



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

May 29, 2012

Jennifer Young Gaudet
HPC Wireless Services
46 Mill Plain Road, Floor 2
Danbury, CT 06811

RE: **EM-CING-079-120511** - New Cingular Wireless PCS, LLC (AT&T) notice of intent to modify an existing telecommunications facility located at 45 North Main Street, Marlborough, Connecticut.

Dear Ms. Gaudet:

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:

- Any deviation from the proposed modification ~~as specified~~ in this notice and supporting materials with Council shall render this ~~acknowledgment~~ 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 May 9, 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/cm

c: The Honorable Catherine D. Gaudinski, First Selectman, Town of Marlborough
Peter F. Hughes, Zoning Enforcement Officer, Town of Marlborough

EM-CING-079-120511

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



May 9, 2012

ORIGINAL

VIA OVERNIGHT COURIER

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

RECEIVED
MAY 11 2012

CONNECTICUT
SITING COUNCIL

Re: New Cingular Wireless PCS, LLC – exempt modification
45 North Main Street, Marlborough, Connecticut

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 R.C.S.A. Section 16-50j-73, 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 Marlborough.

AT&T plans to modify the existing wireless communications facility owned by Crown Castle and located at 45 North Main Street in the Town of Marlborough (coordinates 41°-50’-66” N, 72°-44’-28.26” 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 antennas to the existing six (6) antennas at a center

Boston

Albany

Buffalo

Danbury

Philadelphia

Raleigh

Atlanta

line of approximately 145' on the existing platform and six (6) RRHs (remote radio heads) on mounts at the base of the platform. AT&T also will relocate the existing GSM and UMTS antennas on the platform and mount surge arrestor on a pipe mount behind an antenna. AT&T will also place a DC power and fiber run from the equipment to the antennas along the existing coaxial cable run. The proposed modifications will not extend the height of the approximately 155' structure.

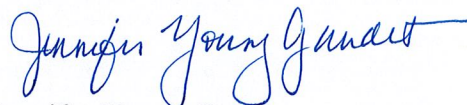
2. The proposed changes will not extend the site boundaries. AT&T will install related equipment within its existing shelter and will mount a GPS antenna to the shelter. These changes will be within the existing compound and will have no effect on the site boundaries.

3. The proposed changes will not increase the noise level at the existing facility by six 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 1.54%; the combined site operations will result in a total power density of approximately 38.95%.

Please feel free to contact me by phone at (860) 798-7454 or by e-mail at jgaudet@hpcwireless.com with questions concerning this matter. Thank you for your consideration.

