



January 28, 2015

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

Regarding: Notice of Exempt Modification – Addition of 3 radio heads previously approved
Property Address: 123 Costello Road, Newington, CT (the “Property”)
Applicant: AT&T Mobility (“AT&T”)

Dear Ms. Bachman:

AT&T currently maintains a wireless telecommunications facility on an existing 145 foot Monopole (“tower”) location on the Property. AT&T’s facility consists of nine (9) wireless telecommunications antenna at 105 feet. The tower is controlled by Crown Castle, LLC. The Council approved the previous application on May 18th 2012 reference number EM-CING-094-120430. This application (attached) granted AT&T the use of 6 radio heads at this location. The approval expired one year from the issue date. During that time AT&T made the changes to the site per the approval but only installed three (3) of the six (6) radio heads that they received approval. AT&T would now like to install the additional three (3) radio heads that were originally approved under EM-CING-094-120430.

Please accept this application as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72 (b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to the Mayor, Town Manager, and Town Planner of the Town of Newington. A copy of this letter is also being sent to Crown Castle, LLC, the owner of the structure that AT&T is located.

The planned modifications to AT&T’s facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

1. The planned modifications will not result in an increase in the height of the existing structure. AT&T’s additional, previously approved 3 radio heads will be installed at 105 foot level of the 145 foot monopole.
2. The proposed modifications will not involve any changes to ground-mounted equipment and, therefore will not require an extension of the site boundary.
3. The proposed modification will not increase the noise level at the facility by six decibel or more, or to levels that exceed state and local criteria.
4. The operation of the modified facility will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety



standard. An RF emissions calculation (attached) for AT&T's modified facility was provided in the application which led to the May 18th 2012 Decision.

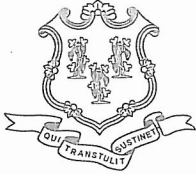
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The tower and its foundation can support AT&T's proposed modifications. (Please see attached Structural analysis completed by Paul J Ford and Company, dated April 13, 2012).

For the foregoing reasons AT&T respectfully requests that the proposed addition of 3 radio heads previously approved be allowed within the exempt modifications under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

David P. Cooper
Director of Site Acquisition
Empire Telecom

CC: Mayor Stephen Woods, Mayor, Town of Newington
John Salomone, Town Manager, Town of Newington
Craig Minor, Town Planner, Town of Newington
Crown Castle, LLC



STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

CT 1107

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 18, 2012

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

RE: **EM-CING-094-120430** – New Cingular Wireless PCS, LLC (AT&T) notice of intent to modify an existing telecommunications facility located at 123 Costello Road, Newington, 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 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 April 27, 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



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

April 30, 2012

The Honorable Stephen Woods
Mayor
Town of Newington
131 Cedar Street
Newington, CT 06111

RE: **EM-CING-094-120430** – New Cingular Wireless PCS, LLC (AT&T) notice of intent to modify an existing telecommunications facility located at 123 Costello Road, Newington, Connecticut.

Dear Mayor Woods:

The Connecticut Siting Council (Council) received this request to modify an existing telecommunications facility, pursuant to Regulations of Connecticut State Agencies Section 16-50j-72.

If you have any questions or comments regarding this proposal, please call me or inform the Council by May 14, 2012.

Thank you for your cooperation and consideration.

Very truly yours,

Linda Roberts
Executive Director

LR/cm

Enclosure: Notice of Intent

c: John L. Salomone, Town Manager, Town of Newington
Edmund Meehan, Town Planner, Town of Newington

EM-CING-094-120430

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



April 27, 2012

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
123 Costello Road, Newington, 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 Mayor of the Town of Newington.

AT&T plans to modify the existing wireless communications facility owned by Crown Castle and located at 123 Costello Road in the Town of Newington (coordinates 41°-39’-18.71” N, 72°-43’-17.2” 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 to its existing platform at a center line of approximately 105’. Six (6) RRHs (remote radio heads) and a surge arrestor will

be mounted to the tower behind the antennas. AT&T will also place a DC power and fiber run from the equipment to the antennas, up the tower along the existing coaxial cable run. The proposed modifications will not extend the height of the 145' 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 2.92%; the combined site operations will result in a total power density of approximately 54.0%.

