STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

November 2, 2012

Christopher Bisson
New Cingular Wireless PCS, LLC
154 General Patton Drive
Naugatuck, CT 06770

RE: **EM-CING-086-121018** – New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 71 Moxley Hill Road, Uncasville, Connecticut.

Dear Mr. Bisson:

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 and accessory equipment shall be installed in accordance with the recommendations made in the Structural Analysis Report prepared by FDH Engineering dated August 24, 2012 and stamped by Christopher Murphy; and
- Following the installation of the proposed equipment, AT&T shall provide documentation certifying that the installation complied with the engineer's recommendation.
- Any deviation from the proposed modification as specified in this notice and supporting materials with Council shall render this acknowledgement invalid;
- Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
- Not less than 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
- The validity of this action shall expire one year from the date of this letter; and
- The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration;

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated October 5, 2012. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General

Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Thank you for your attention and cooperation.

Very truly yours,

Linda Roberts
Executive Director

LR/CDM/CM

c: The Honorable Ronald K. McDaniel, Mayor, Town of Montville
Marcia Vlaun, Town Planner, Town of Montville

New Cingular Wireless PCS, LLC
154 General Patton Dr.
Naugatuck, CT 06770
Phone: (203)-217-6200
Christopher Bisson
Real Estate Consultant

October 5, 2012

Hand Delivered

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

RE: New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 71 Moxley Hill Road, Uncasville, CT 06382, known to AT&T as site CT5236.

Dear Ms. Roberts:

In order to accommodate technological changes, implement Uniform Mobile Telecommunications System ("UMTS") and/or Long Term Evolution ("LTE") capabilities, and enhance system performance in the state of Connecticut, New Cingular Wireless PCS, LLC ("AT&T") plans to modify the equipment configurations at many of its existing cell sites. Please accept this letter and attachments as notification, pursuant to R.C.S.A. Section 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter and its attachments is being sent to the chief elected official of the municipality in which affected cell site is located.

UMTS offers services to mobile computer and phone users anywhere in the world. Based on the Global System for Mobile ("GSM") communication standard, UMTS is the planned worldwide standard for mobile users. UMTS, fully implemented, gives computer and phone users high-speed access to the internet as they travel. They have the same capabilities even when they roam, through both terrestrial wireless and satellite transmissions.

LTE is a new high-performance air interface for cellular mobile communications. It is designed to increase the capacity and speed of mobile telephone networks.

Attached is a summary of the planned modifications, including power density calculations reflecting the change in AT&T's operations at the site. Also included is documentation of the structural sufficiency of the tower to accommodate the revised antenna configuration based on the supplied structural modification plan dated 4/26/2012 requiring the restacking of the existing coaxial cables.

The changes to the facility do not constitute modification as defined Connecticut General Statues ("C.G.S.") Section 16-50i(d) because the general physical characteristics of the facility will not be significantly changed or altered. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for the R.C.S.A. Section 16-50j-72(b)(2).

1. The height of the overall structure will not be affected.
2. The proposed changes will not extend the site boundaries. There will be no effect on the site compound as all proposed equipment will be located in the existing AT&T equipment shelter.
3. The proposed changes will not increase the noise level at the existing facility by 6 decibels or more.
4. Radio Frequency power density may increase due to the use of one or more GSM channels for UMTS transmissions. Moreover, LTE will utilize additional radio frequencies newly licensed by the FCC for cellular mobile communications. However, the changes will not increase the calculated "worst case" power density for the combined operations at the site to a level at or above the applicable standard for uncontrolled environments as calculated for a mixed frequency site.

For the foregoing reasons New Cingular Wireless PCS, LLC respectfully submits that the proposed changes at the referenced site constitute exempt modifications under R.C.S.A. Section 16-50j-72(b)(2).

Please feel free to call me at (203)-217-6200 or email CBisson@Transcendwireless.com with questions concerning this matter.
Thank you for your consideration.

