EM-CING-010-121116

HPC Wireless Services
46 Mill Plain Rd.
Floor 2
Danbury, CT, 06811
P.: 203.797.1112

HPC WIRELESS SERVICES

November 14, 2012

ORIGINAL

RECEIVED
NOV 16 2012
CONNECTICUT
SITING COUNCIL

VIA OVERNIGHT COURIER

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

Re: New Cingular Wireless PCS, LLC – Exempt Modification
310 Watertown Road, Bethlehem (aka 310 Watertown Road, Morris)

Dear Ms. Roberts:

This letter and attachments are submitted on behalf of New Cingular Wireless PCS, LLC ("AT&T"). AT&T is making modifications to certain existing sites in its Connecticut system in order to implement LTE technology. Please accept this letter and attachments as notification, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies ("R.S.C.A."), of construction that 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 attachments is being sent to the First Selectman of the Town of Bethlehem.

AT&T plans to modify the existing wireless communications facility owned by SBA Towers, Inc. and located at 310 Watertown Road, Bethlehem (coordinates 41°-40'-02.5" N, 73°-10'-14" W). Attached are a compound plan and elevation depicting the planned changes, and documentation of the structural sufficiency of the structure to accommodate the revised antenna configuration. Also included is a power density report reflecting the modification to AT&T's operations at the site.

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

1. AT&T will add three (3) LTE panel antennas on new mounts attached to the existing platform, and six (6) RRUS (remote radio units) behind the LTEs, all at a centerline height of approximately 165'. One (1) Surge Arrestor will also be added to the platform supporting arm at a centerline height of approximately 165'. AT&T will also

place DC power and fiber runs from the equipment to the antennas along the existing coaxial cable run. These changes will not extend the height of the approximately 195' structure.

2. AT&T will place related equipment in an existing Equipment Shelter and mount a new GPS antenna on the existing Equipment Shelter. These changes will be within the existing compound and will have no effect on the site boundaries.

3. The proposed changes will not increase the noise level at the existing facility by six (6) decibels or more. The incremental effect of the proposed changes will be negligible.

4. The changes to the facility 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. As indicated on the attached report prepared by C Squared Systems, LLC, AT&T's operations at the site will result in a power density of approximately 1.17%; the combined site operations will result in a total power density of approximately 13.13%.

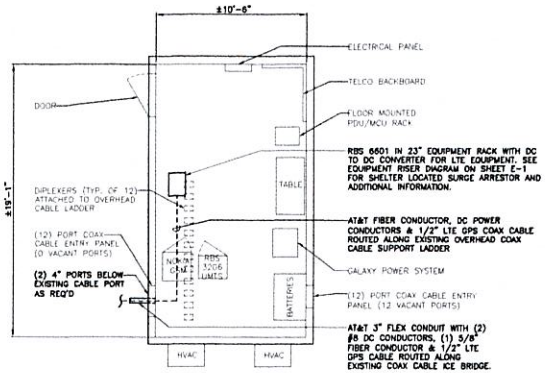
Please contact me by phone at (203) 610-1071, or by e-mail at mhowlett@optonline.net, if there are any questions concerning this matter. Thank you for your consideration.

Respectfully yours,

Melanie J. Howlett

Attachments

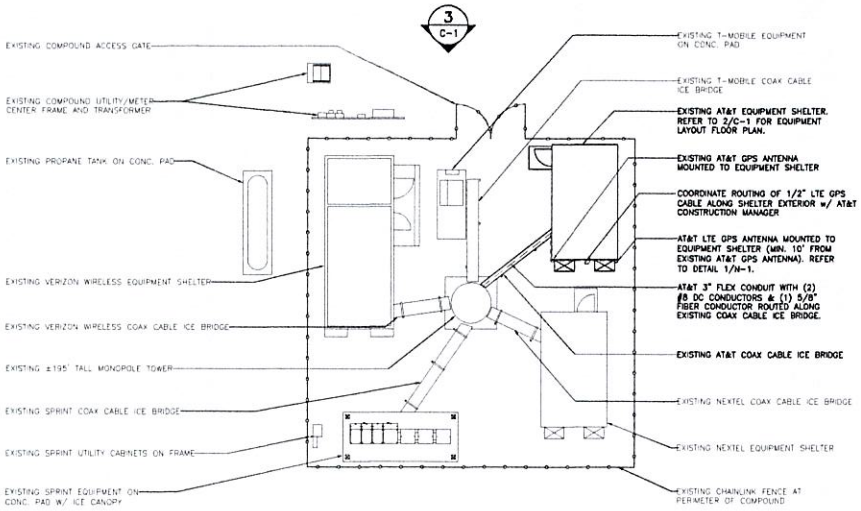
cc: Honorable Jeffrey Hamel, First Selectman, Town of Bethlehem
Walker T. and Susan A. McDonald (underlying property owners)