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,

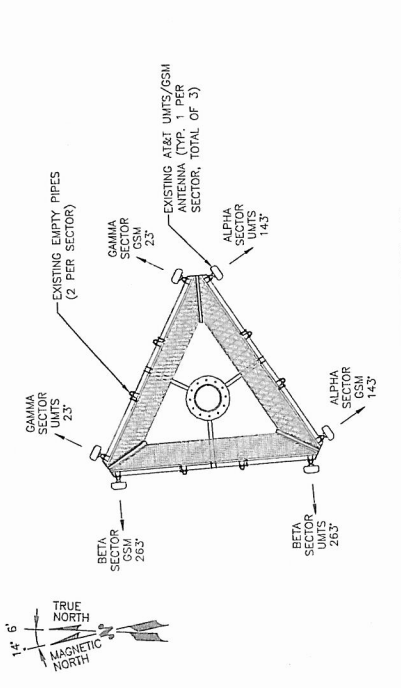
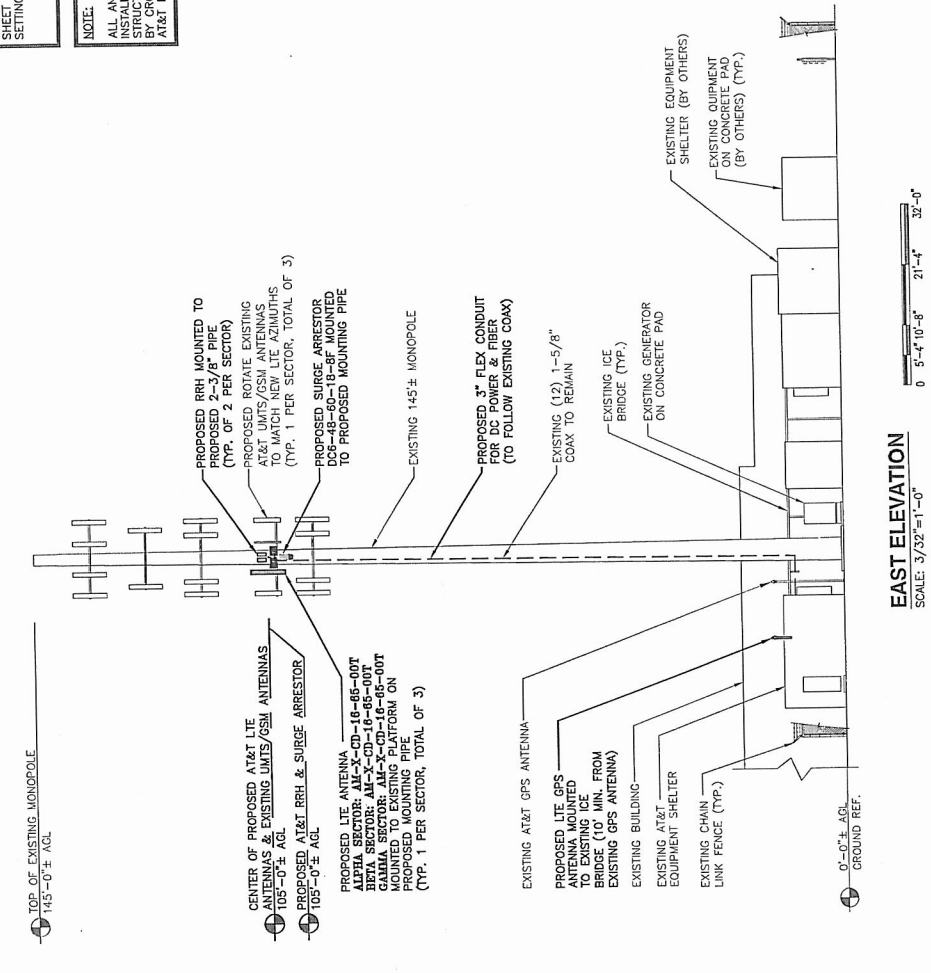


