



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

November 23, 2012

Eric Dahl
Nexlink Global Services
55 Lynn Road
Ivoryton, CT 06442

RE: **EM-AT&T-041-121106** – AT&T Mobility notice of intent to modify an existing telecommunications facility located at 169 Nichols Road, East Haddam, Connecticut.

Dear Mr. Dahl:

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 November 5, 2012. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

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

closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Thank you for your attention and cooperation.

Very truly yours,

Handwritten signature of Linda Roberts in cursive, with the initials "LRAB" written in the upper right corner of the signature.

Linda Roberts
Executive Director

LR/CDM/cm

- c: The Honorable Mark B. Walter, First Selectman, Town of East Haddam
- Crary H. Brownell, Chm, Planning and Zoning Comm, Town of East Haddam



November 5, 2012

VIA OVERNIGHT DELIVERY

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



RE: AT&T Mobility – Notice of Exempt Modification
169 Nichols Road, East Haddam, CT (a.k.a 169 Trowbridge Road)

Dear Ms. Roberts:

This letter and attachments are submitted on behalf of AT&T Mobility (“AT&T”). AT&T is enhancing the capabilities of its wireless system in Connecticut by implementing LTE technology. In order to do so, AT&T will modify antenna and equipment configurations at a number of existing 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 attachments is being sent to the First Selectman of the Town of East Haddam.

AT&T plans to modify the existing facility at 169 Nichols Road, East Haddam, owned by Message Center Management (coordinates 41°31’16.6”N, -72°25’23.7”W). Attached are drawings depicting the planned changes, and documentation of the structural sufficiency of the tower to accommodate the revised antenna configuration. Also included is a power density calculation 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.The height of the overall structure will be unaffected. AT&T proposes to add three (3) new antennas, six (6) RRU's and one (1) surge arrester. Additionally, AT&T will install one (1) fiber cable and two (2) DC control cables within a 3" flex conduit inside the monopole.

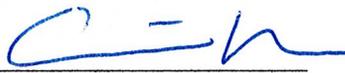
2.The proposed changes will not extend the site boundaries. AT&T will install additional equipment within its existing equipment shelter. Thus, there will be no effect on the site compound.

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 in the attached power density calculations, AT&T's operations at the site will result in a power density of 1.27%; the combined site operations will result in a total power density of 1.27%.

Please feel free to call me with any questions or concerns regarding this matter.
Thank you for your consideration.

Respectfully submitted,
AT&T Mobility

By: 

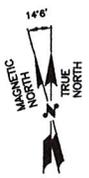
Eric Dahl, Consultant

edahl@comcast.net

860-227-1975

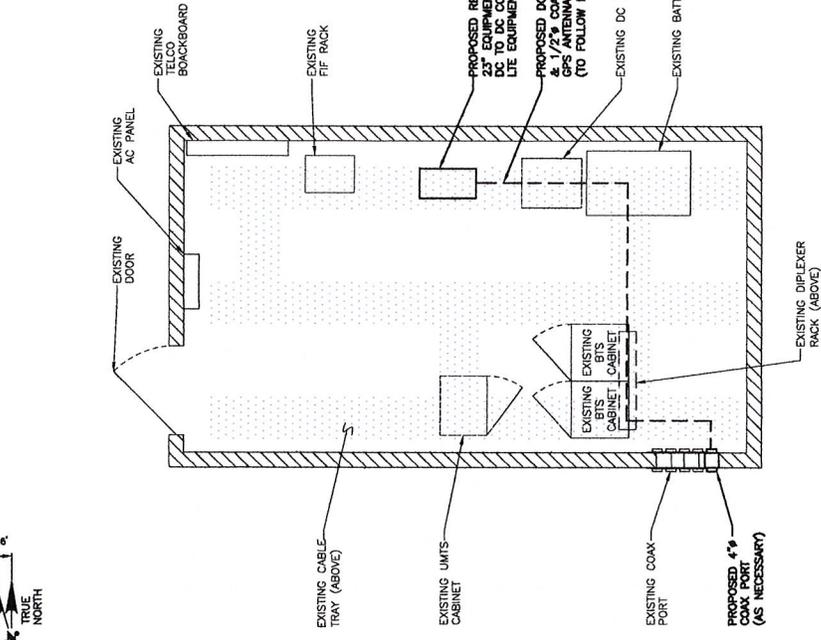
cc: Honorable Mark B. Walter, First Selectman, Town of East Haddam

Attachments

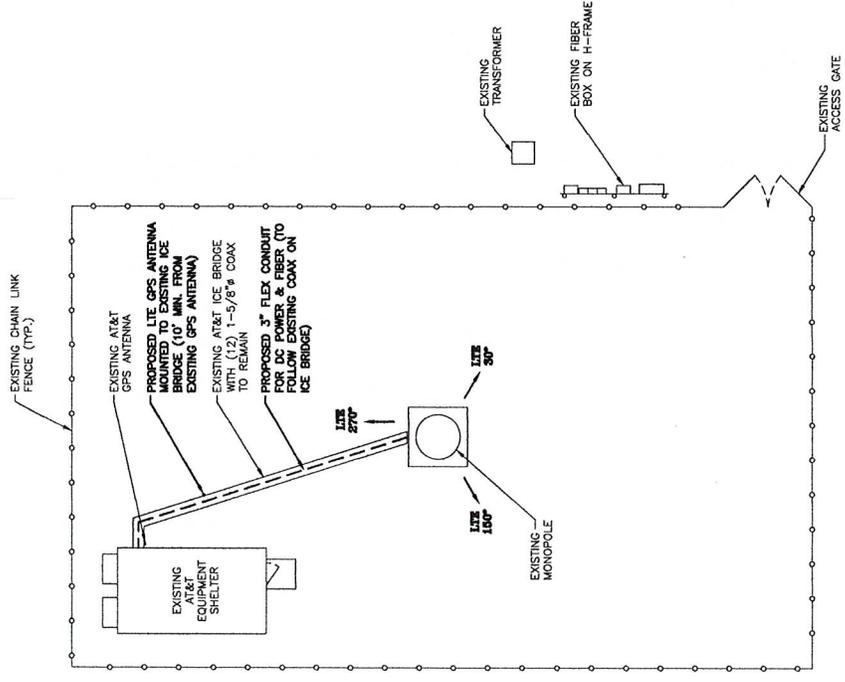


NOTE:
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:
REFER TO STRUCTURAL ANALYSIS REPORT DATED 08/28/13 BY HUNSDEN GROUP, LLC, DATED 08/28/13 FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.