2 / C-1 **EQUIPMENT BIULDING FLOOR PLAN**
SCALE: 1/4" = 1'-0"

APPROX. NORTH

GRAPHIC SCALE
4 0 2 4 8 16
(IN FEET)
1 inch = 4 ft.



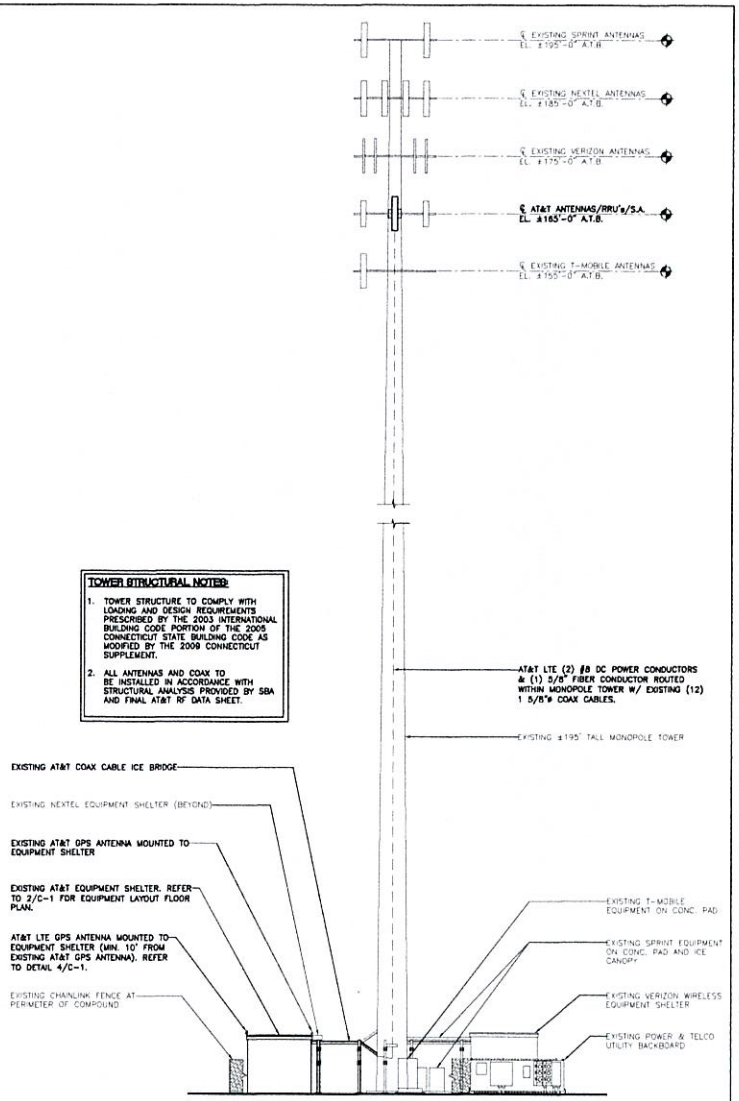
1 / C-1 **COMPOUND PLAN**
SCALE: 1" = 10'-0"

APPROX. NORTH

GRAPHIC SCALE
10 0 5 10 20 40
(IN FEET)
1 inch = 10 ft.

TOWER STRUCTURAL NOTES:

1. TOWER STRUCTURE TO COMPLY WITH LOADING AND DESIGN REQUIREMENTS PRESCRIBED BY THE 2003 INTERNATIONAL BUILDING CODE PORTION OF THE 2005 CONNECTICUT STATE BUILDING CODE AS MODIFIED BY THE 2009 CONNECTICUT SUPPLEMENT.
2. ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY SBA AND FINAL AT&T RF DATA SHEET.



