

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)

August 20, 2013

Kenneth C. Baldwin, Esq.  
Robinson & Cole LLP  
280 Trumbull Street  
Hartford, CT 06103-3597

RE: **EM-VER-027-130729** – Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 46 Meadow Road, Clinton, Connecticut.

Dear Attorney Baldwin:

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

- The coax lines shall be installed as shown in Figure 1 of the Structural Analysis Report prepared by FDH Engineering dated April 19, 2013 and stamped by Christopher Murphy and the accessory equipment shall installed as recommended in said Report;
- Within 45 days following completion of the antenna installation, Verizon shall provide documentation certified by a professional engineer that its installation complied with the recommendations of the structural analysis;
- Any deviation from the proposed modification as specified in this notice and supporting materials with the 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;
- Within 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 July 26, 2013. 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,



Melanie A. Bachman  
Acting Executive Director

MAB/CDM/jb

c: The Honorable William W. Fritz, Jr., First Selectman, Town of Clinton  
Thomas Lane, Zoning Enforcement Officer, Town of Clinton  
Sean Gormley, SBA

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

Also admitted in Massachusetts

ORIGINAL

January 15, 2014

RECEIVED  
JAN 16 2014

CONNECTICUT  
SITING COUNCIL

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

Re: **EM-VER-027-130729 – Cellco Partnership d/b/a Verizon Wireless  
46 Meadow Road, Clinton, Connecticut**

Dear Mr. Martin:

On August 20, 2013, the Siting Council acknowledged receipt of Cellco's notice of intent to modify its telecommunications facility at 46 Meadow Road in Clinton. The modification involved the replacement of certain antennas and addition of coaxial cables.

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

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

Sincerely,



Kenneth C. Baldwin



Law Offices

BOSTON

PROVIDENCE

HARTFORD

NEW LONDON

STAMFORD

WHITE PLAINS

NEW YORK CITY

ALBANY

SARASOTA

www.rc.com

Attachment

Copy to:

Sandy M. Carter  
Brian Ragozzine  
Mark Gauger

Centered on Solutions™

January 10, 2014

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

**Re: Existing Telecommunications Facility Tower Modification Certification Letter**

**Project:** Verizon ~ Clinton South  
46 Meadow Road  
Clinton, CT

**Tower Owner:** SBA Communications Corporation  
5900 Broken Sound Parkway NW  
Boca Raton, Florida 33487

**Engineer:** FDH Engineering  
2730 Rowland Ave Raleigh, NC 27615

**Centek Project No.:** 13008.050

Dear Mr. Gauger,

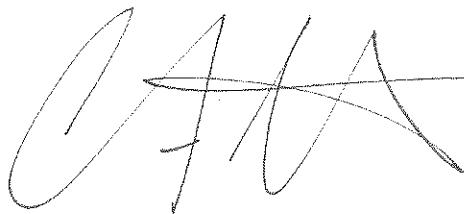
We are providing this "Existing Telecommunications Facility Tower Modification Certification Letter" with regard to the antenna upgrade by Verizon Wireless at the above referenced project.

The following are the basis for substantiating compliance with the FDH Engineering Structural Analysis Report (FDH Project No. 1325331400) dated April 19, 2013:

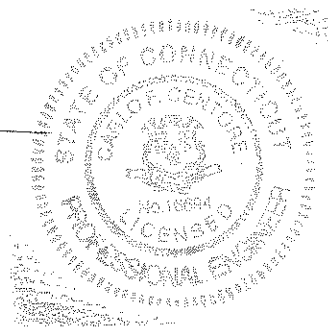
- Review of the FDH Structural Analysis Report dated 04/19/2013.
- Field observations by Centek personnel of the coax installation on 01/09/2014 which determined all coax lines and diplexers were installed in general compliance with the recommendations of the structural analysis report prepared by FDH on 04/19/2013.

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

Sincerely,



Carlo F. Centore, PE  
Principal ~ Structural Engineer



CC: Rachel Mayo, Tim Parks, Jim Smith

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

Also admitted in Massachusetts

July 26, 2013

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

Re: **Notice of Exempt Modification – Facility Modification  
46 Meadow Road, Clinton, Connecticut**

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless (“Cellco”) currently maintains twelve (12) wireless telecommunications antennas at the 162-foot level on an existing 195-foot tower at the above-referenced address. The tower is owned by SBA. Cellco’s use of the tower was approved by the Council in 2001. Cellco now intends to replace two (2) of its existing antennas with two (2) model BXA-70063-6CF LTE antennas, at the same 162-foot level. Cellco also intends to install six (3) coax cable diplexers behind its antennas. Attached behind Tab 1 are the specifications for Cellco’s 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 W. Fritz, First Selectman of the Town of Clinton. A copy of this letter is also being sent to Ann Louise Charney, the owner of the property on which the tower is located.