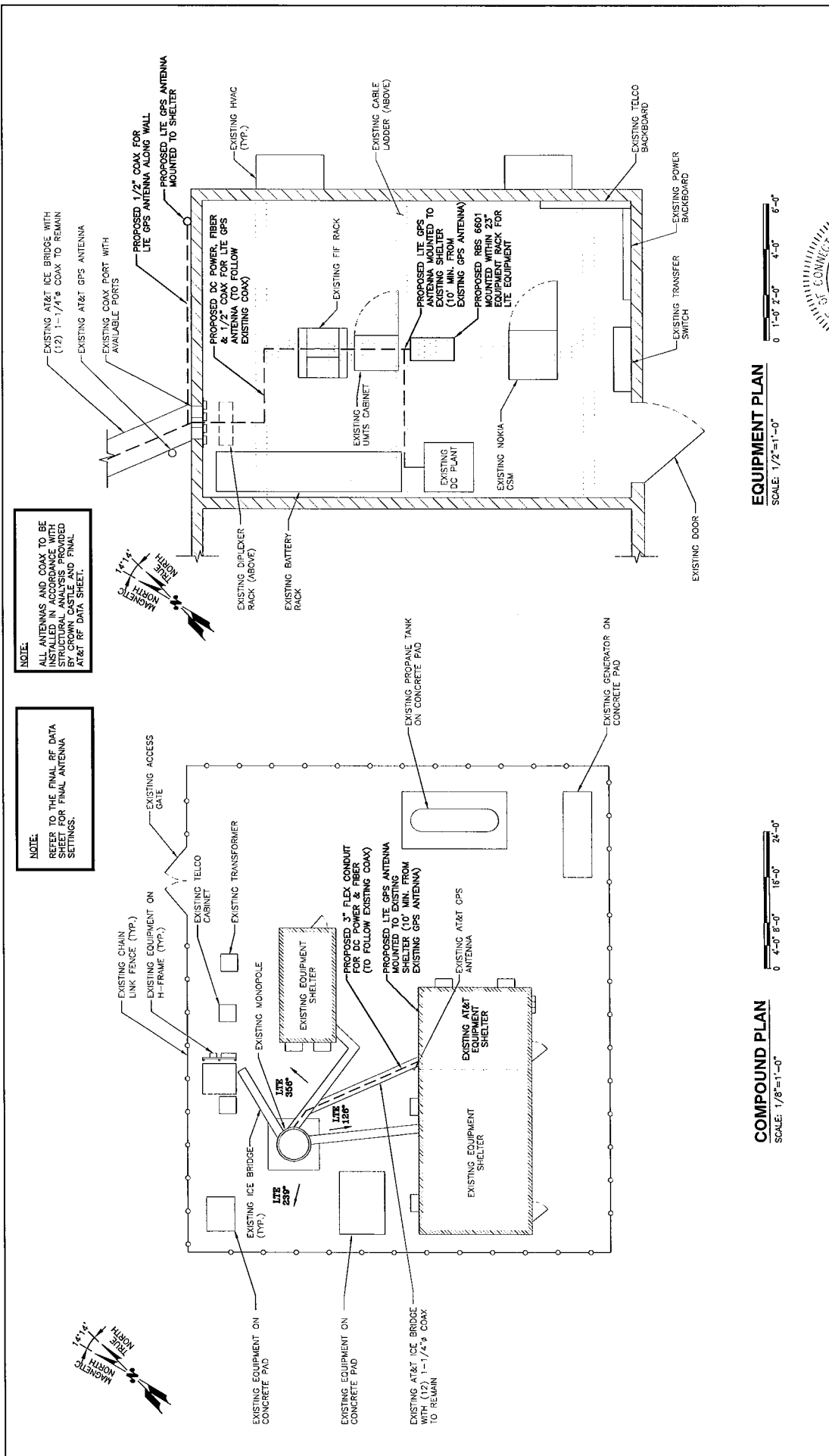
Respectfully yours,



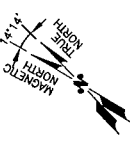
Jennifer Young Gaudet

Attachments

cc: Honorable Catherine D. Gaudinski, First Selectman, Town of Marlborough
Crown Castle (underlying property owner)