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



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

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



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

SITE NUMBER: CT2271
SITE NAME: EAST HADDAM
169 NICHOLS ROAD
EAST HADDAM, CT 06423
MIDDLESEX COUNTY



AT&T	
COMPOUND AND EQUIPMENT PLAN (LIE)	
REV	DESCRIPTION
1	10/29/12 ISSUED FOR CONSTRUCTION
0	07/16/13 ISSUED FOR REVIEW
DATE	BY
REVISIONS	DESIGNED BY: DC
SCALE: AS SHOWN	DRAWN BY: RM
PROJECT NUMBER	2271.01
REV	1

STRUCTURAL ANALYSIS REPORT

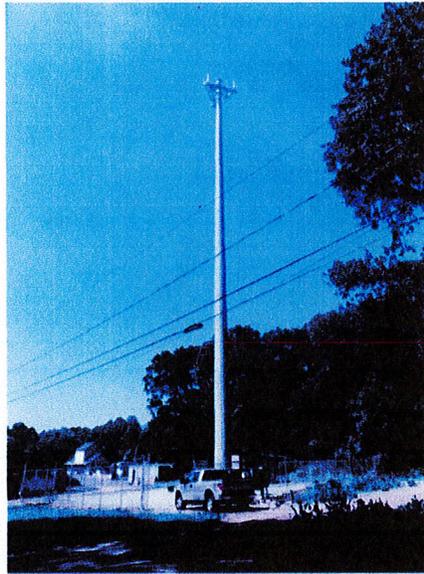
For

CT2271

EAST HADDAM

169 Nichols Road
East Haddam, CT 06423

Antennas Mounted to the Monopole



Prepared for:



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



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

Dated: October 26, 2012

Prepared by:

Hudson
Design Group LLC



1600 Osgood Street Building 20 North, Suite 3090
North Andover, MA 01845
Phone: (978) 557-5553

www.hudsondesigngroupllc.com



Gi Kai Wang 10/29/12



SCOPE OF WORK:

Hudson Design Group LLC (HDG) has been authorized by AT&T to conduct a structural evaluation of the 175' monopole supporting the proposed AT&T antennas located at elevation 167' above the ground level.

This report represents this office's findings, conclusions and recommendations pertaining to the support of AT&T's existing and proposed antennas listed below.

Record drawings of the existing monopole prepared by Pirod Inc., dated June 21, 2005 were available and obtained for our use. The previous structural analysis report prepared by URS Corporation, dated June 29, 2005 was also available and obtained for our use.

A limited visual survey of the structure in or near the areas of the Proposed Work was performed by this office on May 31, 2012.

CONCLUSION SUMMARY:

Based on our evaluation, we have determined that the existing monopole, anchor bolts, base plate and foundation **are in conformance** with the ANSI/TIA-222-F Standard for the loading considered under the criteria listed in this report. The monopole structure is rated at **50.4%** - (Pole Section L4 from El.0' to El.44.92' Controlling).



APPURTENANCES CONFIGURATION:

Tenant	Appurtenances	Elev.	Mount
	Lighting Rod	179'	Monopole
AT&T	(6) Powerwave 7770 Antennas	167'	Low Profile Platform
AT&T	(6) LGP 21400 TMA	167'	Low Profile Platform
AT&T	(6) LGP 21900	167'	Low Profile Platform
AT&T	SBNH-1D4545A Antenna	167'	Low Profile Platform
AT&T	(2)AM-X-CD-17-65 Antennas	167'	Low Profile Platform
AT&T	(6) RRHs	167'	Ring Mount
AT&T	Surge Arrestor DC6-48-60-18-8F	165'	Ring Mount

**Proposed AT&T Appurtenances shown in Bold.*

AT&T EXISTING/PROPOSED COAX CABLES:

Tenant	Coax Cables	Elev.	Mount
AT&T	(12) 1 5/8" Cables	167'	Inside Monopole
AT&T	Fiber Cable	167'	Inside Monopole
AT&T	(2) DC Power Cables	167'	Inside Monopole

**Proposed AT&T Coax Cables shown in Bold.*

ANALYSIS RESULTS SUMMARY:

Component	Max. Stress Ratio	Elev. of Component (ft)	Pass/Fail	Comments
Pole Section-L1	22.4 %	125.42 – 175	PASS	
Pole Section-L2	28.0 %	91.25 – 125.42	PASS	
Pole Section-L3	36.6 %	44.92 – 91.25	PASS	
Pole Section-L4	50.4 %	0 – 44.92	PASS	Controlling
Base Plate	48.7 %	0	PASS	



DESIGN CRITERIA:

1. Connecticut State Building Code
2. EIA/TIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures

City/Town: East Haddam
County: Middlesex
Wind Load: 90 mph (fastest mile)
 110 mph (3 second gust)
Nominal Ice Thickness: 1/2 inch

3. Approximate height above grade to proposed antennas: 167'-0"

***Calculations and referenced documents are attached.**

ASSUMPTIONS:

1. The geometry and material strength of the monopole, base plate, anchor bolts and foundation are as indicated in the record drawings prepared by Pirod Inc., dated June 21, 2005.
2. The monopole and foundation are properly constructed and maintained. All structural members and their connections are assumed to be in good condition and are free from defects with no deterioration to its member capacities.
3. The appurtenances configuration is as stated in this report. All antennas, coax cables and waveguide cables are assumed to be properly installed and supported as per the manufacturer requirements.
4. The support mounts and platforms are not analyzed and are considered adequate to support the loading. The analysis is limited to the primary support structure itself.
5. All prior structural modification, if any, are assumed to be as per the data supplied (if available), and installed properly.