Sincerely,

Christopher Bisson
Real Estate Consultant

C Squared Systems, LLC
65 Dartmouth Drive, Unit A3
Auburn, NH 03032
(603) 644-2800
support@csquaredsystems.com

Calculated Radio Frequency Emissions

at&t

CT5236

(Montville SE)

71 Moxley Road, Uncasville, CT 06382

(Montville – 71 Moxley Road)

September 14, 2012

Table of Contents

1. Introduction 1
2. FCC Guidelines for Evaluating RF Radiation Exposure Limits 1
3. RF Exposure Prediction Methods 2
4. Calculation Results 3
5. Conclusion 4
6. Statement of Certification 4
Attachment A: References 5
Attachment B: FCC Limits for Maximum Permissible Exposure (MPE) 6
Attachment C: AT&T Antenna Data Sheets and Electrical Patterns 8

List of Tables

Table 1: Carrier Information 3
Table 2: FCC Limits for Maximum Permissible Exposure (MPE) 6

List of Figures

Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE) 7

1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for the proposed modifications to the existing AT&T antenna arrays mounted on the guyed wire tower located at 71 Moxley Road in Uncasville, CT. The coordinates of the tower are 41° 26' 6.53" N, 72° 7' 24.18" W.

AT&T is proposing the following modifications:

1) Install three multi-band (700/850/1900/2100 MHz) antennas (one per sector) for their LTE network.

2. FCC Guidelines for Evaluating RF Radiation Exposure Limits

In 1985, the FCC established rules to regulate radio frequency (RF) exposure from FCC licensed antenna facilities. In 1996, the FCC updated these rules, which were further amended in August 1997 by OET Bulletin 65 Edition 97-01. These new rules include Maximum Permissible Exposure (MPE) limits for transmitters operating between 300 kHz and 100 GHz. The FCC MPE limits are based upon those recommended by the National Council on Radiation Protection and Measurements (NCRP), developed by the Institute of Electrical and Electronics Engineers, Inc., (IEEE) and adopted by the American National Standards Institute (ANSI).

The FCC general population/uncontrolled limits set the maximum exposure to which most people may be subjected. General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

Public exposure to radio frequencies is regulated and enforced in units of milliwatts per square centimeter (mW/cm^2). The general population exposure limits for the various frequency ranges are defined in the attached "FCC Limits for Maximum Permissible Exposure (MPE)" in Attachment B of this report.

Higher exposure limits are permitted under the occupational/controlled exposure category, but only for persons who are exposed as a consequence of their employment and who have been made fully aware of the potential for exposure, and they must be able to exercise control over their exposure. General population/uncontrolled limits are five times more stringent than the levels that are acceptable for occupational, or radio frequency trained individuals. Attachment B contains excerpts from OET Bulletin 65 and defines the Maximum Exposure Limit.

Finally, it should be noted that the MPE limits adopted by the FCC for both general population/uncontrolled exposure and for occupational/controlled exposure incorporate a substantial margin of safety and have been established to be well below levels generally accepted as having the potential to cause adverse health effects.

3. RF Exposure Prediction Methods

The emission field calculation results displayed in the following figures were generated using the following formula as outlined in FCC bulletin OET 65:

$$\text{Power Density} = \left(\frac{1.6^2 \times EIRP}{4\pi \times R^2} \right) \text{x Off Beam Loss}$$

Where:

EIRP = Effective Isotropic Radiated Power

R = Radial Distance = $\sqrt{(H^2 + V^2)}$

H = Horizontal Distance from antenna in meters

V = Vertical Distance from radiation center of antenna in meters

Ground reflection factor of 1.6

Off Beam Loss is determined by the selected antenna pattern

These calculations assume that the antennas are operating at 100 percent capacity and power, and that all channels are transmitting simultaneously. Obstructions (trees, buildings, etc.) that would normally attenuate the signal are not taken into account. The calculations assume even terrain in the area of study and do not take into account actual terrain elevations which could attenuate the signal. As a result, the predicted signal levels reported below are much higher than the actual signal levels will be from the finished modifications.