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing tower. Cellco’s replacement antennas will be located at the 162-foot level on the 195-foot tower.



*Law Offices*

BOSTON

PROVIDENCE

HARTFORD

NEW LONDON

STAMFORD

WHITE PLAINS

NEW YORK CITY

ALBANY

SARASOTA

*www.rc.com*

12348350-v1

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

Melanie A. Bachman  
July 26, 2013  
Page 2

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

3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.

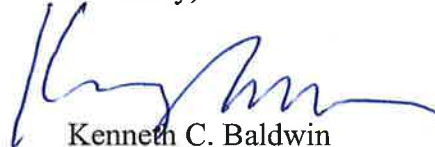
4. The operation of the modified facility will not increase radio frequency (RF) emissions to a level at or above the Federal Communications Commission (FCC) adopted safety standard. A cumulative power density table for Cellco's modified facility is included behind Tab 2.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The tower and its foundation can support Cellco's proposed modifications. (*See Structural Analysis attached behind Tab 3*). Please note, under the recommendations section on page 3 of the Structural Analysis, Cellco does not propose any modification to the coax cable location or configuration. Cellco's existing cables are installed as shown in "Figure 1" of the Structural Analysis.

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 W. Fritz, Clinton First Selectman  
Ann Louise Charney  
Sandy M. Carter



# **TAB 1**

## BXA-70063-6CF-EDIN-X

X-Pol | FET Panel | 63° | 14.5 dBd

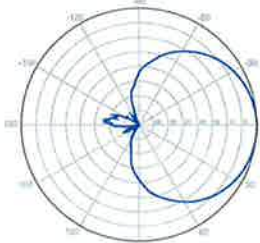
Replace 'X' with desired electrical downtilt.

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



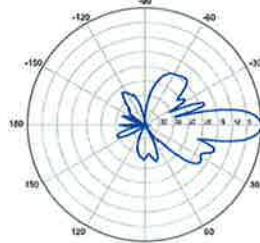
Electrical Characteristics	696-900 MHz		
Frequency bands	696-806 MHz	806-900 MHz	
Polarization	±45°		
Horizontal beamwidth	65°	63°	
Vertical beamwidth	13°	11°	
Gain	14.0 dBd (16.1 dBi)	14.5 dBd (16.6 dBi)	
Electrical downtilt (X)	0, 2, 3, 4, 5, 6, 8, 10		
Impedance	50Ω		
VSWR	≤1.35:1		
Upper sidelobe suppression (0°)	-18.3 dB	-18.2 dB	
Front-to-back ratio (+/-30°)	-33.4 dB	-36.3 dB	
Null fill	5% (-26.02 dB)		
Isolation between ports	< -25 dB		
Input power with EDIN connectors	500 W		
Input power with NE connectors	300 W		
Lightning protection	Direct Ground		
Connector(s)	2 Ports / EDIN or NE / Female / Center (Back)		
Mechanical Characteristics			
Dimensions Length x Width x Depth	1804 x 285 x 132 mm	71.0 x 11.2 x 5.2 in	
Depth with z-brackets	172 mm	6.8 in	
Weight without mounting brackets	7.9 kg	17 lbs	
Survival wind speed	> 201 km/hr	> 125 mph	
Wind area	Front: 0.51 m <sup>2</sup> Side: 0.24 m <sup>2</sup>	Front: 5.5 ft <sup>2</sup> Side: 2.6 ft <sup>2</sup>	
Wind load @ 161 km/hr (100 mph)	Front: 759 N Side: 391 N	Front: 169 lbf Side: 89 lbf	
Mounting Options	Part Number	Fits Pipe Diameter	Weight
3-Point Mounting & Downtilt Bracket Kit	36210008	40-115 mm 1.57-4.5 in	6.9 kg 15.2 lbs
Concealment Configurations	For concealment configurations, order BXA-70063-6CF-EDIN-X-FP		

