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Also admitted in Massachusetts

July 25, 2013

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

**Re: Notice of Exempt Modification – Facility Modification
150 Lost Acres Road, Granby, Connecticut**

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless (“Cellco”) currently maintains twelve (12) wireless telecommunications antennas at the 160-foot level on an existing 170-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 2008. Cellco now intends to replace two (2) of its existing antennas with two (2) model BXA-70063-6CF LTE antennas, at the same 160-foot level. Attached behind Tab 1 are the specifications for Cellco’s 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 William F. Smith, Jr., Town Manager of the Town of Granby. A copy of this letter is also being sent to John Lombardi, the owners of the property on which the tower is located.

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

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 160-foot level on the existing 170-foot tower.



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Melanie A. Bachman

July 25, 2013

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

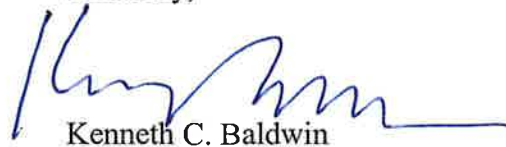
3. The proposed modifications will not increase noise levels at the facility by six decibels or more.

4. The operation of the replacement antennas will not increase radio frequency (RF) emissions at the facility to levels at or above the Federal Communications Commission (FCC) adopted safety standard. A cumulative General Power Density table 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). 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. The cables that exist today are installed as shown in "Figure 1".

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 F. Smith, Jr., Granby Town Manger

John Lombardi

Sandy M. Carter



TAB 1

BXA-70063-6CF-EDIN-X

X-Pol | FET Panel | 63° | 14.5 dBd

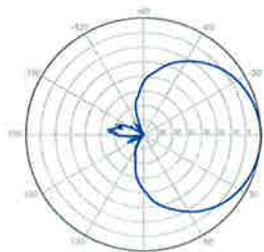
Replace 'X' with desired electrical downtilt.

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 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			