3 / C-1 **NORTH ELEVATION**
SCALE: 1" = 10'-0"

GRAPHIC SCALE
10 0 5 10 20 40
(IN FEET)
1 inch = 10 ft.

DESIGNED BY:	NMR
DRAWN BY:	NMR
CHK'D BY:	CFC

REV.	DATE	DRAWN BY	CHK'D BY	
1	10/26/12	NMR	DEB	CONSTRUCTION - CLIENT REVIEW
0	08/14/12	CLT	DEB	CONSTRUCTION - CLIENT REVIEW

PROFESSIONAL ENGINEER SEAL

CENTEK engineering
Centered on Solutions
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

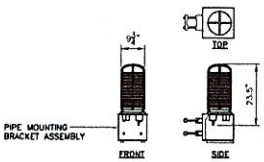
AT&T MOBILITY
WIRELESS COMMUNICATIONS FACILITY LTE UPGRADE
CT1174
MORRIS CT
330 WATERTOWN ROAD
MORRIS, CT 06763

DATE:	10/26/12
SCALE:	AS NOTED
JOB NO.	12063.0027

PLANS AND ELEVATION

C-1

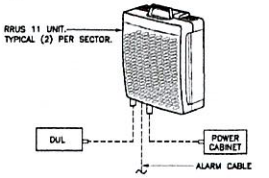
Sheet No. 3 of 6



SITE TYPE	ARRESTOR MAKE/MODEL	QTY REQUIRED	ARRESTOR LOCATION	WEIGHT
	MAKE: RAYCAP (SQUID) MODEL: DC6-48-60-18-8F	(1) PER SITE	TOWER, ADJACENT TO AT&T ANTENNAS AND RRUs.	20 LBS. (WITHOUT MOUNT)

NOTES:
1. CONTRACTOR TO COORDINATE FINAL SURGE ARRESTOR MODEL SELECTION(S) WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.
2. CONTRACTOR TO INSTALL ARRESTOR IN CONFORMANCE WITH MANUFACTURERS RECOMMENDATIONS.

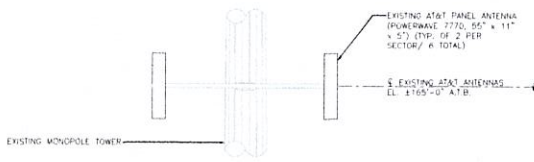
6 / C-2 SURGE ARRESTOR DETAIL
NOT TO SCALE



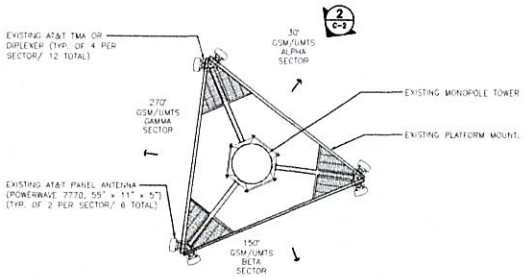
RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RRUS 11	17.6"L x 17.3"W x 7.2"D	BAND 4: 44 LBS. BAND 12: 50 LBS.	ABOVE: 18" MIN. BELOW: 12" MIN. SIDE: 0" MIN.

NOTES:
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.

7 / C-2 RRU DETAIL
NOT TO SCALE

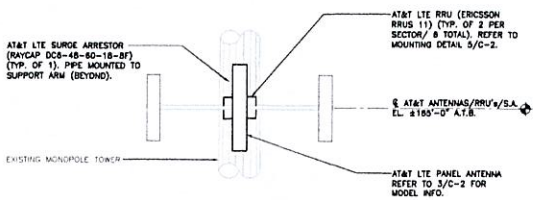


2 / C-2 EXISTING ANTENNA SECTOR ELEVATION
SCALE: 1/4" = 1'-0"

