EM-CING-058-121129

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

ORIGINAL

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CONNECTICUT
SITING COUNCIL

November 27, 2012

Hand Delivered

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

RE: New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 181 Norman RD, Griswold, CT 06351, know to AT&T as site CT5457.

Dear Ms. Roberts:

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

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

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

Structural Analysis for SBA Network Services, Inc.

160' Self-Support Tower

SBA Site Name: Griswold 2
SBA Site ID: CT10012-A
New Cingular Site ID: CT5457
New Cingular Site Name: Griswold West

FDH Project Number 12-09278E S1

Analysis Results

Tower Components	94.1%	Sufficient
Foundation	92.1%	Sufficient

Prepared By:

Nick Schauer, EI
Project Engineer

Reviewed By:

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

FDH Engineering, Inc.
6521 Meridien Drive
Raleigh, NC 27616
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STATE OF CONNECTICUT
Christopher Michael Murphy
No. 25842
LICENSED
PROFESSIONAL ENGINEER
9/25/10

September 25, 2012

Prepared pursuant to TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures and 2005 Connecticut Building Code

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EXECUTIVE SUMMARY

At the request of SBA Network Services, Inc., FDH Engineering, Inc. performed a structural analysis of the existing self-supported tower located in Griswold, CT to determine whether the tower is structurally adequate to support both the existing and proposed loads pursuant to the *Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, TIA/EIA-222-F and 2005 Connecticut Building Code (2005 CT Building Code).* Information pertaining to the existing/proposed antenna loading, current tower geometry, the member sizes, and foundation dimensions was obtained from:

- ☐ Rohn Industries, Inc. (File No. 37696SP001) original design drawings dated April 6, 1999
- ☐ FDH, Inc. (Job No. 07-0317T) TIA Inspection Report dated April 6, 2007
- ☐ SBA Network Services, Inc.

The *basic design wind speed* per the *TIA/EIA-222-F* standards and *2005 CT Building Code* is 85 mph without ice and 38 mph with 3/4" radial ice. Ice is considered to increase in thickness with height.

Conclusions

With the existing and proposed antennas from New Cingular in place at 135 ft, the tower meets the requirements of the *TIA/EIA-222-F* standards and *2005 CT Building Code* provided the **Recommendations** listed below are satisfied. Furthermore, provided the foundation was designed and constructed to support the original design reactions (see Rohn, Inc. File No. 37696SP001), the foundation should be adequate to support the existing and proposed loading. For a more detailed description of the analysis of the tower, see the **Results** section of this report.

Our structural analysis has been performed assuming all information provided to FDH Engineering, Inc. is accurate (i.e., the steel data, tower layout, existing antenna loading, and proposed antenna loading) and that the tower has been properly erected and maintained per the original design drawings.

Recommendations

To ensure the requirements of the *TIA/EIA-222-F* standards and *2005 CT Building Code* are met with the existing and proposed loading in place, we have the following recommendations:

1. Coax lines must be installed as shown in **Figure 1**.
2. RRU/RRH Stipulation: The equipment may be installed in any arrangement as determined by the client.
3. The proposed and existing TMAs and diplexers should be installed directly behind the existing and 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	Carrier	Mount Elevation (ft)	Mount Type
169	(2) Decibel 20' x 2" Dipoles	(2) 7/8"	Quinebaug Comm 911	160	Direct Mount
163	(1) Andrew DB201-C Yagi	(1) 1/2"			
158	(3) Antel BXA-171085-12BF-EDIN w/Mount Pipe (6) RFS APL869012-42T0 w/Mount Pipe (6) Antel BXA-70063/6CF w/Mount Pipe (6) RFS FD9R6004/2C-3L Diplexers	(18) 1-5/8"	Verizon	158	(3) 15' T-Frames
149	(6) Powerwave 63SSFL TMAs	(6) 1-5/8"	T-Mobile	148	(3) 10.5' T-Frames
148	(6) Dapa 59212 w/Mount Pipe				
137	(6) Powerwave 7770.00 w/Mount Pipe (6) Powerwave LGP21401 TMAs (6) Powerwave LGP21903 Diplexers	(12) 1-1/4"	New Cingular	137	(3) 12' T-Frames
128	(6) Kathrein 742 351 w/ Mount Pipe	(12) 1-5/8" (1) 3/8"	Metro PCS	128	(3) 12' T-Frames
82	(1) Yagi	(1) 1/2"	Quinebaug Comm 911	82	Direct Mount
76	(1) GPS	(1) 1/2"	Verizon	76	(1) 3' Standoff
68	(1) 6' Trombone	(1) 1/2"	Quinebaug Comm 911	65	Direct Mount