4. Calculation Results

Table 1 below outlines the power density information for the site. Because the proposed AT&T antennas are directional in nature, the majority of the RF power is focused out towards the horizon. As a result, there will be less RF power directed below the antennas relative to the horizon, and consequently lower power density levels around the base of the tower. Please refer to Attachment C for the vertical pattern of the proposed AT&T antennas. The calculated results for AT&T in Table 1 include a nominal 10 dB off-beam pattern loss to account for the lower relative gain below the antennas.

Carrier	Antenna Height (Feet)	Operating Frequency (MHz)	Number of Trans.	ERP Per Transmitter (Watts)	Power Density (mw/cm^2)	Limit	%MPE
Cingular GSM	130	880	4	296	0.0252	0.5867	4.29%
Cingular GSM	130	1900	2	427	0.0182	1.0000	1.82%
Cingular UMTS	130	880	1	500	0.0106	0.5867	1.81%
Verizon	142	869	9	282	0.0453	0.5793	7.81%
Verizon	142	1970	11	431	0.0845	1.0000	8.45%
Verizon	142	757	1	737	0.0131	0.5047	2.60%
Nextel	185	851	9	100	0.0095	0.5673	1.67%
Sprint	161	1962.5	11	122	0.0186	1.0000	1.86%
Omnipoint	154	1930			0.0148	1.0000	1.48%
MetroPCS	175	2140	3	443.61	0.0156	1.0000	1.56%
AT&T UMTS	130	880	2	565	0.0024	0.5867	0.41%
AT&T UMTS	130	1900	2	875	0.0037	1.0000	0.37%
AT&T LTE	130	734	1	1375	0.0029	0.4893	0.60%
AT&T GSM	130	880	1	283	0.0006	0.5867	0.10%
AT&T GSM	130	1900	4	525	0.0045	1.0000	0.45%
						Total	**27.37%**

Table 1: Carrier Information [1] [2] [3]

[1] The existing CSC filing for Cingular should be removed and replaced with the updated AT&T technologies and values provided in Table 1. The power density information for carriers other than AT&T was taken directly from the CSC database dated 7/26/2012. Please note that %MPE values listed are rounded to two decimal points. The total %MPE listed is a summation of each unrounded contribution. Therefore, summing each rounded value may not reflect the total value listed in the table.

[2] In the case where antenna models are not uniform across all 3 sectors for the same frequency band, the antenna model with the highest gain was used for the calculations to present a worse-case scenario.

[3] Antenna height listed for AT&T is in reference to the FDH Engineering, Inc. Structural Analysis dated August 24, 2012.

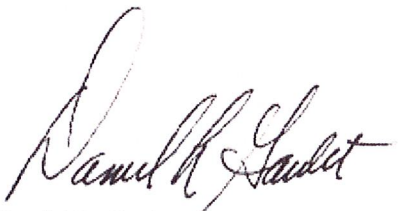
5. Conclusion

The above analysis verifies that emissions from the existing site will be below the maximum power density levels as outlined by the FCC in the OET Bulletin 65 Ed. 97-01. Even when using conservative methods, the cumulative power density from the proposed transmit antennas at the existing facility is well below the limits for the general public. The highest expected percent of Maximum Permissible Exposure at ground level is **27.37% of the FCC limit**.

As noted previously, obstructions (trees, buildings, etc.) that would normally attenuate the signal are not taken into account. As a result, the predicted signal levels are more conservative (higher) than the actual signal levels will be from the finished modifications.

6. Statement of Certification

I certify to the best of my knowledge that the statements in this report are true and accurate. The calculations follow guidelines set forth in ANSI/IEEE Std. C95.3, ANSI/IEEE Std. C95.1 and FCC OET Bulletin 65 Edition 97-01.