Jennifer Young Gaudet

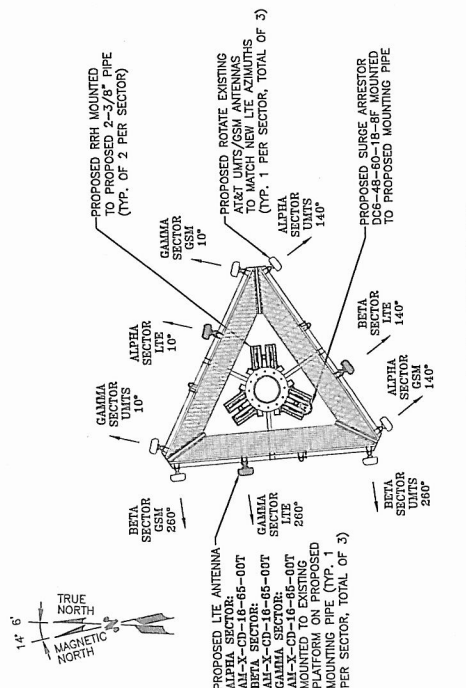
cc: Honorable Steven Woods, Mayor, Town of Newington
Costello Industries, Inc. (underlying property owner)

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 WITH THIS DRAWING AND FINAL AT&T RF DATA SHEET.

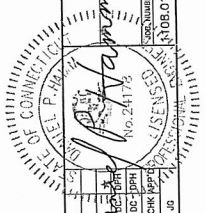


EXISTING GSM/UMTS ANTENNA PLAN
SCALE: N.T.S.

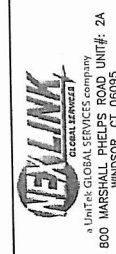


PROPOSED LTE ANTENNA PLAN
SCALE: N.T.S.

NOTES:
1. REFER TO RF CONFIG & SECTOR SCHEMATICS FOR QUANTITY REQUIRED PER SECTOR.



SITE NUMBER: CT1108
SITE NAME: NEWINGTON - ROUTE 15 CROWN CASTLE ID: 881364
123 CASTELLO ROAD
NEWINGTON, CT 06111
HARTFORD COUNTY



Hudson
DISTRIBUTION GROUP
1000 GLOUCESTER STREET, SUITE 200
N. ANDOVER, MA 01855
TEL: (978) 534-6563
FAX: (978) 350-5058

NO.	DATE	REVISIONS	BY	CHKD BY	DESIGNED BY	SCALE
1	09/23/12	ISSUED FOR CONSTRUCTION	AS	DC/DPH	AS	
0	09/09/12	ISSUED FOR REVIEW	BT	DKM/DPH	BT	

