8 lbs
Concealment Configurations	For concealment configurations, order BXA-171063-8BF-EDIN-X-FP		

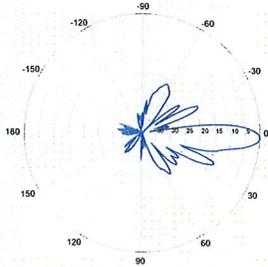


Quoted performance parameters are provided to offer typical or range values only and may vary as a result of normal manufacturing and operational conditions. Extreme operational conditions and/or stress on structural supports is beyond our control. Such conditions may result in damage to this product.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

BXA-171063-8BF-EDIN-X

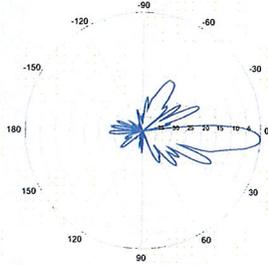
X-Pol | FET Panel | 63° | 17.4 dBi

BXA-171063-8BF-EDIN-2



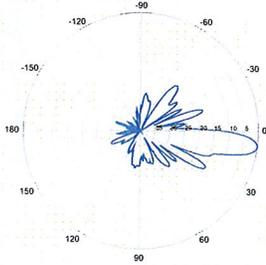
2° | Vertical | 1710-1880 MHz

BXA-171063-8BF-EDIN-4



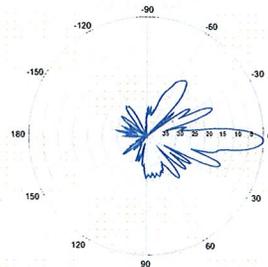
4° | Vertical | 1710-1880 MHz

BXA-171063-8BF-EDIN-8



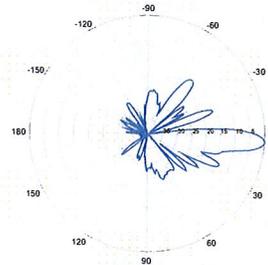
8° | Vertical | 1710-1880 MHz

BXA-171063-8BF-EDIN-2



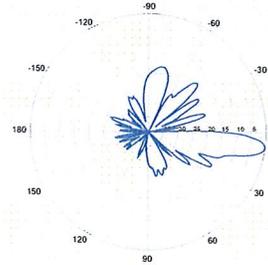
2° | Vertical | 1850-1990 MHz

BXA-171063-8BF-EDIN-4



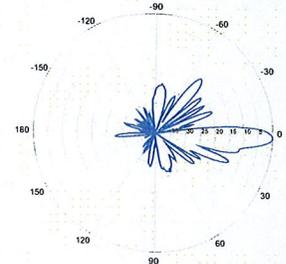
4° | Vertical | 1850-1990 MHz

BXA-171063-8BF-EDIN-8



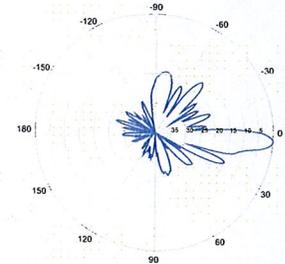
8° | Vertical | 1850-1990 MHz

BXA-171063-8BF-EDIN-2



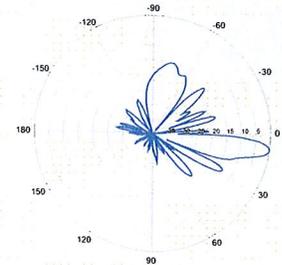
2° | Vertical | 1920-2170 MHz

BXA-171063-8BF-EDIN-4



4° | Vertical | 1920-2170 MHz

BXA-171063-8BF-EDIN-8



8° | Vertical | 1920-2170 MHz

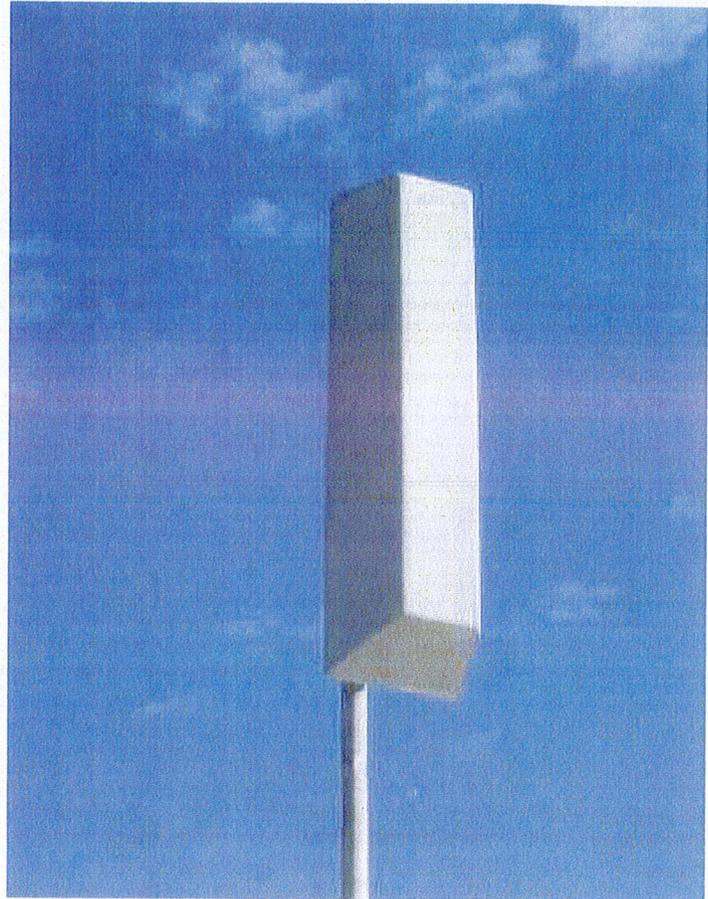
Quoted performance parameters are provided to offer typical or range values only and may vary as a result of normal manufacturing and operational conditions. Extreme operational conditions and/or stress on structural supports is beyond our control. Such conditions may result in damage to this product.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

SLCP 2x6014

Dual (2x) Circularly Polarized log-periodic antenna

Features

