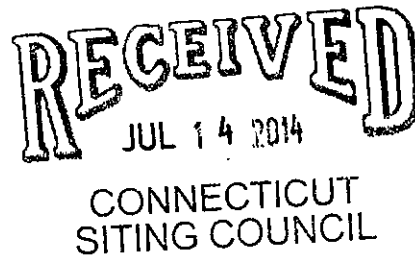


Pinnacle Wireless

800 Marshall Phelps Rd
Building 2A
Windsor, CT 06095

July 11, 2014



Melanie Bachman
Acting Executive Director
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

RE: **EM-CING-023-130201** – New Cingular Wireless PCS, LLC notification of completion of construction at 96 Powder Mill Road, Canton, CT.

Dear Ms. Bachman:

This letter is submitted on behalf of New Cingular Wireless PCS, LLC ("AT&T"), whose notice of intent to modify an existing telecommunications facility was acknowledged by the Connecticut Siting Council ("Council") on February 20th, 2013.

Please accept this letter as notification of completion of construction by AT&T as required as a condition of the Council's acknowledgement. In addition, please refer to the attached documentation from AT&T's Engineer confirming the structural analysis passed.

Respectfully Yours,

A handwritten signature in black ink, appearing to read "Cecilia Post".

Cecilia Post
Project Coordinator

Cc: Kevin Mason, AT&T



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

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

180' Monopole Tower

**SBA Site Name: South Canton
SBA Site ID: CT01722-S
AT&T Site ID: CT1114
AT&T Site Name: Canton 2**

FDH Project Number 12-06272E S3

Analysis Results

Tower Components	58.2%	Sufficient
Foundation	93.4%	Sufficient

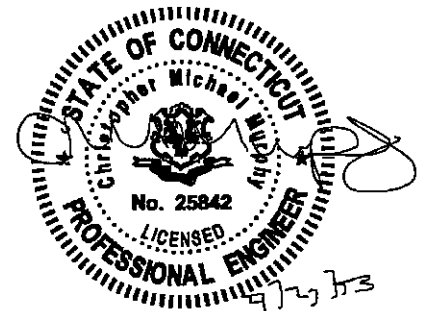
Prepared By:

Daniel Chang, 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 4, 2013

Prepared pursuant to ANSI/TIA-222-G Structural Standard for Antenna Supporting Structures and Antennas and 2005 Connecticut 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 monopole located in Canton, CT to determine whether the tower is structurally adequate to support both the existing and proposed loads pursuant to the *Structural Standard for Antenna Supporting Structures and Antennas, ANSI/TIA-222-G* and *2005 Connecticut Building Code*. Information pertaining to the existing/proposed antenna loading, current tower geometry, geotechnical data, foundation dimensions, and member sizes was obtained from:

- ☐ Valmont Microflex (Order No. 12156-00) Communication Pole Design Calculations dated August 3, 2000
- ☐ Valmont Microflex (Order No. 12156-00) Communication Pole Record Drawings dated August 3, 2000
- ☐ FDH Engineering, Inc. (Project No. 12-06272E G1) Geotechnical Evaluation of Subsurface Conditions dated August 6, 2012
- ☐ FDH Engineering, Inc. (Project No. 12-06272E N1) Dispersive Wave Propagation Testing and Rebar Investigation of an Existing Tower Foundation dated August 1, 2012
- ☐ FDH Engineering, Inc. (Project No. 12-06272E S3) Modification Drawings for a 180' Monopole dated April 4, 2013
- ☐ SBA Network Services, Inc.

The *basic design wind speed* per the *ANSI/TIA-222-G* standard and *2005 Connecticut Building Code* is 100 mph without ice and 50 mph with 1" radial ice. Ice is considered to increase in thickness with height. Furthermore, this structure was analyzed as a Class II structure in Exposure Category C with a topographical factor of 1.