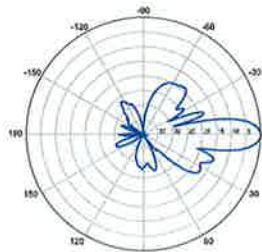


BXA-70063-6CF-EDIN-X



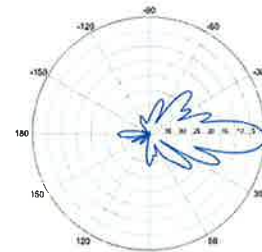
Horizontal | 750 MHz

BXA-70063-6CF-EDIN-0

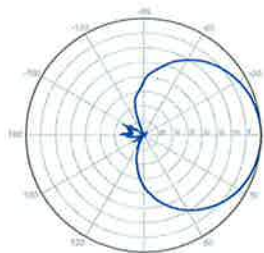


0° | Vertical | 750 MHz

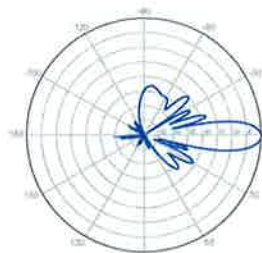
BXA-70063-6CF-EDIN-2



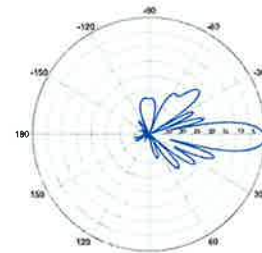
2° | Vertical | 750 MHz



Horizontal | 850 MHz



0° | Vertical | 850 MHz



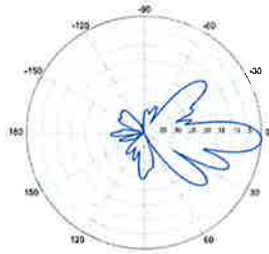
2° | Vertical | 850 MHz

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

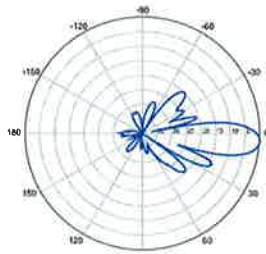
X-Pol | FET Panel | 63° | 14.5 dBd

BXA-70063-6CF-EDIN-3



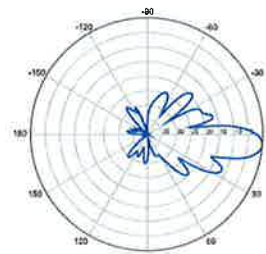
3° | Vertical | 750 MHz

BXA-70063-6CF-EDIN-4

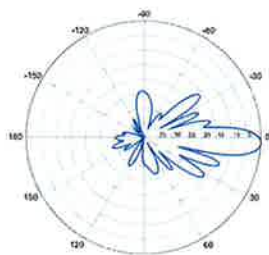


4° | Vertical | 750 MHz

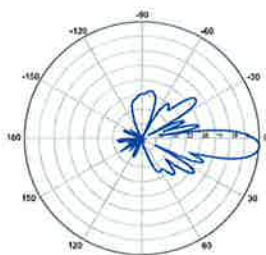
BXA-70063-6CF-EDIN-5



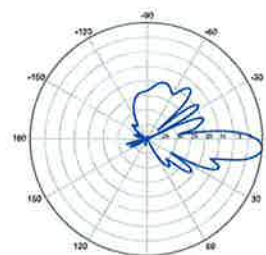
5° | Vertical | 750 MHz



3° | Vertical | 850 MHz

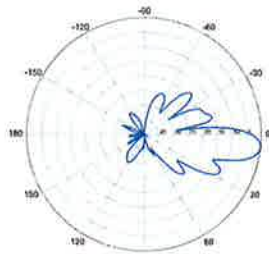


4° | Vertical | 850 MHz



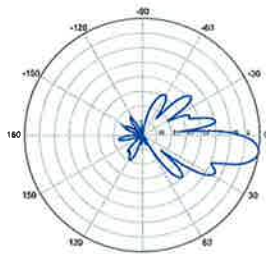
5° | Vertical | 850 MHz

BXA-70063-6CF-EDIN-6



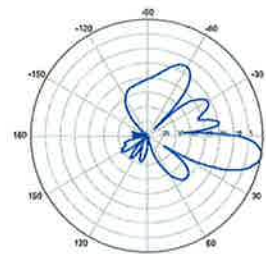
6° | Vertical | 750 MHz

BXA-70063-6CF-EDIN-8

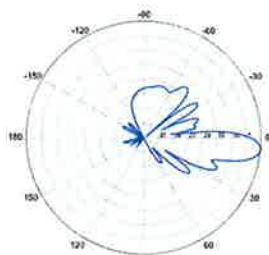


8° | Vertical | 750 MHz

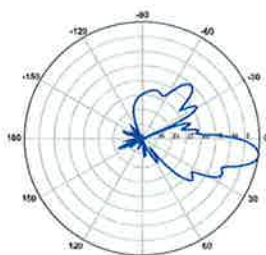
BXA-70063-6CF-EDIN-10



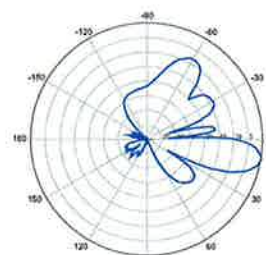
10° | Vertical | 750 MHz



6° | Vertical | 850 MHz



8° | Vertical | 850 MHz



10° | Vertical | 850 MHz

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TAB 2

	General	Power	Density				
Site Name: North Granby (Granby)							
Tower Height: Verizon @ 160ft							
CARRIER	# OF CHAN.	WATTS ERP	HEIGHT	CALC. POWER DENS	FREQ.	MAX. PERMISS. EXP.	FRACTION MPE
*AT&T UMTS	2	565	170	0.0141	880	0.5867	2.40%
*AT&T UMTS	2	875	170	0.0218	1900	1.0000	2.18%
*AT&T GSM	1	283	170	0.0035	880	0.5867	0.60%
*AT&T GSM	4	525	170	0.0261	1900	1.0000	2.61%
*AT&T LTE	1	1313	170	0.0163	734	0.4893	3.34%
Verizon PCS	11	331	160	0.0511	1970	1.0000	5.11%
Verizon Cellular	9	348	160	0.0440	869	0.5793	7.59%
Verizon AWS	1	1750	160	0.0246	2145	1.0000	2.46%
Verizon 700	1	811	160	0.0114	698	0.4653	2.45%
							28.74%
* 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.**