Proposed Loading:

Antenna Elevation (ft)	Description	Coax and Lines	Carrier	Mount Elevation (ft)	Mount Type
135	(9) Powerwave 7770.00 w/Mount Pipe (2) Powerwave P65-17-XLH-RR w/Mount Pipe (1) KMW AM-X-CD-16-65-00T-RET w/Mount Pipe (6) Powerwave LGP17201 TMAs (6) Ericsson RRUS-11 RRUs (6) Powerwave LGP21901 Diplexers (1) Raycap DC6-48-60-18-8F Surge Arrestor	(12) 1-1/4" (2) DC Cables (1) Fiber Cable	New Cingular	137	(3) 12' T-Frames

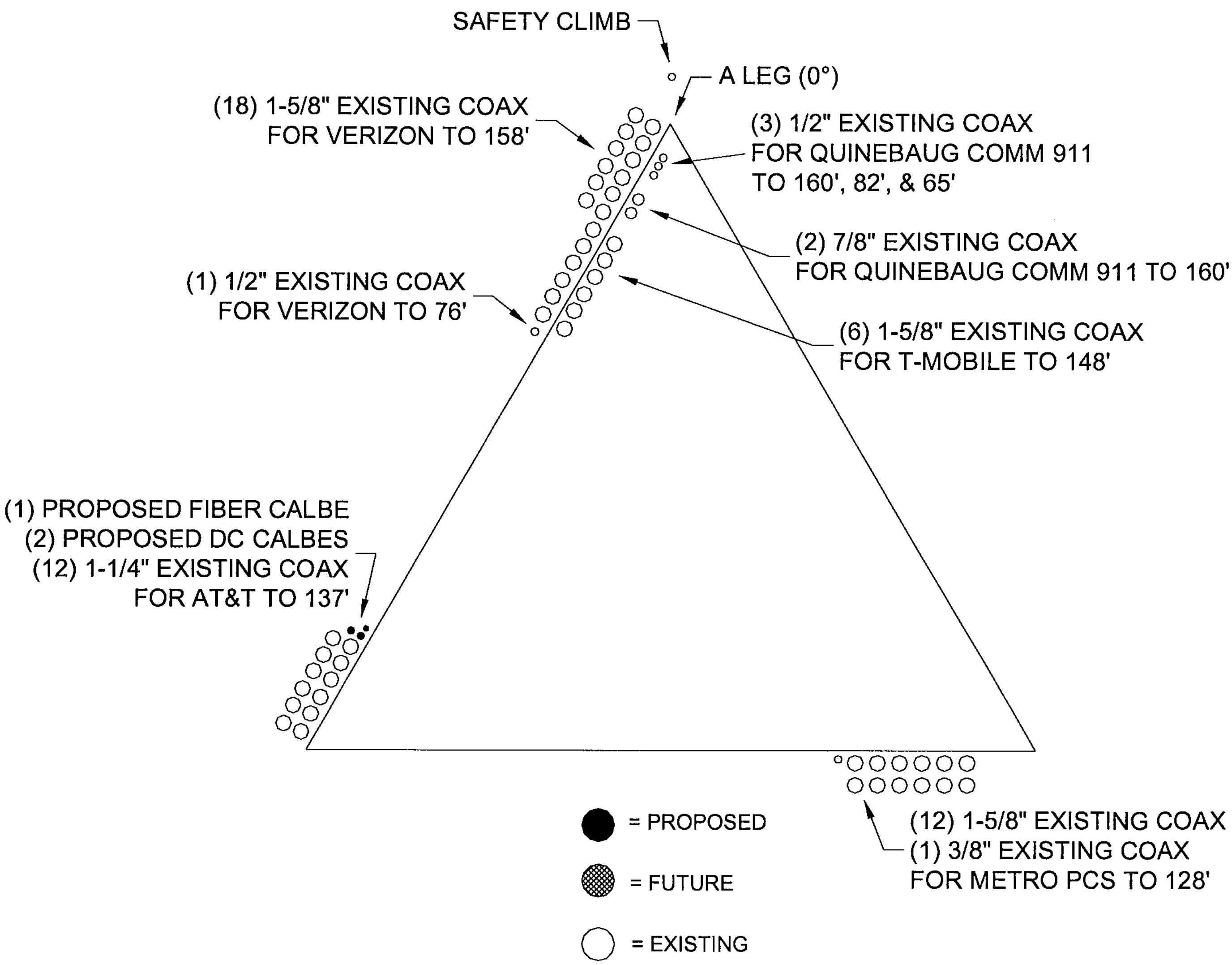


Figure 1 – Coax Layout

RESULTS

The following yield strength of steel for individual members was used for analysis:

Table 2 - Material Strength

Member Type	Yield Strength
Legs	50 ksi
Bracing	36 ksi & 50 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 100% 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
T1	160 - 140	Leg	ROHN 2.5 STD	33.1	Pass
		Diagonal	L1 3/4x1 3/4x3/16	38.2 57.4 (b)	Pass
		Top Girt	L1 3/4x1 3/4x3/16	3.4	Pass