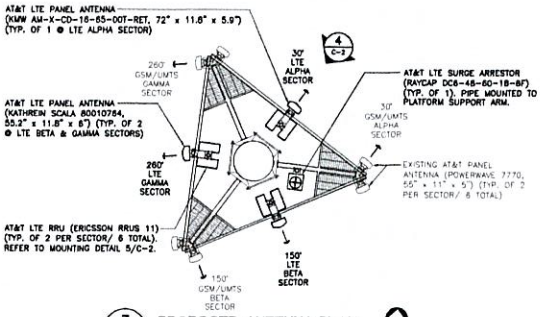


1 / C-2 EXISTING ANTENNA PLAN
SCALE: 1/4" = 1'-0"

APPROX. NORTH



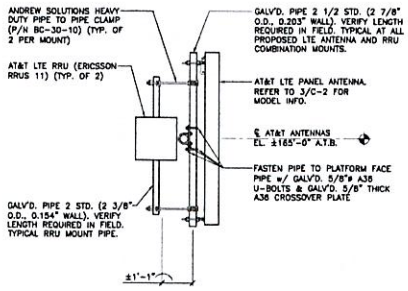
4 / C-2 PROPOSED LTE ANTENNA SECTOR ELEVATION
SCALE: 1/4" = 1'-0"

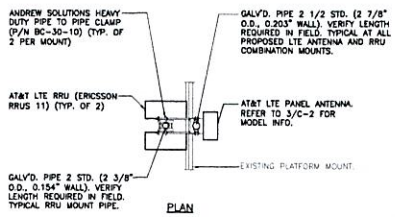


3 / C-2 PROPOSED ANTENNA PLAN
SCALE: 1/4" = 1'-0"

APPROX. NORTH

NOTES:
1. PAN EXISTING ANTENNAS TO ACQUIRE PROPOSED AZIMUTHS.
2. PROVIDE MOUNTING PIPES, CROSSOVERS & ASSOCIATED HARDWARE TO COMPLETE THE PROPOSED UPGRADE.
3. REFER TO STRUCTURAL ANALYSIS AND FINAL AT&T RFDS PRIOR TO INSTALLATION OF ANTENNAS AND COAX.





5 / C-2 LTE ANTENNA/RRU MOUNT DETAILS
SCALE: 1/2" = 1'-0"

DESIGNED BY:	HMR
DRAWN BY:	HMR
CHK'D BY:	CFC

REV.	DATE	DRAWN BY	CHK'D BY
1	10/26/12	HMR	SLM
0	08/24/12	CLT	SLM

10/26/12 CONSTRUCTION
08/24/12 CLIENT REVIEW

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AT&T MOBILITY
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CT1174
MORRIS CT
316 WATERTOWN ROAD
MORRIS, CT 06763

DATE:	10/26/12
SCALE:	AS NOTED
JOB NO.	12063.0027

LTE EQUIPMENT DETAILS

C-2

Sheet No. 4 of 5

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

Calculated Radio Frequency Emissions

CT1174

(Morris)

310 Watertown Road, Morris, CT 06763

a.k.a. (310 Watertown Road, Bethlehem, CT)

October 10, 2012

Table of Contents

List of Tables

List of Figures

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 monopole tower located at 310 Watertown Road in Morris, CT. The coordinates of the tower are 41° 40' 2.06" N, 73° 10' 13.77" W.

AT&T is proposing the following modifications:

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

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 patterns 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	*165*	*880*	*6*	*296*	*0.0235*	*0.5867*	*4.00%*
Cingular	*165*	*1930*	*3*	*427*	*0.0169*	*1.0000*	*1.69%*
Nextel	185	851	9	100	0.0095	0.5673	1.67%
Sprint	195	1962.5	11	111	0.0115	1.0000	1.15%
Verizon cellular	175	869	9	244	0.0258	0.5793	4.45%
Verizon PCS	175	1970	7	230	0.0189	1.0000	1.89%
Verizon AWS	175	1970	1	650	0.0076	1.0000	0.76%
Verizon LTE	175	698	1	804	0.0094	0.4653	2.03%
AT&T UMTS	165	880	2	565	0.0015	0.5867	0.25%
AT&T UMTS	165	1900	2	875	0.0023	1.0000	0.23%
AT&T LTE	165	734	1	1313	0.0017	0.4893	0.35%
AT&T GSM	165	880	1	283	0.0004	0.5867	0.06%
AT&T GSM	165	1900	4	525	0.0028	1.0000	0.28%
						Total	**13.13%**

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 Structural Analysis dated September 10, 2012.