- ❑ Transmit Diversity Gain
- ❑ Can be configured to combine space & polarization diversity
- ❑ Outstanding performance over the entire band (700 - 800 MHz)
- ❑ Excellent Axial Ratio
- ❑ Optimized for 4G & 3G systems
- ❑ Low intermodulation
- ❑ Improved Side-to-side rejection
- ❑ Fading reduction
- ❑ Excellent isolation between ports



Electrical specifications

Frequency range:	700-800 MHz
Impedance:	50 ohm
Connector type:	7/16 Din
Return loss:	18 dB
Polarization:	Circular
Gain ea. port [Circular]:	2x14 dBdC
Gain ea. port [Linear]:	2x11 dBdL
Axial Ratio:	2 dB
Isolation between ports (TX band):	30 dB
Front-to-back ratio:	30 dB
Intermodulation (2x20W):	IM3 150 dB
	IM5 160 dB
	IM7/9 170 dB
Power rating:	2x 500 W
H-plane (-3 dB point):	2x 55°
V-plane (-3 dB point):	2x 16°
Lightning protection:	DC grounded

Mechanical specifications

Overall height:	53 in	[1346 mm]
Width:	14 in	[356 mm]
Depth:	11 in	[279 mm]
Weight (excluding brackets):	20 lbs	[9 Kg]
Wind load measured up to:	150 mph	[240 Km/h]
Wind area (side of antenna):	5.15 sq. ft.	[0.48 sq.m]
Lateral thrust at 113 mph/ 180 Km/h (worst case):	263 lbs	[1171 N]

Materials

Radiating Elements:	Aluminum
Transformer (Power distribution)	Ceramic PCB
Chassis:	Aluminum
Radome:	Grey Fiberglass/PVC
Mounting bolts:	Stainless steel

The SLCP 2x6014 is made in the U.S.A.

Mechanical specifications

Length	1205 mm	47.4 in
Width	285 mm	11.2 in
Depth	126 mm	5.0 in
Depth with z-bracket	166 mm	6.5 in
Weight ⁴⁾	4.5 kg	9.9 lbs
Wind Area Fore/Aft	0.36 m ²	3.9 ft ²
Wind Area Side	0.15 m ²	1.7 ft ²
Max Wind Survivability	>201 km/hr	>125 mph
Wind Load @ 100 mph (161 km/hr)		
Fore/Aft	522 N	117 lbf
Side	244 N	55 lbf

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

Mounting & Downtilting

Mounting hardware attaches to pipe diameter $\varnothing 50\text{-}160 \text{ mm}$; $\varnothing 2.0\text{-}6.3 \text{ in}$.

