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Also admitted in Massachusetts

January 9, 2014

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

Re: **Notice of Exempt Modification – Antenna Swap**
10 Ashpohtag Road, Norfolk, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) wireless telecommunications antennas at the 127-foot level on the existing 149-foot tower at the above-referenced address. The tower is owned by SBA. Cellco's shared use of this tower was approved in 2007. Cellco now intends to replace three (3) of its existing antennas with two (2) model BXA-70040-6CF 700 MHz antennas and one (1) model BXA-70063-6CF 700 MHz antenna, at the 127-foot level on the tower. Included in Attachment 1 are specifications for the replacement antennas.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Susan M. Dyer, First Selectman for the Town of Norfolk. A copy of this letter is also being sent to Federal National Mortgage Association, the owner of the property at 10 Ashpohtag Road.

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 proposed antennas will be located at the 127-foot level on the 149-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 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 at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. A cumulative General Power Density table for Cellco's modified facility is included behind Attachment 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 included in Attachment 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:
Susan M. Dyer, Norfolk First Selectman
Federal National Mortgage Association
Sandy M. Carter

ATTACHMENT 1

Amphenol ANTENNA SOLUTIONS

BXA-70040-6CF-EDIN-X

X-Pol | FET Panel | 40° | 16.0 dBd

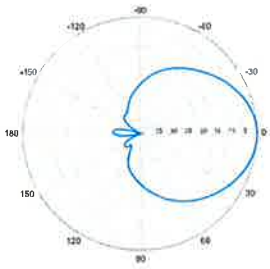
Replace "X" with desired electrical downtilt.

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

Electrical Characteristics	696-900 MHz	
Frequency bands	696-806 MHz	806-900 MHz
Polarization	±45°	
Horizontal beamwidth	42°	40°
Vertical beamwidth	12°	10°
Gain	15.5 dBd (17.6 dBi)	16.0 dBd (18.1 dBi)
Electrical downtilt (X)	0, 2, 4, 6, 8, 10	
Impedance	50Ω	
VSWR	≤1.35:1	
Upper sidelobe suppression (0°)	-12.1 dB	-13.4 dB
Front-to-back ratio (+/-30°)	-35.8 dB	-38.0 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	1806 x 606 x 200 mm	71.1 x 23.9 x 7.9 in
Depth with z-brackets	240 mm	9.4 in
Weight without mounting brackets	17 kg	38 lbs
Survival wind speed	> 201 km/hr	> 125 mph
Wind area	Front: 1.09 m^2 Side: 0.36 m^2	Front: 11.8 ft^2 Side: 3.9 ft^2
Wind load @ 161 km/hr (100 mph)	Front:1564 N Side: 547 N	Front: 350 lbf Side: 123 lbf

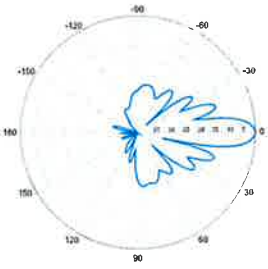
Mounting Options	Part Number	Fits Pipe Diameter	Weight
3-Point Mounting & Downtilt Bracket Kit	36210008	40-115 mm 1.57-4.5 in	6.9 kg 15.2 lbs
Concealment Configurations	This model cannot be used in a standard FP concealment configuration		