170' Self-Support Tower

**SBA Site Name: North Granby
SBA Site ID: CT10017-A-02
Verizon Site Name: North Granby, CT**

FDH Project Number 1340051400

Analysis Results

Tower Components	87.4%	Sufficient
Foundation	84.7%	Sufficient

Prepared By:

Christopher B. Stryffeler, 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



June 21, 2013

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

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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 North Granby, 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 State Building Code (CSBC)*. Information pertaining to the existing/proposed antenna loading, current tower geometry, the member sizes, and foundation dimensions was obtained from:

- ☐ Rohn (Eng. File No. 37696MP) original design drawings dated August 3, 1998
- ☐ FDH, Inc. (Job No. 07-0320T) TIA Inspection Report dated April 11, 2007
- ☐ FDH Engineering, Inc. (09-07094E S2) Extension Drawings for 160' Self Support Tower dated October 23, 2009
- ☐ FDH, Inc. (Job No. 09-10153T T1) TIA Inspection Report dated December 29, 2009
- ☐ FDH Engineering, Inc. (09-07094E S2) Post-Construction Inspection Report dated January 6, 2010
- ☐ SBA Network Services, Inc.

The *basic design wind speed* per the *TIA/EIA-222-F* standards and the *2005 CSBC* is 80 mph without ice and 38 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 160 ft, the tower meets the requirements of the *TIA/EIA-222-F* standards and the *2005 CSBC* provided the **Recommendation** listed below is satisfied. Furthermore, provided the foundations were designed and constructed to support the original design reactions (See Rohn Eng. File No. 37696MP), the foundations should have the necessary capacity to support the existing and proposed loading. For a more detailed description of the analysis of the tower, see the **Results** section of this report.

Our structural analysis has been performed assuming all information provided to FDH Engineering, Inc. is accurate (i.e., the steel data, tower layout, existing antenna loading, and proposed antenna loading) and that the tower has been properly erected and maintained per the original design drawings.

Recommendation

To ensure the requirements of the *TIA/EIA-222-F* standards and the *2005 CSBC* are met with the existing and proposed loading in place, we have the following recommendation:

1. Coax lines must be installed as shown in **Figure 1**.

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
170	(6) Powerwave 7770.00 (3) KMW AM-X-CD-17-65-001-RET (6) Powerwave LGP21401 TMAs (6) Ericsson RRUS11 RRUs (1) Andrew ABT-DF-DMADBH Surge Arrestor (1) Raycap DC6-48-60-18-8F Surge Arrestor	(12) 1-5/8" (1) 7/16" Fiber ² (2) DC Cables ²	AT&T	170	(3) T-Frames
160.5	(6) ADC Cleargain TMAs	(12) 1-5/8"	Verizon	159.1	(3) 14.5' Andrew T-Frames (QT-SF14-4-72)
160	(2) Antel BXA-70063/4CF (3) Antel BXA-171085-12BF (4) Antel LPA-80063/4CF (1) Antel BXA-70063/6CF (2) Antel LPA-80080/6CF (6) RFS FD9R6004/2C-3L Diplexers				

1. See Figure 1 for coax location.

2. AT&T has installed (1) 7/16" fiber and (2) DC cables inside (1) 3" flex conduit.

Proposed Loading:

Antenna Elevation (ft)	Description	Coax and Lines	Carrier	Mount Elevation (ft)	Mount Type
160	(1) Antel BXA-70063/4CF (3) Antel BXA-171085-12BF (4) Antel LPA-80063/4CF (2) Antel BXA-70063/6CF (2) Antel LPA-80080/6CF (6) RFS FD9R6004/2C-3L Diplexers	(12) 1-5/8"	Verizon	159.1	(3) 14.5' Andrew T-Frames (QT-SF14-4-72)