Daniel L. Goulet
C Squared Systems, LLC

September 14, 2012
Date

Attachment A: References

OET Bulletin 65 - Edition 97-01 - August 1997 Federal Communications Commission Office of Engineering & Technology

ANSI C95.1-1982, American National Standard Safety Levels With Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 300 kHz to 100 GHz. IEEE-SA Standards Board

IEEE Std C95.3-1991 (Reaff 1997), IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave. IEEE-SA Standards Board

Attachment B: FCC Limits for Maximum Permissible Exposure (MPE)

(A) Limits for Occupational/Controlled Exposure[4]

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $|E|^2$, $|H|^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	($900/f^2$)*	6
30-300	61.4	0.163	1.0	6
300-1500	-	-	f/300	6
1500-100,000	-	-	5	6

(B) Limits for General Population/Uncontrolled Exposure[5]

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $|E|^2$, $|H|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1500	-	-	f/1500	30
1500-100,000	-	-	1.0	30

f = frequency in MHz * Plane-wave equivalent power density

Table 2: FCC Limits for Maximum Permissible Exposure (MPE)

[4] Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure

[5] General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure

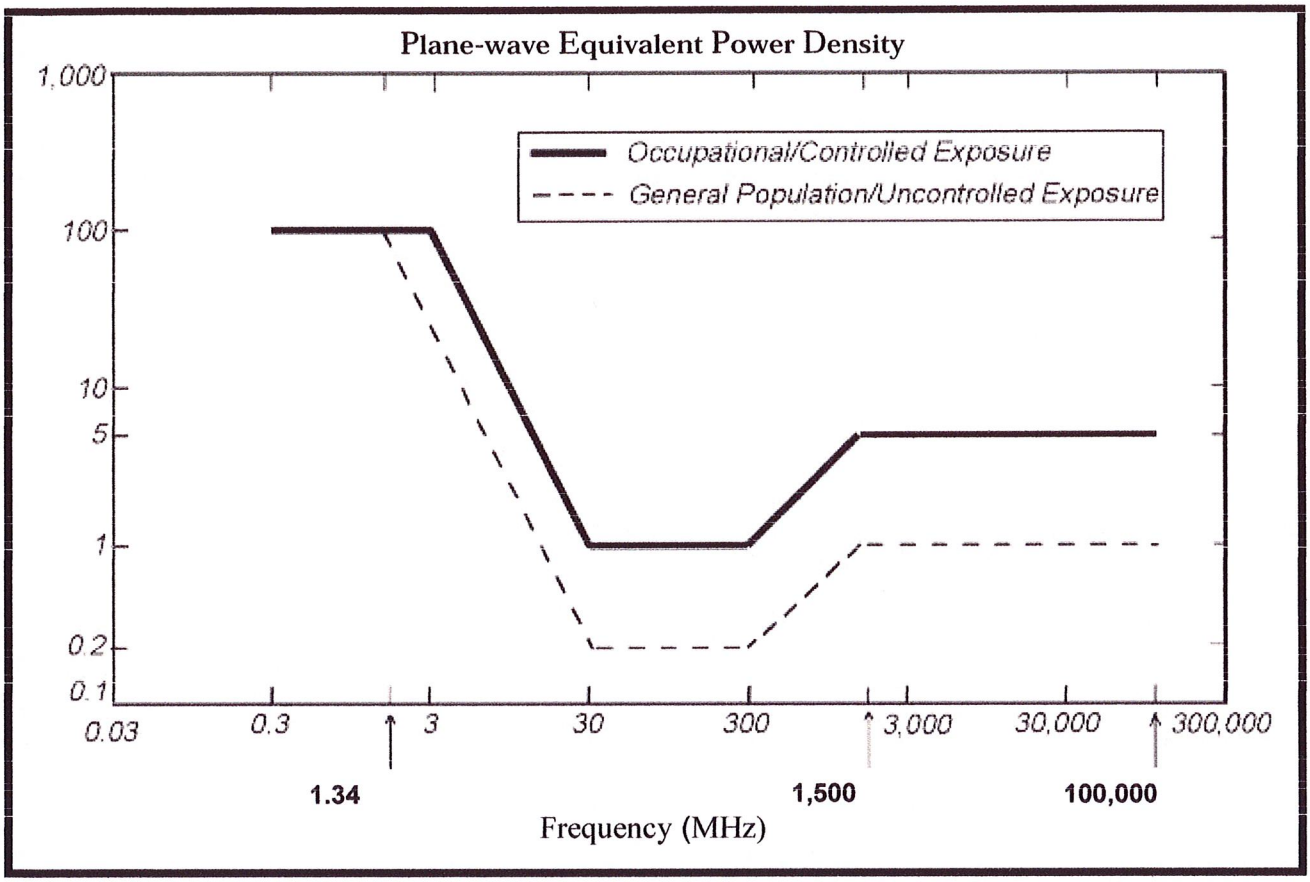
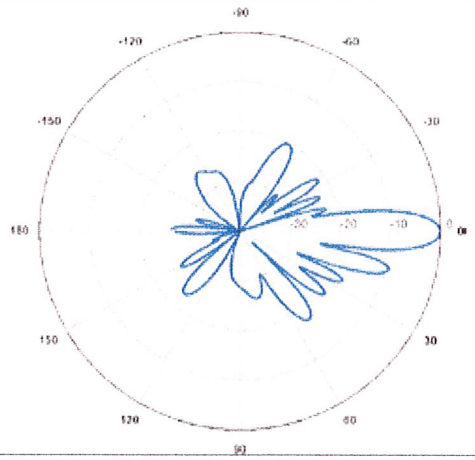


Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

Attachment C: AT&T Antenna Data Sheets and Electrical Patterns

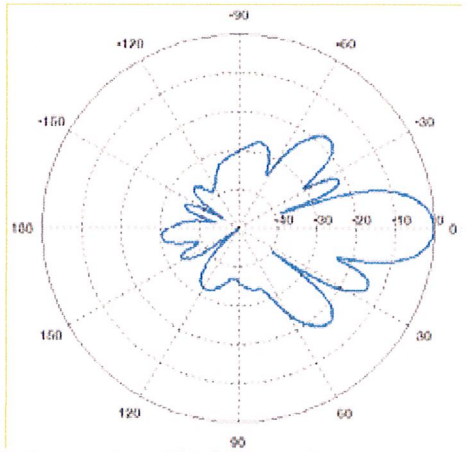
700 MHz

Manufacturer:	Commscope
Model #:	SBNH-1D6565C
Frequency Band:	698-806 MHz
Gain:	13.6 dBd
Vertical Beamwidth:	8.6°
Horizontal Beamwidth:	71°
Polarization:	± 45°
Size L x W x D:	96.42" x 11.85" x 7.1"



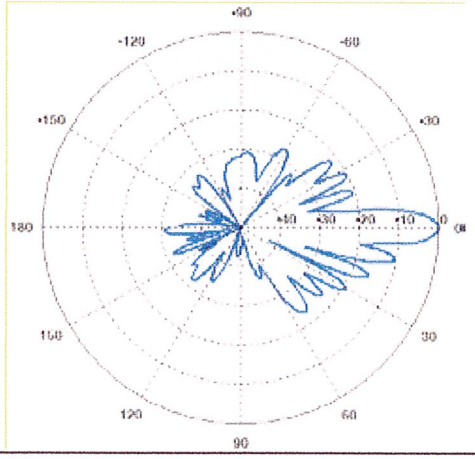
850 MHz

Manufacturer:	Powerwave
Model #:	7770.00
Frequency Band:	824-896 MHz
Gain:	11.5 dBd
Vertical Beamwidth:	15°
Horizontal Beamwidth:	82°
Polarization:	Dual Linear ± 45°
Size L x W x D:	55.0" x 11.0" x 5.0"



1900 MHz

Manufacturer:	Powerwave
Model #:	7770.00
Frequency Band:	1850-1990 MHz
Gain:	13.4 dBd
Vertical Beamwidth:	7°
Horizontal Beamwidth:	86°
Polarization:	Dual Linear ± 45°
Size L x W x D:	55.0" x 11.0" x 5.0"



FDH Engineering, Inc., 2730 Rowland Rd. Raleigh, NC 27615, Ph. 919.755.1012, Fax 919.755.1031

Structural Analysis for SBA Network Services, Inc.