BXA-70040-6CF-EDIN-X



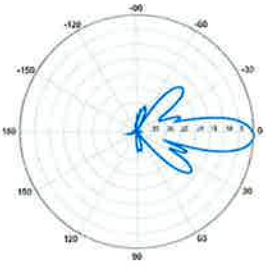
Horizontal | 750 MHz

BXA-70040-6CF-EDIN-0



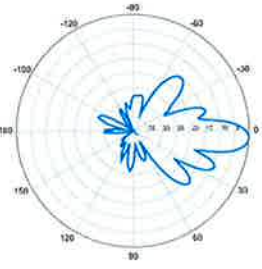
0° | Vertical | 750 MHz

BXA-70040-6CF-EDIN-2



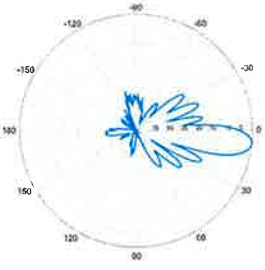
2° | Vertical | 750 MHz

BXA-70040-6CF-EDIN-4

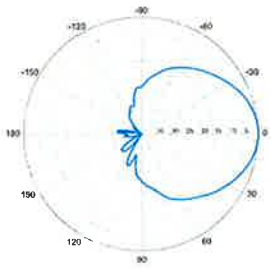


4° | Vertical | 750 MHz

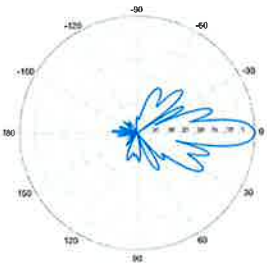
BXA-70040-6CF-EDIN-6



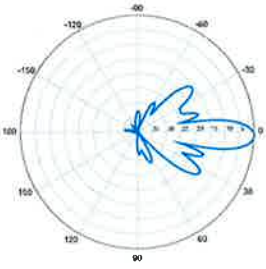
6° | Vertical | 750 MHz



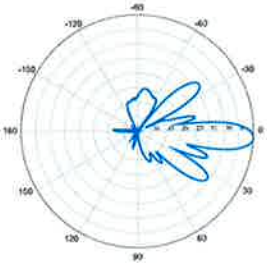
Horizontal | 850 MHz



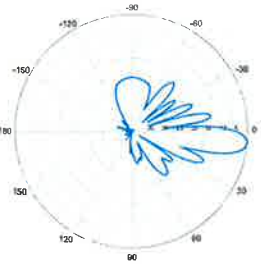
0° | Vertical | 850 MHz



2° | Vertical | 850 MHz



4° | Vertical | 850 MHz



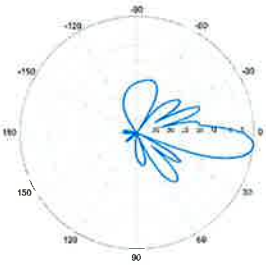
6° | Vertical | 850 MHz

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-70040-6CF-EDIN-X

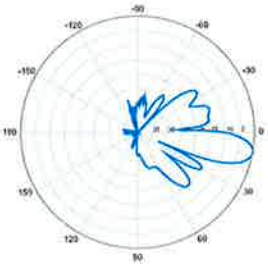
X-Pol | FET Panel | 40° | 16.0 dBd

BXA-70040-6CF-EDIN-8

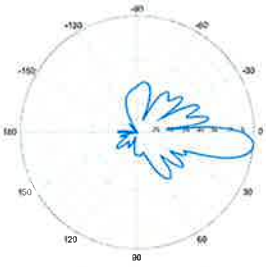


8° | Vertical | 750 MHz

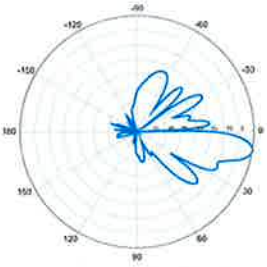
BXA-70040-6CF-EDIN-10



10° | Vertical | 750 MHz



8° | Vertical | 850 MHz



10° | Vertical | 850 MHz

BXA-70063-6CF-EDIN-X

X-Pol | FET Panel | 63° | 14.5 dBd

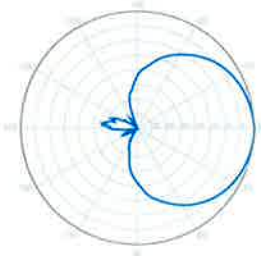
Replace "X" with desired electrical downtilt.

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	
IM3 (2x20W carriers)	< -153 dBc	
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^2 Side: 0.24 m^2	Front: 5.5 ft^2 Side: 2.6 ft^2
Wind load @ 161 km/hr (100 mph)	Front: 759 N Side: 391 N	Front: 169 lbf Side: 89 lbf

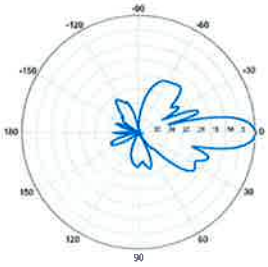
Mounting Options	Part Number	Fits Pipe Diameter	Weight
3-Point Mounting & Downtilt Bracket Kit	36210008	40-115 mm 1.57-4.5 in	6.9 kg 15.2 lbs
Concealment Configurations	For concealment configurations, order BXA-70063-6CF-EDIN-X-FP		