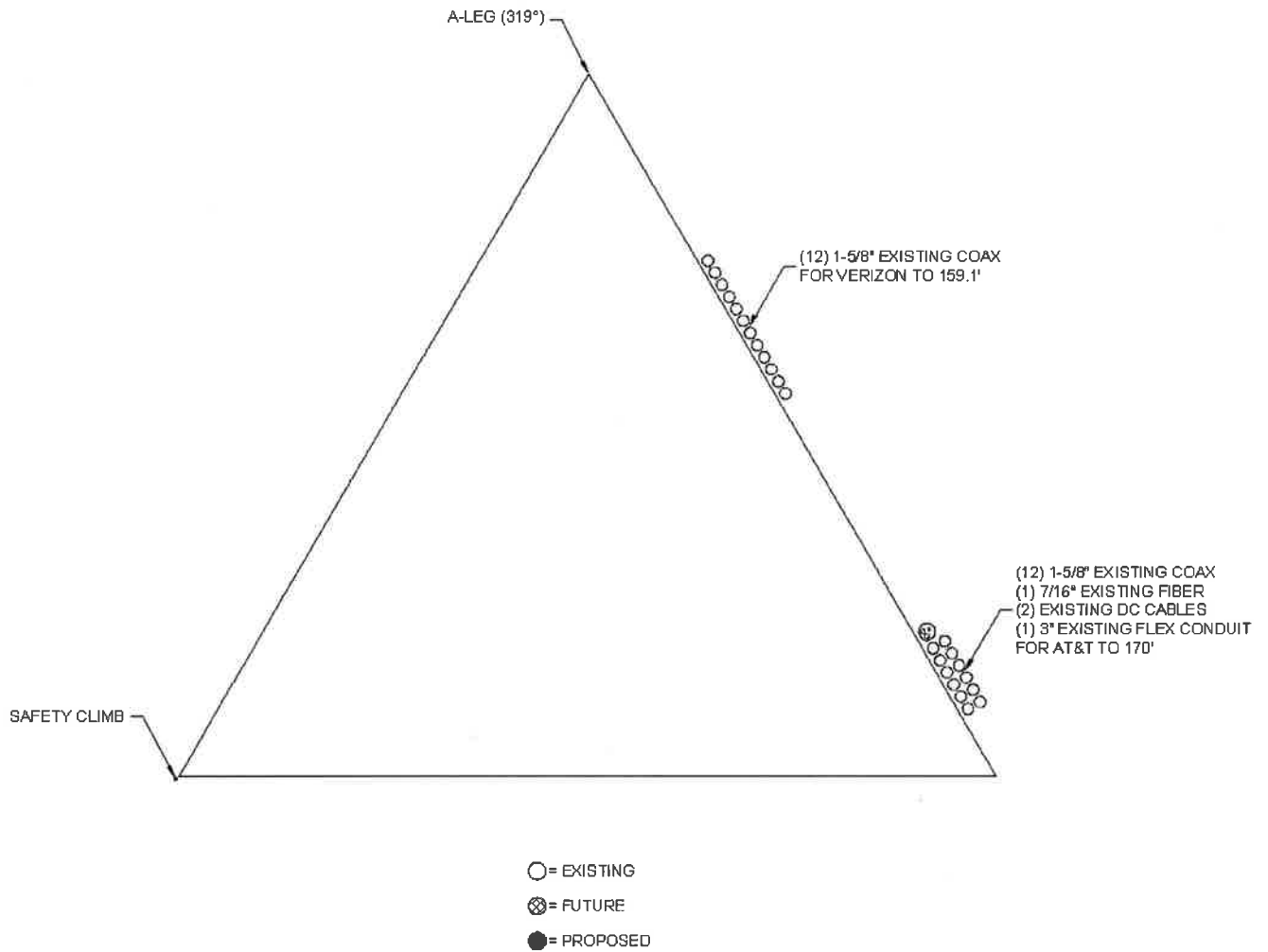


Figure 1 – Coax Layout

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	50 ksi & 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 105% are considered acceptable.* **Table 4** displays the maximum foundation reactions.