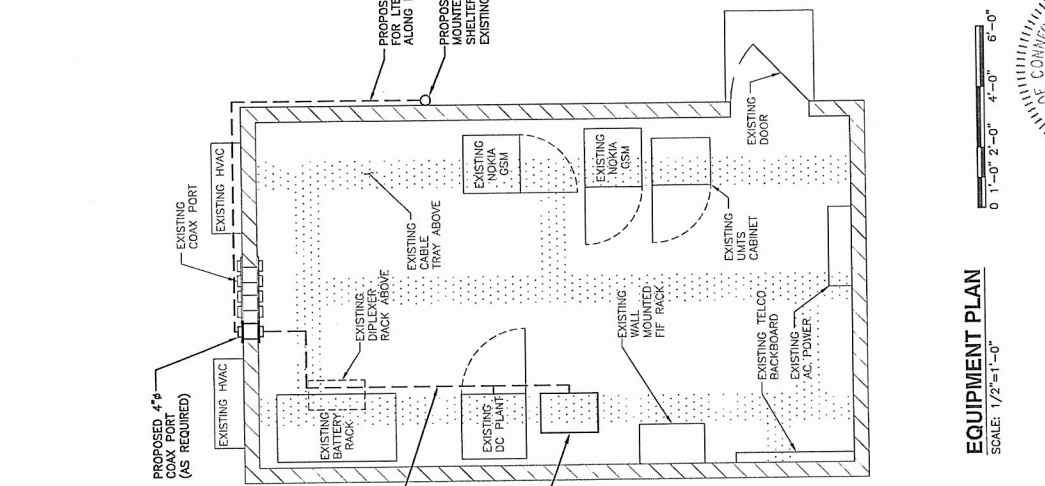
SCALE: AS SHOWN

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

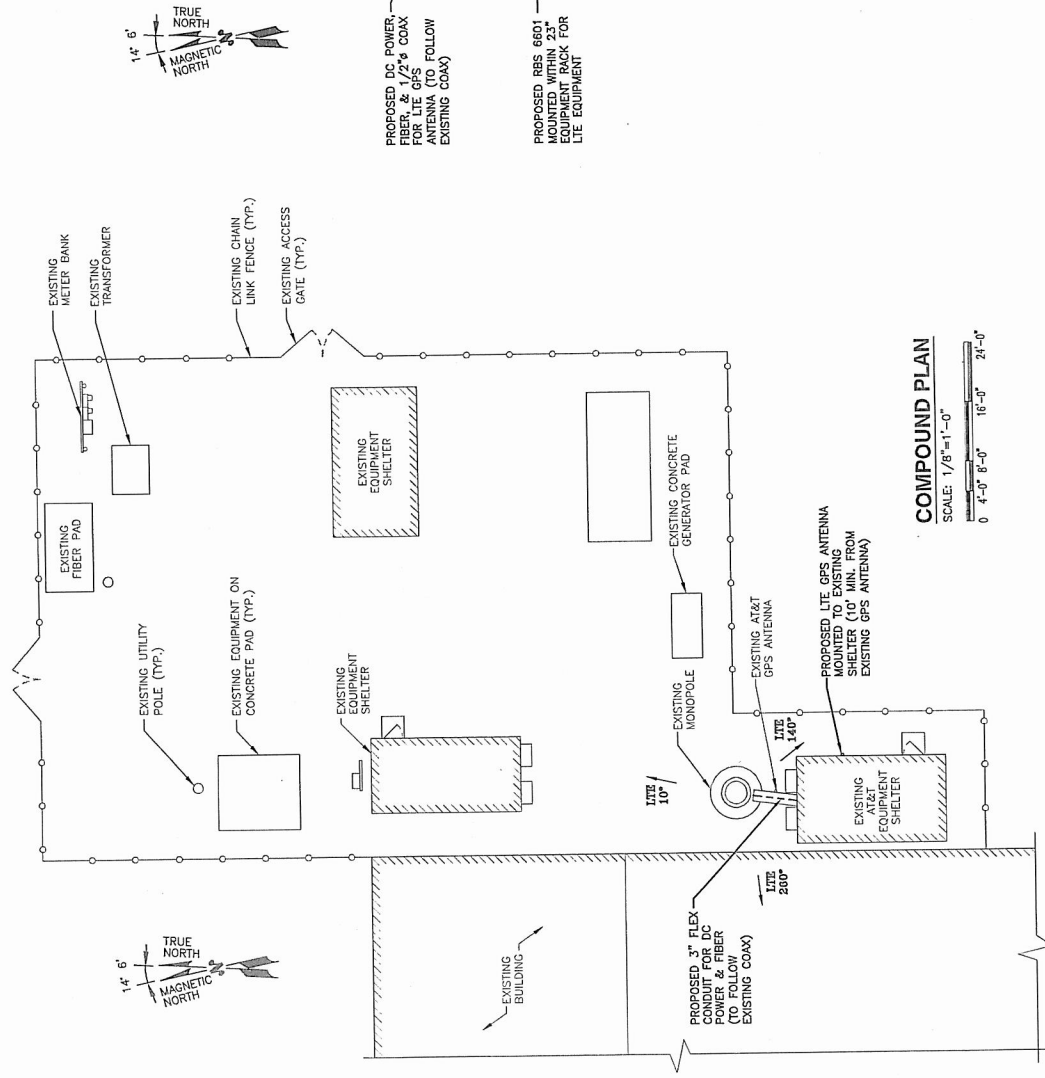
AT&T
ELEVATION & EQUIPMENT PLAN
(LITE)
DRAWING NUMBER: A-2
JOB NUMBER: 108.01

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

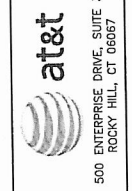
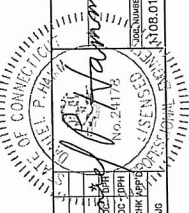
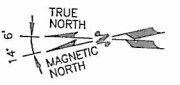
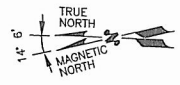
NOTE:
ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE AND FINAL AT&T RF DATA SHEET.