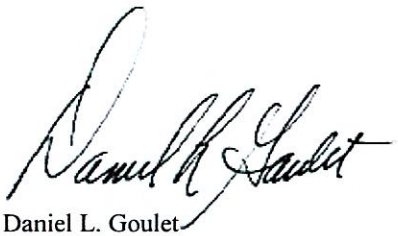
5. Conclusion

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 **13.13% 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

October 10, 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.

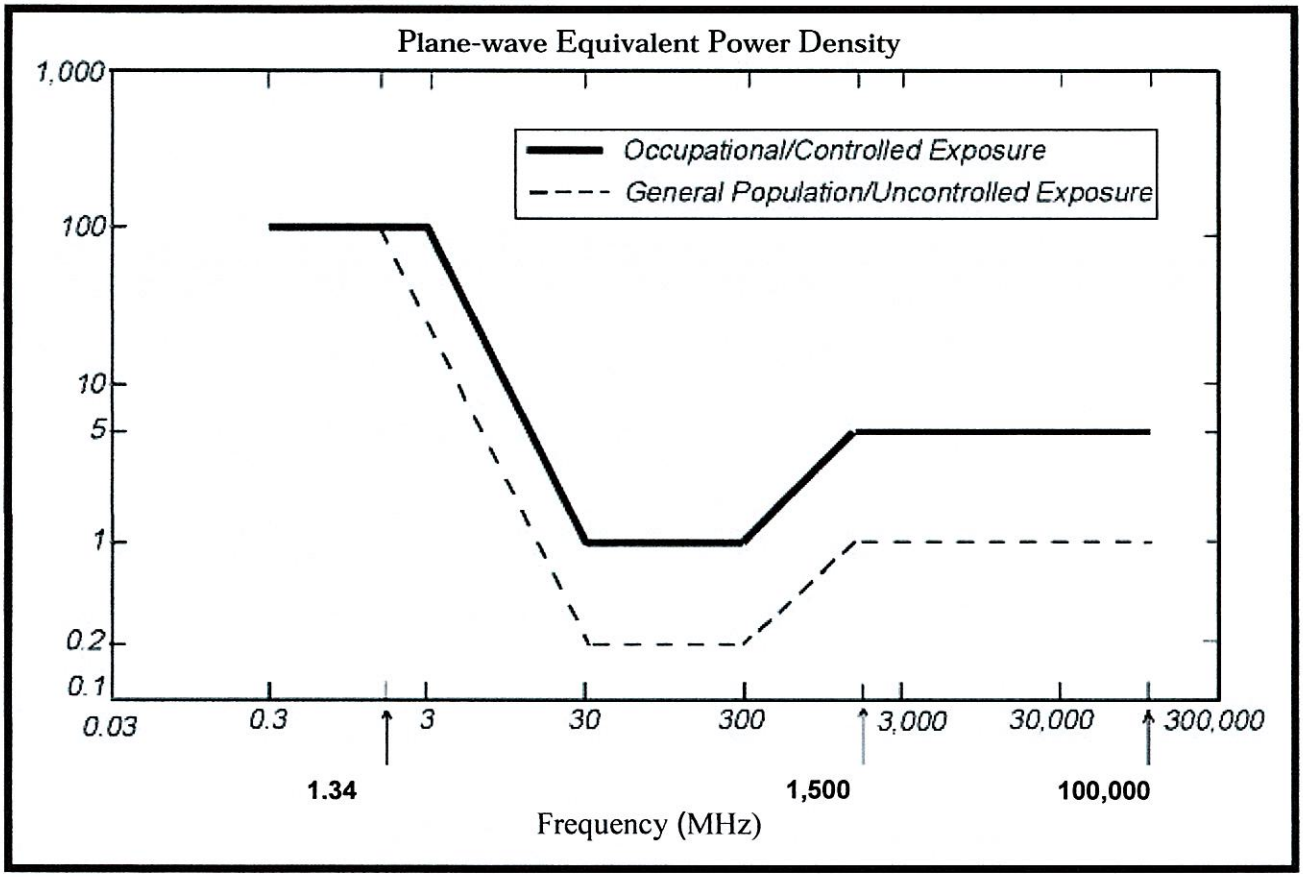
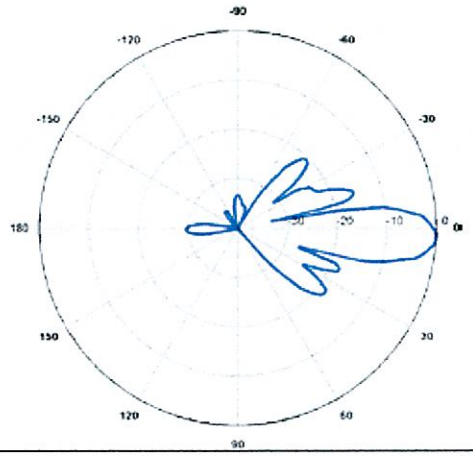


Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

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

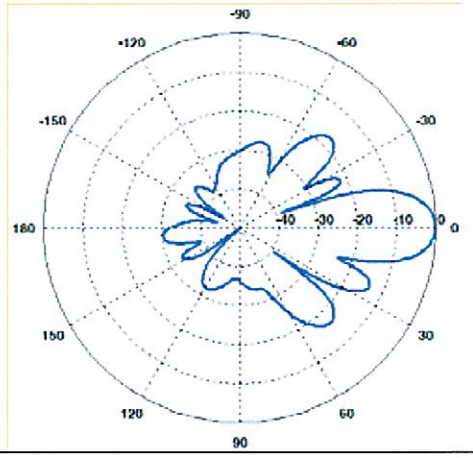
700 MHz

Manufacturer:	KMW
Model #:	AM-X-CD-16-65-00T-RET
Frequency Band:	698-806 MHz
Gain:	13.35 dBd
Vertical Beamwidth:	12.3°
Horizontal Beamwidth:	65°
Polarization:	Dual Slant ± 45°
Size L x W x D:	72.0" x 11.8" x 5.9"



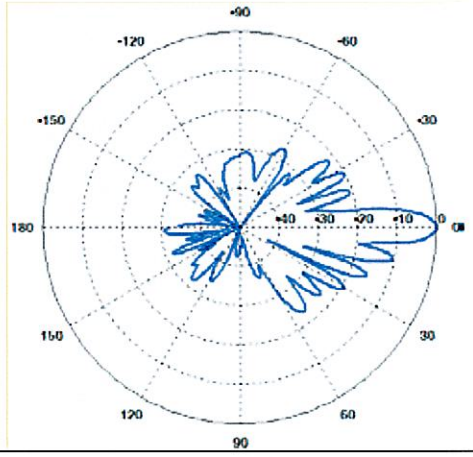
850 MHz

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" 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" x 11.0" x 5.0"



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

Structural Analysis for SBA Network Services, Inc.

195' Monopole Tower

SBA Site Name: Morris
SBA Site ID: CT01501-S
New Cingular Site ID: 54149
New Cingular Site Name: Morris

FDH Project Number 12-04774E S2

Analysis Results

Tower Components	93.1%	Sufficient
Foundation	90.6%	Sufficient

Prepared By:

Logan Poe, 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

9/10/12

September 10, 2012

Prepared pursuant to TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures & 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 Bethlehem, 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 (CTBC).* Information pertaining to the existing/proposed antenna loading, current tower geometry, geotechnical data, and member sizes was obtained from:

- Fred A. Nudd Corporation (Drawing No. 00-7627-1) original design drawings dated May 8, 2000
- o2wireless Solutions (Job No. 2230-043) Monopole Tower Structural Analysis Report dated September 4, 2002
- Vertical Structures, Inc. (Job No. 2008-007-002) Structural Analysis Report dated January 8, 2008
- Vertical Structures, Inc. (Job No. 2008-007-002) Structural Opinion Letter dated September 18, 2008
- SBA Network Services, Inc.

The *basic design wind speed* per the *TIA/EIA-222-F* standards and the *2005 CTBC* is 80 mph without ice and 28 mph with 1 - 1/4" radial ice. Ice is considered to increase in thickness with height.