SUPPORT RECOMMENDATIONS:

HDG recommends that the proposed antennas be mounted on the existing steel platform supported by the monopole; the proposed RRHs and surge arrestor be mounted on the proposed mount pipes.

Reference HDG's Latest Construction Drawings for all component and connection requirements (attached).

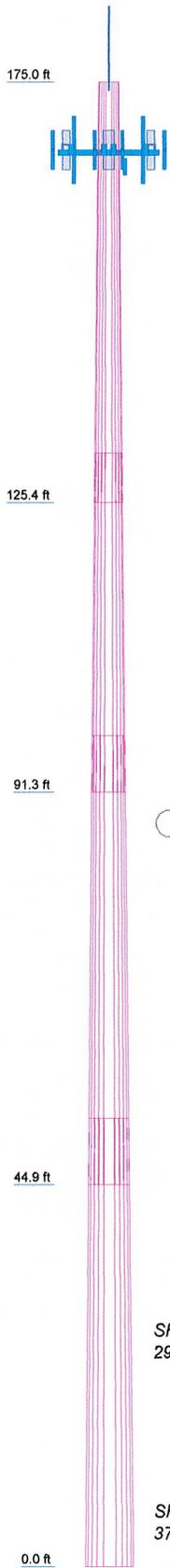


Photo 1: Photo illustrating the Monopole with Appurtenances shown.



CALCULATIONS

Length (ft)	52.75	53.00	40.00	49.58
Number of Sides	12	12	12	12
Thickness (in)	0.5000	0.5000	0.4375	0.3125
Socket Length (ft)	55.3428	7.83	6.67	5.83
Top Dia (in)	68.0000	45.5133	38.3845	28.5000
Bot Dia (in)	17678.0	58.2200	47.9900	40.4100
Grade		A572-65		
Weight (lb)	46596.1	14914.8	8197.2	5796.2



DESIGNED APPURTENANCE LOADING

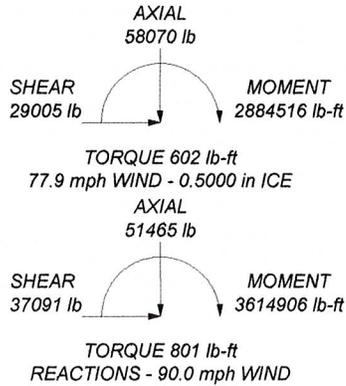
TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod w/Pipe Extension	179	(2) Powerwave LGP21900 (ATTI - existing)	167
PIROD 15' Low Profile Platform (ATTI - existing)	167	(2) Powerwave LGP21900 (ATTI - existing)	167
(2) Powerwave 7770 w/mount pipe (ATTI - existing)	167	SBNH-1D4545A w/mount pipe (ATTI - proposed)	167
(2) Powerwave 7770 w/mount pipe (ATTI - existing)	167	KMW AM-X-CD-17-65-00T-RET w/mount pipe (ATTI - proposed)	167
(2) Powerwave 7770 w/mount pipe (ATTI - existing)	167	KMW AM-X-CD-17-65-00T-RET w/mount pipe (ATTI - proposed)	167
(2) Powerwave TMA LGP21400 (ATTI - existing)	167	(2) Ericsson RRU (ATTI - proposed)	167
(2) Powerwave TMA LGP21400 (ATTI - existing)	167	(2) Ericsson RRU (ATTI - proposed)	167
(2) Powerwave TMA LGP21400 (ATTI - existing)	167	(2) Ericsson RRU (ATTI - proposed)	167
(2) Powerwave TMA LGP21400 (ATTI - existing)	167	Ring Mount (ATTI - proposed)	166
(2) Powerwave LGP21900 (ATTI - existing)	167	Surge Arrestor (DC6-48-60-18-8F) (ATTI - proposed)	165

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Middlesex County, Connecticut.
2. Tower designed for a 90.0 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 77.9 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 50.0 mph wind.
5. TOWER RATING: 50.4%



Hudson Design Group, LLC 1600 Osgood Street, Building 20 North, Suite 2-101 North Andover, MA 01845 Phone: (978) 557-5553 FAX: (978) 226-5586			Job: CT 2271 East Haddam, CT Project: 175 ft Monopole
Client: AT&T	Drawn by: kw	App'd:	
Code: TIA/EIA-222-F	Date: 10/26/12	Scale:	
Path: C:\Users\kwanj\Documents\Hudson\AAACT 2271 - MP (AT&T)\CT 2271\GT 2271.dwg		Dwg N	

<p>tnxTower</p> <p>Hudson Design Group, LLC 1600 Osgood Street, Building 20 North, Suite 2-101 North Andover, MA 01845 Phone: (978) 557-5553 FAX: (978) 226-5586</p>	Job CT 2271 East Haddam, CT	Page 1 of 7
	Project 175 ft Monopole	Date 09:28:58 10/26/12
	Client AT&T	Designed by kw

Tower Input Data

There is a pole section.

This tower is designed using the TIA/EIA-222-F standard.

The following design criteria apply:

Tower is located in Middlesex County, Connecticut.

Basic wind speed of 90.0 mph.

Nominal ice thickness of 0.5000 in.

Ice density of 56.0 pcf.

A wind speed of 77.9 mph is used in combination with ice.

Temperature drop of 50.0 °F.

Deflections calculated using a wind speed of 50.0 mph.

A non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

Stress ratio used in pole design is 1.333.

Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	175.00-125.42	49.58	5.83	12	28.5000	40.4100	0.3125	1.2500	A572-65 (65 ksi)
L2	125.42-91.25	40.00	6.67	12	38.3845	47.9900	0.4375	1.7500	A572-65 (65 ksi)
L3	91.25-44.92	53.00	7.83	12	45.5133	58.2200	0.5000	2.0000	A572-65 (65 ksi)
L4	44.92-0.00	52.75		12	55.3428	68.0000	0.5000	2.0000	A572-65 (65 ksi)

Monopole Base Plate Data

Base Plate Data	
Base plate is square	
Base plate is grouted	
Anchor bolt grade	A615-75
Anchor bolt size	2.2500 in
Number of bolts	28
Embedment length	85.7500 in
f_c	4.0 ksi
Grout space	3.0000 in
Base plate grade	A572-50
Base plate thickness	3.2500 in
Bolt circle diameter	75.8300 in
Outer diameter	81.8300 in
Inner diameter	48.0000 in
Base plate type	Plain Plate

<p>tnxTower</p> <p>Hudson Design Group, LLC 1600 Osgood Street, Building 20 North, Suite 2-101 North Andover, MA 01845 Phone: (978) 557-5553 FAX: (978) 226-5586</p>	Job CT 2271 East Haddam, CT	Page 2 of 7
	Project 175 ft Monopole	Date 09:28:58 10/26/12
	Client AT&T	Designed by kw

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C _{AA}		Weight plf
						No Ice	1/2" Ice	
7/8	A	No	Inside Pole	175.00 - 7.00	1	No Ice 1/2" Ice	0.00 0.00	0.54 0.54
1 5/8 (AT&T - existing) *****	A	No	Inside Pole	167.00 - 7.00	12	No Ice 1/2" Ice	0.00 0.00	1.04 1.04
FB-L98B-002 (AT&T - proposed)	A	No	Inside Pole	167.00 - 7.00	1	No Ice 1/2" Ice	0.00 0.00	0.25 0.25
WR-VG122ST-BRDA (AT&T - proposed)	A	No	Inside Pole	167.00 - 7.00	2	No Ice 1/2" Ice	0.00 0.00	0.25 0.25

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment °	Placement ft	C _{AA}		Weight lb
			Horz Lateral ft	Vert ft	Front ft ²			Side ft ²		
Lightning Rod w/Pipe Extension	A	From Leg	1.00 0.00 0.00	0.0000	179.00	No Ice 1/2" Ice	2.58 4.02	2.58 4.02	51.50 76.29	
***** PiROD 15' Low Profile Platform (AT&T - existing)	A	None		0.0000	167.00	No Ice 1/2" Ice	17.30 22.10	17.30 22.10	1500.00 2030.00	
(2) Powerwave 7770 w/mount pipe (AT&T - existing)	A	From Leg	3.50 0.00 0.00	0.0000	167.00	No Ice 1/2" Ice	6.02 6.47	4.10 4.75	57.25 101.14	
(2) Powerwave 7770 w/mount pipe (AT&T - existing)	B	From Leg	3.50 0.00 0.00	0.0000	167.00	No Ice 1/2" Ice	6.02 6.47	4.10 4.75	57.25 101.14	
(2) Powerwave 7770 w/mount pipe (AT&T - existing)	C	From Leg	3.50 0.00 0.00	0.0000	167.00	No Ice 1/2" Ice	6.02 6.47	4.10 4.75	57.25 101.14	
(2) Powerwave TMA LGP21400 (AT&T - existing)	A	From Leg	3.50 0.00 0.00	0.0000	167.00	No Ice 1/2" Ice	1.23 1.38	0.41 0.52	14.10 21.29	
(2) Powerwave TMA LGP21400 (AT&T - existing)	B	From Leg	3.50 0.00 0.00	0.0000	167.00	No Ice 1/2" Ice	1.23 1.38	0.41 0.52	14.10 21.29	
(2) Powerwave TMA LGP21400 (AT&T - existing)	C	From Leg	3.50 0.00 0.00	0.0000	167.00	No Ice 1/2" Ice	1.23 1.38	0.41 0.52	14.10 21.29	
(2) Powerwave LGP21900 (AT&T - existing)	A	From Leg	3.50 0.00 0.00	0.0000	167.00	No Ice 1/2" Ice	0.23 0.30	0.12 0.17	5.50 7.70	
(2) Powerwave LGP21900 (AT&T - existing)	B	From Leg	3.50 0.00 0.00	0.0000	167.00	No Ice 1/2" Ice	0.23 0.30	0.12 0.17	5.50 7.70	
(2) Powerwave LGP21900 (AT&T - existing)	C	From Leg	3.50 0.00 0.00	0.0000	167.00	No Ice 1/2" Ice	0.23 0.30	0.12 0.17	5.50 7.70	

<p>tnxTower</p> <p>Hudson Design Group, LLC 1600 Osgood Street, Building 20 North, Suite 2-101 North Andover, MA 01845 Phone: (978) 557-5553 FAX: (978) 226-5586</p>	Job CT 2271 East Haddam, CT	Page 3 of 7
	Project 175 ft Monopole	Date 09:28:58 10/26/12
	Client AT&T	Designed by kw