**BXA-70063-6CF-EDIN-X**



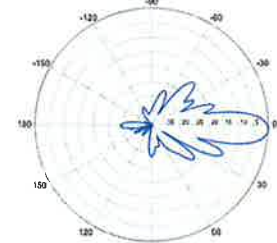
Horizontal | 750 MHz

**BXA-70063-6CF-EDIN-0**

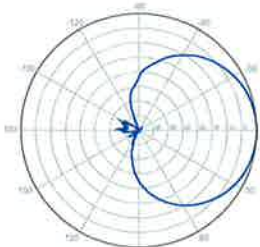


0° | Vertical | 750 MHz

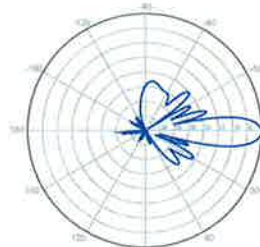
**BXA-70063-6CF-EDIN-2**



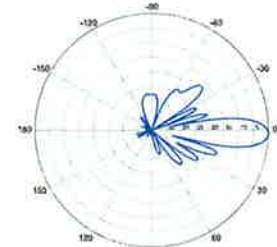
2° | Vertical | 750 MHz



Horizontal | 850 MHz



0° | Vertical | 850 MHz



2° | Vertical | 850 MHz

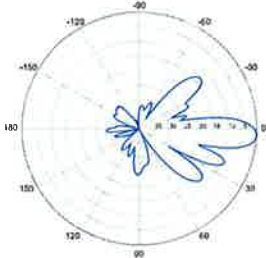
Quoted performance parameters are provided to offer typical or range values only and may vary as a result of normal manufacturing and operational conditions. Extreme operational conditions and/or stress on structural supports is beyond our control. Such conditions may result in damage to this product.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



**BXA-70063-6CF-EDIN-X**

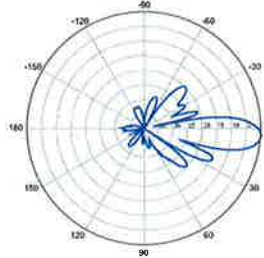
X-Pol | FET Panel | 63° | 14.5 dBd

**BXA-70063-6CF-EDIN-3**



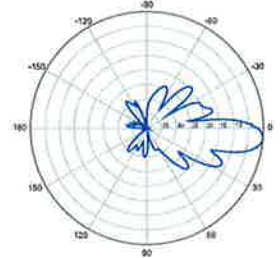
3° | Vertical | 750 MHz

**BXA-70063-6CF-EDIN-4**

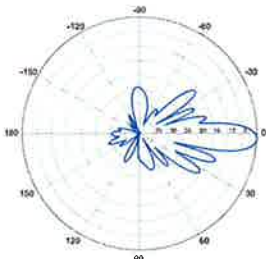


4° | Vertical | 750 MHz

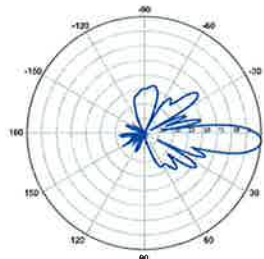
**BXA-70063-6CF-EDIN-5**



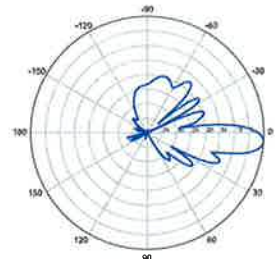
5° | Vertical | 750 MHz



3° | Vertical | 850 MHz

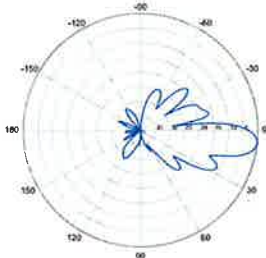


4° | Vertical | 850 MHz



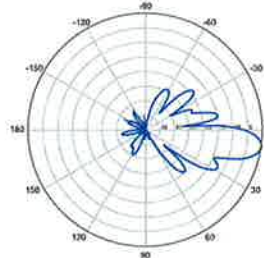
5° | Vertical | 850 MHz

**BXA-70063-6CF-EDIN-6**



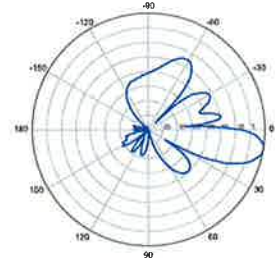
6° | Vertical | 750 MHz

**BXA-70063-6CF-EDIN-8**

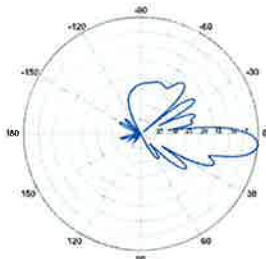


8° | Vertical | 750 MHz

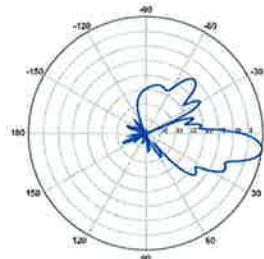
**BXA-70063-6CF-EDIN-10**



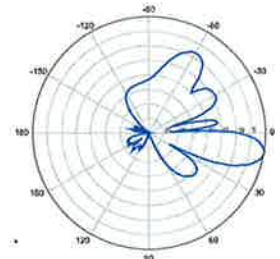
10° | Vertical | 750 MHz



6° | Vertical | 850 MHz



8° | Vertical | 850 MHz



10° | Vertical | 850 MHz

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.