Conclusions

With the existing and proposed antennas from AT&T in place at 137 ft, the tower meets the requirements of the *ANSI/TIA-222-G* standard and *2005 Connecticut Building Code* provided the **Recommendations** listed below are satisfied. Furthermore, given the foundation dimensions listed in the FDH Engineering, Inc. Dispersive Wave Propagation Testing and Rebar Investigation of an Existing Tower Foundation dated August 1, 2012 (see FDH Project No. 12-06272E N1) and the foundation modifications in the FDH Engineering, Inc. Modification Drawings for a 180' Monopole (see FDH Project No. Project No. 12-06272E S3) and the given soil parameters (see FDH Engineering, Inc. Project No. 12-06272E G1), 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.

Recommendations

To ensure the requirements of the *ANSI/TIA-222-G* standard and *2005 Connecticut Building Code* are met with the existing and proposed loading in place, we have the following recommendations:

1. The proposed coax should be installed inside the pole's shaft.
2. The existing TMAs and diplexers should be installed directly behind the proposed and existing panel antennas.
3. The modifications outlined in the FDH Engineering, Inc. Modification Drawings for a 180' Monopole dated April 4, 2013 (see FDH Project No. 12-06272E S3) must be installed correctly per the referenced drawings for this report to be valid.

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
177	(6) Decibel DB980H90E-M w/ Mount Pipe	(6) 1 5/8	Sprint	177	(1) Platform w/ Handrails
167	(3) Kathrein 742 213	(6) 1 5/8	Pocket	167	(3) Pipe Mounts
147	(3) Antel BXA-70063/6CF w/ Mount Pipe (4) Antel LPA-80080/4CF-EDIN w/ Mount Pipe (2) Antel BXA 171085-8CF-2 w/ Mount Pipe (1) Antel BXA-171063/8CF-2 w/ Mount Pipe (2) Antel LPA-80063/4CF w/ Mount Pipe (6) RFS FD9R6004/2C-3 Diplexers	(12) 1 5/8	Verizon	147	(1) Low Profile Platform
137	(6) Powerwave 7770 w/ Mount Pipe (3) CSS DUO1417-8686-40 w/ Mount Pipe (6) Powerwave LGP 21401 TMAs (6) Powerwave LGP 21903 Diplexers	(12) 1 5/8	AT&T	137	(3) T-Arms
70	(1) GPS	(1) 1/2	Sprint	70	(1) Standoff

1. Coax installed inside the monopole's shaft unless otherwise noted.

Proposed Loading:

Antenna Elevation (ft)	Description	Coax and Lines	Carrier	Mount Elevation (ft)	Mount Type
137	(6) Powerwave 7770 w/ Mount Pipe (3) CSS DUO1417-8686-40 w/ Mount Pipe (2) Powerwave P65-17-XLH-RR w/ Mount Pipe (1) KMW AM-X-CD-16-65-001-RET w/ Mount Pipe (6) Powerwave LGP 21401 TMAs (6) Powerwave LGP 21903 Diplexers (6) Ericsson RRUS-11 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 ¹ (2) 3/4" DC Power ¹	AT&T	137	(3) T-Arms

1. Coax installed inside 3" Flex Conduit inside the monopole's shaft.

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	180 - 131.75	Pole	TP36.25x26.84x0.25	25.3	Pass
L2	131.75 - 91.6667	Pole	TP43.56x34.7261x0.2813	58.2	Pass
L3	91.6667 - 45.4167	Pole	TP52.02x41.7634x0.4375	49.3	Pass
L4	45.4167 - 0	Pole	TP60x49.7146x0.5	54.5	Pass
		Anchor Bolts	(28) 2.25" Ø on 68.62" Ø BC	43.5	Pass
		Base Plate	74.62" Ø x 2.75" thk PL	41.2	Pass

Table 4 - Maximum Base Reactions

Base Reactions	Current Analysis* (ANSI/TIA-222-G)	Original Design (TIA/EIA-222-F)
Axial	58 k	53 k
Shear	38 k	39 k
Moment	4,337 k-ft	4,924 k-ft

*Foundations adequate based on 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.