EQUIPMENT PLAN
SCALE: 1/2"=1'-0"



COMPOUND PLAN
SCALE: 1/8"=1'-0"



SITE NUMBER: CT11108
SITE NAME: NEWINGTON - ROUTE 15
CROWN CASTLE ID: 881364
123 COSTELLO ROAD
NEWINGTON, CT 06111
HARTFORD COUNTY



NO.	DATE	REVISIONS	DESIGNED BY: DC	DRAWN BY: JG	SCALE: AS SHOWN
1	04/23/12	ISSUED FOR CONSTRUCTION			
0	04/04/12	ISSUED FOR REVIEW			
NO.	DATE	REVISIONS			
1	06/01				

AT&T
COMPOUND PLAN
(LITE)
DRAWING NUMBER
A-1



PAUL J. FORD AND COMPANY
 STRUCTURAL ENGINEERS
 250 East Broad Street • Suite 1500 • Columbus, Ohio 43215-3708

Date: April 13, 2012

Veronica Harris
 Crown Castle USA Inc.
 1200 McArthur Blvd
 Mahwah, NJ 07430
 (201) 236-9094

Paul J Ford and Company
 250 East Broad Street, Suite 1500
 Columbus, OH 43215
 (614) 221-6679
 abonham@pjfweb.com

Subject: Structural Analysis Report

Carrier Designation: AT&T Mobility Co-Locate
 Carrier Site Number: CT1108
 Carrier Site Name: Newington 3

Crown Castle Designation: Crown Castle BU Number: 881364
 Crown Castle Site Name: Newington
 Crown Castle JDE Job Number: 183444
 Crown Castle Work Order Number: 483590
 Crown Castle Application Number: 144441 Rev. 1

Engineering Firm Designation: Paul J Ford and Company Project Number: 37512-1014

Site Data: 123 Costelo Road, Newington, Hartford County, CT
 Latitude 41° 39' 18.72", Longitude -72° 43' 17.19"
 145 Foot - Monopole Tower

Dear Veronica Harris,

Paul J Ford and Company 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 459110, in accordance with application 144441, 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 + Proposed Equipment

Sufficient Capacity

Note: See Table I and Table II for the proposed and existing loading, respectively.

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, the 2005 Connecticut State Building Code, and using a fastest mile wind speed of 80 mph with no ice, 37.6 mph with 1.25 inch ice thickness and 50 mph under service loads.

We at Paul J Ford and Company 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.

Respectfully submitted by:



 Allen R Bonham, EI
 Structural Engineer



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1) INTRODUCTION

This tower is a 145 ft Monopole tower designed by Summit in October of 1997. The tower was originally designed for a wind speed of 75 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 1.25 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
107.0	107.0	1	-	Side Arm Mount [SO 102-3]			
105.0	105.0	6	Ericsson	RRUS-11	1 (I) 2 (I)	3/8 3/4	-
		3	KMW Communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe			
		1	Raycap	DC6-48-60-18-8F			