## 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
Application	LTE700, GSM900, UMTS, GSM1800, Cellular 800, PCS
Frequency Range 1, MHz	698-960
Frequency Range 2, MHz	1710-2200
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)
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; 57/70@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

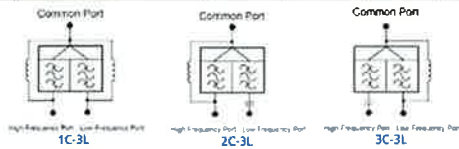


ShareLite Wideband Diplexer – In-line 698-960 MHz/1710-2200 MHz, DC pass in high frequency path

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

# TAB 2

		General		Power		Density							
Site Name: Clinton S													
Tower Height: Verizon @ 162ft													
CARRIER	# OF CHAN.	WATTS ERP	HEIGHT	CALC. POWER DENS	FREQ.	MAX. PERMISS. EXP.	FRACTION MPE	Total					
*Sprint CDMA/LTE	3	778	180	0.0259	1900	1.0000	2.59%						
*Sprint CDMA/LTE	1	438	180	0.0049	850	0.5667	0.86%						
*T-Mobile GSM	8	110	192.5	0.0085	1945	1.0000	0.85%						
*T-Mobile UMTS	2	622	192.5	0.0121	2100	1.0000	1.21%						
*AT&T UMTS	1	500	150	0.0080	880	0.5867	1.36%						
*AT&T GSM	2	296	150	0.0095	880	0.5867	1.61%						
*AT&T GSM	2	427	150	0.0136	1900	1.0000	1.36%						
*AT&T LTE	1	500	150	0.0080	740	0.4933	1.62%						
<b>Verizon PCS</b>	<b>11</b>	<b>417</b>	<b>162</b>	<b>0.0628</b>	<b>1970</b>	<b>1.0000</b>	<b>6.28%</b>						
<b>Verizon Cellular</b>	<b>9</b>	<b>391</b>	<b>162</b>	<b>0.0482</b>	<b>869</b>	<b>0.5793</b>	<b>8.32%</b>						
<b>Verizon AWS</b>	<b>1</b>	<b>1750</b>	<b>162</b>	<b>0.0240</b>	<b>2145</b>	<b>1.0000</b>	<b>2.40%</b>						
<b>Verizon 700</b>	<b>1</b>	<b>812</b>	<b>162</b>	<b>0.0111</b>	<b>698</b>	<b>0.4653</b>	<b>2.39%</b>						
								<b>30.86%</b>					
* Source: Siting Council													

# TAB 3



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

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

**195' Self-Support Tower**

**SBA Site Name: Clinton 4  
SBA Site ID: CT01879-S-00  
Verizon Site Name: Clinton South**

FDH Project Number 1325331400

**Analysis Results**

Tower Components	97.5%	Sufficient
Foundation	95.7%	Sufficient

Prepared By:

Andrew Reynolds, EI  
Project Engineer

Reviewed By:

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

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



April 19, 2013

*Prepared pursuant to TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures and the 2005 Connecticut Building Code (CBC)*

**TABLE OF CONTENTS**

EXECUTIVE SUMMARY ..... 3  
    Conclusions ..... 3  
    Recommendations ..... 3  
APPURTENANCE LISTING ..... 4  
RESULTS ..... 5  
GENERAL COMMENTS ..... 7  
LIMITATIONS ..... 7  
APPENDIX ..... 8



## EXECUTIVE SUMMARY

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

- Sabre Communications Corporation (Job No. 00-10101) Structural Design Report dated November 19, 1999
- Jaworski Geotech, Inc. (Job No. 99500G) Field Soil Screening dated December 13, 1999
- SBA Network Services, Inc.

The *basic design wind speed* per the *TIA/EIA-222-F* standards and the *2005 CBC* 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 162 ft, the tower meets the requirements of the *TIA/EIA-222-F* standards and the *2005 CBC* provided the **Recommendations** listed below are satisfied. Furthermore, provided the foundations were designed and constructed to support the original design reactions (see Sabre Job No. 00-10101), the foundations 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.