Conclusions

With the existing and proposed antennas from New Cingular in place at 165 ft, the tower meets the requirements of the *TIA/EIA-222-F standards* and the *2005 Connecticut Building Code* provided the **Recommendations** listed below are satisfied. Furthermore, provided the foundation was designed and constructed to support the original design reactions (see Fred A. Nudd Drawing No. 00-7627-1), 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 the *2005 CTBC* 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. RRU/RRH Stipulation: The equipment may be installed in any arrangement as determined by the client.
3. The existing TMAs should be installed directly behind the 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	Coax and Lines[1]	Carrier	Mount Elevation (ft)	Mount Type
195	(3) RFS APXVSPP18-C-A20 (3) ALU 1900 MHz RRH (3) ALU 800 MHz RRH (3) ALU 800 MHz Filter (4) RFS ACU-A20-N RETs	(3) 1-1/4" Fiber Cables	Sprint	195	(1) 14' Low Profile Platform
185	(12) Decibel DB844H80-XY	(12) 1-5/8"	Nextel	185	(1) 12' Low Profile Platform
175	(6) Antel LPA-80080/6CF (3) Antel BXA-70063/6CF (3) Antel BXA-171085-12CF-2 (6) RFS FD9R6004/2C-3L Diplexers	(12) 1-5/8"	Verizon	175	(1) 14' Low Profile Platform
165	(6) Powerwave 7770.00 (12) Powerwave LGP21401 TMAs	(12) 1-5/8"	New Cingular	165	(1) 14' Low Profile Platform
155	(3) RFS APXV18-209014-C (3) Remec S20057A1 TMAs	(6) 1-5/8"	T-Mobile	155	(1) 14' Low Profile Platform

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

Proposed Loading:

Antenna Elevation (ft)	Description	Coax and Lines[1]	Carrier	Mount Elevation (ft)	Mount Type
165	(6) Powerwave 7770.00 (2) Kathrein 800 10764 (1) KMW AM-X-CD-16-65-00T-RET (12) Powerwave LGP21401 TMAs (6) Ericsson 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) 3/4" DC Power	New Cingular	165	(1) 14' Low Profile Platform

1. The 7/16" coax and (2) 3/4 coax will be installed in (1) 3" conduit.

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
Flange Plate	45 ksi
Flange Bolts	Fu=120 ksi
Base Plate	45 ksi
Anchor Bolts	Fu=125 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
L1	195 - 180	Pole	TP24x24x0.281	13.3	Pass
	180	Flange Bolts	(18) 1/2" Ø w/ BC = 27"	59.1	Pass
	180	Flange Plate	30" PL x 1/2" thk	56.2	Pass
L2	180 - 130	Pole	TP35.9444x24x0.25	82.3	Pass
L3	130 - 85	Pole	TP46.1944x34.25x0.3125	88.4	Pass
L4	85 - 81	Pole	TP46.525x44.1361x0.3125	93.1	Pass
L5	81 - 41	Pole	TP55.4556x46.525x0.375	82.7	Pass
L6	41 - 0	Pole	TP64.5x53.1427x0.375	91.1	Pass
		Anchor Bolts	(24) 2" Ø w/ BC = 58"	87.0	Pass
		Base Plate	64.5" Ø PL x 1.5" thk	77.2	Pass

*Capacities include 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	51 k	- - -
Shear	32 k	36 k
Moment	4,421 k-ft	4,878 k-ft

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.