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _A A ₁ Front ft ²	C _A A ₂ Side ft ²	Weight lb
*****			0.00						
SBNH-1D4545A w/mount pipe (AT&T - proposed)	A	From Leg	3.50 0.00 0.00	0.0000	167.00	No Ice 1/2" Ice	9.23 9.82	5.43 6.30	61.90 124.53
KMW AM-X-CD-17-65-00T-RET w/mount pipe (AT&T - proposed)	B	From Leg	3.50 0.00 0.00	0.0000	167.00	No Ice 1/2" Ice	11.60 12.32	9.39 10.90	111.61 198.07
KMW AM-X-CD-17-65-00T-RET w/mount pipe (AT&T - proposed)	C	From Leg	3.50 0.00 0.00	0.0000	167.00	No Ice 1/2" Ice	11.60 12.32	9.39 10.90	111.61 198.07
(2) Ericsson RRU (AT&T - proposed)	A	From Leg	1.00 0.00 0.00	0.0000	167.00	No Ice 1/2" Ice	2.07 2.26	1.08 1.23	44.00 58.64
(2) Ericsson RRU (AT&T - proposed)	B	From Leg	1.00 0.00 0.00	0.0000	167.00	No Ice 1/2" Ice	2.07 2.26	1.08 1.23	44.00 58.64
(2) Ericsson RRU (AT&T - proposed)	C	From Leg	1.00 0.00 0.00	0.0000	167.00	No Ice 1/2" Ice	2.07 2.26	1.08 1.23	44.00 58.64
Surge Arrestor (DC6-48-60-18-8F) (AT&T - proposed)	B	From Leg	1.00 0.00 0.00	0.0000	165.00	No Ice 1/2" Ice	1.27 1.46	1.27 1.46	20.00 35.12
Ring Mount (AT&T - proposed)	A	None		0.0000	166.00	No Ice 1/2" Ice	1.40 2.40	1.40 2.40	90.00 130.00

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 60 deg - No Ice
5	Dead+Wind 90 deg - No Ice
6	Dead+Wind 120 deg - No Ice
7	Dead+Wind 150 deg - No Ice
8	Dead+Wind 180 deg - No Ice
9	Dead+Wind 210 deg - No Ice
10	Dead+Wind 240 deg - No Ice
11	Dead+Wind 270 deg - No Ice
12	Dead+Wind 300 deg - No Ice
13	Dead+Wind 330 deg - No Ice
14	Dead+Ice+Temp
15	Dead+Wind 0 deg+Ice+Temp
16	Dead+Wind 30 deg+Ice+Temp
17	Dead+Wind 60 deg+Ice+Temp
18	Dead+Wind 90 deg+Ice+Temp
19	Dead+Wind 120 deg+Ice+Temp
20	Dead+Wind 150 deg+Ice+Temp

<p>tnxTower</p> <p>Hudson Design Group, LLC 1600 Osgood Street, Building 20 North, Suite 2-101 North Andover, MA 01845 Phone: (978) 557-5553 FAX: (978) 226-5586</p>	Job CT 2271 East Haddam, CT	Page 4 of 7
	Project 175 ft Monopole	Date 09:28:58 10/26/12
	Client AT&T	Designed by kw

Comb. No.	Description
21	Dead+Wind 180 deg+Ice+Temp
22	Dead+Wind 210 deg+Ice+Temp
23	Dead+Wind 240 deg+Ice+Temp
24	Dead+Wind 270 deg+Ice+Temp
25	Dead+Wind 300 deg+Ice+Temp
26	Dead+Wind 330 deg+Ice+Temp
27	Dead+Wind 0 deg - Service
28	Dead+Wind 30 deg - Service
29	Dead+Wind 60 deg - Service
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	21	58070.36	0.00	-29004.51
	Max. H _x	11	51465.38	37001.96	-0.00
	Max. H _z	2	51465.38	-0.00	37090.58
	Max. M _x	2	3614603.00	-0.00	37090.58
	Max. M _z	5	3599726.45	-37001.96	-0.00
	Max. Torsion	11	801.21	37001.96	-0.00
	Min. Vert	1	51465.38	0.00	0.00
	Min. H _x	5	51465.38	-37001.96	-0.00
	Min. H _z	8	51465.38	-0.00	-37090.58
	Min. M _x	8	-3614905.58	-0.00	-37090.58
	Min. M _z	11	-3599644.95	37001.96	-0.00
	Min. Torsion	5	-801.21	-37001.96	-0.00

Tower Mast Reaction Summary

Load Combination	Vertical lb	Shear _x lb	Shear _z lb	Overturning Moment, M _x lb-ft	Overturning Moment, M _z lb-ft	Torque lb-ft
Dead Only	51465.38	0.00	0.00	147.22	-39.62	0.00
Dead+Wind 0 deg - No Ice	51465.38	0.00	-37090.58	-3614603.00	-40.61	138.52
Dead+Wind 30 deg - No Ice	51465.38	18500.98	-32121.38	-3130319.64	-1799880.37	520.63
Dead+Wind 60 deg - No Ice	51465.38	32044.64	-18545.29	-1807229.35	-3117458.01	763.18
Dead+Wind 90 deg - No Ice	51465.38	37001.96	0.00	150.42	-3599726.45	801.21
Dead+Wind 120 deg - No Ice	51465.38	32044.64	18545.29	1807530.64	-3117458.77	624.54
Dead+Wind 150 deg - No Ice	51465.38	18500.98	32121.38	3130621.79	-1799881.12	280.56
Dead+Wind 180 deg - No Ice	51465.38	0.00	37090.58	3614905.58	-40.61	-138.52
Dead+Wind 210 deg - No Ice	51465.38	-18500.98	32121.38	3130621.67	1799799.83	-520.49
Dead+Wind 240 deg - No Ice	51465.38	-32044.64	18545.29	1807530.52	3117377.33	-763.07