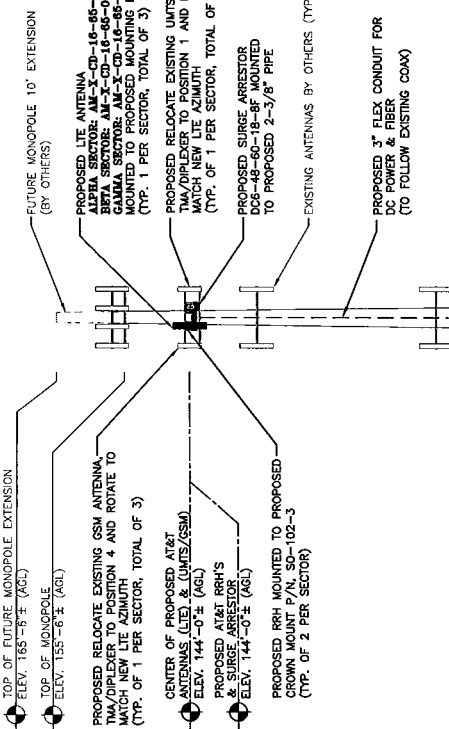


 HUDSON DESIGN GROUP 1400 CONCORD STREET, SUITE 210 N. ANDOVER, MA 01855 TEL: (978) 555-6555 FAX: (978) 234-5566		 NEWLINK a Unit of GLOBAL SERVICES company 800 MARSHALL PHELPS ROAD UNIT# 2A WINDSOR, CT 06095		 500 ENTERPRISE DRIVE, SUITE 3A ROCKY HILL, CT 06067	
SITE NUMBER: CT1073 SITE NAME: MARLBOROUGH COUNTRY BARN CROWN ID: 806386 43 NORTH MAIN STREET MARLBOROUGH, CT 05447 MIDDLESEX COUNTY		AT&T AT&T COMPOUND & EQUIPMENT PLAN (LIE)		1 04/24/13 ISSUED FOR CONSTRUCTION 0 04/02/13 ISSUED FOR REVIEW NO. 24113 DATE: 04/24/13 BY: CHK/SP/2 CHECKED BY: DB DRAWN BY: DB DESIGNED BY: DC SCALE: AS SHOWN SHEET NUMBER: A-1 DRAWING NUMBER: 1073.01	

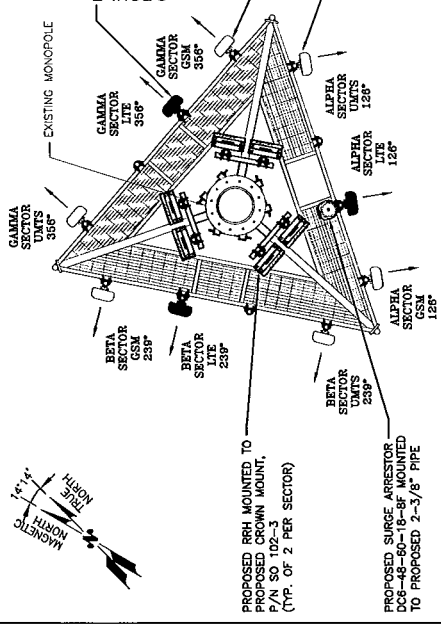


NOTE:
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

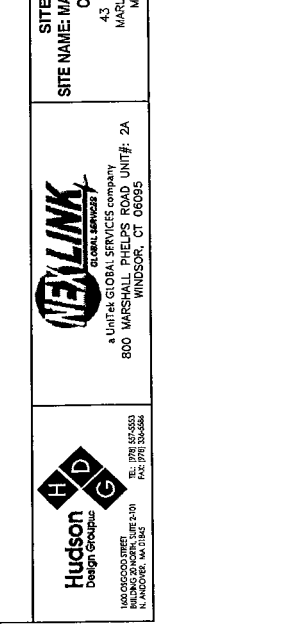
NOTE:
ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE AND FINAL AT&T RF DATA SHEET.



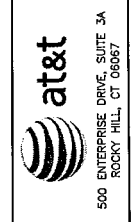
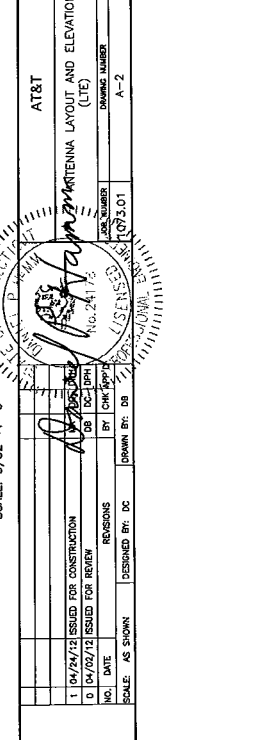
EXISTING UMTS/GSM ANTENNA PLAN
SCALE: N.T.S.



PROPOSED LTE ANTENNA PLAN
SCALE: N.T.S.