BXA-70063-6CF-EDIN-X



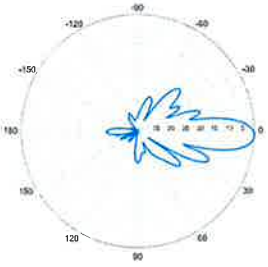
Horizontal | 750 MHz

BXA-70063-6CF-EDIN-0

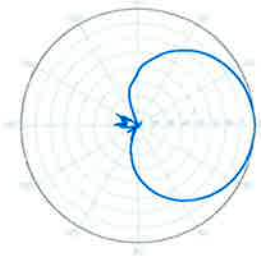


0° | Vertical | 750 MHz

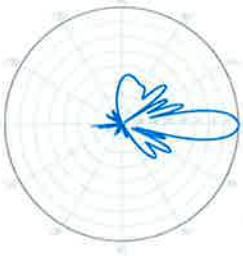
BXA-70063-6CF-EDIN-2



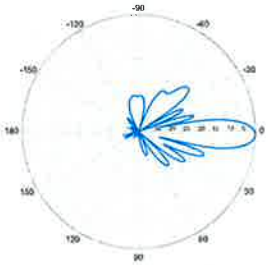
2° | Vertical | 750 MHz



Horizontal | 850 MHz



0° | Vertical | 850 MHz



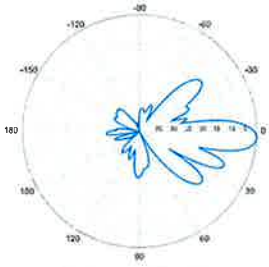
2° | Vertical | 850 MHz

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

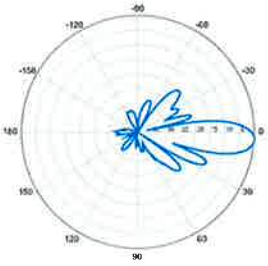
X-Pol | FET Panel | 63° | 14.5 dBd

BXA-70063-6CF-EDIN-3



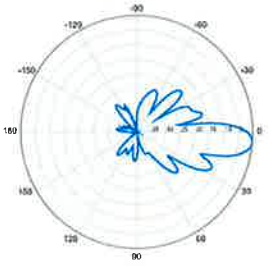
3° | Vertical | 750 MHz

BXA-70063-6CF-EDIN-4

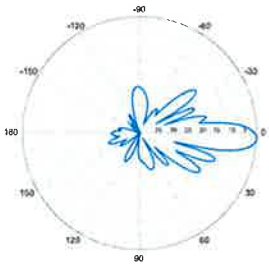


4° | Vertical | 750 MHz

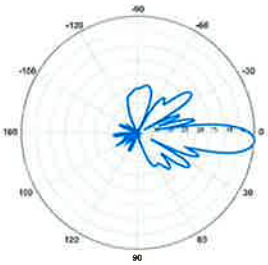
BXA-70063-6CF-EDIN-5



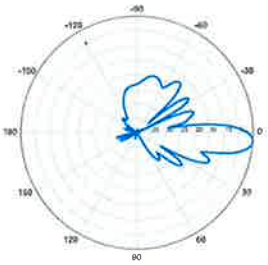
5° | Vertical | 750 MHz



3° | Vertical | 850 MHz

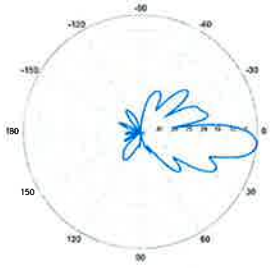


4° | Vertical | 850 MHz



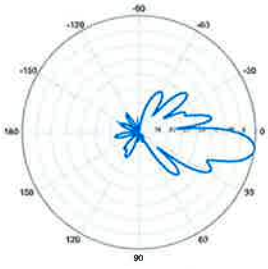
5° | Vertical | 850 MHz

BXA-70063-6CF-EDIN-6



6° | Vertical | 750 MHz

BXA-70063-6CF-EDIN-8



8° | Vertical | 750 MHz

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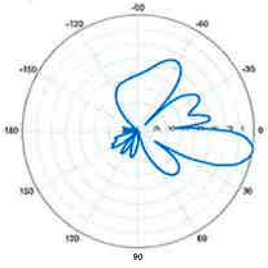
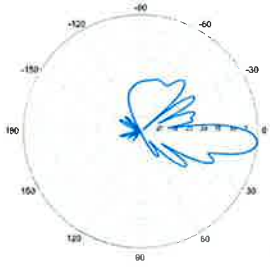
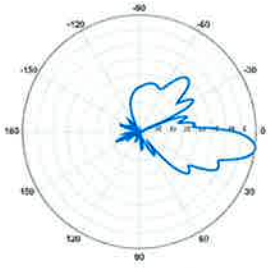