<p>tnxTower</p> <p>Hudson Design Group, LLC 1600 Osgood Street, Building 20 North, Suite 2-101 North Andover, MA 01845 Phone: (978) 557-5553 FAX: (978) 226-5586</p>	Job CT 2271 East Haddam, CT	Page 5 of 7
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Load Combination	Vertical	Shear _x	Shear _y	Overturning Moment, M _x	Overturning Moment, M _y	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
Dead+Wind 270 deg - No Ice	51465.38	-37001.96	0.00	150.42	3599644.95	-801.21
Dead+Wind 300 deg - No Ice	51465.38	-32044.64	-18545.29	-1807229.24	3117376.57	-624.66
Dead+Wind 330 deg - No Ice	51465.38	-18500.98	-32121.38	-3130319.52	1799799.07	-280.70
Dead+Ice+Temp	58070.36	0.00	0.00	223.89	-69.57	0.00
Dead+Wind 0 deg+Ice+Temp	58070.36	-0.00	-29004.51	-2884052.73	-71.95	119.26
Dead+Wind 30 deg+Ice+Temp	58070.36	14458.26	-25118.63	-2497633.60	-1434704.95	404.17
Dead+Wind 60 deg+Ice+Temp	58070.36	25042.45	-14502.25	-1441913.09	-2484931.53	580.74
Dead+Wind 90 deg+Ice+Temp	58070.36	28916.55	-0.00	231.15	-2869341.65	601.64
Dead+Wind 120 deg+Ice+Temp	58070.36	25042.45	14502.25	1442375.70	-2484932.07	461.33
Dead+Wind 150 deg+Ice+Temp	58070.36	14458.26	25118.63	2498096.83	-1434705.49	197.46
Dead+Wind 180 deg+Ice+Temp	58070.36	-0.00	29004.51	2884516.26	-71.95	-119.26
Dead+Wind 210 deg+Ice+Temp	58070.36	-14458.26	25118.63	2498096.73	1434561.54	-404.02
Dead+Wind 240 deg+Ice+Temp	58070.36	-25042.45	14502.25	1442375.61	2484788.01	-580.59
Dead+Wind 270 deg+Ice+Temp	58070.36	-28916.55	-0.00	231.15	2869197.54	-601.64
Dead+Wind 300 deg+Ice+Temp	58070.36	-25042.45	-14502.25	-1441913.00	2484787.47	-461.48
Dead+Wind 330 deg+Ice+Temp	58070.36	-14458.26	-25118.63	-2497633.51	1434561.00	-197.61
Dead+Wind 0 deg - Service	51465.38	0.00	-11447.71	-1115699.61	-40.81	42.82
Dead+Wind 30 deg - Service	51465.38	5710.18	-9914.01	-966203.96	-555639.32	160.91
Dead+Wind 60 deg - Service	51465.38	9890.32	-5723.85	-557774.13	-962365.79	235.88
Dead+Wind 90 deg - Service	51465.38	11420.36	0.00	151.57	-1111238.08	247.65
Dead+Wind 120 deg - Service	51465.38	9890.32	5723.85	558077.31	-962365.86	193.05
Dead+Wind 150 deg - Service	51465.38	5710.18	9914.01	966507.22	-555639.39	86.74
Dead+Wind 180 deg - Service	51465.38	0.00	11447.71	1116002.91	-40.81	-42.82
Dead+Wind 210 deg - Service	51465.38	-5710.18	9914.01	966507.21	555557.78	-160.90
Dead+Wind 240 deg - Service	51465.38	-9890.32	5723.85	558077.30	962284.23	-235.87
Dead+Wind 270 deg - Service	51465.38	-11420.36	0.00	151.57	1111156.44	-247.65
Dead+Wind 300 deg - Service	51465.38	-9890.32	-5723.85	-557774.12	962284.16	-193.07
Dead+Wind 330 deg - Service	51465.38	-5710.18	-9914.01	-966203.95	555557.70	-86.75

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	
1	0.00	-51465.38	0.00	0.00	51465.38	0.00	0.000%
2	0.00	-51465.38	-37090.58	-0.00	51465.38	37090.58	0.000%
3	18500.98	-51465.38	-32121.38	-18500.98	51465.38	32121.38	0.000%
4	32044.64	-51465.38	-18545.29	-32044.64	51465.38	18545.29	0.000%
5	37001.96	-51465.38	0.00	-37001.96	51465.38	-0.00	0.000%
6	32044.64	-51465.38	18545.29	-32044.64	51465.38	-18545.29	0.000%
7	18500.98	-51465.38	32121.38	-18500.98	51465.38	-32121.38	0.000%
8	0.00	-51465.38	37090.58	-0.00	51465.38	-37090.58	0.000%
9	-18500.98	-51465.38	32121.38	18500.98	51465.38	-32121.38	0.000%
10	-32044.64	-51465.38	18545.29	32044.64	51465.38	-18545.29	0.000%
11	-37001.96	-51465.38	0.00	37001.96	51465.38	-0.00	0.000%
12	-32044.64	-51465.38	-18545.29	32044.64	51465.38	18545.29	0.000%
13	-18500.98	-51465.38	-32121.38	18500.98	51465.38	32121.38	0.000%
14	0.00	-58070.36	0.00	0.00	58070.36	0.00	0.000%
15	0.00	-58070.36	-29004.49	0.00	58070.36	29004.51	0.000%
16	14458.26	-58070.36	-25118.63	-14458.26	58070.36	25118.63	0.000%
17	25042.45	-58070.36	-14502.25	-25042.45	58070.36	14502.25	0.000%
18	28916.53	-58070.36	0.00	-28916.55	58070.36	0.00	0.000%
19	25042.45	-58070.36	14502.25	-25042.45	58070.36	-14502.25	0.000%
20	14458.26	-58070.36	25118.63	-14458.26	58070.36	-25118.63	0.000%
21	0.00	-58070.36	29004.49	0.00	58070.36	-29004.51	0.000%
22	-14458.26	-58070.36	25118.63	14458.26	58070.36	-25118.63	0.000%
23	-25042.45	-58070.36	14502.25	25042.45	58070.36	-14502.25	0.000%

