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DEC 03 2014

CONNECTICUT  
SITING COUNCIL

ORIGINAL

Melanie Bachman  
Acting Executive Director  
Connecticut Siting Council  
10 Franklin Square  
New Britain, CT 06051

RE: EM-CING-031-130116 Notice of Completion of Construction & Commencement of Site Operations  
New Cingular Wireless PCS, LLC / AT&T facility (AT&T No.CT1025) at  
Mohawk Mountain Road, Cornwall, Connecticut

Dear Ms. Bachman:

On behalf of New Cingular Wireless PCS, LLC (AT&T), please accept this letter as our notification of the completion of site construction and the commencement of site operations.

If you have any questions or need any additional information regarding this facility, please do not hesitate to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "Eric H. Campbell", with a long, sweeping underline.

Eric Campbell  
SAI Communications  
Agent for New Cingular Wireless/AT&T Mobility, Inc.  
27 Northwestern Drive  
Salem, New Hampshire 03079

Cc: Melanie Bachman (via email and USPS)  
Christine Vergati, Cuddy Feder (via email only)  
Tim Burks, SAI (via email only)



# 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](mailto:siting.council@ct.gov)

[www.ct.gov/csc](http://www.ct.gov/csc)

February 1, 2013

Melanie Howlett  
HPC Wireless Services  
46 Mill Plain Road, Floor 2  
Danbury, CT 06811

RE: **EM-CING-031-130116** – New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 36 Mohawk Mountain Road, Cornwall, Connecticut.

Dear Ms. Howlett:

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;
- Within 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 January 14, 2013. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding



the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Thank you for your attention and cooperation.

Very truly yours,



Linda Roberts  
Executive Director

LR/CDM/cm

c: The Honorable Gordon M. Ridgway, First Selectman, Town of Cornwall  
Karl Nilsen, Zoning Enforcement Officer, Town of Cornwall



January 14, 2013

**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  
Mohawk Mountain Road, (aka 36 Mohawk Mountain Road) Cornwall

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.C.S.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 Cornwall.

AT&T plans to modify the existing wireless communications facility owned by American Tower Corp. and located at Mohawk Mountain Road (aka 36 Mohawk Mountain Road), Cornwall (coordinates 41° -49’-17” N, 73°-17’-50” W). Attached are a compound plan and elevation depicting the planned changes, documentation of the structural sufficiency of the structure to accommodate the revised antenna configuration, and tower design modifications as detailed in the attached documentation. 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 relocate six (6) existing TMA antennas, and add three (3) LTE panel antennas on new pipe mounts attached to a new mounting frame that will be attached to the existing tower legs at a centerline height of approximately 65’. Six (6) RRUs (remote

Ms. Linda Roberts

January 14, 2013

Page 2

radio units) and one (1) Surge Arrestor will be placed behind the LTEs on new mounts, attached to the new mounting frame. AT&T will also place DC power and fiber runs along the existing coaxial cable run. These changes will not extend the height of the approximately 65' structure.

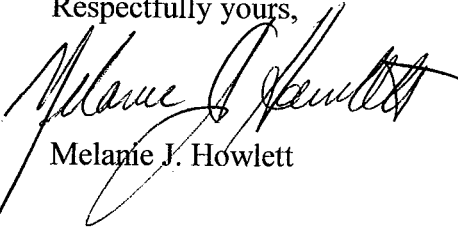
2. AT&T will place related equipment in an existing Equipment Shelter and mount a new GPS antenna on the existing Ice Bridge. These changes will be within the existing compound and will have no effect on the site boundaries.

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 7.61%; the combined site operations will result in a total power density of approximately 22.13%.

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

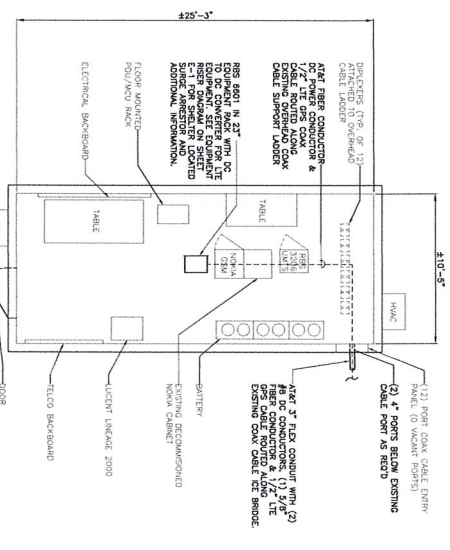
Respectfully yours,



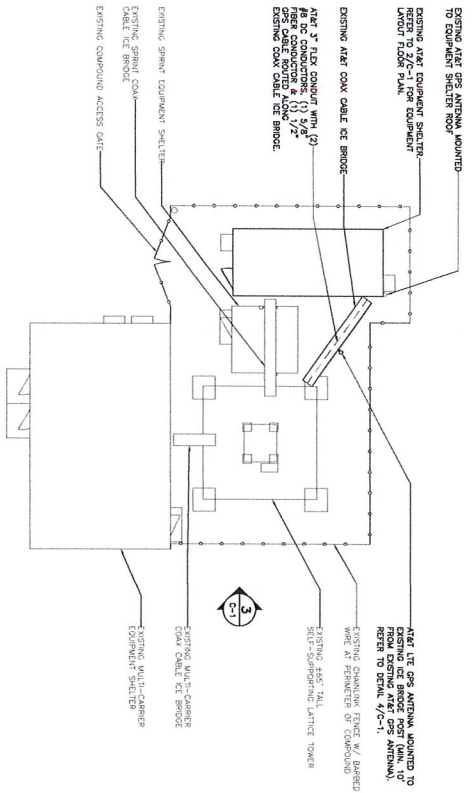
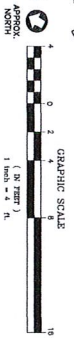
Melanie J. Howlett

Attachments

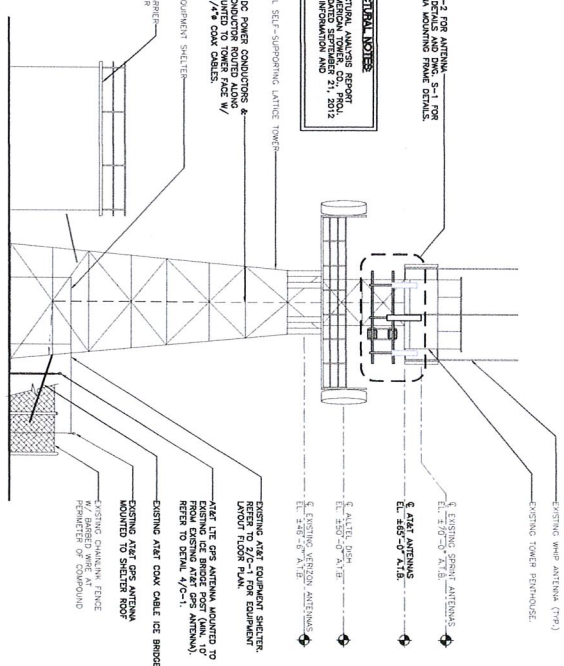
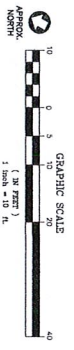
cc: Honorable Gordon M. Ridgeway, First Selectman, Town of Cornwall  
American Tower Management (underlying property owner)



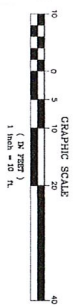
**2 EQUIPMENT BUILDING FLOOR PLAN**  
SCALE: 1/8" = 1'-0"



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



**3 PARTIAL WEST ELEVATION**  
SCALE: 1" = 10'-0"



**TOWER STRUCTURAL NOTES**  
REFER TO STRUCTURAL ANALYSIS REPORT FOR TOWER DESIGN AND FOUNDATION DESIGN. ALL DIMENSIONS AND WEIGHTS ARE IN POUNDS PER SQUARE FOOT UNLESS OTHERWISE NOTED.  
DATE: 08/23/12