If the assumptions outlined in this report differ from actual field conditions, FDH Engineering, Inc. should be contacted to perform a revised analysis. Furthermore, as no information pertaining to the allowable twist and sway requirements for the existing or proposed appurtenances was provided, deflection and rotation were not taken into consideration when performing this analysis.

See the **Appendix** for detailed modeling information.

Table 3 - Summary of Working Percentage of Structural Components

Section No.	Elevation ft	Component Type	Size	% Capacity*	Pass Fail
T1	170 - 160	Leg	ROHN 2.5 STD	10.6	Pass
		Diagonal	L1 3/4x1 3/4x3/16	18.0 29.4 (b)	Pass
		Top Girt	L2x2x3/16	12.2	Pass
T2	160 - 140	Leg	ROHN 2.5 STD	66.2	Pass
		Diagonal	L1 3/4x1 3/4x3/16	55.9 81.9 (b)	Pass
		Top Girt	L2x2x3/16	5.9	Pass
T3	140 - 120	Leg	ROHN 3 STD	87.4	Pass
		Diagonal	L2x2x3/16	54.9 60.4 (b)	Pass
		Top Girt	L2x2x3/16	2.9	Pass
T4	120 - 100	Leg	ROHN 3.5 EH	76.9	Pass
		Diagonal	L2 1/2x2 1/2x3/16	54.1 65.1 (b)	Pass
T5	100 - 80	Leg	ROHN 4 EH	77.1	Pass
		Diagonal	L2 1/2x2 1/2x3/16	78.2	Pass
T6	80 - 60	Leg	ROHN 5 EH	62.9	Pass
		Diagonal	L3x3x1/4	48.1 64.8 (b)	Pass
T7	60 - 40	Leg	ROHN 6 EHS	70.6	Pass
		Diagonal	L3 1/2x3 1/2x1/4	52.5 54.2 (b)	Pass
T8	40 - 20	Leg	ROHN 6 EH	64.9	Pass
		Diagonal	L3 1/2x3 1/2x1/4	67.0	Pass
T9	20 - 0	Leg	ROHN 6 EH	73.0	Pass
		Diagonal	L3 1/2x3 1/2x1/4	86.0	Pass

* Capacities include 1/3 allowable stress increase for wind per the 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	21 k	29 k
	Uplift	175 k	214 k
	Compression	198 k	240 k
Overturing Moment	---	3,432 k-ft	4,053 k