T2	140 - 120	Leg	ROHN 3 STD	68.8	Pass
		Diagonal	L2x2x3/16	72.6 82.5 (b)	Pass
		Top Girt	L1 3/4x1 3/4x3/16	5.3	Pass
T3	120 - 100	Leg	ROHN 3.5 EH	72.6	Pass
		Diagonal	L2 1/2x2 1/2x3/16	65.1 80.2 (b)	Pass
T4	100 - 80	Leg	ROHN 4 EH	78.4	Pass
		Diagonal	L2 1/2x2 1/2x3/16	89.2	Pass
T5	80 - 60	Leg	ROHN 5 EH	66.4	Pass
		Diagonal	L3x3x1/4	54.4 72.8 (b)	Pass
T6	60 - 40	Leg	ROHN 6 EHS	76.2	Pass
		Diagonal	L3 1/2x3 1/2x1/4	58.8 60.3 (b)	Pass
T7	40 - 20	Leg	ROHN 6 EH	71.4	Pass
		Diagonal	L3 1/2x3 1/2x1/4	77.2	Pass
T8	20 - 0	Leg	ROHN 6 EH	81.3	Pass
		Diagonal	L3 1/2x3 1/2x1/4	94.1	Pass

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

Table 4 - Maximum Base Reactions

Load Type	Direction	Current Analysis *(TIA/EIA-222-F)*	Original Design *(TIA/EIA-222-F)*
Individual Foundation	Horizontal	25 k	28 k
	Uplift	191 k	214 k
	Compression	221 k	240 k
Overturning Moment	---	3,803 k-ft	4,053 k-ft