## Recommendations

To ensure the requirements of the *TIA/EIA-222-F* standards and the *2005 CBC* 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 existing diplexers should be installed directly behind the proposed and existing 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	Carrier	Mount Elevation (ft)	Mount Type
192.5	(9) EMS RR90-17-02DP (3) RFS APX16DWV-16DWV-S (3) Twin PCS TMAs (3) Twin AWS TMAs	(12) 1-5/8"	T-Mobile	192	(3) T-Frames
191.8	(1) Celwave PD1151 Omni	(1) 7/8"	Town of Clinton	184	(1) Standoff
182	(3) RFS APXVSP18-C-A20 (3) ALU 1900 MHZ RRUs (3) ALU 800 MHZ RRUs (3) ALU 800 MHZ Filters (4) RFS ACU-A20-N RETs	(3) 1-1/4" Fiber	Sprint	182	(3) T-Frames
162	(2) Antel BXA-70063/4CF_2I (1) Antel BXA-70063/6CF_2 (4) Antel LPA-80063/4CF (1) Antel BXA-171063/12BF (2) Antel BXA-171063/8BF (2) Antel LPA-80063/6CF (6) RFS FD9R6004/2C-3L Diplexers	(12) 1-5/8"	Verizon	162	(3) T-Frames
152	(9) KMW AM-X-CD-14-65-00T (3) Powerwave 7770 (6) Powerwave TT19-08BP111-001 TMAs (3) Powerwave LGP13519 Diplexers (3) CSS DBC-750 Combiners (6) Ericsson RRUS-11 RRHs (1) Raycap DC6-48-60-18-8F Surge Arrestor	(12) 1-5/8" (1) 3" Rigid Conduit	AT&T	152	(3) T-Frames
143.5	(3) Sinclair SD312HL Dipoles	(3) 7/8"	Town of Clinton	140	(3) Standoffs
100	(1) Radiowaves RDH4518A Dish	(2) CAT 5e		100	(1) Pipe Mount

**Proposed Loading:**

Antenna Elevation (ft)	Description	Coax and Lines	Carrier	Mount Elevation (ft)	Mount Type
162	(3) Antel BXA-70063/6CF (4) Antel LPA-80063/4CF (2) Antel BXA-171063/8BF (1) Antel BXA-171063/12CF (2) Antel LPA-80063/6CF (6) RFS FD9R6004/2C-3L Diplexers	(12) 1-5/8"	Verizon	162	(3) T-Frames

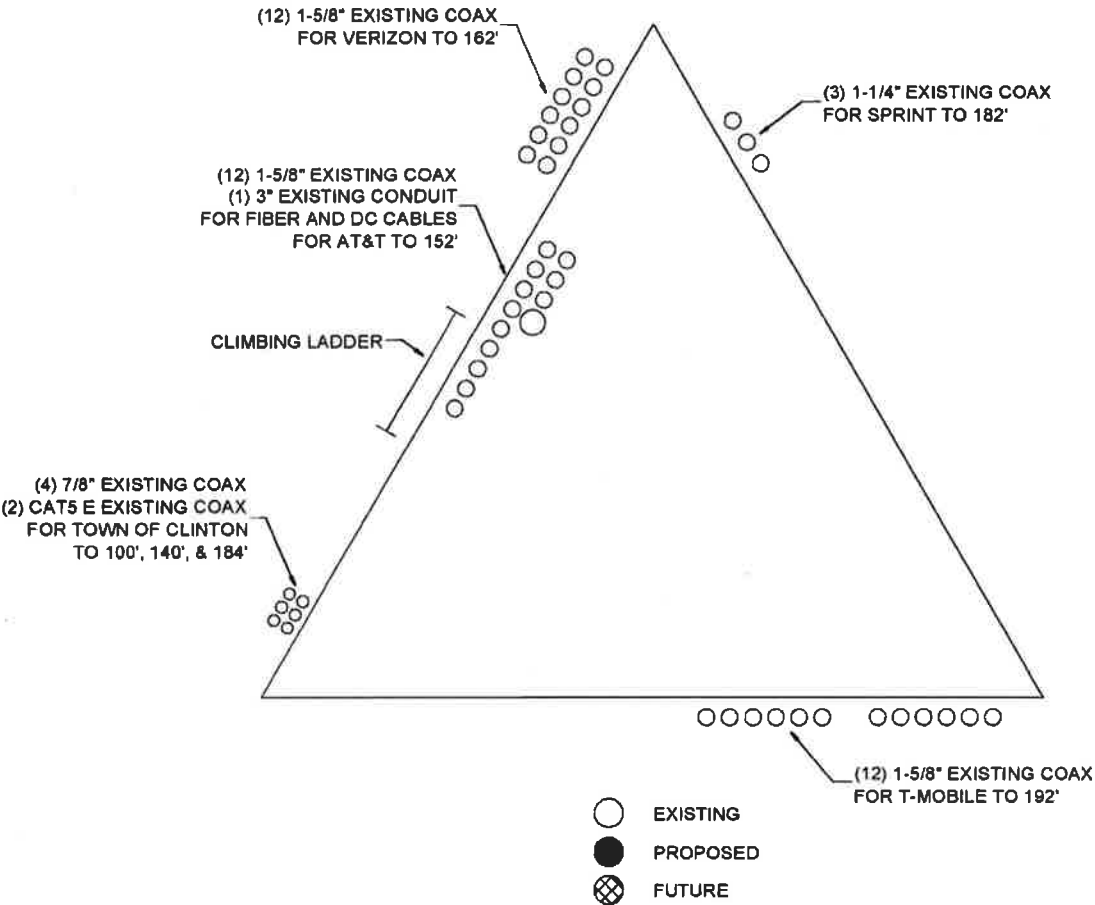


Figure 1 – Coax Layout

## 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
Bracing	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. *Note: Capacities up to 100% are considered acceptable.* **Table 4** displays the maximum foundation reactions. **Table 5** displays the maximum antenna rotations at service wind speeds.