Mounting Bracket Kit	36210002
Downtilt Bracket Kit	36114003

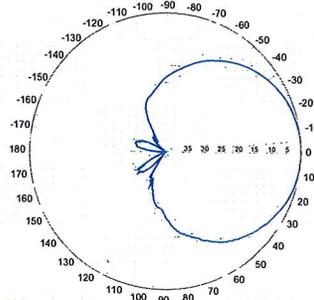
Electrical specifications

Frequency Range	696-900 MHz
Impedance	50 Ω
Connector ³⁾	NE or E-DIN Female 2 ports / Center
VSWR ¹⁾	$\leq 1.4:1$
Polarization	Slant $\pm 45^\circ$
Isolation Between Ports ¹⁾	< -30 dB
Gain ¹⁾	13.0 dBd 15.0 dBi
Power Rating ²⁾	500 W
Half Power Angle ¹⁾	
Horizontal Beamwidth	63 $^\circ$
Vertical Beamwidth	15 $^\circ$
Electrical downtilt ⁵⁾	0 $^\circ$
Null fill ¹⁾	5%
Lightning protection	Direct ground
Patented Dipole Design: U.S. Patent No. 6,608,600 B2	

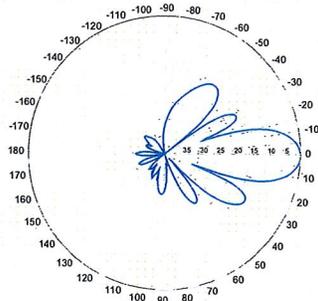
- 1) Typical values.
- 2) Power rating limited by connector only.
- 3) NE indicates an elongated N connector.
E-DIN indicates an elongated DIN connector.
- 4) Antenna weight does not include brackets.
- 5) Add'l downtilts may be available. Check website for details.

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

Radiation-pattern¹⁾
750 MHz

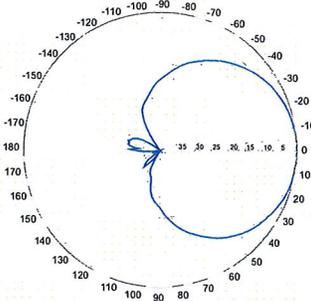


Horizontal

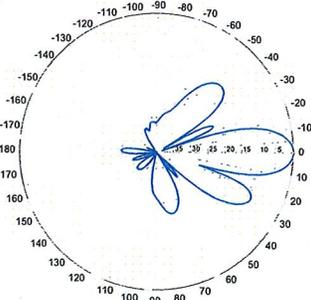


Vertical

850 MHz



Horizontal

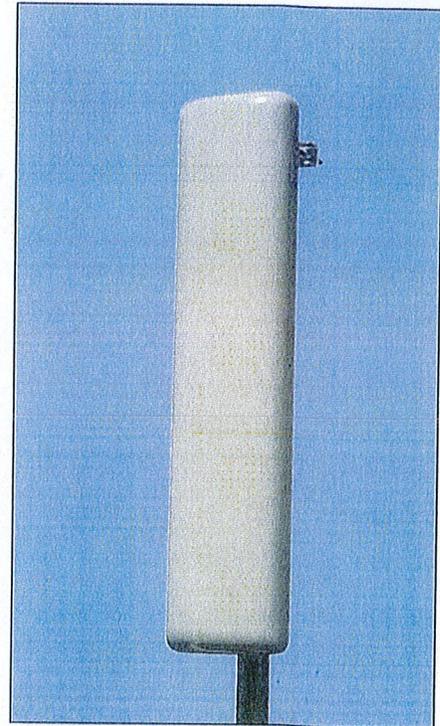


Vertical

696-900 MHz

BXA-70063/4CF

When ordering replace " " with connector type.



Featuring our Exclusive
3T 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.