SOUTHEAST ELEVATION
SCALE: 3/32"=1'-0"



500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

SITE NAME: MARLBOROUGH COUNTRY BARN
CROWN ID: 8063366
43 NORTH MAIN STREET
MARLBOROUGH, CT 06447
MIDDLESEX COUNTY

MEALINK
GLOBAL SERVICES
a UNITA GLOBAL SERVICES company
800 MARSHALL PHELPS ROAD UNIT# 2A
WINDSOR, CT 06095

Hudson Design Group
INCORPORATED
100 WASHINGTON STREET SUITE 210
N. ANDOVER, MA 01861
TEL: (978) 537-5500
FAX: (978) 336-5566

NO.	DATE	REVISIONS	ISSUED BY	ISSUED FOR	SCALE
1	04/24/13	ISSUED FOR CONSTRUCTION	DB	DC-DPH	
0	04/02/13	ISSUED FOR REVIEW	DB	CHK-PP-2	

SCALE: AS SHOWN

DESIGNED BY	CHK-PP-2
CHECKED BY	DB
ISSUED BY	DB
DRAWN BY	DB
DATE	04/24/13
DRAWING NUMBER	A-2



AT&T
ANTENNA LAYOUT AND ELEVATION (LIE)

Date: April 22, 2012

Veronica Harris
Crown Castle USA Inc.
1200 McArthur Blvd
Mahwah, NJ 07430



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

Subject: Structural Analysis Report

Carrier Designation:	AT&T Mobility Co-Locate	
	Carrier Site Number:	CT1073
	Carrier Site Name:	MARLBOROUGH
Crown Castle Designation:	Crown Castle BU Number:	806366
	Crown Castle Site Name:	HRT 107(C) 943204
	Crown Castle JDE Job Number:	183421
	Crown Castle Work Order Number:	483588
	Crown Castle Application Number:	144206 Rev. 1
Engineering Firm Designation:	FDH Engineering, Inc. Project Number:	12-04610E S1
Site Data:	NORTH MAIN STREET, MARLBOROUGH, Hartford County, CT	
	Latitude 41° 37' 47.3", Longitude -72° 27' 59.4"	
	165.5 Foot - Monopole Tower	

Dear Veronica Harris,

FDH Engineering, Inc. is pleased to submit this "Structural Analysis Report" to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 460086, in accordance with application 144206, revision 1.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC5: Existing + Reserved + Proposed Equipment	Sufficient Capacity
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.	

The analysis has been performed in accordance with the TIA/EIA-222-F standard and 2005 Connecticut Building Code based upon a wind speed of 80 mph fastest mile.

All modifications and equipment proposed in this report shall be installed in accordance with the attached drawings for the determined available structural capacity to be effective.

We at FDH Engineering, Inc. appreciate the opportunity of providing our continuing professional services to you and Crown Castle USA Inc. If you have any questions or need further assistance on this or any other projects please give us a call.

Structural analysis prepared and submitted by:

Daniel Chang, EI
Project Engineer

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



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1) INTRODUCTION

This tower is a 155.5 ft monopole tower designed by FWT INC. in December of 1997. The tower has a proposed 10' extension to be designed by others. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 80 mph with no ice, 37.6 mph with 1 inch ice thickness and 50 mph under service loads.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
144.0	144.0	6	ericsson	RRUS-11	2 1	3/4 3/8	1
		3	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe			
		1	raycap	DC6-48-60-18-8F			
143	143	1	crown mounts	Side Arm Mount [SO 102-3]			

Notes:

- 1) Proposed Equipment.

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
165.5	168.0	12	decibel	DB846G90A-XY w/ Mount Pipe	12	1 5/8	2
	165.5	1	crown mounts	Platform Mount (LP 602-1)			
156.0	160.0	2	antel	BXA-171063-12BF w/ Mount Pipe	---	---	2
		1	antel	BXA-171063-8BF-2 w/ Mount Pipe	---	---	2
		3	antel	BXA-70063/4CF w/ Mount Pipe	---	---	2
		2	antel	LPA-80063/6CF-2 w/ Mount Pipe	---	---	2
		6	rfs celwave	FD9R6004/2C-3L	---	---	2
		4	antel	LPA-80080/6CF w/ Mount Pipe	15	1 5/8	1
		3	decibel	DB809K-Y			
		2	antel	LPA-80080/6CF w/ Mount Pipe	---	---	3
6	decibel	DB948F85T2E-M w/ Mount Pipe					