REVISION	DATE	BY	CHK'D BY	DESCRIPTION
1	12/6/12	DEB	CFC	CONSTRUCTION - CLIENT REVIEW
0	08/23/12	CLT	DEB	CONSTRUCTION - CLIENT REVIEW

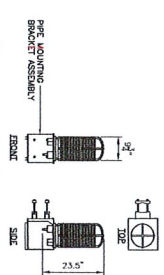
**AT&T MOBILITY**  
WIRELESS COMMUNICATIONS FACILITY LTE UPGRADE  
**CT1025**  
CORNWALL

36 MOHAWK MOUNTAIN  
CORNWALL, CT 06753

DATE:	10/27/12
SCALE:	AS NOTED
DWG. NO.:	100810004

**C-1**

PLANS AND ELEVATION



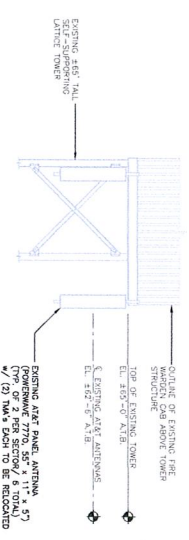
SITE TYPE	ARRESTOR MAKE/MODEL	QTY REQUIRED	ARRESTOR LOCATION	WEIGHT
	BAVCO (ROUND)	(1) PER SITE	TOWER, ADJACENT TO TOWER, MOUNTING AND RISE	20 LBS.
	BAVCO (SQUARE)	(1) PER SITE	TOWER, MOUNTING AND RISE	(WHICH? MOUNT)

**6 SURGE ARRESTOR DETAIL**  
SCALE: 1/4" = 1'-0"

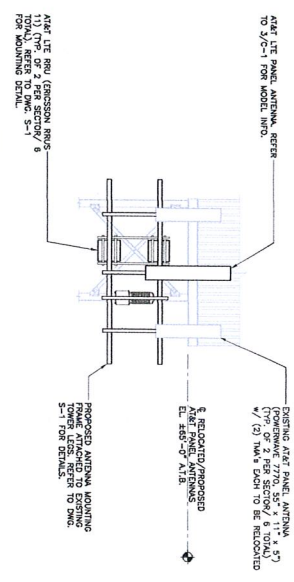
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERSSON	17.6" x 17.2" x 7.2"	BAND 4: 44 LBS.	ABOVE: 12" MIN.
MODEL: RRU5 11		BAND 12: 50 LBS.	BELOW: 12" MIN.

**7 RRU DETAIL**  
SCALE: 1/4" = 1'-0"

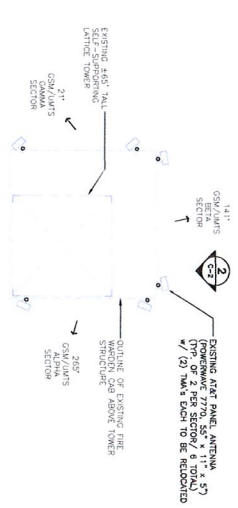
NOTES:  
1. PROVIDE MOUNTING BRACKET ASSEMBLY TO SUPPORT THE PROPOSED UPGRADE.  
2. REFER TO STRUCTURAL ANALYSIS AND OF ANTENNA AND COWL TO INSTALLATION.



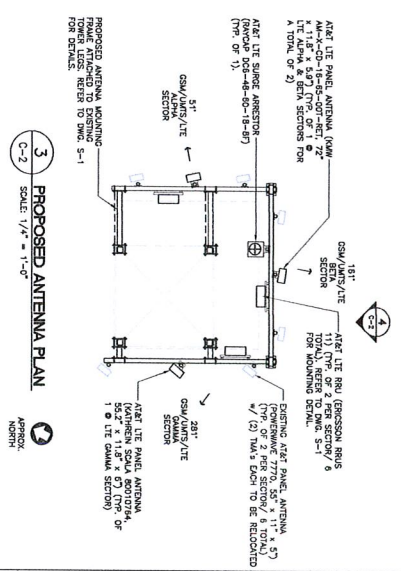
**2 EXISTING ANTENNA SECTOR ELEVATION**  
SCALE: 1/4" = 1'-0"



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

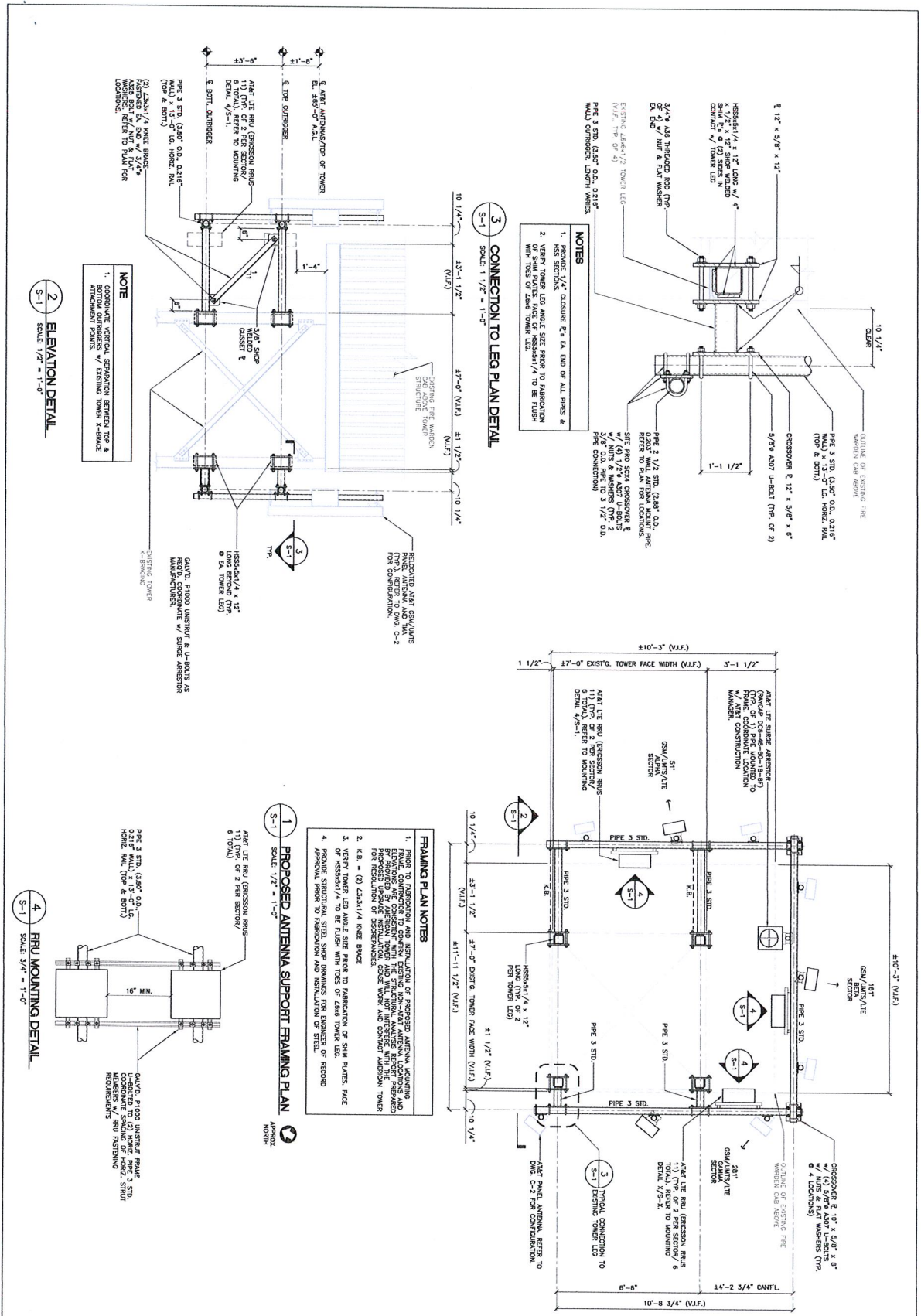


**1 EXISTING ANTENNA PLAN**  
SCALE: 1/4" = 1'-0"



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

 WIRELESS COMMUNICATIONS FACILITY LTE UPGRADE <b>CT1025 CORNWALL</b> 36 MOHAWK MOUNTAIN CORNWALL, CT 06753	   2025 RELEASE UNDER E.O. 14176 www.Ceniek.com	DESIGNED BY: RDB DRAWN BY: FLD CHECKED BY: CFC PROJECT NO.: 17083.0004	DATE: 10/27/12 SCALE: AS NOTED JOB NO.: 17083.0004	<b>C-2</b> LITE EQUIPMENT DETAILS	SHEET NO. 5 OF 2
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DESIGNED BY	DBB
DRAWN BY	PLC
CHECKED BY	PLC