190' Guy Tower

SBA Site Name: Montville 3
SBA Site ID: CT10016-A
AT&T Site Name: Montville SE Moxley Hill Rd
AT&T Site ID: CT5236

FDH Project Number 12-03634E S2

Analysis Results

Tower Components	99.5%	Sufficient
Foundations	52.5%	Sufficient

Prepared By:

Joshua H. Carden, EI
Project Engineer

Reviewed By:

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

FDH Engineering, Inc.
2730 Rowland Rd.
Raleigh, NC 27615
(919) 755-1012
info@fdh-inc.com

August 24, 2012

Prepared pursuant to ANSI/TIA-222-G Structural Standard for Antenna Supporting Structures and Antennas

TABLE OF CONTENTS

EXECUTIVE SUMMARY 3

Conclusions 3

Recommendations 3

APPURTENANCE LISTING 4

RESULTS 5

GENERAL COMMENTS 6

LIMITATIONS 6

APPENDIX 7

EXECUTIVE SUMMARY

At the request of SBA Network Services, Inc., FDH Engineering, Inc. performed a structural analysis of the monopole located in Stonington, 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 2005 Connecticut Building Code (2005 CT Building Code)*. Information pertaining to the existing/proposed antenna loading, current tower geometry, foundation dimensions, geotechnical data, and member sizes was obtained from:

- Valmont Industries, Inc. (Order No. 17507-98) Communication Pole Record Drawings dated June 23, 1998
- SAGE Environmental, Inc. (Project No. G004) geotechnical report dated June 10, 1998
- SBA Network Services, Inc.

The *basic design wind speed* per the *TIA/EIA-222-F* standards and *2005 CT Building Code* 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 Sprint in place at 195 ft, the tower meets the requirements of the *TIA/EIA-222-F* standards and *2005 CT Building Code* provided the **Recommendations** listed below are satisfied. Furthermore, provided the foundation was designed and constructed to support the original design reactions (see Valmont Industries, Inc. Order No. 17507-98), 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 *TIA/EIA-222-F* standards and *2005 CT Building Code* are met with the existing and proposed loading in place, we have the following recommendations:

1. The proposed coax must be installed inside the pole's shaft.
2. RRU/RRH Stipulation: The equipment may be installed in any arrangement as determined by the client.

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
193	(6) Decibel DB980H90E-M w/Mount Pipe	(6) 1-5/8"	Sprint	193	(1) Low Profile Platform
180	(9) Swedcom ALP 9212-N w/ Mount Pipe	(9) 1-5/8"	Nextel	180	(1) T-Arms w/Working Platform
167	(3) EMS RR90-17-02DP w/Mount Pipe (3) RFS APX16DWV-16DWV-A20 w/Mount Pipe (3) RFS Twin PCS TMA (3) RFS Twin AWS TMA	(12) 1-5/8"	T-Mobile	165	(1) Low Profile Platform
150	(6) Powerwave 7700.00 w/Mount Pipe (2) Powerwave P65-17-XLH-RR w/Mount Pipe (1) KMW AM-X-CD-14-65-00T w/ Mount Pipe (6) Powerwave LGP21401 TMAs (6) Powerwave LGP13519 TMA Diplexers (6) Ericsson RRUS-11 RRUs (1) Raycap DC6-48-60-18-8F Surge Arrestor	(12) 1-5/8" (2) DC Cables (1) Fiber Cable	New Cingular	150	(1) Low Profile Platform
140	(6) Antel RWA-80014 w/Mount Pipe (3) Antel BXA-70063/6CF w/ Mount Pipe (3) Rymsa MGD5-800T2 w/Mount Pipe (6) RFS FD9R6004/2C-3L Diplexers	(12) 1-5/8"	Verizon[2]	140	(1) Low Profile Platform
130	(6) Kathrein 742 351 w/Mount Pipe	(12) 1-5/8"	Metro PCS[3]	130	(1) Low Profile Platform
30	(1) GPS	—	Sprint	30	(1) Standoff

1. Coax installed inside the pole's shaft unless otherwise noted.
2. Verizon's coax are installed outside the pole's shaft in a single row.
3. Metro PCS's coax are installed outside the pole's shaft in a single row.