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
	158.0	12	bam mla	BAM MLA_ANTENNA w/ Mount Pipe	12	1 5/8	4
	156.0	1	crown mounts	Platform Mount (LP 1001-1)			1
144.0	145.0	6	powerwave technologies	7770.00 w/ Mount Pipe	12	1 1/4	1
	144.0	1	crown mounts	Platform Mount (LP 1001-1)			
	142.0	6	powerwave technologies	LGP 17201			
		6	powerwave technologies	LGP21903			
135.0	135.0	1	crown mounts	Side Arm Mount [SO 102-3]	6	1 1/4	1
		3	kathrein	742 213 w/ Mount Pipe			
126.0	128.0	6	decibel	DB980H90E-M w/ Mount Pipe	6	1 1/4	1
	126.0	1	crown mounts	Sector Mount [SM 602-3]			
	120.0	3	decibel	DB809K-Y	5	1/2	5
100.0	100.0	1	crown mounts	Side Arm Mount [SO 101-3]	6	1 5/8	1
		6	ems wireless	RR90-17-02DP w/ Mount Pipe			

- Notes:
 1) Existing Equipment.
 2) Reserved Equipment.
 3) Equipment to be removed.
 4) MLA Loading; does not control this analysis.
 5) Abandoned Equipment; included in this analysis.

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
157.75	157.75	1	---	16 FT Platform w/ Handrail	---	---
		12	swedcom	ALP-9212-N		
144.25	144.25	1	---	16 FT Platform w/ Handrail	---	---
		9	swedcom	ALP-9212-N		
132	132	3	---	10 FT T-Arm Mount w/ Double Mounts	---	---
		2	celwave	PD1142		
		1	celwave	PD201		
		2	celwave	PD220		
		9	decibel	DB980		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH Engineering, Inc. (February 7, 2008)	2208816	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	FWT, Inc. (December 31, 1997)	823125	CCISITES
4-TOWER MANUFACTURER DRAWINGS	FWT, Inc. (December 31, 1997)	823126	CCISITES

3.1) Analysis Method

tnxTower (version 6.0.4.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

- 1) Tower and structures were built in accordance with the manufacturer's specifications.
- 2) The tower and structures have been maintained in accordance with the manufacturer's specification.
- 3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.

This analysis may be affected if any assumptions are not valid or have been made in error. FDH Engineering, Inc. should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	165.5 - 155.5	Pole	TP58.6x58.6x0.375	1	-7.64	2767.21	2.7	Pass
L2	155.5 - 110	Pole	TP64.606x58.6x0.375	2	-24.91	3194.44	22.1	Pass
L3	110 - 72.5	Pole	TP68.805x62.8x0.4375	3	-40.67	4260.83	37.9	Pass
L4	72.5 - 36	Pole	TP72.748x66.8082x0.5	4	-59.00	5424.19	48.2	Pass
L5	36 - 0	Pole	TP76.5x70.56x0.5	5	-83.39	5547.27	70.7	Pass
							Summary	
						Pole (L5)	70.7	Pass
						Rating =	70.7	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	70.2	Pass
1	Base Plate	0	34.8	Pass
1	Base Foundation Soil Interaction	0	40.6	Pass

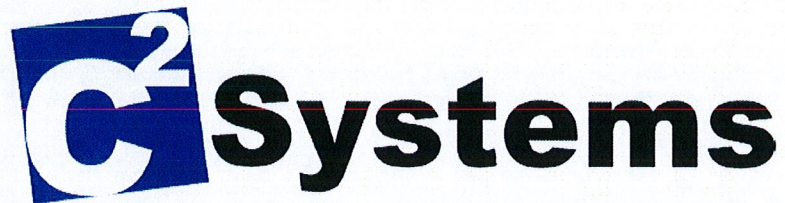
Structure Rating (max from all components) =	70.7%
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Notes:

- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

4.1) Recommendations

- 1) Coax should be installed as seen in Appendix B.



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

Calculated Radio Frequency Emissions



CT1073 - Marlborough

North Main Street, Marlborough, CT 06447

(a.k.a. 75 North Main St.)

(a.k.a. 43 North Main St.)