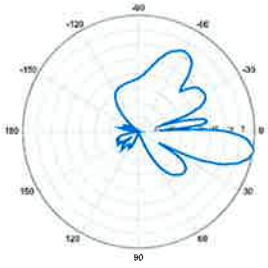
10° | Vertical | 750 MHz



6° | Vertical | 850 MHz



8° | Vertical | 850 MHz



10° | Vertical | 850 MHz

ATTACHMENT 2

	General	Power	Density					
Site Name: Norfolk W								
Tower Height: Verizon @ 127'								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*Sprint CDMA/LTE	2	778	147	0.0259	1900	1.0000	2.59%	
*Sprint CDMA/LTE	1	438	147	0.0073	850	0.5667	1.29%	
*AT&T UMTS	2	565	137	0.0216	880	0.5867	3.69%	
*AT&T UMTS	2	875	137	0.0335	1900	1.0000	3.35%	
*AT&T GSM	1	283	137	0.0054	880	0.5867	0.92%	
*AT&T GSM	4	525	137	0.0402	1900	1.0000	4.02%	
*AT&T LTE	1	1313	137	0.0252	734	0.4893	5.14%	
Verizon	**11**	**431**	**127**	**0.1057**	**1970**	**1.0000**	**10.57%**	
Verizon	**9**	**399**	**127**	**0.0801**	**869**	**0.5793**	**13.82%**	
Verizon	**1**	**1750**	**127**	**0.0390**	**2145**	**1.0000**	**3.90%**	
Verizon	**1**	**1050**	**127**	**0.0234**	**746**	**0.4973**	**4.71%**	
								54.0%
* Source: Siting Council								

ATTACHMENT 3

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

Structural Analysis for SBA Network Services, Inc.

148.5' Monopole Tower

SBA Site Name: Cammilletti Property
SBA Site ID: CT46144-A-00
Verizon Site Name: Norfolk West

FDH Project Number 13SCKU1400

Analysis Results

Tower Components	89.5 %	Sufficient
Foundation	92.7 %	Sufficient

Prepared By:

Mark S. Girgis

Mark S. Girgis, EI
Project Engineer

Reviewed By:

Christopher M. Murphy

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

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

September 24, 2013

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

TABLE OF CONTENTS

EXECUTIVE SUMMARY

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

- Engineered Endeavors, Inc. (Project No. 12856) original design drawings dated August 30, 2004
- Clarence Welti Associates, Inc. (Site Name: Cammilletti Property) Geotechnical Study dated August 17, 2004
- SBA Network Services, Inc.

The *basic design wind speed* per the *TIA/EIA-222-F* standards and the *2005 CBC* is 80 mph without ice and 28 mph with 1" radial ice. Ice is considered to increase in thickness with height.

Conclusions

With the existing and proposed antennas from Verizon in place at 127 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 foundation was designed and constructed to support the original design reactions (see Engineered Endeavors, Inc. Project No. 12856), 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.

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. The proposed feed lines should be installed inside the pole's shaft.
2. The existing diplexers should be installed directly behind the existing and 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	Feed Lines[1]	Carrier	Mount Elevation (ft)	Mount Type
145.5	(4) Decibel DB950F65E-M	(4) 1-5/8"	Sprint	145.5	(3) T-Arms
137	(6) Powerwave 7770.00 (3) KMW AM-X-CD-16-65-00T-RET (6) Powerwave LGP21401 TMAs (6) Powerwave 7020.00 RETs (6) Powerwave LGP 13519 Diplexers (6) Ericsson RRUS-11 RRUs (1) Raycap DC6-48-60-18-8F Surge Arrestor	(12) 1-5/8" (2) 3/4" DC[2] Power (1) 7/16" Fiber	New Cingular	137	(1) Low Profile Platform
127	(3) Antel BXA-70080/6CF (6) Antel LPA-80080/6CF (3) Antel BXA-171085-12BF (6) RFS FD9R6004/2C-3L Diplexers	(12) 1-5/8"	Verizon	127	(1) Low Profile Platform

1. Feed lines installed inside the pole's shaft unless otherwise noted.
2. Currently, New Cingular has (2) 3/4" DC Power cables and (1) 7/16" Fiber cable installed in (1) 3" Conduit installed inside the pole's shaft.

Proposed Loading:

Antenna Elevation (ft)	Description	Feed Lines	Carrier	Mount Elevation (ft)	Mount Type
127	(1) Antel BXA-70063-6CF (3) Antel BXA-171085-12BF (6) Antel LPA-80080-6CF (2) Antel BXA-70040-6CF (6) RFS FD9R6004/2C-3L Diplexers	(12) 1-5/8"	New Cingular	127	(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	60 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.* **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	148.5 - 95.9896	Pole	TP29.0666x18x0.1875	89.5	Pass
L2	95.9896 - 47.3803	Pole	TP38.8113x27.8206x0.3125	79.6	Pass
L3	47.3803 - 0	Pole	TP48x37.0711x0.375	74.8	Pass
		Anchor Bolts	(16) 2.25" Ø w/ BC = 57"	56.7	Pass
		Base Plate	PL 63" Ø x 2" thk.	81.6	Pass