PROFESSIONAL ENGINEER	DATE	DESIGN	BY	CONSTRUCTION	CLIENT REVIEW
1	12/6/12	DES	PLC	CONSTRUCTION	CLIENT REVIEW
0	06/23/12	CLT	DES	CONSTRUCTION	CLIENT REVIEW

AT&T MOBILITY	
WIRELESS COMMUNICATIONS FACILITY LTE UPGRADE	
CT1025	
CORNWALL	
36 MOHAWK MOUNTAIN	
CORNWALL, CT 06753	

DATE:	10/21/12
SCALE:	AS NOTED
DWG NO.:	3200-0004

STRUCTURAL	
MOUNTING DETAILS	
S-1	





**AMERICAN TOWER®**  
CORPORATION

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## Structural Analysis Report

**Structure** : 65 ft Self Supported Tower  
**ATC Site Name** : Cornwall CT, CT  
**ATC Site Number** : 88009  
**Engineering Number** : 50492621  
**Proposed Carrier** : AT&T Mobility  
**Carrier Site Name** : Cornwall  
**Carrier Site Number** : 10035044 / CT1025  
**Site Location** : End of Mohawk Mountain Road  
Cornwall, CT 06759-4232  
41.821303,-73.296442  
**County** : Litchfield  
**Date** : September 21, 2012  
**Max Usage** : 96%  
**Result** : Pass

Esha Modi  
Project Engineer

*Esha Modi*



*9/21/12*



Eng. Number 50492621  
September 21, 2012

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Calculations .....	Attached



## Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 65 ft self supported tower to reflect the change in loading by AT&T Mobility.

## Supporting Documents

<b>Tower Drawings</b>	CSEI ATC #26472221 dated September 19, 2006
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## Analysis

The tower was analyzed using American Tower Corporation's tower analysis software. This program considers an elastic three-dimensional model and second-order effects per ANSI/EIA-222.

<b>Basic Wind Speed:</b>	80 mph (Fastest Mile)
<b>Basic Wind Speed w/ Ice:</b>	69 mph (Fastest Mile)w/ 1/2" radial ice concurrent
<b>Code:</b>	ANSI/TIA/EIA-222-F / 2003 IBC , Sec. 1609.1.1, Exception (4) & Sec. 3108.4 w/ 2005 CT Supplement & 2009 CT Amendment

## Conclusion

Based on the analysis results, the structure meets the requirements per the applicable codes listed above. The tower and foundation can support the equipment as described in this report.

If you have any questions or require additional information, please contact me via email at [esha.modi@americantower.com](mailto:esha.modi@americantower.com) or call 919-466-5017.



**Existing and Reserved Equipment**

Mount Elev. <sup>1</sup> (ft)	Qty.	Antenna	Mount Type	Coax (in)	Carrier	
75.0	3	EMS RR65-19-02DP	Platform w/ Handrails	(6) 7/8	Sprint Nextel	
72.0	1	8' Yagi		(2) 7/8	-	
	1	10' Dipole		(3) 7/8	Sprint Nextel	
70.0	3	Decibel DB809KE-XT		(12) 1 1/4	AT&T Mobility	
65.0	6	Powerwave TT19-08BP111-001		Pipe	(1) 7/8	US Treasury
	6	Allgon 7770.00A	Leg		(3) 1 1/4 Hybriflex	Sprint Nextel
57.0	1	Sinclair SV228-HF2SNM		Large Platform	-	Alltel
	3	RFS APXVSP18-C-A20			(12) 7/8	
	3	Alcatel-Lucent 800 MHz RRH	(3) 1/2			
3	Alcatel-Lucent RRH2x40 (700)	(12) 1 5/8				
50.0	4		10' HP Dish			
48.0	3		Decibel 776QNB120EXM	Platform	-	--
	46.5		6		Antel LPA-80063/6CF	
3		Antel BXA-70063/6CF-EDIN-X				
3		Antel BXA-171063/12CF				
6		RFS FD9R6004/2C-3L				
37.5	-	-				

**Proposed Equipment**

Elevation <sup>1</sup> (ft)		Qty.	Antenna	Mount Type	Coax (in)	Carrier
Mount	RAD					
65.0	65.0	3	KMW AM-X-CD-16-65-00T-RET	Platform w/ Handrails	(2) 0.78 AWG 6 (1) 3" Conduit (1) 0.39	AT&T Mobility
		6	Ericsson RRUS 11			
		1	Andrew ABT-DMDF-ADBH			

<sup>1</sup>Mount elevation is defined as height above bottom of steel structure to the bottom of mount, RAD elevation is defined as center of antenna above ground level (AGL).

Install proposed coax alongside existing AT&T Mobility coax.



**Structure Usages**

Structural Component	Controlling Usage	Pass/Fail
Legs	45%	Pass
Diagonals	96%	Pass
Horizontals	17%	Pass

**Foundations**

Reaction Component	Original Design Reactions	Analysis Reactions	% of Design
Uplift (Kips)	60.0	55.4	92%
Axial (Kips)	113.9	73.5	65%

The structure base reactions resulting from this analysis are less than those shown on the original structure drawings, therefore no modification or reinforcement of the foundation will be required.

**Deflection, Twist and Sway\***

Antenna Elevation (ft)	Deflection (ft)	Twist (°)	Sway (Rotation) (°)
65.0	0.121	0.002	0.412

\*Deflection, Twist and Sway was evaluated considering a design wind speed of 50 mph (Fastest Mile) per ANSI/TIA/EIA-222-F.



### Standard Conditions

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessary limited, to:

- Information supplied by the client regarding the structure itself, antenna, mounts and feed line loading on the structure and its components, or other relevant information.
- Information from drawings in the possession of American Tower Corporation, or generated by field inspections or measurements of the structure.

It is the responsibility of the client to ensure that the information provided to ATC Engineering Services and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and that their capacity has not significantly changed from the "as new" condition.

Unless explicitly agreed by both the client and American Tower Corporation, all services will be performed in accordance with the current revision of ANSI/TIA -222. The design basic wind speed will be determined based on the minimum basic wind speed as prescribed in ANSI/TIA-222. Although every effort is taken to ensure that the loading considered is adequate to meet the requirements of all applicable regulatory entities, we can provide no assurance to meet any other local and state codes or requirements. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement.

All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. ATC Engineering Services is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

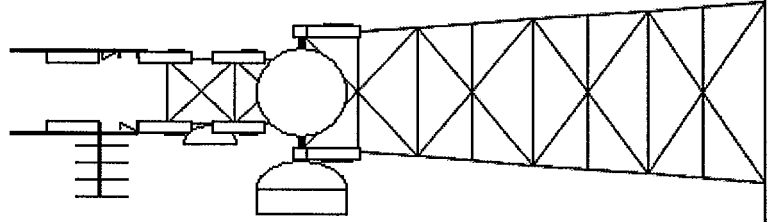
Copyright Semaan Engineering Solutions, Inc  
 Loads: 80 mph no ice  
 69 mph w/ 1/2" radial ice  
 50 mph no ice

Job Information		
Tower : 88009	Location : Cornwall CT, CT	Base Width : 19.72 ft
Code : TIA/EIA-222 Rev F	Shape : Square	Top Width : 7.00 ft
Client : AT&T Mobility		