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	195 - 180	Leg	P2x.154	38.3	Pass
		Diagonal	L1 3/4x1 3/4x3/16	27.6 36.9 (b)	Pass
		Top Girt	L1 3/4x1 3/4x3/16	4.0	Pass
T2	180 - 160	Leg	P3x.216	52.7	Pass
		Diagonal	L1 3/4x1 3/4x3/16	55.4	Pass
		Top Girt	L1 3/4x1 3/4x3/16	6.0	Pass
T3	160 - 140	Leg	P3x.3	76.8	Pass
		Diagonal	L2x2x3/16	79.0	Pass
T4	140 - 120	Leg	P4x.337	76.5	Pass
		Diagonal	L2 1/2x2 1/2x3/16	69.0	Pass
T5	120 - 100	Leg	P5x.375	66.7	Pass
		Diagonal	L2 1/2x2 1/2x3/16	92.5	Pass
T6	100 - 80	Leg	P6x.28	85.0	Pass
		Diagonal	L3x3x3/16	72.1	Pass
T7	80 - 60	Leg	P6x.432	73.2	Pass
		Diagonal	L3x3x1/4	95.8	Pass
T8	60 - 40	Leg	P8x.322	76.9	Pass
		Diagonal	L3x3 1/2x1/4	97.5	Pass
T9	40 - 20	Leg	P8x.322	86.3	Pass
		Diagonal	L3 1/2x3 1/2x1/4	93.5	Pass
T10	20 - 0	Leg	P8x.5	63.1	Pass
		Diagonal	L3 1/2x4x1/4	96.6	Pass

\*Capacities include 1/3 allowable stress increase for wind per TIA/EIA-222-F standards.

**Table 4 - Maximum Base Reactions**

Load Type	Direction	Current Analysis (TIA/EIA-222-F)	Original Design (TIA/EIA-222-F)
Individual Foundation	Horizontal*	29 k	29 k
	Uplift	247 k	258 k
	Compression	281 k	306 k
Overturning Moment	---	5,340 k-ft	5,764 k-ft

\* Per our experience with foundations of similar type, the shear loading should not control the foundation analysis.

**Table 5 – Maximum Antenna Rotations at Service Wind Speed**

Centerline Elevation (ft)	Antenna	Tilt (deg)*	Twist (deg)*
100	(1) Radiowaves RDH4518A Dish	0.1596	0.0042

\*Allowable tilt and twist values to be reviewed by the carrier.

### GENERAL COMMENTS

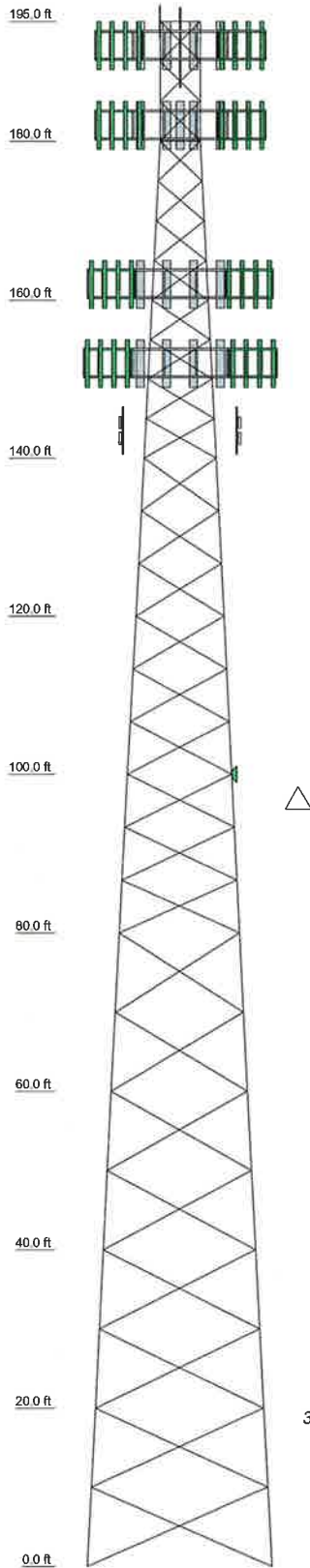
This engineering analysis is based upon the theoretical capacity of the structure. It is not a condition assessment of the tower and its foundation. It is the responsibility of SBA Network Services, Inc. to verify that the tower modeled and analyzed is the correct structure (with accurate antenna loading 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	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	P8x.5 (8.625 OD)	P8x.322 (8.625 OD)	P8x.322 (8.625 OD)	P8x.432 (8.625 OD)	P6x.28 (6.625 OD)	P5x.375 (5.5625 OD)	P4x.337 (4.50 OD)	P3x.300 (3.50 OD)	P3x.216 (3.5 OD)	P2x.154 (2.38 OD)
Leg Grade	L3 1/2x3 1/2x1/4	L3 1/2x3 1/2x1/4	L3x3 1/2x1/4	L3x3x1/4	L3x3x3/16	A572-50	L2 1/2x2 1/2x3/16	L2x2x3/16	L1 3/4x1 3/4x3/16	L1 3/4x1 3/4x3/16
Diagonals	L3 1/2x4x1/4	L3 1/2x3 1/2x1/4	L3x3 1/2x1/4	L3x3x1/4	L3x3x3/16	A36	L2 1/2x2 1/2x3/16	L2x2x3/16	L1 3/4x1 3/4x3/16	L1 3/4x1 3/4x3/16
Diagonal Grade										
Top Girts										
Face Width (ft)	21	19	17	15	13	11	9	7	5	5
# Panels @ (ft)		8 @ 10				9 @ 6.66667			11 @ 5	
Weight (K)	21.8	44	33	28	22	20	16	12	9	0.5