May 7, 2012

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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 North Main Street, Marlborough, CT. The coordinates of the tower are 41-37-47.3 N, 72-27-59.4 W.

AT&T is proposing the following modifications:

- 1) Install three 700 MHz LTE antennas (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:

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

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
AT&T UMTS	146	880	1	500	0.0084	0.5867	1.44%
AT&T GSM	146	880	4	296	0.0200	0.5867	3.40%
AT&T GSM	146	1930	2	427	0.0144	1.0000	1.44%
Pocket	135	2130	3	631	0.0373	1.0000	3.73%
Verizon cellular	158	869	9	332	0.0430	0.5793	7.43%
Verizon PCS	158	1970	7	268	0.0270	1.0000	2.70%
Verizon AWS	158	2145	1	670	0.0097	1.0000	0.97%
Verizon LTE	158	698	2	695	0.0200	0.4653	4.30%
Omnipoint	100	1930			0.0351	1.0000	3.51%
Town	130						6.03%
Sprint Nextel - iDEN	168	851	12	100	0.0153	0.5673	2.69%
Sprint Nextel -CDMA	164	1962	11	411	0.0604	1.0000	6.04%
AT&T UMTS	145	880	2	565	0.0019	0.5867	0.33%
AT&T UMTS	145	1900	2	875	0.0030	1.0000	0.30%
AT&T LTE	144	734	1	1313	0.0023	0.4893	0.47%
AT&T GSM	145	880	1	283	0.0005	0.5867	0.08%
AT&T GSM	145	1900	4	525	0.0036	1.0000	0.36%
Total							38.95%

Table 1: Carrier Information^{1 2 3}

¹ The existing CSC filing for AT&T 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 3/29/2012. 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 Report dated 4/22/2012.

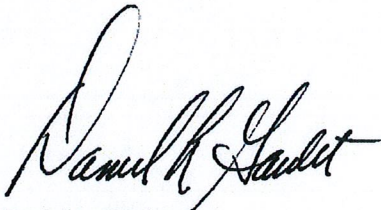
5. Conclusion

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 **38.95% 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