Sections Properties			
Section	Leg Members	Diagonal Members	Horizontal Members
1 - 2	SAE 33 ksi 6X6X0.625	SAU 36 ksi 3X4X0.25	DAL 36 ksi 3X2.5X0.25
3	SAE 33 ksi 6X6X0.5	SAU 36 ksi 3.5X3X0.25	DAL 36 ksi 3.5X3X0.3125
4	SAE 33 ksi 6X6X0.5	SAE 36 ksi 3.5X3.5X0.25	DAL 36 ksi 3.5X3X0.3125
5	SAE 33 ksi 6X6X0.5		
6	SAE 33 ksi 6X6X0.5	SAU 36 ksi 3X2X0.25	DAL 36 ksi 2.5X2X0.25

Discrete Appurtenance		
Elev (ft)	Type	Qty Description
75.00	Panel	3 EMS RR65-19-02DP
72.00	Yagi	1 8' Yagi
72.00	Whip	1 10' Dipole
70.00	Whip	3 Decibel DB809KE-XT
65.01	Panel	1 Fire Warden Cab
65.00	Panel	3 KMMV AMX-CD-16-65-00T-RET
65.00	Panel	6 Ericsson RRUS TT
65.00	Panel	6 Powerwave TT19-08BP111-001
65.00	Panel	1 Andrew ABT-DMDF-ADBH
60.00	Dish	6 Alligon 7770.00A
57.00	Panel	1 Sinclair SV228-HF2SNM
57.00	Panel	3 RFS APXV/SP/18-C-420
57.00	Panel	3 Alcatel-Lucent 800 MHz RRH
50.00	Dish	3 Alcatel-Lucent RRH2x40 (700)
50.00	Dish	4 10" HP Dish
48.00	Platform	1 Large Flat Platform
48.00	Panel	3 Decibel 776QNB120EXM
46.50	Panel	6 Antel LPA-80063/6CF
46.50	Panel	3 Antel BXA-70063/6CF-EDIN-X
46.50	Panel	3 Antel BXA-171063/12CF
46.50	Platform	6 RFS FD9R6004/2C-3L
37.50	Platform	1 Platform

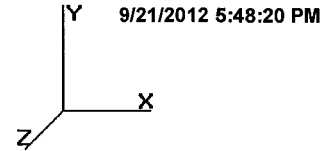
Linear Appurtenance			
Elev (ft)	From	To	Qty Description
0.000	75.000	6	7/8" Coax
0.000	72.000	2	7/8" Coax
0.000	70.000	3	7/8" Coax
0.000	65.000	1	Wave Guide
0.000	65.000	1	Climbing Ladder
0.000	65.000	1	3" Conduit
0.000	65.000	12	1 1/4" Coax
0.000	65.000	2	0.78" AWG 6
0.000	65.000	1	0.39" Cable
0.000	60.000	1	7/8" Coax
0.000	57.000	3	1 1/4" Hybriflex
0.000	48.000	12	7/8" Coax
0.000	48.000	3	1/2" Coax
0.000	46.500	12	1 5/8" Coax



65.00 Sect 6  
 50.10  
 37.50 Sect 4  
 25.00 Sect 3  
 12.50 Sect 2  
 Sect 1

Uplift 55.39 k Moment 1,770.85 ft-k  
 Vert 73.52 k Total Down 32.46 k  
 Horiz 16.06 k Total Shear 38.81 k

Site Number: 88009  
 Location: Cornwall CT, CT  
 Code: TIA/EIA-222 Rev F



Gh : 1.19

**Section Forces**

**LoadCase Normal No Ice 80.00 mph Wind Normal To Face with No Ice**

Allow Stress Inc: 1.333  
 Dead LF: 1.000  
 Wind LF: 1.000

Sect Seq	Height (ft)	Wind qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Rr	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Ice Weight (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)	Eff Face
6	57.55	19.21	34.57	22.50	0.00	0.55	1.97	1.00	1.00	0.72	50.83	3.72	0.00	2,922.5	0.0	2,296.63	170.93	2,467.56	1
5	50.05	18.45	4.30	0.17	0.00	1.00	2.10	1.00	1.00	1.00	4.48	0.02	0.00	338.7	0.0	207.37	1.10	42.99	1 **
4	43.75	17.76	36.30	38.13	0.00	0.45	2.16	1.00	1.00	0.67	61.94	3.13	0.00	4,078.5	0.0	2,837.63	132.59	2,970.22	1
3	31.25	16.38	38.14	43.00	0.00	0.43	2.20	1.00	1.00	0.67	66.74	3.13	0.00	4,314.8	0.0	2,870.45	122.33	2,992.78	1
2	18.75	16.38	41.41	43.00	0.00	0.40	2.28	1.00	1.00	0.65	69.42	3.13	0.00	4,427.8	0.0	3,099.39	122.33	3,221.72	1
1	6.25	16.38	43.57	43.00	0.00	0.37	2.37	1.00	1.00	0.64	71.06	3.13	0.00	4,673.4	0.0	3,293.83	122.33	3,416.16	1
														20,755.8	0.0			15,111.42	

\*\* = 2QzGhAg Controls

**LoadCase Normal Ice 69.28 mph Wind Normal To Face with Ice**

Allow Stress Inc: 1.333  
 Dead LF: 1.000  
 Wind LF: 1.000

Sect Seq	Height (ft)	Wind qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Rr	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Ice Weight (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)	Eff Face
6	57.55	14.40	34.57	50.20	26.99	0.81	1.85	1.00	1.00	0.91	80.09	3.72	1.24	4,523.3	1,600.8	2,545.43	153.83	2,699.26	1
5	50.05	13.84	4.30	1.04	0.80	1.00	2.10	1.00	1.00	1.00	5.34	0.02	0.01	426.9	88.2	185.49	0.99	32.24	1 **
4	43.75	13.32	36.30	76.05	37.30	0.68	1.84	1.00	1.00	0.80	97.39	3.13	1.04	6,327.2	2,248.7	2,850.01	119.33	2,969.33	1
3	31.25	12.29	38.14	84.56	40.90	0.65	1.85	1.00	1.00	0.79	104.75	3.13	1.04	6,734.0	2,419.1	2,848.57	110.09	2,958.66	1
2	18.75	12.29	41.41	85.00	41.31	0.60	1.90	1.00	1.00	0.75	105.38	3.13	1.04	6,929.8	2,502.0	2,941.68	110.09	3,051.77	1
1	6.25	12.29	43.57	85.45	41.72	0.55	1.97	1.00	1.00	0.72	105.44	3.13	1.04	7,288.0	2,614.6	3,042.21	110.09	3,152.30	1
														32,229.2	11,473.4			14,863.57	

\*\* = 2QzGhAg Controls

**LoadCase 45 deg No Ice 80.00 mph Wind at 45 deg From Face with No Ice**

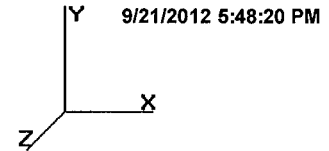
Allow Stress Inc: 1.333  
 Dead LF: 1.000  
 Wind LF: 1.000

Sect Seq	Height (ft)	Wind qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Rr	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Ice Weight (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)	Eff Face
6	57.55	19.21	34.57	22.50	0.00	0.55	1.97	1.20	1.20	0.72	61.00	3.72	0.00	2,922.5	0.0	2,755.96	170.93	2,926.88	1
5	50.05	18.45	4.30	0.17	0.00	1.00	2.10	1.20	1.20	1.00	5.37	0.02	0.00	338.7	0.0	248.85	1.10	42.99	1 **
4	43.75	17.76	36.30	38.13	0.00	0.45	2.16	1.20	1.20	0.67	74.33	3.13	0.00	4,078.5	0.0	3,405.16	132.59	3,537.75	1
3	31.25	16.38	38.14	43.00	0.00	0.43	2.20	1.20	1.20	0.67	80.09	3.13	0.00	4,314.8	0.0	3,444.54	122.33	3,566.87	1
2	18.75	16.38	41.41	43.00	0.00	0.40	2.28	1.20	1.20	0.65	83.30	3.13	0.00	4,427.8	0.0	3,719.27	122.33	3,841.59	1
1	6.25	16.38	43.57	43.00	0.00	0.37	2.37	1.20	1.20	0.64	85.27	3.13	0.00	4,673.4	0.0	3,952.59	122.33	4,074.92	1
														20,755.8	0.0			17,991.01	