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

Table 4 - Maximum Base Reactions

Base Reactions	Current Analysis *(TIA/EIA-222-F)*	Original Design *(TIA/EIA-222-F)*
Axial	26 k*	21 k
Shear	20 k	22 k
Moment	2,132 k-ft	2,300 k-ft

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

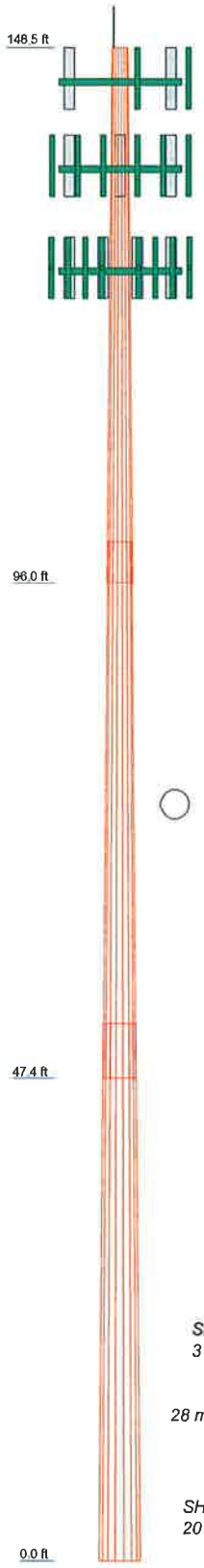
LIMITATIONS

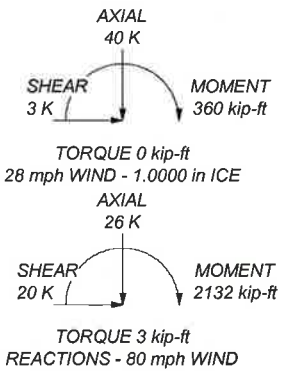
All opinions and conclusions are considered accurate to a reasonable degree of engineering certainty based upon the evidence available at the time of this report. All opinions and conclusions are subject to revision based upon receipt of new or additional/updated information. All services are provided 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
Length (ft)	52.51	52.74	52.73
Number of Sides	18	18	18
Thickness (in)	0.1875	0.3125	0.3750
Socket Length (ft)	4.13	5.35	
Top Dia (in)	18.0000	27.8206	37.0711
Bot Dia (in)	29.0666	38.8113	48.0000
Grade		A572-65	
Weight (K)	2.5	5.9	9.0

Total Weight: 17.4 K





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod	148.5	(2) LGP21401 TMA	137
(2) DB950F65E-M w/ Mount Pipe	145.5	(2) LGP21401 TMA	137
(2) DB950F65E-M w/ Mount Pipe	145.5	(2) LGP13519 TMA	137
(2) Empty Pipe Mount	145.5	(2) LGP13519 TMA	137
(2) Empty Pipe Mount	145.5	(2) LGP13519 TMA	137
(4) Empty Pipe Mount	145.5	(2) RRUS-11	137
(3) T-Arms	145.5	(2) RRUS-11	137
(2) 7770.00 w/Mount Pipe	137	(2) RRUS-11	137
(2) 7770.00 w/Mount Pipe	137	DC6-48-60-18-8F	137
(2) 7770.00 w/Mount Pipe	137	Low Profile Platform	137
AM-X-CD-16-65-00T-RET w/ Mount Pipe	137	Low Profile Platform	127
		BXA-70063-6CF w/ Mount Pipe	127
AM-X-CD-16-65-00T-RET w/ Mount Pipe	137	(3) BXA-171085-12BF w/ Mount Pipe	127
		(4) LPA-80080-6CF w/ Mount Pipe	127
AM-X-CD-16-65-00T-RET w/ Mount Pipe	137	(2) LPA-80080-6CF w/ Mount Pipe	127
		(2) BXA-70040-6CF w/ Mount Pipe	127
(2) 7020.00 RET	137	(2) FD9R6004/2C-3L Diplexer	127
(2) 7020.00 RET	137	(2) FD9R6004/2C-3L Diplexer	127
(2) 7020.00 RET	137	(2) FD9R6004/2C-3L Diplexer	127
(2) LGP21401 TMA	137		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Litchfield County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 28 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 89.5%

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Job: Cammilletti Property, CT46144-A-00			
Project: 13SCKU1400			
Client: SBA Network Services, Inc.	Drawn by: Mark S. Girgis	App'd:	
Code: TIA/EIA-222-F	Date: 09/24/13	Scale: NTS	
Path:		Dwg No. E-1	