Proposed Loading:

Antenna Elevation (ft)	Description	Coax and Lines	Carrier	Mount Elevation (ft)	Mount Type
195	(3) RFS APXVSPP18-C-A20w/Mount Pipe (3) ALU 1900MHZ RRHs (3) ALU 800MHZ RRHs (3) ALU 800MHZ RRH Filters (4) RFS ACU-A20-N RETs	(3) 1.5" (7) LCF12-50J Jumpers	Sprint	193	(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 (assumed)

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
L1	196 - 154.75	Pole	TP27.76x17.39x0.1875	72.5	Pass
L2	154.75 - 118.75	Pole	TP36.42x26.3166x0.3125	82.0	Pass
L3	118.75 - 74.5	Pole	TP46.91x34.4772x0.375	95.6	Pass
L4	74.5 - 35.5	Pole	TP55.97x44.5274x0.4375	93.3	Pass
L5	35.5 - 0	Pole	TP64x53.2089x0.4688	98.2	Pass
	0	Anchor Bolts	(24) 2.25"Ø on a 72.76" BC	81.6	Pass
	0	Base Plate	PL 2.5" x 78.75"Ø	83.7	Pass

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

Table 4 - Maximum Base Reactions

Base Reactions	Current Analysis* *(TIA/EIA-222-F)*	Original Design *(TIA/EIA-222-F)*
Axial	58 k	60 k
Shear	48 k	45 k
Moment	5,873 k-ft	5,768 k-ft

** Foundation determined to be adequate per independent analysis.*

GENERAL COMMENTS

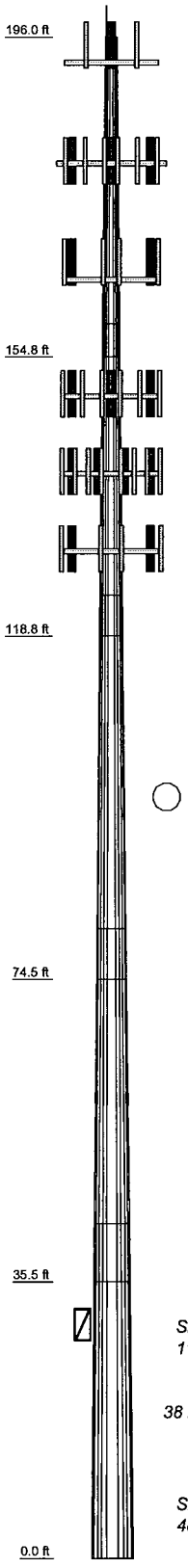
This engineering analysis is based upon the theoretical capacity of the structure. It is not a condition assessment of the tower and its foundation. It is the responsibility of SBA Network Services, Inc. to verify that the tower modeled and analyzed is the correct structure (with accurate antenna loading information) modeled. If there are substantial modifications to be made or the assumptions made in this analysis are not accurate, FDH Engineering, Inc. should be notified immediately to perform a revised analysis.

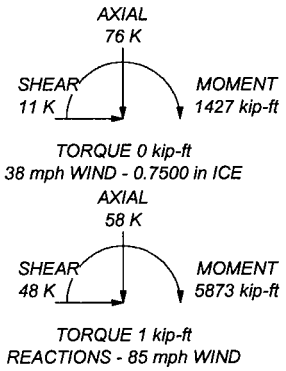
LIMITATIONS

All opinions and conclusions are considered accurate to a reasonable degree of engineering certainty based upon the evidence available at the time of this report. All opinions and conclusions are subject to revision based upon receipt of new or additional/updated information. All services are provided exercising a level of care and diligence equivalent to the standard and care of our profession. No other warranty or guarantee, expressed or implied, is offered. Our services are confidential in nature and we will not release this report to any other party without the client's consent. The use of this engineering work is limited to the express purpose for which it was commissioned and it may not be reused, copied, or distributed for any other purpose without the written consent of FDH Engineering, Inc.