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Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	
24	-28916.53	-58070.36	0.00	28916.55	58070.36	0.00	0.000%
25	-25042.45	-58070.36	-14502.25	25042.45	58070.36	14502.25	0.000%
26	-14458.26	-58070.36	-25118.63	14458.26	58070.36	25118.63	0.000%
27	0.00	-51465.38	-11447.71	-0.00	51465.38	11447.71	0.000%
28	5710.18	-51465.38	-9914.01	-5710.18	51465.38	9914.01	0.000%
29	9890.32	-51465.38	-5723.85	-9890.32	51465.38	5723.85	0.000%
30	11420.36	-51465.38	0.00	-11420.36	51465.38	-0.00	0.000%
31	9890.32	-51465.38	5723.85	-9890.32	51465.38	-5723.85	0.000%
32	5710.18	-51465.38	9914.01	-5710.18	51465.38	-9914.01	0.000%
33	0.00	-51465.38	11447.71	-0.00	51465.38	-11447.71	0.000%
34	-5710.18	-51465.38	9914.01	5710.18	51465.38	-9914.01	0.000%
35	-9890.32	-51465.38	5723.85	9890.32	51465.38	-5723.85	0.000%
36	-11420.36	-51465.38	0.00	11420.36	51465.38	-0.00	0.000%
37	-9890.32	-51465.38	-5723.85	9890.32	51465.38	5723.85	0.000%
38	-5710.18	-51465.38	-9914.01	5710.18	51465.38	9914.01	0.000%

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	175 - 125.42	13.8115	33	0.6372	0.0010
L2	131.25 - 91.25	8.2110	33	0.5510	0.0004
L3	97.92 - 44.92	4.7312	33	0.4322	0.0002
L4	52.75 - 0	1.4514	33	0.2451	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
179.00	Lightning Rod w/Pipe Extension	33	13.8115	0.6372	0.0010	136877
167.00	PiROD 15' Low Profile Platform	33	12.7441	0.6249	0.0009	85548
166.00	Ring Mount	33	12.6112	0.6233	0.0009	76043
165.00	Surge Arrestor (DC6-48-60-18-8F)	33	12.4784	0.6217	0.0008	68438

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P _{allow} lb	% Capacity	Pass Fail	
L1	175 - 125.42	Pole	TP40.41x28.5x0.3125	1	-7800.84	1995780.85	22.4	Pass	
L2	125.42 - 91.25	Pole	TP47.99x38.3845x0.4375	2	-15669.20	3365278.33	28.0	Pass	
L3	91.25 - 44.92	Pole	TP58.22x45.5133x0.5	3	-30336.10	4673991.02	36.6	Pass	
L4	44.92 - 0	Pole	TP68x55.3428x0.5	4	-51452.90	5315017.36	50.4	Pass	
Summary									
							Pole (L4)	50.4	Pass
							Base Plate	48.7	Pass

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Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P _{allow} lb	% Capacity	Pass Fail
RATING =							50.4	Pass

DATE: 10/26/2012
Project Name: CT2271
Project No.: _____
Design By: KW Chk'd By: _____ Page 1 of 1



MONOPOLE FOUNDATION WAS DESIGNED BY PIROD INC, DATED 6/21/2005.

THE EXISTING FOUNDATION HAS 31' X 31' X 3' THICK CONCRETE FOOTING WITH 8'-6" DIAMETER CONCRETE PIER.

(NOTE: THE AS-BUILT PIER SIZE IS 8' X 8')

THE FOUNDATION WAS DESIGNED FOR THE FOLLOWING BASE REACTIONS:

MOMENT = 89747 in-kips = 7479 ft-kips

SHEAR = 54.1 kips

VERTICAL = 77.7 kips

BASE REACTIONS OF THE MONOPOLE WITH PROPOSED AT&T ANTENNAS:

MOMENT = 3415 ft-kips < 7479 ft-kips

SHEAR = 37.1 kips < 54.1 kips OK

VERTICAL = 51.5 kips < 77.7 kips

* THE EXISTING FOUNDATION IS CAPABLE OF SUPPORTING THE PROPOSED AT&T ANTENNA LOADING.



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Calculated Radio Frequency Emissions



at&t

CT2271

(East Haddam)

169 Nichols Road, East Haddam, CT 06423

(a.k.a. Nichols Road (169 Trowbridge))

October 31, 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 169 Nichols Road in East Haddam, CT. The coordinates of the tower are 41° 31' 16.6" N, 72° 25' 23.7" W.

AT&T is proposing the following modifications:

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

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

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

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 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
<i>Cingular</i>	170	880	6	296	0.0221	0.5867	3.77%
<i>Cingular</i>	170	1930	3	427	0.0159	1.0000	1.59%
AT&T UMTS	167	880	2	565	0.0015	0.5867	0.25%
AT&T UMTS	167	1900	2	875	0.0023	1.0000	0.23%
AT&T LTE	167	734	1	1771	0.0023	0.4893	0.47%
AT&T GSM	167	880	1	283	0.0004	0.5867	0.06%
AT&T GSM	167	1900	4	525	0.0027	1.0000	0.27%
						Total	1.27%

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. 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 Hudson Design Group Structural Analysis dated October 26, 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 **1.27% 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 31, 2012

Date

Attachment A: References

OET Bulletin 65 - Edition 97-01 - August 1997 Federal Communications Commission Office of Engineering & Technology

ANSI C95.1-1982, American National Standard Safety Levels With Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 300 kHz to 100 GHz. IEEE-SA Standards Board

IEEE Std C95.3-1991 (Reaff 1997), IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave. IEEE-SA Standards Board

Attachment B: FCC Limits for Maximum Permissible Exposure (MPE)

(A) Limits for Occupational/Controlled Exposure⁴

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f ²)*	6
30-300	61.4	0.163	1.0	6
300-1500	-	-	f/300	6
1500-100,000	-	-	5	6

(B) Limits for General Population/Uncontrolled Exposure⁵

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f ²)*	30
30-300	27.5	0.073	0.2	30
300-1500	-	-	f/1500	30
1500-100,000	-	-	1.0	30

f = frequency in MHz * Plane-wave equivalent power density

Table 2: FCC Limits for Maximum Permissible Exposure (MPE)