Warranty:

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

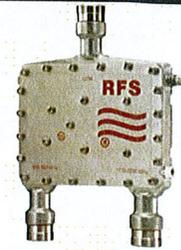
Revision Date 10/27/08



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 Range 1, MHz	698-960
Frequency Range 2, MHz	1710-2200
Application	LTE700, GSM900, UMTS, GSM1800, Cellular 800, PCS
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)
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, Path 1, dB	0.07 typ.
Insertion Loss, Path 2, dB	0.13 typ.
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
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

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

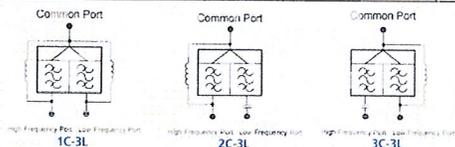


ShareLite Wideband Diplexer – In-line 698-960 MHz/1710-2200 MHz, DC pass in high frequency path

Other Documentation

FD9R6004/2C-3L Installation Instructions: [Wideband_Diplexer_Installation_Rev5.pdf](#)

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 FD9R6004/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: Bethel W		General		Power		Density							
Tower Height: Verizon @ 137ft													
CARRIER	# OF CHAN.	WATTS ERP	HEIGHT	CALC. POWER DENS	FREQ.	MAX. PERMISS. EXP.	FRACTION MPE	Total					
*AT&T GSM	2	296	127	0.0132	880	0.5867	2.25%						
*AT&T GSM	8	427	127	0.0762	1900	1.0000	7.62%						
*AT&T UMTS	1	500	127	0.0111	880	0.5867	1.90%						
*AT&T UMTS	1	500	127	0.0111	1900	1.0000	1.11%						
*AT&T LTE	1	500	127	0.0111	740	0.4933	2.26%						
*MetroPCS	3	443.61	117	0.0350	2140	1.0000	3.50%						
*Nextel iDEN	24	100	146	0.0405	851	0.5673	7.14%						
*Clearwire	2	153	157	0.0045	2496	1.0000	0.45%						
*Clearwire	1	211	157	0.0031	11 GHz	1.0000	0.31%						
*Sprint/Nextel PCS	11	1184	157	0.1900	1962.5	1.0000	19.00%						
*Sprint/Nextel WiMAX	3	562	157	0.0246	2657	1.0000	2.46%						
*Sprint/Nextel microwave	2	4.42	157	0.0001	22500	1.0000	0.01%						
*Sprint/Nextel microwave	2	4.42	157	0.0001	22500	1.0000	0.01%						
Verizon PCS	15	274	137	0.0754	1970	1.0000	7.54%						
Verizon Cellular	9	379	137	0.0626	869	0.5793	10.81%						
Verizon AWS	1	686	137	0.0126	2145	1.0000	1.26%						
Verizon 700	1	627	137	0.0115	698	0.4653	2.47%						
								70.09%					
* 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.**

155' Monopole Tower

**SBA Site Name: North Bethel
SBA Site ID: CT00248-S
Verizon Site Name: Bethel West**

FDH Project Number 12-01208E S1

Analysis Results

Tower Components	81.1%	Sufficient
Foundation	72.3%	Sufficient

Prepared By:

Sean O'Sullivan, EI
Project Engineer

Reviewed By:

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 11, 2012

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

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EXECUTIVE SUMMARY

At the request of SBA Network Services, Inc., FDH Engineering, Inc. performed a structural analysis of the monopole located in Bethel, 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, geotechnical data, and member sizes was obtained from:

- Summit Manufacturing LLC. (Job No. 4071) original design drawings dated October 22, 1998
- Paul J. Ford and Company (Job No. 29200-1210) Pad and Pier Foundation design drawings dated August 17, 2000
- Jaworski Geotech, Inc. (Project No. C98342G) Geotechnical Evaluation dated August 6, 1998
- SBA Network Services, Inc.