APPENDIX

Section	5	4	3	2	1
Length (ft)	43.00	45.50	49.50	40.25	41.25
Number of Sides	12	12	12	12	12
Thickness (in)	0.4688	0.4375	0.3750	0.3125	0.1875
Socket Length (ft)		7.50	6.50	5.25	4.25
Top Dia (in)	53.2089	44.5274	34.4772	26.3166	17.3900
Bot Dia (in)	64.0000	55.9700	46.9100	36.4200	27.7600
Grade			A572-65		
Weight (K)	12.8	10.9	8.2	4.3	1.9





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod	196	(2) 7700.00 w/Mount Pipe	150
APXVSPP18-C-A20 w/Mount Pipe	193	(2) 7700.00 w/Mount Pipe	150
APXVSPP18-C-A20 w/Mount Pipe	193	P65-17-XLH-RR w/Mount Pipe	150
APXVSPP18-C-A20 w/Mount Pipe	193	P65-17-XLH-RR w/Mount Pipe	150
1900 MHz RRH	193	AM-X-CD-14-65-00T w/ Mount Pipe	150
1900 MHz RRH	193	(2) Powerwave LGP21401 TMAs	150
1900 MHz RRH	193	(2) Powerwave LGP21401 TMAs	150
800 MHz RRH	193	(2) Powerwave LGP21401 TMAs	150
800 MHz RRH	193	(2) Powerwave LGP13519 TMA Diplexers	150
800 MHz RRH	193		
800 MHz Filter	193	(2) Powerwave LGP13519 TMA Diplexers	150
800 MHz Filter	193		
800 MHz Filter	193	(2) Powerwave LGP13519 TMA Diplexers	150
ACU-A20-N RET	193		
ACU-A20-N RET	193	(2) RRUS-11	150
(2) ACU-A20-N RET	193	(2) RRUS-11	150
(1) Low Profile Platform MNT	193	(2) RRUS-11	150
(3) ALP 9212-N w/ Mount Pipe	180	DC6-48-60-18-8F Surge Arrestor	150
(3) ALP 9212-N w/ Mount Pipe	180	(1) Low Profile Platform MNT	150
(3) ALP 9212-N w/ Mount Pipe	180	(2) RWA-80014 w/Mount Pipe	140
(1) T-Arms w/Working Platform MNT	180	(2) RWA-80014 w/Mount Pipe	140
RR90-17-02DP w/Mount Pipe	165	(2) RWA-80014 w/Mount Pipe	140
RR90-17-02DP w/Mount Pipe	165	BXA-70063/6CF w/ Mount Pipe	140
RR90-17-02DP w/Mount Pipe	165	BXA-70063/6CF w/ Mount Pipe	140
RFS APX16DWV-16DWV-A20 w/Mount Pipe	165	BXA-70063/6CF w/ Mount Pipe	140
		MGD5-800TX w/Mount Pipe	140
RFS APX16DWV-16DWV-A20 w/Mount Pipe	165	MGD5-800TX w/Mount Pipe	140
		MGD5-800TX w/Mount Pipe	140
RFS APX16DWV-16DWV-A20 w/Mount Pipe	165	(2) RFS FD9R6004/2C-3L Diplexers	140
		(2) RFS FD9R6004/2C-3L Diplexers	140
RFS Twin PCS TMA	165	(2) RFS FD9R6004/2C-3L Diplexers	140
RFS Twin PCS TMA	165	(1) Low Profile Platform MNT	140
RFS Twin PCS TMA	165	(2) 742 351 w/Mount Pipe	130
RFS Twin AWS TMA	165	(2) 742 351 w/Mount Pipe	130
RFS Twin AWS TMA	165	(2) 742 351 w/Mount Pipe	130
RFS Twin AWS TMA	165	(1) Low Profile Platform MNT	130
(1) Low Profile Platform MNT	165	GPS	30
(2) 7700.00 w/Mount Pipe	150	(1) Standoff MNT	30

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in New London 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: 98.2%

FDH Tower Analysis

FDH Engineering, Inc.
6521 Meridien Drive
Raleigh, NC 27616
Phone: (919) 755-1012
FAX: (919) 755-1031

Job: *Stonington East, CT00595-S*			
Project: *12-09275E S2*			
Client: SBA	Drawn by: Nick Schauer	App'd:	
Code: TIA/EIA-222-F	Date: 09/28/12	Scale: NTS	
Path:		Dwg No. E-1	