Table 2 - Existing 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
133.0	139.0	2	Andrew	VHLP2.5-11	3 (I) 6 (I)* 9 (I)	1/2 5/16 1 1/4	1
		2	Dragonwave	HORIZON COMPACT			
	135.0	3	Kathrein	840 10054 w/ Mount Pipe			
		1	Motorola	TIMING 2000			
		3	Samsung Telecommunications	WIMAX DAP HEAD			
	134.0	9	Decibel	DB844H90E-XY w/ Mount Pipe			
	133.0	1	-	Platform Mount [LP 401-1]			
124.0	124.0	6	Dapa	49000 w/ Mount Pipe	6 (I)	1 5/8	1
		1	-	Platform Mount [LP 401-1]			
114.0	116.0	1	Lucent	KS24019-L112A	12 (I) 1 (I)	1 5/8 1/2	1
	114.0	3	Andrew	LNx-6514DS-T4M w/ Mount Pipe			
		3	Antel	BXA-185063/8CF w/ Mount Pipe			
		6	Decibel	DB844H65E-XY w/ Mount Pipe			
		6	RFS/Celwave	FD9R6004/2C-3L			
114.0	1	-	Platform Mount [LP 401-1]				

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
105.0	105.0	6	ADC	DD1900 FULL BAND MASTHEAD	12 (I)	1 5/8	1
		6	CSS	DUO1417-8686i w/ Mount Pipe			
		1	-	Platform Mount [LP 401-1]			
94.0	95.0	6	EMS Wireless	RR90-17-02DP w/ Mount Pipe	6 (E) 12 (I)	1 5/8 1 5/8	1
		3	RFS/Celwave	APX16DWV-16DWV-S-E-ACU w/ Mount Pipe			
		3		ATMAA1412D-1A20			
	3		ATMPP1412D-1CWA				
	94.0	1	-	Platform Mount [LP 401-1]			
87.0	87.0	3	Kathrein	742 213	6 (E)	1 5/8	1
		1	-	Pipe Mount [PM 601-3]			
77.0	77.0	1	Symmetricom	58532A	1 (I)	1/2	1
		1	-	Side Arm Mount [SO 701-1]			

Notes:

- 1) Existing Equipment
- 2) Reserved Equipment
- (E) Coax to be mounted externally and exposed to the wind. See coax layout in Appendix B.
- (I) Coax to be mounted internally and shielded from the wind. See coax layout in Appendix B.
- * Mounted inside a 2" diameter conduit ran inside the monopole.

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Dr. Clarence Welti, 8/10/1999	1425352	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Summit, 5153, 8/11/1999	1425473	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Summit, 5153, 8/10/1999	1425417	CCISITES

3.1) Analysis Method

tnxTower (version 6.0.3.0), 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.
- 4) The flange bolt size and grade and the flange plate grade were not provided in the manufactures drawings so conservative values were assumed.

This analysis may be affected if any assumptions are not valid or have been made in error. Paul J Ford and Company should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	145 - 130	Pole	TP26.77x24x0.1875	1	-2.713	822.430	6.0	Pass
L2	130 - 84.75	Pole	TP35.27x26.77x0.25	2	-15.844	1409.767	58.6	Pass
L3	84.75 - 44.25	Pole	TP42.26x33.9247x0.3125	3	-24.487	2112.858	87.7	Pass
L4	44.25 - 0	Pole	TP49.83x40.6625x0.375	4	-38.344	3060.155	94.7	Pass
							Summary	
						Pole (L4)	94.7	Pass
						Rating =	94.7	Pass

Table 5 - Tower Component Stresses vs. Capacity – LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	77.3	Pass
1	Base Plate	0	77.3	Pass
1, 2	Base Foundation Soil Interaction	0	65.9	Pass
1	Base Foundation Structural Steel	0	58.9	Pass
1	Flange Bolts	130	8.2	Pass
1	Flange Plate	130	3.9	Pass

Structure Rating (max from all components) =	94.7%
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Notes:

- 1) See additional documentation in "Appendix C - Additional Calculations" for calculations supporting the % capacity listed.
- 2) Foundation Analysis Notes: According to the procedures prescribed and agreed to by the Crown Castle Engineering Foundation Committee, held in January 2010, the existing caisson foundation was analyzed using the methodology in the software 'PLS-Caisson' (Version 8.10, or newer, by Power Line Systems, Inc.). Per the methods in PLS-Caisson, the soil reactions of cohesive soils are calculated using 8CD independent of the depth of the soil layer. The depth of soil to be ignored at the top of the caisson is the greater of the geotechnical report's recommendation, the frost depth of the site or half of the caisson diameter.