GENERAL COMMENTS

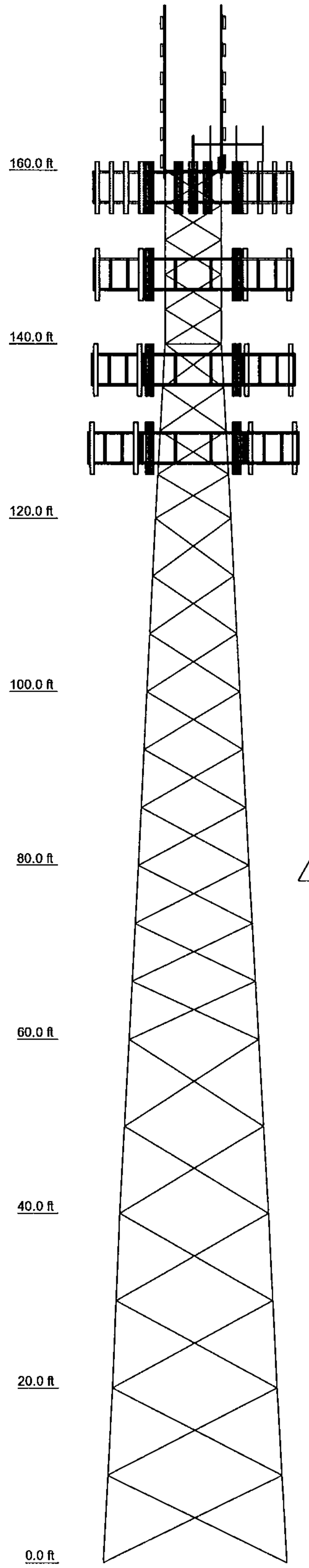
This engineering analysis is based upon the theoretical capacity of the structure. It is not a condition assessment of the tower and its foundation. It is the responsibility of SBA Network Services, Inc. to verify that the tower modeled and analyzed is the correct structure (with accurate antenna loading 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	T1	T2	T3	T4	T5	T6	T7	T8	
Legs	ROHN 2.5 STD	ROHN 3 STD	ROHN 3.5 EH	ROHN 4 EH	ROHN 5 EH	ROHN 6 EHS	ROHN 6 EH		
Leg Grade	A572-50								
Diagonals	L1 3/4x1 3/4x3/16	L2x2x3/16	L2 1/2x2 1/2x3/16		L3x3x1/4	L3 1/2x3 1/2x1/4			
Diagonal Grade	A36			A572-50					
Top Girts	L1 3/4x1 3/4x3/16		N.A.						
Face Width (ft)	6.58		8.59	10.65	12.74	14.83	16.92	18.88	20.96
# Panels @ (ft)	5 @ 4	4 @ 5	9 @ 6.66667			6 @ 10			
Weight (K)	0.9	1.0	1.4	1.8	2.8	2.7	3.1	3.3	16.6



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod	160	(2) Powerwave 63SSFL TMAs	148
Beacon	160	(2) Powerwave 63SSFL TMAs	148
Andrew DB201-C Yagi	160	(3) 10.5' T-Frames MNT	148
Leg Extension	160	(3) 7770.00A w/Mount Pipe	137
Decibel 20' x 2" Dipole	160	(3) 7770.00A w/Mount Pipe	137
Decibel 20' x 2" Dipole	160	(3) 7770.00A w/Mount Pipe	137
Antel BXA-171085-12BF-EDIN w/ Mount Pipe	158	P65-17-XLH-RR w/Mount Pipe	137
		P65-17-XLH-RR w/Mount Pipe	137
Antel BXA-171085-12BF-EDIN w/ Mount Pipe	158	AM-X-CD-16-65-00T-RET w/ Mount Pipe	137
Antel BXA-171085-12BF-EDIN w/ Mount Pipe	158	(2) Powerwave LGP17201 TMAs	137
		(2) Powerwave LGP17201 TMAs	137
(2) APL869012-42T0 W/Mount Pipe	158	(2) Powerwave LGP17201 TMAs	137
(2) APL869012-42T0 W/Mount Pipe	158	(2) RRUS-11	137
(2) APL869012-42T0 W/Mount Pipe	158	(2) RRUS-11	137
(2) Antel BXA-70063/6CF w/Mount Pipe	158	(2) RRUS-11	137
		(2) Powerwave LGP21901 Diplexers	137
(2) Antel BXA-70063/6CF w/Mount Pipe	158	(2) Powerwave LGP21901 Diplexers	137
(2) Antel BXA-70063/6CF w/Mount Pipe	158	(2) Powerwave LGP21901 Diplexers	137
		DC6-48-60-18-8F Surge Arrestor	137
(2) RFS FD9R6004/2C-3L Diplexers	158	(3) 12' T-Frames MNT	137
(2) RFS FD9R6004/2C-3L Diplexers	158	(2) 742 351 w/ Mount Pipe	128
(2) RFS FD9R6004/2C-3L Diplexers	158	(2) 742 351 w/ Mount Pipe	128
(3) 15' T-Frames MNT	158	(2) 742 351 w/ Mount Pipe	128
(2) 59212 w/ Mount Pipe	148	(3) 12' T-Frames MNT	128
(2) 59212 w/ Mount Pipe	148	Yagi	82
(2) 59212 w/ Mount Pipe	148	GPS	76
(2) Powerwave 63SSFL TMAs	148	(1) 3' Standoff MNT	76
		6' Trombone	65

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

1. Tower is located in New London County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 94.1%

MAX. CORNER REACTIONS AT BASE:
DOWN: 221 K
SHEAR: 25 K

UPLIFT: -191 K
SHEAR: 22 K

AXIAL 73 K
SHEAR 13 K
MOMENT 1249 kip-ft
TORQUE 7 kip-ft
38 mph WIND - 0.7500 in ICE