May 7, 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 Exposure⁴

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 Exposure⁵

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

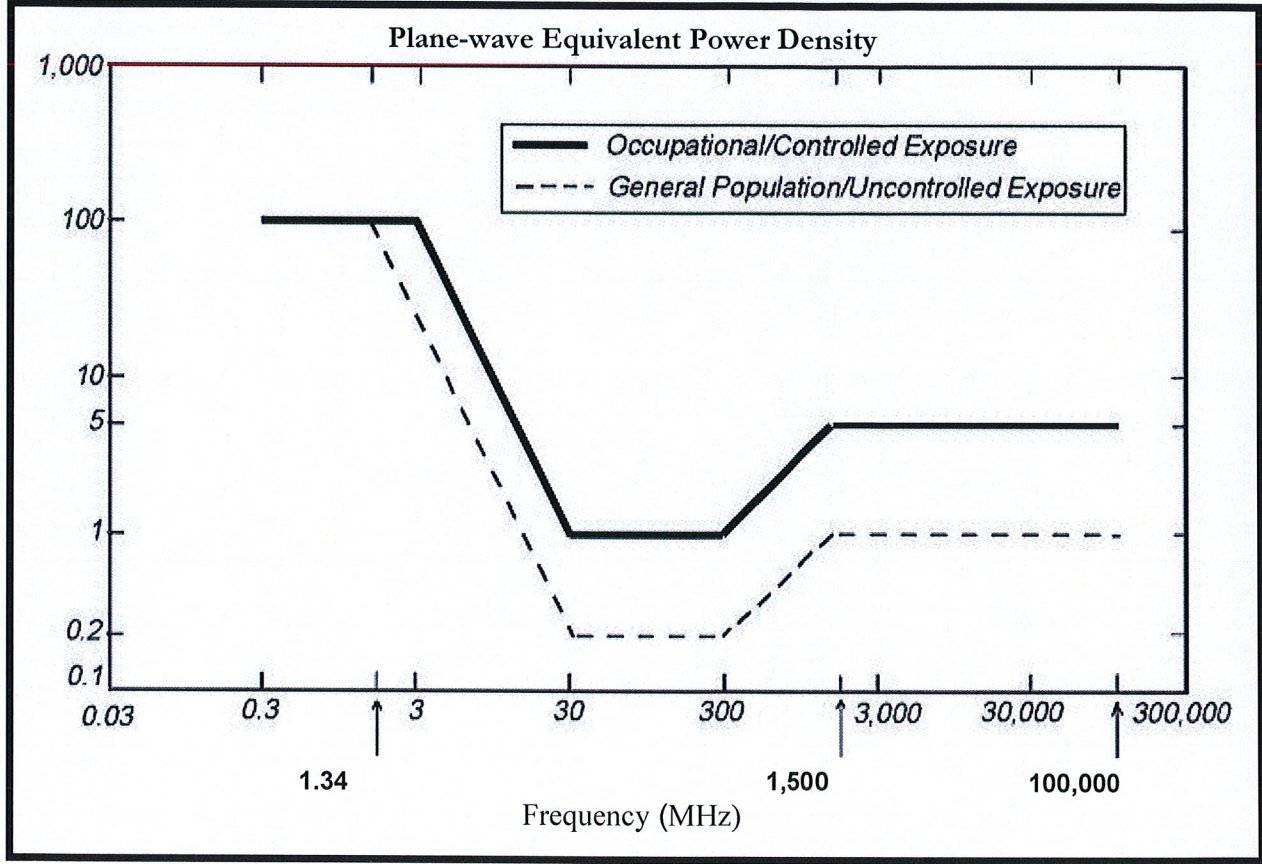
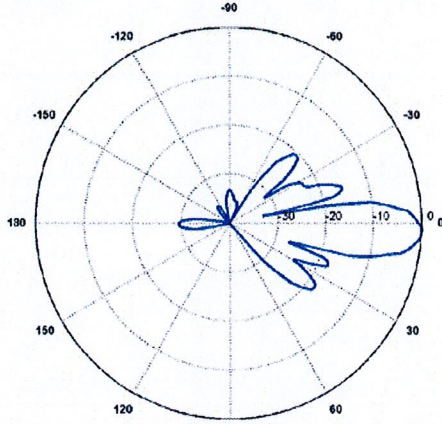
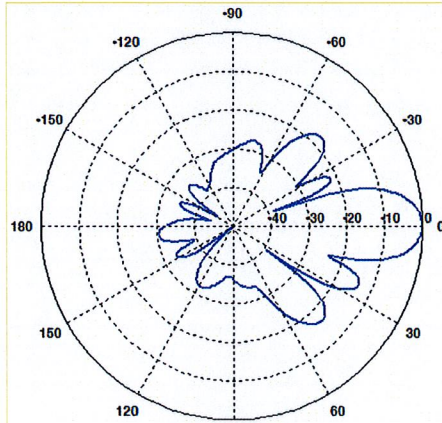


Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

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

<p>700 MHz</p> <p>Manufacturer: KMW Model #: AM-X-CD-16-65-00T-RET Frequency Band: 698-806 MHz Gain: 13.4 dBd Vertical Beamwidth: 12.3° Horizontal Beamwidth: 65° Polarization: Dual Slant $\pm 45^\circ$ Size L x W x D: 72.0" x 11.8" x 5.9"</p>	
<p>850 MHz</p> <p>Manufacturer: Powerwave Model #: 7770 Frequency Band: 824-896 MHz Gain: 11.5 dBd Vertical Beamwidth: 15° Horizontal Beamwidth: 85° Polarization: Dual Linear $\pm 45^\circ$ Size L x W x D: 55.4" x 11.0" x 5.0"</p>	
<p>1900 MHz</p> <p>Manufacturer: Powerwave Model #: 7770 Frequency Band: 1850-1990 MHz Gain: 13.4 dBd Vertical Beamwidth: 7° Horizontal Beamwidth: 90° Polarization: Dual Linear $\pm 45^\circ$ Size L x W x D: 55.4" x 11.0" x 5.0"</p>	