\*\* = 2QzGhAg Controls



Site Number: 88009  
 Location: Cornwall CT, CT  
 Code: TIA/EIA-222 Rev F



Gh : 1.19

**Section Forces**

**LoadCase 45 deg Ice 69.28 mph Wind at 45 deg From Face with Ice**

Allow Stress Inc: 1.333  
 Dead LF: 1.000  
 Wind LF: 1.000

Sect Seq	Wind Height (ft)	Wind qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Rr	Eff Area (sqft)	Linear Area (sqft)	Ice		Struct Force (lb)	Linear Force (lb)	Total Force (lb)	Eff Face		
													Linear Area (sqft)	Total Weight (lb)					Weight Ice (lb)	
6	57.55	14.40	34.57	50.20	26.99	0.81	1.85	1.20	1.20	0.91	96.11	3.72	1.24	4,523.3	1,600.8	3,054.52	153.83	3,208.35	1	
5	50.05	13.84	4.30	1.04	0.80	1.00	2.10	1.20	1.20	1.00	6.41	0.02	0.01	426.9	88.2	222.59	0.99	32.24	1	**
4	43.75	13.32	36.30	76.05	37.30	0.68	1.84	1.20	1.20	0.80	116.87	3.13	1.04	6,327.2	2,248.7	3,420.01	119.33	3,539.34	1	
3	31.25	12.29	38.14	84.56	40.90	0.65	1.85	1.20	1.20	0.79	125.70	3.13	1.04	6,734.0	2,419.1	3,418.29	110.09	3,528.38	1	
2	18.75	12.29	41.41	85.00	41.31	0.60	1.90	1.20	1.20	0.75	126.45	3.13	1.04	6,929.8	2,502.0	3,530.01	110.09	3,640.10	1	
1	6.25	12.29	43.57	85.45	41.72	0.55	1.97	1.20	1.20	0.72	126.53	3.13	1.04	7,288.0	2,614.6	3,650.66	110.09	3,760.75	1	
													32,229.2	11,473.4			17,709.15			

\*\* = 2QzGhAg Controls

**LoadCase Normal 50.00 mph Wind Normal To Face with No Ice**

Allow Stress Inc: 1.333  
 Dead LF: 1.000  
 Wind LF: 1.000

Sect Seq	Wind Height (ft)	Wind qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Rr	Eff Area (sqft)	Linear Area (sqft)	Ice		Struct Force (lb)	Linear Force (lb)	Total Force (lb)	Eff Face		
													Linear Area (sqft)	Total Weight (lb)					Weight Ice (lb)	
6	57.55	7.50	34.57	22.50	0.00	0.55	1.97	1.00	1.00	0.72	50.83	3.72	0.00	2,922.5	0.0	897.12	66.77	963.89	1	
5	50.05	7.21	4.30	0.17	0.00	1.00	2.10	1.00	1.00	1.00	4.48	0.02	0.00	338.7	0.0	81.00	0.43	16.79	1	**
4	43.75	6.94	36.30	38.13	0.00	0.45	2.16	1.00	1.00	0.67	61.94	3.13	0.00	4,078.5	0.0	1,108.45	51.79	1,160.24	1	
3	31.25	6.40	38.14	43.00	0.00	0.43	2.20	1.00	1.00	0.67	66.74	3.13	0.00	4,314.8	0.0	1,121.27	47.78	1,169.05	1	
2	18.75	6.40	41.41	43.00	0.00	0.40	2.28	1.00	1.00	0.65	69.42	3.13	0.00	4,427.8	0.0	1,210.70	47.78	1,258.48	1	
1	6.25	6.40	43.57	43.00	0.00	0.37	2.37	1.00	1.00	0.64	71.06	3.13	0.00	4,673.4	0.0	1,286.65	47.78	1,334.44	1	
													20,755.8	0.0			5,902.90			

\*\* = 2QzGhAg Controls

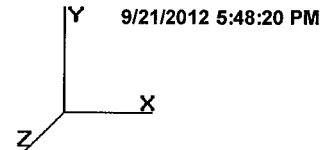
**LoadCase 45 deg 50.00 mph Wind at 45 deg From Face with No Ice**

Allow Stress Inc: 1.333  
 Dead LF: 1.000  
 Wind LF: 1.000

Sect Seq	Wind Height (ft)	Wind qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Rr	Eff Area (sqft)	Linear Area (sqft)	Ice		Struct Force (lb)	Linear Force (lb)	Total Force (lb)	Eff Face		
													Linear Area (sqft)	Total Weight (lb)					Weight Ice (lb)	
6	57.55	7.50	34.57	22.50	0.00	0.55	1.97	1.20	1.20	0.72	61.00	3.72	0.00	2,922.5	0.0	1,076.54	66.77	1,143.31	1	
5	50.05	7.21	4.30	0.17	0.00	1.00	2.10	1.20	1.20	1.00	5.37	0.02	0.00	338.7	0.0	97.21	0.43	16.79	1	**
4	43.75	6.94	36.30	38.13	0.00	0.45	2.16	1.20	1.20	0.67	74.33	3.13	0.00	4,078.5	0.0	1,330.14	51.79	1,381.93	1	
3	31.25	6.40	38.14	43.00	0.00	0.43	2.20	1.20	1.20	0.67	80.09	3.13	0.00	4,314.8	0.0	1,345.52	47.78	1,393.31	1	
2	18.75	6.40	41.41	43.00	0.00	0.40	2.28	1.20	1.20	0.65	83.30	3.13	0.00	4,427.8	0.0	1,452.84	47.78	1,500.62	1	
1	6.25	6.40	43.57	43.00	0.00	0.37	2.37	1.20	1.20	0.64	85.27	3.13	0.00	4,673.4	0.0	1,543.98	47.78	1,591.77	1	
													20,755.8	0.0			7,027.74			

\*\* = 2QzGhAg Controls

Site Number: 88009  
 Location: Cornwall CT, CT  
 Code: TIA/EIA-222 Rev F



### Tower Loading

#### Discrete Appurtenance Properties

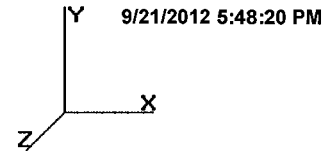
Attach Elev (ft)	Description	Qty	Weight (lb)	No Ice CaAa (sf)	CaAa Factor	Weight (lb)	Ice CaAa (sf)	CaAa Factor	Distance From Face (ft)	X Angle (deg)	Vert Ecc (ft)
75.00	EMS RR65-19-02DP	3	23.00	5.867	0.73	51.51	6.692	0.73	0.000	0.00	0.000
72.00	8' Yagi	1	30.00	12.000	1.00	127.20	21.590	1.00	0.000	0.00	0.000
72.00	10' Dipole	1	30.00	3.760	1.00	62.00	5.480	1.00	0.000	0.00	0.000
70.00	Decibel DB809KE-XT	3	37.50	3.660	1.00	64.00	4.920	1.00	0.000	0.00	6.100
65.01	Fire Warden Cab	1	1500.00	218.40	1.00	2000.00	320.00	1.00	0.000	0.00	0.000
65.00	KMW AM-X-CD-16-65-00T-	3	48.50	8.260	0.78	95.00	9.080	0.78	0.000	0.00	0.000
65.00	Ericsson RRUS 11	6	50.00	2.990	0.67	69.90	3.340	0.67	0.000	0.00	0.000
65.00	Powerwave TT19-08BP111-	6	16.00	0.640	0.50	21.80	0.820	0.50	0.000	0.00	0.000
65.00	Andrew ABT-DMDF-ADBH	1	1.10	0.050	1.00	1.80	0.110	1.00	0.000	0.00	0.000
65.00	Allgon 7770.00A	6	35.00	5.880	0.75	68.00	6.430	0.75	0.000	0.00	0.000
60.00	Sinclair SV228-HF2SNM	1	93.00	15.830	0.82	347.20	48.370	0.82	0.000	0.00	0.000
57.00	RFS APXSPP18-C-A20	3	57.00	8.260	0.82	106.50	9.080	0.82	0.000	0.00	0.000
57.00	Alcatel-Lucent 800 MHz RRH	3	53.00	2.490	0.92	74.10	2.820	0.92	0.000	0.00	0.000
57.00	Alcatel-Lucent RRH2x40 (700)	3	50.00	2.480	1.00	71.08	2.810	1.00	0.000	0.00	0.000
50.00	10' HP Dish	4	705.00	99.100	0.80	1310.00	100.75	0.80	0.000	0.00	0.000
50.00	Large Flat Platform	1	4000.00	75.000	1.00	4700.00	95.000	1.00	0.000	0.00	0.000
48.00	Decibel 776QNB120EXM	3	117.00	25.900	0.63	240.76	26.970	0.63	0.000	0.00	0.000
46.50	Antel LPA-80063/6CF	6	27.00	10.340	0.94	101.00	11.180	0.94	0.000	0.00	0.000
46.50	Antel BXA-70063/6CF-EDIN-X	3	17.00	7.730	0.74	58.00	8.540	0.74	0.000	0.00	0.000
46.50	Antel BXA-171063/12CF	3	15.00	4.790	0.88	42.40	5.460	0.88	0.000	0.00	0.000
46.50	RFS FD9R6004/2C-3L	6	2.00	0.360	0.50	6.00	0.570	0.50	0.000	0.00	1.180
37.50	Platform	1	1200.00	25.000	1.00	1500.00	32.000	1.00	0.000	0.00	0.000
<b>Totals</b>		<b>68</b>	<b>11708.10</b>			<b>17988.45</b>			<b>Number of Appurtenances : 22</b>		