GENERAL COMMENTS

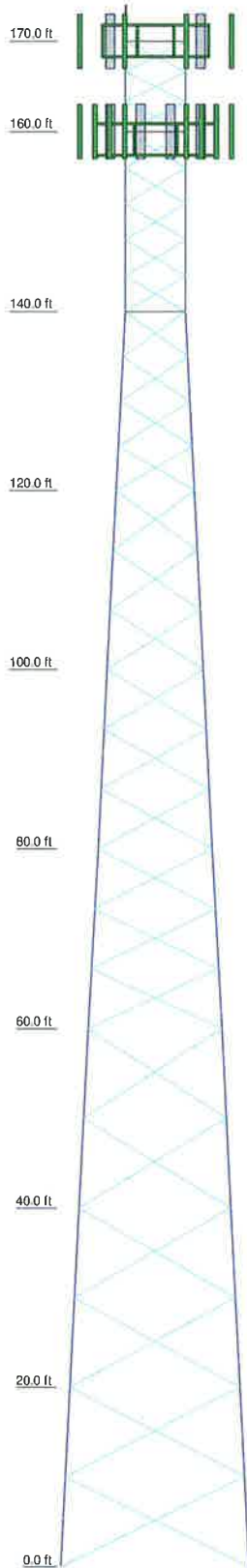
This engineering analysis is based upon the theoretical capacity of the structure. It is not a condition assessment of the tower and its foundation. It is the responsibility of SBA Network Services, Inc. to verify that the tower modeled and analyzed is the correct structure (with accurate antenna loading 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	T1	T2	T3	T4	T5	T6	T7	T8	T9
Legs	ROHN 2.5 STD	ROHN 3 STD	ROHN 3.5 EH	ROHN 4 EH	ROHN 5 EH	ROHN 6 EHS	ROHN 6 EH	ROHN 6 EH	ROHN 6 EH
Leg Grade	L1 3/4x1 3/4x3/16	L2x2x3/16	L2 1/2x2 1/2x3/16	L3x3x1/4	L3 1/2x3 1/2x1/4	L3 1/2x3 1/2x1/4	L3 1/2x3 1/2x1/4	L3 1/2x3 1/2x1/4	L3 1/2x3 1/2x1/4
Diagonals	A36	A36	A36	A36	A36	A36	A36	A36	A36
Diagonal Grade	L2x2x3/16	L2x2x3/16	L2x2x3/16	L2x2x3/16	L2x2x3/16	L2x2x3/16	L2x2x3/16	L2x2x3/16	L2x2x3/16
Top Girts	L2x2x3/16	L2x2x3/16	L2x2x3/16	L2x2x3/16	L2x2x3/16	L2x2x3/16	L2x2x3/16	L2x2x3/16	L2x2x3/16
Face Width (ft)	6.64583	8.6848	10.7148	12.7447	14.7747	16.8048	18.8348	20.8648	22.8948
# Panels @ (ft)	3 @ 3.33333	4 @ 5	5 @ 4	6 @ 10	7 @ 10	8 @ 10	9 @ 10	10 @ 10	11 @ 10
Weight (K)	0.5	0.9	1.0	1.4	1.6	2.5	2.7	3.1	3.3



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod	170	(2) RRUS-11	170
(2) 7770.00 w/ mount pipe	170	(2) RRUS-11	170
(2) 7770.00 w/ mount pipe	170	ABT-DFDM-ADBH	170
(2) 7770.00 w/ mount pipe	170	DC6-48-60-18-8F Surge Arrestor	170
AM-X-CD-17-65-001-RET w/ Mount Pipe	170	(3) T-Frames MNT	170
AM-X-CD-17-65-001-RET w/ Mount Pipe	170	BXA-70063/4CF W/ Mount Pipe	159.1
AM-X-CD-17-65-001-RET w/ Mount Pipe	170	(3) BXA-171085-12BF w/ Mount Pipe	159.1
(2) LGP21401 TMA	170	(4) LPA-80063/4CF w/ Mount Pipe	159.1
(2) LGP21401 TMA	170	(2) BXA-70063/6CF W/ Mount Pipe	159.1
(2) LGP21401 TMA	170	(2) LPA-80080/6CF w/ mount pipe	159.1
(2) RRUS-11	170	(2) FD9R6004/2C-3CL Diplexer	159.1
		(2) FD9R6004/2C-3CL Diplexer	159.1
		(2) FD9R6004/2C-3CL Diplexer	159.1
		(3) 14.5' Andrew T-Frames MNT	159.1

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Hartford 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 38 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: 87.4%

MAX. CORNER REACTIONS AT BASE:

DOWN: 198 K
SHEAR: 21 K

UPLIFT: -175 K
SHEAR: 19 K

AXIAL
65 K
SHEAR 13 K
MOMENT 1355 kip-ft

TORQUE 9 kip-ft
38 mph WIND - 1.0000 in ICE

AXIAL
26 K
SHEAR 35 K
MOMENT 3432 kip-ft

TORQUE 35 kip-ft
REACTIONS - 80 mph WIND

FDH Engineering, Inc. 6521 Meridian Drive Raleigh, NC 27616 Phone: (919) 755 1012 FAX: (919) 755 1031		Job: North Granby, CT10017-A-02 Project: 1340051400 Client: SBA Network Services, Inc. Code: TIA/EIA-222-F Path:		Drawn by: Christopher B. Stryfeler, EIT Date: 06/21/13 Scale: NTS Dwg No. E-1
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