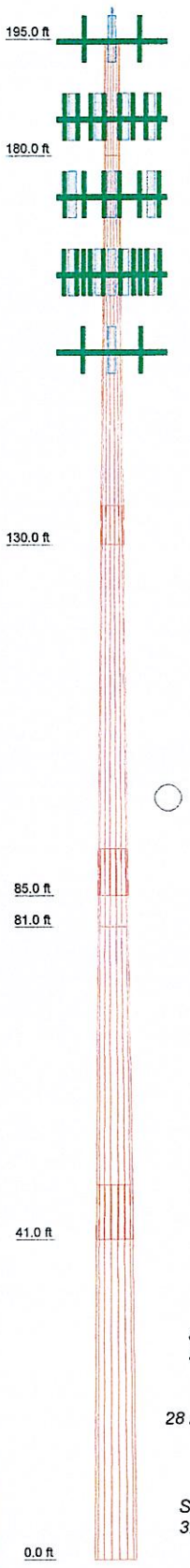
LIMITATIONS

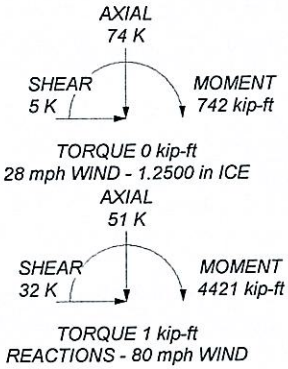
All opinions and conclusions are considered accurate to a reasonable degree of engineering certainty based upon the evidence available at the time of this report. All opinions and conclusions are subject to revision based upon receipt of new or additional/updated information. All services are provided 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	4	5	6
Length (ft)	15.00	50.00	50.00	10.00	40.00	48.00
Number of Sides	18	18	18	18	18	18
Thickness (in)	0.2810	0.2500	0.3125	0.3125	0.3750	0.3750
Socket Length (ft)		5.00	6.00		7.00	
Top Dia (in)	24.0000	24.0000	34.2500	44.1361	46.5250	53.1427
Bot Dia (in)	24.0000	35.9444	46.1944	46.5250	55.4556	64.5000
Grade		4.0	6.7	1.5	8.2	11.4
Weight (K)	1.1					32.9

A572-65





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(1) 14' Low Profile Platform MNT	195	BXA-171085-12CF-EDIN-X w/Mount Pipe	175
APXVSPP18-C-A20 w/Mount Pipe	195	(2) FD9R6004/2C-3L Diplexer	175
APXVSPP18-C-A20 w/Mount Pipe	195	(2) FD9R6004/2C-3L Diplexer	175
APXVSPP18-C-A20 w/Mount Pipe	195	(2) FD9R6004/2C-3L Diplexer	175
1900 MHz RRH	195	(1) 14' Low Profile Platform Mount	175
1900 MHz RRH	195	(2) 7770.00 w/Mount Pipe	165
1900 MHz RRH	195	(2) 7770.00 w/Mount Pipe	165
800 MHz RRH	195	(2) 7770.00 w/Mount Pipe	165
800 MHz RRH	195	800 10764 w/ Mount Pipe	165
800 MHz RRH	195	800 10764 w/ Mount Pipe	165
800 MHz Filter	195	AM-X-CW-16-65-00T-RET w/Mount Pipe	165
800 MHz Filter	195	(4) LGP21401 TMA	165
800 MHz Filter	195	(4) LGP21401 TMA	165
(2) ACU-A20-N RET	195	(4) LGP21401 TMA	165
ACU-A20-N RET	195	(2) RRU	165
ACU-A20-N RET	195	(2) RRU	165
Lightning Rod	195	(2) RRU	165
(4) DB844H80-XY w/Mount Pipe	185	Andrew ABT-DF-DMADBH Surge Arrestor	165
(4) DB844H80-XY w/Mount Pipe	185	DC6-48-60-18-8F Surge Arrestor	165
(4) DB844H80-XY w/Mount Pipe	185	(1) 14' Low Profile Platform MNT	165
(1) 12' Low Profile Platform MNT	185	APXV18-209014 w/Mount Pipe	155
(2) LPA-80080/6CF w/ Mount Pipe	175	APXV18-209014 w/Mount Pipe	155
(2) LPA-80080/6CF w/ Mount Pipe	175	APXV18-209014 w/Mount Pipe	155
(2) LPA-80080/6CF w/ Mount Pipe	175	S20057A1	155
BXA-70063/6CF W/Mount Pipe	175	S20057A1	155
BXA-70063/6CF W/Mount Pipe	175	S20057A1	155
BXA-70063/6CF W/Mount Pipe	175	(1) 14' Low Profile Platform MNT	155
BXA-171085-12CF-EDIN-X w/Mount Pipe	175		
BXA-171085-12CF-EDIN-X w/Mount Pipe	175		

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 1.25 in ice.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 93.1%

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Tower Analysis

Job:	Morris, CT01501-S
Project:	12-04774E S2
Client: SBA Network Services, Inc.	Drawn by: Logan Poe
Code: TIA/EIA-222-F	Date: 09/10/12
Path:	Scale: NTS
	Dwg No. E-