#### Linear Appurtenance Properties

Elev From (ft)	Elev To (ft)	Description	Qty	Width (in)	Weight (lb/ft)	Pct In Wind	Spread On Faces	Bundling Arrangement
0.00	75.00	7/8" Coax	6	1.09	0.33	100.00	1	Separate
0.00	72.00	7/8" Coax	2	1.09	0.33	0.00	1	Separate
0.00	70.00	7/8" Coax	3	1.09	0.33	100.00	1	Separate
0.00	65.00	0.39" Cable	1	0.39	0.07	100.00	1	Separate
0.00	65.00	0.78" AWG6	2	0.78	0.59	100.00	1	Separate
0.00	65.00	1 1/4" Coax	12	1.55	0.63	0.00	1	Separate
0.00	65.00	3" Conduit	1	3.50	7.58	100.00	1	Separate
0.00	65.00	Climbing Ladder	1	3.00	4.00	100.00	Lin App	Separate
0.00	65.00	Wave Guide	1	3.00	5.00	100.00	1	Separate
0.00	60.00	7/8" Coax	1	1.09	0.33	100.00	1	Separate
0.00	57.00	1 1/4" Hybriflex	3	1.54	1.00	100.00	1	Separate
0.00	48.00	1/2" Coax	3	0.63	0.15	100.00	1	Separate
0.00	48.00	7/8" Coax	12	1.09	0.33	50.00	1	Separate
0.00	46.50	1 5/8" Coax	12	1.98	0.82	50.00	1	Separate

Site Number: 88009  
Location: Cornwall CT, CT

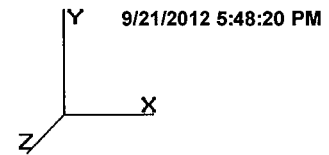
Code: TIA/EIA-222 Rev F



### Force/Stress Summary

Section: 1		1		Bot Elev (ft): 0.00				Height (ft): 12.500							
Max Compression Member		Force (kip)	Load Case	Len (ft)	Bracing %			Fa (ksi)	Member Cap Num		Num	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
					X	Y	Z	KL/R	(kip)	Bolts	Holes	(kip)	(kip)	%	
LEG	SAE - 6X6X0.625	-68.02	45 deg Ice	12.57	50	50	50	63.9	21.2	150.45	0	0	0.00	0.00	45 Member Z
HORIZ	DAL - 3X2.5X0.25	-3.56	Normal Ice	17.84	50	50	25	113.3	15.0	39.37	0	0	0.00	0.00	9 Member X
DIAG	SAU - 3X4X0.25	-7.20	Normal No Ice	22.57	50	50	50	212.0	4.4	7.49	0	0	0.00	0.00	96 Member Z
Max Tension Member		Force (kip)	Load Case	Fy (ksi)	Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls				
LEG	SAE - 6X6X0.625	49.25	45 deg No Ice	33	187.69	0	0	0.00	0.00	26	Member				
HORIZ	DAL - 3X2.5X0.25	3.45	Normal No Ice	36	75.74	0	0	0.00	0.00	4	Member				
DIAG	SAU - 3X4X0.25	8.31	45 deg Ice	36	48.67	0	0	0.00	0.00	17	Member				
Section: 2		1		Bot Elev (ft): 12.50				Height (ft): 12.500							
Max Compression Member		Force (kip)	Load Case	Len (ft)	Bracing %			Fa (ksi)	Member Cap Num		Num	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
					X	Y	Z	KL/R	(kip)	Bolts	Holes	(kip)	(kip)	%	
LEG	SAE - 6X6X0.625	-52.73	45 deg Ice	12.57	50	50	50	63.9	21.2	150.45	0	0	0.00	0.00	35 Member Z
HORIZ	DAL - 3X2.5X0.25	-1.80	Normal No Ice	15.96	50	50	25	101.3	17.1	44.91	0	0	0.00	0.00	4 Member X
DIAG	SAU - 3X4X0.25	-7.65	Normal No Ice	21.04	50	50	50	197.6	5.1	8.62	0	0	0.00	0.00	88 Member Z
Max Tension Member		Force (kip)	Load Case	Fy (ksi)	Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls				
LEG	SAE - 6X6X0.625	37.94	45 deg No Ice	33	187.69	0	0	0.00	0.00	20	Member				
HORIZ	DAL - 3X2.5X0.25	2.41	Normal No Ice	36	75.74	0	0	0.00	0.00	3	Member				
DIAG	SAU - 3X4X0.25	6.84	Normal No Ice	36	48.67	0	0	0.00	0.00	14	Member				
Section: 3		1		Bot Elev (ft): 25.00				Height (ft): 12.500							
Max Compression Member		Force (kip)	Load Case	Len (ft)	Bracing %			Fa (ksi)	Member Cap Num		Num	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
					X	Y	Z	KL/R	(kip)	Bolts	Holes	(kip)	(kip)	%	
LEG	SAE - 6X6X0.5	-37.70	45 deg Ice	12.57	50	50	50	63.9	21.2	121.67	0	0	0.00	0.00	30 Member Z
HORIZ	DAL - 3.5X3X0.3125	-2.37	Normal No Ice	14.08	50	50	25	76.8	20.9	81.04	0	0	0.00	0.00	2 Member X
DIAG	SAU - 3.5X3X0.25	-7.96	Normal No Ice	19.56	50	50	50	186.0	5.8	8.97	0	0	0.00	0.00	88 Member Z
Max Tension Member		Force (kip)	Load Case	Fy (ksi)	Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls				
LEG	SAE - 6X6X0.5	25.13	45 deg No Ice	33	151.78	0	0	0.00	0.00	16	Member				
HORIZ	DAL - 3.5X3X0.3125	3.64	Normal Ice	36	111.44	0	0	0.00	0.00	3	Member				
DIAG	SAU - 3.5X3X0.25	7.00	Normal No Ice	36	44.92	0	0	0.00	0.00	15	Member				