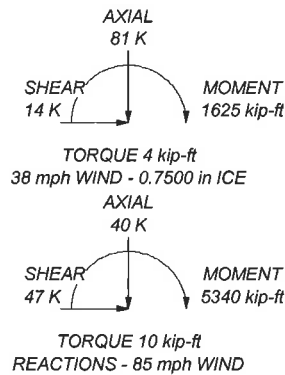
### TOWER DESIGN NOTES


1. Tower is located in Middlesex 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: 97.5%

#### MAX. CORNER REACTIONS AT BASE:

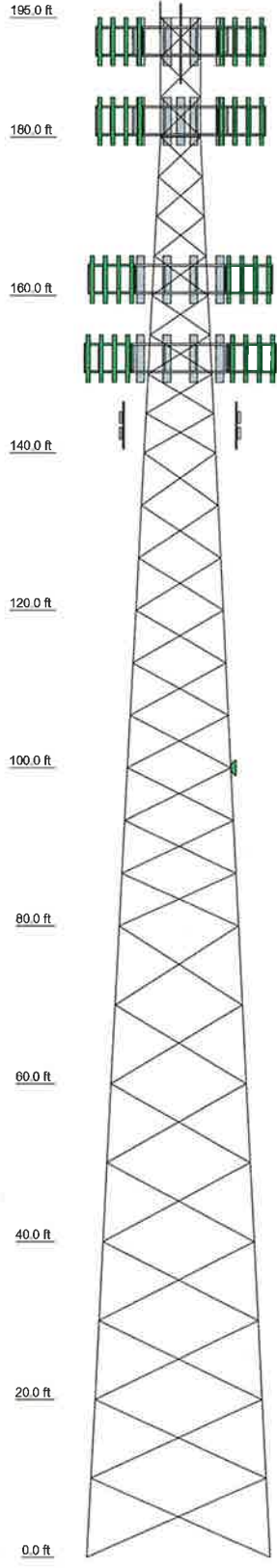
DOWN: 281 K  
SHEAR: 29 K

UPLIFT: -247 K  
SHEAR: 26 K



 Tower Analysis	<b>FDH Engineering, Inc.</b> 6521 Meridian Drive, Suite 107 Raleigh, NC 27616 Phone: 9197551012 FAX: 9197551031		Job: <b>Clinton 4, CT01879-S-00</b> Project: <b>1325331400</b>	
	Client: SBA Network Services, Inc.	Drawn by: Andrew Reynolds	App'd:	
	Code: TIA/EIA-222-F	Date: 04/19/13	Scale: NTS	
	Path:		Dwg No. E-1	