AXIAL 35 K
SHEAR 40 K
MOMENT 3803 kip-ft
TORQUE 26 kip-ft
REACTIONS - 85 mph WIND

FDH Engineering, Inc. 6521 Meridien Drive, Raleigh, NC 27616, Phone: (919) 755-1012, FAX: (919) 755-1031 — Tower Analysis	Job: **Griswold 2, CT10012-A**		
	Project: **12-09278E S1**		
	Client: SBA	Drawn by: Nick Schauer	App'd:
	Code: TIA/EIA-222-F	Date: 09/25/12	Scale: NTS
	Path:		Dwg No. E-1

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

Calculated Radio Frequency Emissions

CT5457

(Griswold West)

181 Norman Road, Griswold, CT 06351

a.k.a. (Griswold – Norman Road)

a.k.a. (Griswold – 257 Norman Road)

a.k.a. (Griswold – 297 Norman Road)

November 21, 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 lattice tower located on 181 Norman Road in Griswold, CT. The coordinates of the tower are 41° 36' 4.6" N, 71° 57' 13.9" 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 UMTS	137	880	1	500	0.0096	0.5867	1.63%
Cingular GSM	137	1900	2	427	0.0164	1.0000	1.64%
Cingular GSM	137	880	4	296	0.0227	0.5867	3.87%
Fire Dept	160	33	4	300	0.0169	0.2000	8.43%
Fire Dept	160	458	2	200	0.0056	0.3053	1.84%
Fire Dept	160	152	1	200	0.0028	0.2000	1.40%
Fire Dept	60	76	1	100	0.0100	0.2000	4.99%
MetroPCS	128	2140	3	443.61	0.0292	1.0000	2.92%
Verizon cellular	158	869	9	258	0.0334	0.5793	5.77%
Verizon PCS	158	1970	7	210	0.0212	1.0000	2.12%
Verizon AWS	158	2145	1	525	0.0076	1.0000	0.76%
Verizon LTE	158	698	2	765	0.0220	0.4653	4.74%
VoiceStream	148	1930	2	441	0.0145	1.0000	1.45%
AT&T UMTS	135	880	2	565	0.0022	0.5867	0.38%
AT&T UMTS	135	1900	2	875	0.0035	1.0000	0.35%
AT&T LTE	135	734	1	1615	0.0032	0.4893	0.65%
AT&T GSM	135	880	1	283	0.0006	0.5867	0.10%
AT&T GSM	135	1900	4	525	0.0041	1.0000	0.41%
						Total	36.30%

Table 1: Carrier Information[1 2 3]

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

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

[3] Antenna height listed for AT&T is in reference to the FDH Engineering, Inc. Structural Analysis dated September 25, 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 **36.30% 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

November 21, 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.