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

Calculated Radio Frequency Emissions



CT1108 (Newington 3)

123 Costello Road, Newington, CT

April 20, 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 123 Costello Road in Newington, CT. The coordinates of the tower are: 41°39'18.72"N, 72° 43'17.19"W.

AT&T is proposing the following modifications:

- 1) Install three new panel antennas for LTE

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
Cingular UMTS	105	1935	1	500	0.0163	1.0000	1.63%
Cingular	105	880	2	296	0.0193	0.5867	3.29%
Cingular	105	1930	2	427	0.0279	1.0000	2.79%
Verizon	114	869	9	326	0.0812	0.5793	14.01%
Verizon	114	1970	3	451	0.0374	1.0000	3.74%
Verizon	114	757	1	848	0.0235	0.5047	4.65%
Pocket	87	2130	3	631	0.0899	1.0000	8.99%
Clearwire	133	2496	2	153	0.0062	1.0000	0.62%
Clearwire	133	11 GHz	1	211	0.0043	1.0000	0.43%
Sprint	125	1962.5	11	250	0.0633	1.0000	6.33%
Nextel	135	851	9	100	0.0178	0.5673	3.13%
T-Mobile GSM	95	1945	8	120	0.0382	1.0000	3.82%
T-Mobile UMTS	95	2100	2	677	0.0539	1.0000	5.39%
AT&T UMTS	105	880	2	565	0.0037	0.5867	0.63%
AT&T UMTS	105	1900	2	875	0.0057	1.0000	0.57%
AT&T LTE	105	734	1	1313	0.0043	0.4893	0.88%
AT&T GSM	105	880	1	283	0.0009	0.5867	0.16%
AT&T GSM	105	1900	4	525	0.0068	1.0000	0.68%
						Total	54.0%

Table 1: Carrier Information^{1,2}

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 1/10/2012. 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 identically match the total value reflected 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.

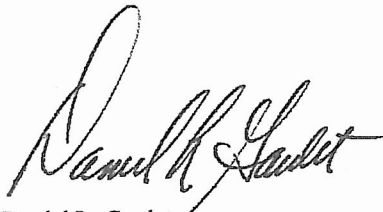
5. Conclusion

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 **54.0% 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

April 20, 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 Exposure³

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 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)
0.3-1.34	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)