Section	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	P8x5 (6.625 OD)	P8x3.222 (6.625 OD)	P8x3.222 (6.625 OD)	P8x4.32 (6.625 OD)	P6x2.28 (6.625 OD)	P5x3.75 (5.9525 OD)	P4x.337 (4.50 OD)	P3x.300 (3.50 OD)	P3x.216 (3.5 OD)	P2x.154 (2.38 OD)
Leg Grade	L3 1/2x4x1/4	L3 1/2x3 1/2x1/4	L3x3 1/2x1/4	L3x3x1/4	L3x3x3/16	L2 1/2x2 1/2x3/16	L2x2x3/16	L1 3/4x1 3/4x3/16	L1 3/4x1 3/4x3/16	L1 3/4x1 3/4x3/16
Diagonals	L3 1/2x4x1/4	L3x3 1/2x1/4	L3x3 1/2x1/4	L3x3x1/4	L3x3x3/16	L2 1/2x2 1/2x3/16	L2x2x3/16	L1 3/4x1 3/4x3/16	L1 3/4x1 3/4x3/16	L1 3/4x1 3/4x3/16
Diagonal Grade										
Top Girts										
Face Width (ft)	21	19	17	15	13	11	9	7	5	5
# Panels @ (ft)	8 @ 10	8 @ 10	8 @ 10	9 @ 6.66667	9 @ 6.66667	9 @ 6.66667	11 @ 5	11 @ 5	11 @ 5	11 @ 5
Weight (K)	4.4	3.3	3.0	2.8	2.2	2.0	1.6	1.2	0.8	0.5




**DESIGNED APPURTENANCE LOADING**

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod	195	(2) LPA-80063/4CF w/ Mount Pipe	162
(3) RR90-17-02DP w/ Mount Pipe	192	LPA-80063/4CF w/ Mount Pipe	162
RFS APX16DWV-16DWV-S w/ Mount Pipe	192	BXA-171063/8BF w/ Mount Pipe	162
(3) RR90-17-02DP w/ Mount Pipe	192	BXA-171063/8BF w/ Mount Pipe	162
RFS APX16DWV-16DWV-S w/ Mount Pipe	192	BXA-171063/12CF w/ Mount Pipe	162
(3) RR90-17-02DP w/ Mount Pipe	192	LPA-80063/6CF w/ Mount Pipe	162
RFS APX16DWV-16DWV-S w/ Mount Pipe	192	(2) RFS FD9R6004/2C-3L Diplexer	162
Twin PCS TMA	192	(2) RFS FD9R6004/2C-3L Diplexer	162
Twin AWS TMA	192	(3) T-Frames	162
Twin PCS TMA	192	(2) RRUS-11	152
Twin AWS TMA	192	(2) RRUS-11	152
Twin PCS TMA	192	(2) RRUS-11	152
Twin AWS TMA	192	Raycap DC6-48-60-18-8F	152
(3) T-Frames	192	(3) T-Frames	152
PD1151	184	(3) AM-X-CD-14-65-00T w/ Mount Pipe	152
Standoff	184	(3) AM-X-CD-14-65-00T w/ Mount Pipe	152
APXVSP18-C-A20 w/ Mount Pipe	182	7770 w/ Mount Pipe	152
APXVSP18-C-A20 w/ Mount Pipe	182	7770 w/ Mount Pipe	152
APXVSP18-C-A20 w/ Mount Pipe	182	7770 w/ Mount Pipe	152
RRU-ALU 1900MHZ	182	(2) TT19-08BP111-001 TMA	152
RRU-ALU 1900MHZ	182	(2) TT19-08BP111-001 TMA	152
RRU-ALU 800MHZ	182	(2) TT19-08BP111-001 TMA	152
RRU-ALU 800MHZ	182	TMA - LGP13519	152
RRU-ALU 800MHZ	182	TMA - LGP13519	152
Filter- ALU 800MHZ	182	TMA - LGP13519	152
Filter- ALU 800MHZ	182	Combiner - CSS DBC-750	152
Filter- ALU 800MHZ	182	Combiner - CSS DBC-750	152
(2) ACU-A20-N RET	182	Combiner - CSS DBC-750	152
ACU-A20-N RET	182	Sinclair SD312HL	140
ACU-A20-N RET	182	Sinclair SD312HL	140
(3) T-Frames	182	Sinclair SD312HL	140
BXA-70063/6CF w/ Mount Pipe	162	(3) Standoffs	140
BXA-70063/6CF w/ Mount Pipe	162	Pipe Mount	100
BXA-70063/6CF w/ Mount Pipe	162	RDH4518A	100

**MATERIAL STRENGTH**

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

 <b>FDH Engineering, Inc.</b> 6521 Meridian Drive, Suite 107 Raleigh, NC 27616 Phone: 9197551012 FAX: 9197551031	<b>Job:</b> Clinton 4, CT01879-S-00 <b>Project:</b> 1325331400	
	<b>Client:</b> SBA Network Services, Inc. <b>Code:</b> TIA/EIA-222-F <b>Path:</b>	<b>Drawn by:</b> Andrew Reynolds <b>Date:</b> 04/19/13 <b>Scale:</b> NTS <b>Dwg No:</b> E-1
	<b>App'd:</b>	