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

Conclusions

With the existing and proposed antennas from Verizon in place at 137 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 constructed per the original design drawings (see Summit Job No. 4071), and given the soil parameters (see Jaworski Project No. C98342G), the foundation should have the necessary capacity to support both the proposed and existing 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. 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 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
157 ²	(2) Decibel DB948F85T2E-M (1) Decibel DB980H90E-M (1) Andrew HBX-6516DS-R2M (2) Andrew HBX-9014DS-R2M (3) Argus LLPX310R (2) Dragonwave A-ANT-23G-2-C Dishes (3) Samsung U-RAS Flexible RRHs (1) Powerwave OS-1991-222W TMA	(6) 1-5/8" (6) 5/16" (2) 1/2"	Sprint	157	(1) Low Profile Platform
147	(9) Decibel DB844H90E-XY	(9) 1-1/4"	Nextel	147	(1) Low Profile Platform
137	(2) Antel LPA-80080/6CF (2) Antel LPA-80090/4CF (2) Antel LPA-80063/6CF (6) Antel LPA-185090/8CF (1) GPS	(12) 1-5/8" (1) 1/2"	Verizon	137	(1) Low Profile Platform
127	(3) Powerwave 7770.00 (3) Powerwave P65-16 (6) Powerwave LGP21401 TMA's (6) Ericsson RRUS-11 RRUs (1) Raycap DC6-48-60-18-8F Surge Suppressor	(9) 1-1/4" (1) Fiber (2) DC Power cables	AT&T	127	(1) Low Profile Platform
117 ³	(3) Kathrein 800-10504 (3) Kathrein 742-351 (6) RETs	(12) 1-5/8" (1) 1/2"	Metro PCS	117	(3) T-Arms

1. The existing coax is inside the pole's shaft, unless otherwise noted.
2. Sprint's (6) 1-5/8" and (2) 1/2" existing coax are installed outside the monopole shaft in a single row.
3. Metro PCS's (12) 1-5/8" coax are installed double stacked (6-on-6) outside the monopole shaft.

Proposed Loading:

Antenna Elevation (ft)	Description	Coax and Lines	Carrier	Mount Elevation (ft)	Mount Type
137	(2) Antel BXA-70063/4CF (2) Antel LPA-80080/4CF (1) Swedcom SLCP 2X6014F (3) Antel BXA-171063-8BF (2) Antel LPA-80080/6CF (2) Antel LPA-80063/6CF (6) RFS FD9R6004/2CL-3L Diplexers (1) GPS	(12) 1-5/8" (1) 1/2"	Verizon	137	(1) Low Profile Platform

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
Base Plate	50 ksi
Anchor Bolts	75 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	155 - 120	Pole	TP26x16.5x0.1875	72.5	Pass
L2	120 - 89.5	Pole	TP33.91x24.7429x0.3125	76.6	Pass
L3	89.5 - 44	Pole	TP45.64x32.1306x0.375	77.4	Pass
L4	44 - 0	Pole	TP56.83x43.3286x0.375	81.1	Pass
		Anchor Bolts	(20) 2.25" Ø w/ BC = 64"	61.2	Pass
		Base Plate	64" SQ. PL x 2.75" thk.	69.8	Pass

Table 4 - Maximum Base Reactions

Base Reactions	Current Analysis* (TIA/EIA-222-F)	Original Design (TIA/EIA-222-F)
Axial	37 k	54 k
Shear	30 k	33 k
Moment	3,231 k-ft	3,938 k-ft

* Foundation determined to be adequate per independent analysis.

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
Length (ft)	35.00	33.75	49.75	49.75
Number of Sides	18	18	18	18
Thickness (in)	0.1875	0.3125	0.3750	0.3750
Socket Length (ft)	3.25	4.25	5.75	43.3286
Top Dia (in)	16.5000	24.7429	32.1306	56.8300
Bot Dia (in)	26.0000	33.9100	45.6400	10.0
Grade			A607-65	
Weight (K)	1.5	3.3	7.8	22.6