³ 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

⁴ 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

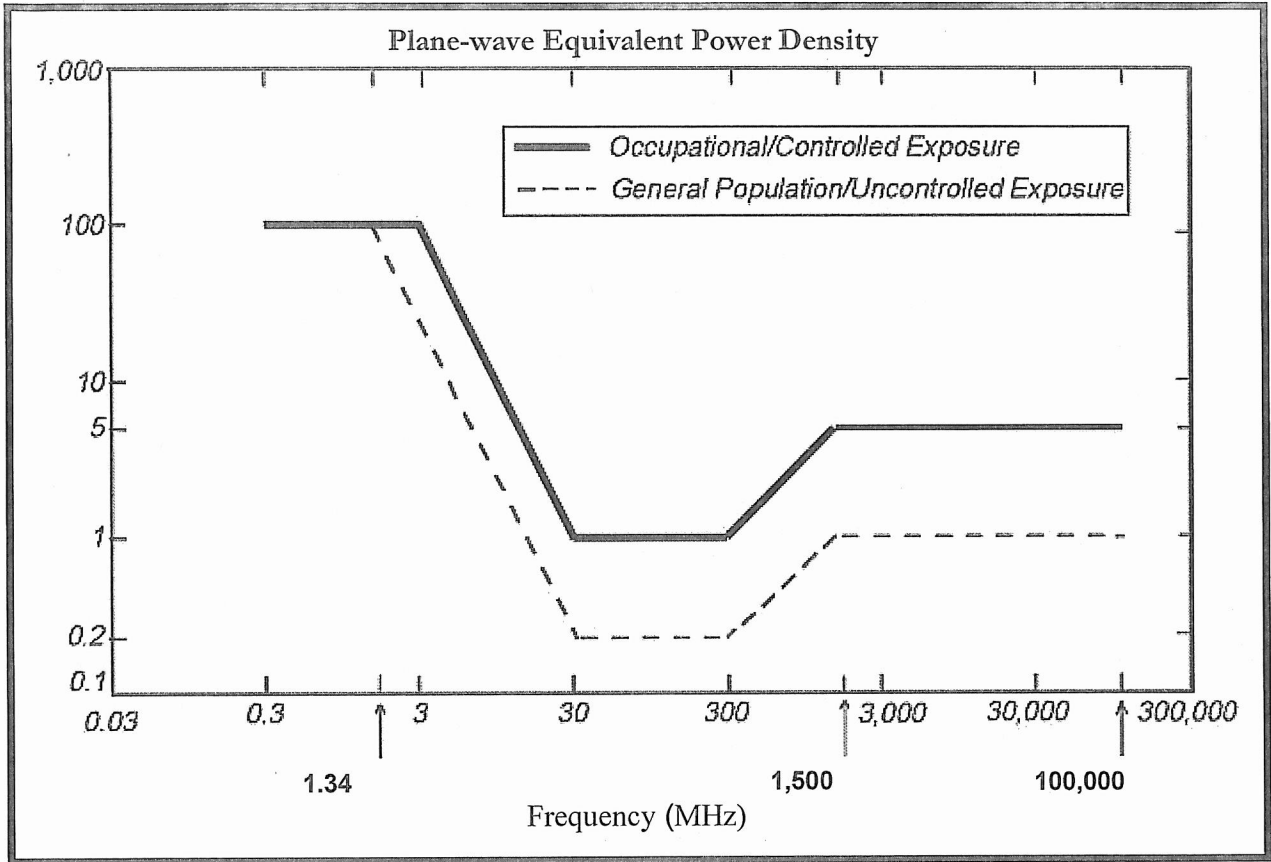
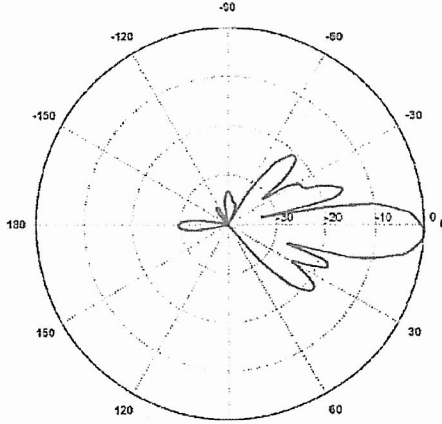
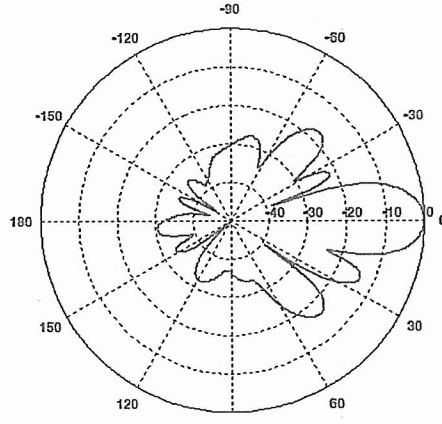


Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

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

<p>700 MHz</p> <p>Manufacturer: KMW Model #: AM-X-CD-16-65-00T Frequency Band: 698-806 MHz Gain: 13.4 dBd Vertical Beamwidth: 12.3° Horizontal Beamwidth: 65° Polarization: Dual Linear ±45° Size L x W x D: 72"×11.8"×5.9"</p>	
<p>850 MHz</p> <p>Manufacturer: Powerwave Model #: 7770.00 Frequency Band: 824-896 MHz Gain: 11.4 dBd Vertical Beamwidth: 15° Horizontal Beamwidth: 85° Polarization: Dual Linear ±45° Size L x W x D: 55.4" x 11.0" x 5.0"</p>	
<p>1900 MHz</p> <p>Manufacturer: Powerwave Model #: 7770.00 Frequency Band: 1850-1990 MHz Gain: 13.4 dBd Vertical Beamwidth: 7° Horizontal Beamwidth: 90° Polarization: Dual Linear ±45° Size L x W x D: 55.4" x 11.0" x 5.0"</p>	