Site Number: 88009  
 Location: Cornwall CT, CT  
 Code: TIA/EIA-222 Rev F

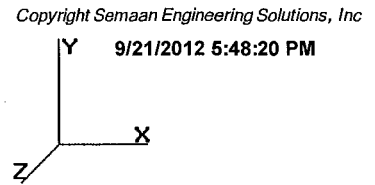


### Force/Stress Summary

Section: 4    1		Bot Elev (ft): 37.50						Height (ft): 12.500								
		Force		Len	Bracing %			Member				Shear Bear		Use		
Max Compression Member		(kip)	Load Case	(ft)	X	Y	Z	KL/R	Fa (ksi)	Cap (kip)	Num Bolts	Num Holes	Cap (kip)	Cap (kip)	%	Controls
LEG	SAE - 6X6X0.5	-22.32	45 deg Ice	12.55	50	50	50	63.8	21.2	121.74	0	0	0.00	0.00	18	Member Z
HORIZ	DAL - 3.5X3X0.3125	-2.03	Normal No Ice	12.50	50	50	25	68.2	22.2	85.74	0	0	0.00	0.00	2	Member X
DIAG	SAE - 3.5X3.5X0.25	-8.12	Normal No Ice	18.26	50	50	50	157.9	8.0	13.50	0	0	0.00	0.00	60	Member Z
Max Tension Member		(kip)	Load Case	Fy (ksi)	Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls					
LEG	SAE - 6X6X0.5	12.43	45 deg No Ice	33	151.78	0	0	0.00	0.00	8	Member					
HORIZ	DAL - 3.5X3X0.3125	2.28	Normal No Ice	36	111.44	0	0	0.00	0.00	2	Member					
DIAG	SAE - 3.5X3.5X0.25	7.18	Normal No Ice	36	48.67	0	0	0.00	0.00	14	Member					
Section: 5    1		Bot Elev (ft): 50.00						Height (ft): 0.100								
Max Compression Member		(kip)	Load Case	(ft)	X	Y	Z	KL/R	Fa (ksi)	Cap (kip)	Num Bolts	Num Holes	Cap (kip)	Cap (kip)	%	Controls
LEG	SAE - 6X6X0.5	-4.40	Normal No Ice	3.89	50	50	50	0.0	0.0	13,332.	0	0	0.00	0.00	0	User Input
HORIZ		0.00		0.000	0	0	0	0.0	0.0	0.00	0	0	0.00	0.00	0	
DIAG		0.00		0.000	0	0	0	0.0	0.0	0.00	0	0	0.00	0.00		
Max Tension Member		(kip)	Load Case	Fy (ksi)	Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls					
LEG	SAE - 6X6X0.5	3.54	Normal No Ice	33	13,332.	0	0	0.00	0.00	0	User Input					
HORIZ		0.00		0	0.00	0	0	0.00	0.00	0						
DIAG		0.00		0	0.00	0	0	0.00	0.00	0						
Section: 6    1		Bot Elev (ft): 50.10						Height (ft): 14.900								
Max Compression Member		(kip)	Load Case	(ft)	X	Y	Z	KL/R	Fa (ksi)	Cap (kip)	Num Bolts	Num Holes	Cap (kip)	Cap (kip)	%	Controls
LEG	SAE - 6X6X0.5	-9.16	45 deg No Ice	7.45	100	100	100	75.8	19.8	113.59	0	0	0.00	0.00	8	Member Z
HORIZ	DAL - 2.5X2X0.25	-1.94	45 deg Ice	7.000	100	100	100	198.1	5.1	10.80	0	0	0.00	0.00	17	Member Z
DIAG	SAU - 3X2X0.25	-0.15	Normal No Ice	10.22	50	75	50	160.3	7.7	9.22	0	0	0.00	0.00		
Max Tension Member		(kip)	Load Case	Fy (ksi)	Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls					
LEG	SAE - 6X6X0.5	5.57	45 deg No Ice	33	151.78	0	0	0.00	0.00	3	Member					
HORIZ	DAL - 2.5X2X0.25	0.67	Normal No Ice	36	61.34	0	0	0.00	0.00	1	Member					
DIAG	SAU - 3X2X0.25	3.92	Normal No Ice	36	34.27	0	0	0.00	0.00	11	Member					

Site Number: 88009  
 Location: Cornwall CT, CT

Code: TIA/EIA-222 Rev F



### Support Forces Summary

Load Case	Node	FX (kip)	FY (kip)	FZ (kip)	(-) = Uplift (+) = Down
45 deg	1c	-0.36	8.14	-2.18	
	1b	-3.19	-16.68	-3.18	
	1a	-2.18	8.09	-0.36	
	1	-4.99	32.91	-4.99	
Normal	1c	2.79	24.70	-4.41	
	1b	-0.98	-8.47	-2.60	
	1a	0.98	-8.47	-2.60	
	1	-2.79	24.70	-4.41	
45 deg Ice	1c	-3.69	12.62	-2.37	
	1b	-10.66	-48.43	-10.65	
	1a	-2.37	12.51	-3.69	
	1	-9.29	73.52	-9.30	
45 deg No Ice	1c	-2.34	8.18	-4.16	
	1b	-9.59	-55.39	-9.58	
	1a	-4.16	8.07	-2.34	
	1	-11.35	71.61	-11.36	
Normal Ice	1c	3.96	53.19	-7.81	
	1b	-5.29	-28.08	-9.16	
	1a	5.29	-28.08	-9.16	
	1	-3.96	53.19	-7.81	
Normal No Ice	1c	5.73	50.58	-9.88	
	1b	-3.92	-34.35	-8.09	
	1a	3.92	-34.35	-8.09	
	1	-5.73	50.58	-9.88	

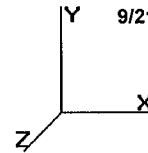
Max Uplift:	55.39 (kip)	Moment:	1,770.85 (ft-kip)	45 deg No Ice
Max Down:	73.52 (kip)	Total Down:	32.46 (kip)	
Max Shear:	16.06 (kip)	Total Shear:	38.81 (kip)	

Site Number: 88009  
 Location: Cornwall CT, CT

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### Deflections and Rotations

Load Case	Elevation (ft)	Deflection (ft)	Twist (deg)	Sway (deg)
50.00 mph Wind at 45 deg From Face with No Ice	37.50	0.0096	0.0131	0.2442
	50.00	0.0142	0.0078	0.8214
	57.55	0.0673	0.0024	0.6198
	65.00	0.1215	0.0016	0.4118
50.00 mph Wind Normal To Face with No Ice	37.50	0.0090	0.0113	0.1872
	50.00	0.0135	0.0064	0.6503
	57.55	0.0617	0.0026	0.4710
	65.00	0.1109	0.0015	0.3725
69.28 mph Wind at 45 deg From Face with Ice	37.50	0.0252	0.0229	0.5738
	50.00	0.0364	0.0108	1.9224
	57.55	0.1811	0.0162	1.6247
	65.00	0.3296	0.0097	1.1132
69.28 mph Wind Normal To Face with Ice	37.50	0.0231	0.0271	0.4195
	50.00	0.0340	0.0156	1.4533
	57.55	0.1657	0.0203	1.2400
	65.00	0.3000	0.0073	1.0007
80.00 mph Wind at 45 deg From Face with No Ice	37.50	0.0245	0.0269	0.5059
	50.00	0.0363	0.0140	1.6533
	57.55	0.1723	0.0128	1.4910
	65.00	0.3107	0.0079	1.0353
80.00 mph Wind Normal To Face with No Ice	37.50	0.0229	0.0306	0.3605
	50.00	0.0344	0.0211	1.2231
	57.55	0.1580	0.0152	1.1438
	65.00	0.2839	0.0075	0.9334
		0.0000	0.0000	0.0000



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Calculated Radio Frequency Emissions



at&t

CT1025

(Cornwall)

Mohawk Mountain Road, Cornwall, CT 06753

(a.k.a. 36 Mohawk Mountain Road)

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October 17, 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 Mohawk Mountain Road in Cornwall, CT. The coordinates of the tower are 41° 49' 16.69" N, 73° 17' 47.19" 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 ( $\text{mW}/\text{cm}^2$ ). 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:

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

Where:

EIRP = Effective Isotropic Radiated Power

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

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 <sup>2</sup> )	Limit	%MPE
Cingular UMTS	65	880	1	500	0.0426	0.5867	14.52%
Cingular GSM	65	880	4	296	0.1008	0.5867	
Cingular GSM	65	1900	2	427	0.0727	1.0000	
Verizon PCS	48	1900	6	305	0.2856	1.0000	
Verizon cellular	48	850	6	61	0.0064	0.5667	
Verizon	48	5400	1	0.61	0.0001	1.0000	
Verizon LTE	46.5	750	2	1005	0.3342	0.5000	
Sprint/Nextel iDEN	60	851	12	100	0.1199	0.5673	
Sprint/Nextel CDMA	60	1962	6	587	0.3518	1.0000	
AT&T UMTS	65	880	2	565	0.0096	0.5867	1.64%
AT&T UMTS	65	1900	2	875	0.0149	1.0000	1.49%
AT&T LTE	65	734	1	1313	0.0112	0.4893	2.28%
AT&T GSM	65	880	1	283	0.0024	0.5867	0.41%
AT&T GSM	65	1900	4	525	0.0179	1.0000	1.79%
						<b>Total</b>	<b>22.13%</b>

**Table 1: Carrier Information**<sup>1 2 3</sup>

As indicated in the CSC power density database from July 26, 2012, the 14.52% MPE value for the existing tower configuration is based upon the highest composite %MPE (measured plus calculated contribution of proposed LTE antennas) reported in Verizon's study dated April 30, 2012. Please note that this measurement portion of the composite %MPE value already includes the existing AT&T configuration. To ensure a conservative analysis, the calculated %MPE from AT&T's proposed configuration has been added to this previously reported value.

<sup>1</sup> The existing CSC filing for Cingular should be removed and replaced with the updated AT&T technologies and values provided in Table 1. 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.

<sup>2</sup> 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.

<sup>3</sup> Antenna height listed for AT&T is in reference to the American Tower Corporation Structural Analysis dated September 21, 2012.

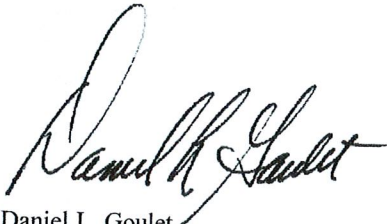
## 5. Conclusion

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 **22.13% 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 17, 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<sup>4</sup>**

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Time  E  <sup>2</sup> ,  H  <sup>2</sup> or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f <sup>2</sup> )*	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<sup>5</sup>**

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Time  E  <sup>2</sup> ,  H  <sup>2</sup> or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f <sup>2</sup> )*	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)**

<sup>4</sup> 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.

<sup>5</sup> 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.

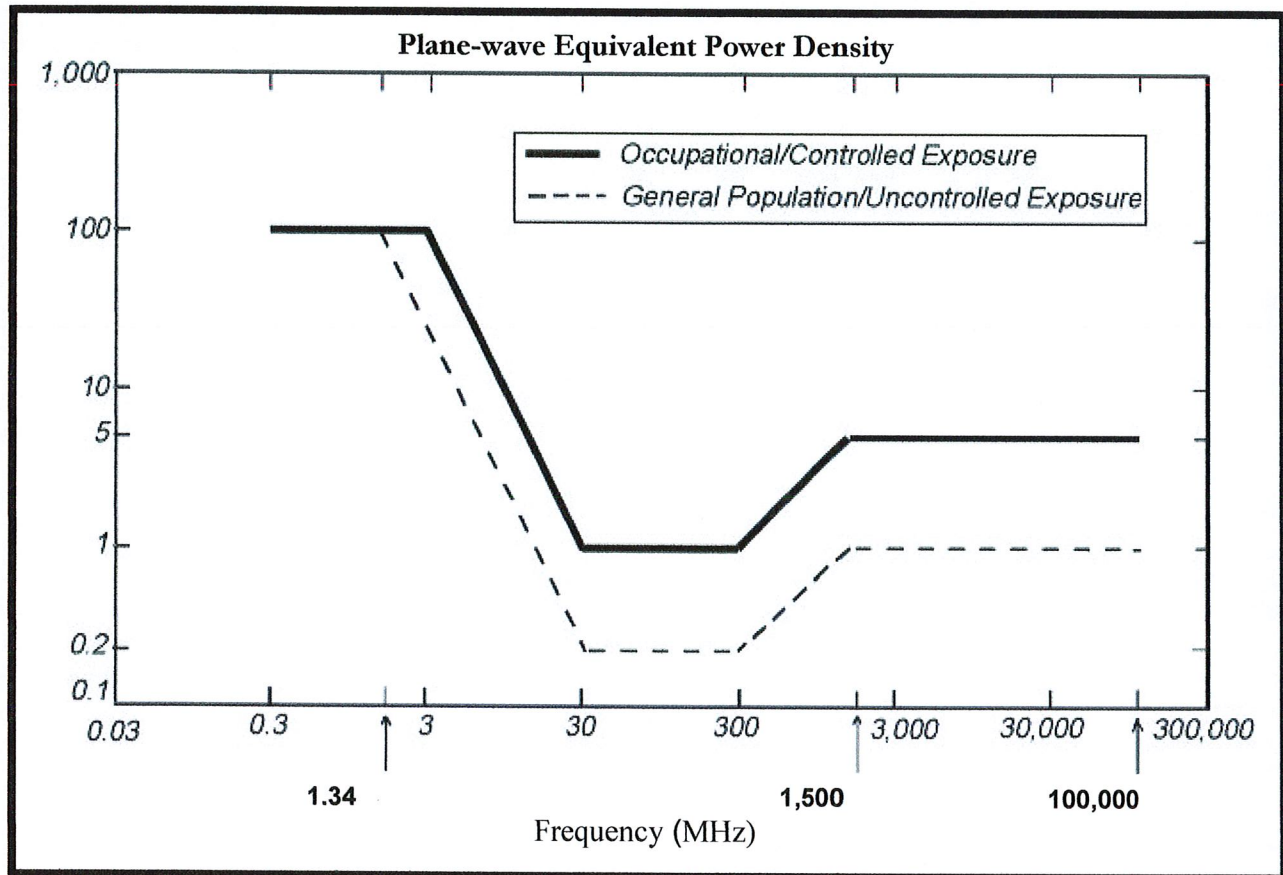
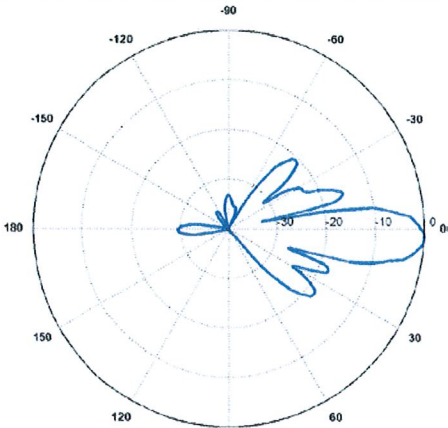
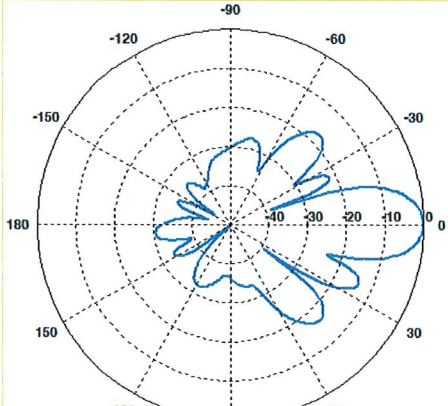


Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

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

<p><b>700 MHz</b></p> <p>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: ± 45°            Size L x W x D: 72.0" x 11.8" x 5.9"</p>	
<p><b>850 MHz</b></p> <p>Manufacturer: Powerwave            Model #: 7770.00            Frequency Band: 824-896 MHz            Gain: 11.5 dBd            Vertical Beamwidth: 15°            Horizontal Beamwidth: 82°            Polarization: ± 45°            Size L x W x D: 55" x 11.0" x 5.0"</p>	
<p><b>1900 MHz</b></p> <p>Manufacturer: Powerwave            Model #: 7770.00            Frequency Band: 1850-1990 MHz            Gain: 13.4 dBd            Vertical Beamwidth: 7°            Horizontal Beamwidth: 86°            Polarization: ± 45°            Size L x W x D: 55" x 11.0" x 5.0"</p>	