DESIGNED APPURTENANCE LOADING

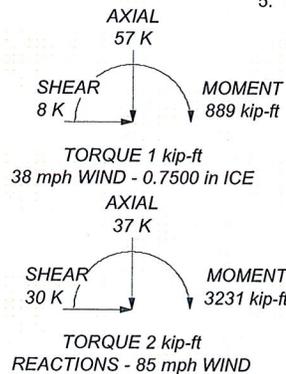
TYPE	ELEVATION	TYPE	ELEVATION
DB948F85T2E-M w/Mount Pipe (Sprint)	155	LPA-80080/6CF W/Mount Pipe (Verizon)	137
DB948F85T2E-M w/Mount Pipe (Sprint)	155	(2) LPA-80063/6CF w/ Mount Pipe (Verizon)	137
Andrew HBX-9014DS-R2M w/ Mount Pipe (Sprint)	155	(2) FD9R6004/2CL-3CL Diplexer (Verizon)	137
DB980H90E-M w/Mount Pipe (Sprint)	155	(2) FD9R6004/2CL-3CL Diplexer (Verizon)	137
Andrew HBX-6516DS-R2M w/ Mount Pipe (Sprint)	155	(2) FD9R6004/2CL-3CL Diplexer (Verizon)	137
Andrew HBX-9014DS-R2M w/ Mount Pipe (Sprint)	155	Powerwave 7770 w/ Mount Pipe (ATI)	127
LLPX310R w/Mount Pipe (Sprint)	155	Powerwave P65-16 w/ Bracket (ATI)	127
LLPX310R w/Mount Pipe (Sprint)	155	Powerwave P65-16 w/ Bracket (ATI)	127
LLPX310R w/Mount Pipe (Sprint)	155	Powerwave P65-16 w/ Bracket (ATI)	127
U-RAS Flexible RRH (Sprint)	155	(2) Ericsson-RRUS-11 (ATI)	127
U-RAS Flexible RRH (Sprint)	155	(2) Ericsson-RRUS-11 (ATI)	127
U-RAS Flexible RRH (Sprint)	155	(2) Ericsson-RRUS-11 (ATI)	127
TMA - Powerwave OS-1991-222W (Sprint)	155	Raycap DC6-48-80-18-8F (ATI)	127
Low Profile Platform (Sprint)	155	Low Profile Platform (ATI)	127
Lighting Rod	155	(2) TMA - Powerwave LGP21401 (ATI)	127
Dragonwave A-ANT-23G-2-C (Sprint)	155	(2) TMA - Powerwave LGP21401 (ATI)	127
Dragonwave A-ANT-23G-2-C (Sprint)	155	(2) TMA - Powerwave LGP21401 (ATI)	127
Low Profile Platform (Nextel)	147	(2) TMA - Powerwave LGP21401 (ATI)	127
(3) DB844H90E-XY w/Mount Pipe (Nextel)	147	Powerwave 7770 w/ Mount Pipe (ATI)	127
(3) DB844H90E-XY w/Mount Pipe (Nextel)	147	Powerwave 7770 w/ Mount Pipe (ATI)	127
(3) DB844H90E-XY w/Mount Pipe (Nextel)	147	Kathrein 742-351 w/ Mount Pipe (Metro PCS)	117
GPS (Verizon)	137	Kathrein 742-351 w/ Mount Pipe (Metro PCS)	117
Low Profile Platform (Verizon)	137	Kathrein 742-351 w/ Mount Pipe (Metro PCS)	117
(2) BXA-70063/4CF W/ Mount Pipe (Verizon)	137	(2) RET (Metro PCS)	117
(2) LPA-80080/4CF W/Mount Pipe (Verizon)	137	(2) RET (Metro PCS)	117
Swedcom SLCP 2X6014F w/Mount Pipe (Verizon)	137	(2) RET (Metro PCS)	117
Antel BXA-171063-8BFw/ Mount Pipe (Verizon)	137	T-Arms (Metro PCS)	117
Antel BXA-171063-8BFw/ Mount Pipe (Verizon)	137	Kathrein 800-10504 w/ Mount Pipe (Metro PCS)	117
Antel BXA-171063-8BFw/ Mount Pipe (Verizon)	137	Kathrein 800-10504 w/ Mount Pipe (Metro PCS)	117
Antel BXA-171063-8BFw/ Mount Pipe (Verizon)	137	Kathrein 800-10504 w/ Mount Pipe (Metro PCS)	117
LPA-80080/6CF W/Mount Pipe (Verizon)	137		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Fairfield 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: 81.1%



 FDH Engineering, Inc. 2730 Rowland Road Raleigh, NC 27615 Phone: (919) 755-1012 FAX: (919) 755-1031	Job: North Bethel, CT00248-S
	Project: 12-01208E S1
	Client: SBA Network
	Code: TIA/EIA-222-F
	Path:
Drawn by: Sean O'Sullivan	App'd:
Date: 01/11/12	Scale: NTS
Dwg No. E-1	