⁴ Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure

⁵ General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure

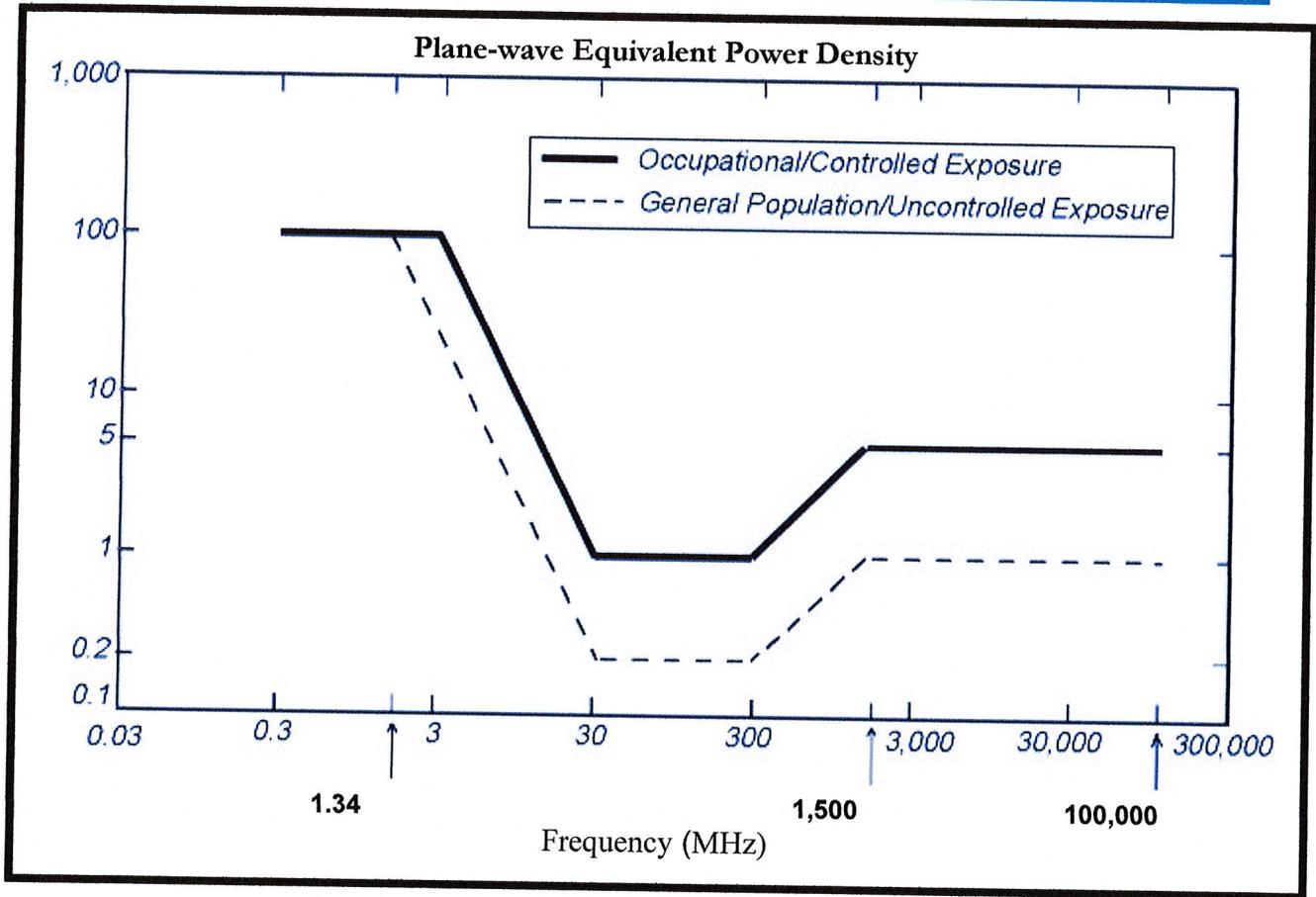
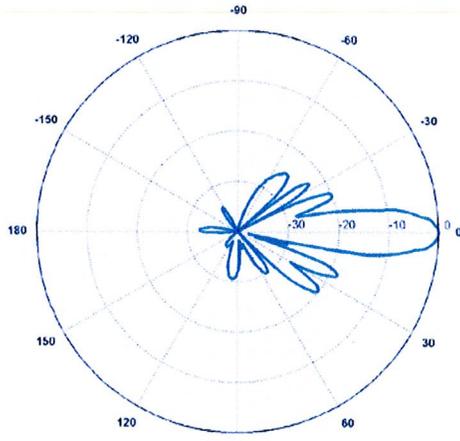
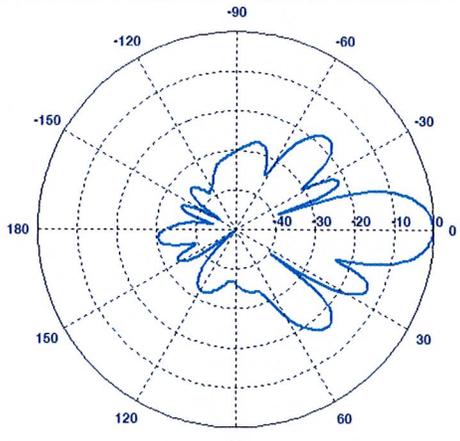


Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

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

<p>700 MHz</p> <p>Manufacturer: KMW Model #: AM-X-CD-17-65-00T-RET Frequency Band: 698-806 MHz Gain: 14.65 dBd Vertical Beamwidth: 10° Horizontal Beamwidth: 66° Polarization: Dual Linear ± 45° Size L x W x D: 96.0" x 11.8" x 6.0"</p>	
<p>850 MHz</p> <p>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: 55.0" 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: 86° Polarization: Dual Linear ± 45° Size L x W x D: 55.0" x 11.0" x 5.0"</p>	