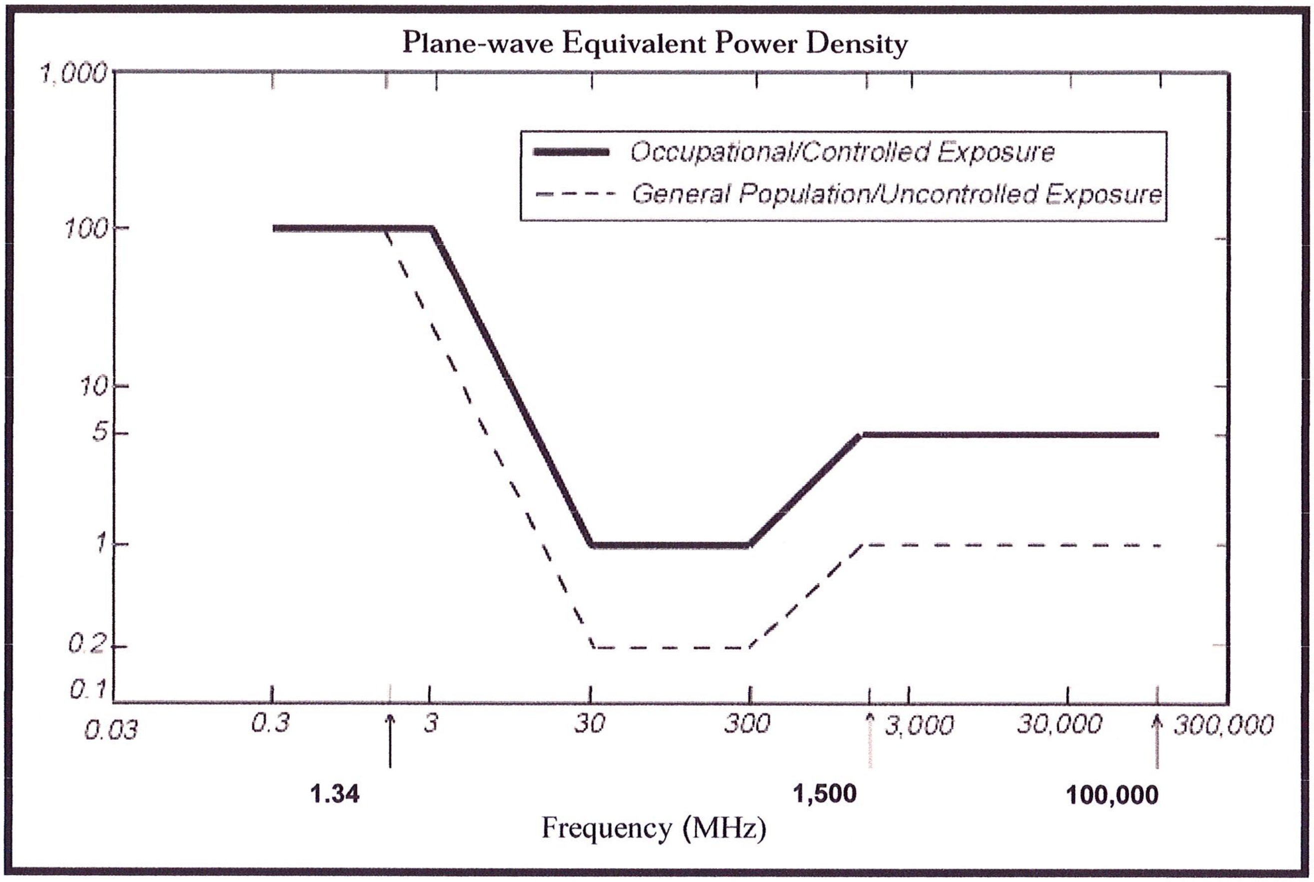
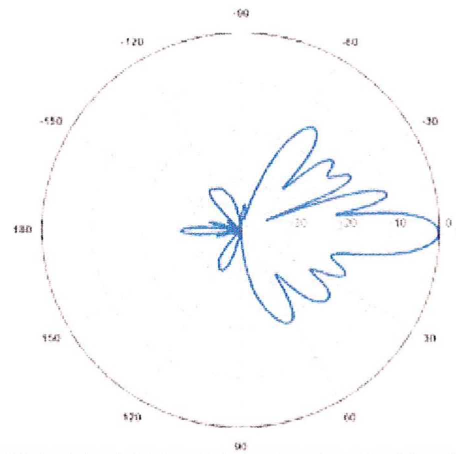


Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

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

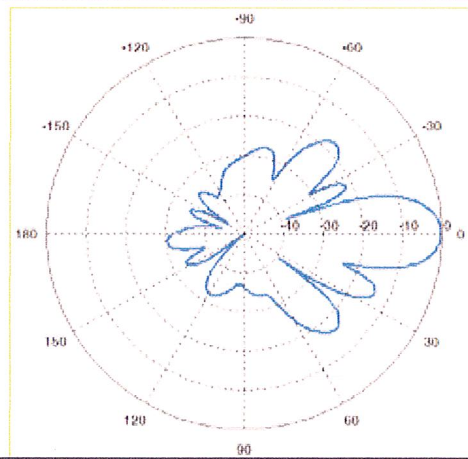
700 MHz

Manufacturer:	Powerwave
Model #:	P65-17-XLH-RR
Frequency Band:	698-806 MHz
Gain:	14.3 dBd
Vertical Beamwidth:	8.4°
Horizontal Beamwidth:	70°
Polarization:	Dual Linear ± 45°
Size L x W x D:	96.0" x 12.0" x 6.0"



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"