EMPIRE
telecom

January 29, 2015

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

Regarding:	Notice of Exempt Modification – Addition of 3 radio heads previously approved
Property Address:	54 Waterbury Road, Prospect, CT (the "Property")
Applicant:	AT&T Mobility ("AT&T")

Dear Ms. Bachman:

AT&T currently maintains a wireless telecommunications facility on an existing 160 foot guyed lattice tower ("tower") location on the Property. AT&T's facility consists of nine (9) wireless telecommunications antenna at 126 feet. The tower is controlled by Charles E. and Averyll B. Bradshaw. The Council approved the previous application on July 20th 2012 reference number EM-CING-115-120705. This application (attached) granted AT&T the use of 6 radio heads at this location. The approval expired one year from the issue date. During that time AT&T made the changes to the site per the approval but only installed three (3) of the six (6) radio heads that they received approval. AT&T would now like to install the additional three (3) radio heads that were originally approved under EM-CING-115-120705.

Please accept this application as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72 (b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to the Mayor, and the Land Use Inspector for the Town of Prospect. A copy of this letter is also being sent to Charles E. and Averyll B. Bradshaw, the owner of the structure that AT&T is located.

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

1. The planned modifications will not result in an increase in the height of the existing structure. AT&T's additional, previously approved 3 radio heads will be installed at 126 foot level of the 160 foot tower.
2. The proposed modifications will not involve any changes to ground-mounted equipment and, therefore will not require an extension of the site boundary.
3. The proposed modification will not increase the noise level at the facility by six decibel or more, or to levels that exceed state and local criteria.

16 Esquire Road, Billerica, MA 01862 Mobile 617-639-4908 Email: Dcooper@empiretelecomm.com

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4. The operation of the modified facility will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. An RF emissions calculation (attached) for AT&T's modified facility was provided in the application which led to the July 20th 2012 Decision.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The tower and its foundation can support AT&T's proposed modifications. (Please see attached Structural analysis completed by Armor Tower Engineering dated May 30, 2012).

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

Sincerely,

David P. Cooper
Director of Site Acquisition
Empire Telecom

CC: Robert J. Chatfield, Mayor, Town of Prospect
William Donovan, Land Use Inspector, Town of Prospect
Charles E. and Averyll B. Bradshaw, Property Owner

16 Esquire Road, Billerica, MA 01862 Mobile 617-639-4908 Email: Dcooper@empiretelecomm.com

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

CT2218

July 20, 2012

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

RE: **EM-CING-115-120705** – New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 54 Waterbury Road, Prospect, Connecticut.

Dear Ms. Gaudet:

The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the following conditions:

- The proposed equipment be installed in accordance with the recommendations made in the Structural Analysis prepared by Armor Tower Engineering dated May 30, 2012 and stamped by Dmitriy Albul; and
- Following the installation of the proposed equipment, AT&T shall engage an engineer to conduct a post-construction inspection to document that the tower-mounted equipment has been placed in compliance with the requirements of the Structural Analysis and that a copy of such documentation be transmitted to the Council.
- 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 July 3, 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.

CSC
CONNECTICUT SITING COUNCIL

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

July 5, 2012

The Honorable Robert J. Chatfield
Mayor
Town of Prospect
Town Office Building
36 Center Street
Prospect, CT 067121699

RE: **EM-CING-115-120705** – New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 54 Waterbury Road, Prospect, Connecticut.

Dear Mayor Chatfield:

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

If you have any questions or comments regarding this proposal, please call me or inform the Council by July 19, 2012.

Thank you for your cooperation and consideration.

Very truly yours,

Linda Roberts

Linda Roberts
Executive Director

LR/cm

Enclosure: Notice of Intent

c: William J. Donovan, Zoning Enforcement Officer, Town of Prospect

CSC
CONNECTICUT SITING COUNCIL

EM-CING-115-120705

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

HPC
WIRELESS SERVICES

July 3, 2012

VIA OVERNIGHT COURIER

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

Re: New Cingular Wireless PCS, LLC – exempt modification
54 Waterbury Road, Prospect, Connecticut

Dear Ms. Roberts:

This letter and attachments are submitted on behalf of New Cingular Wireless PCS, LLC ("AT&T. AT&T is making modifications to certain existing sites in its Connecticut system in order to implement LTE technology. Please accept this letter and attachments as notification, pursuant to R.C.S.A. Section 16-50j-73, of construction that constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter and attachments is being sent to the Mayor of the Town of Prospect.

AT&T plans to modify the existing wireless communications facility owned by Charles Bradshaw and located at 54 Waterbury Road in the Town of Prospect (coordinates 41°-30'-40.43" N, 72°-58'-57.07" W). Attached are a compound plan and elevation depicting the planned changes, and documentation of the structural sufficiency of the structure to accommodate the revised antenna configuration. Also included is a power density report reflecting the modification to AT&T's operations at the site.

The changes to the facility do not constitute a modification as defined in Connecticut General Statutes ("C.G.S.") Section 16-50i(d) because the general physical characteristics of the facility will not be significantly changed. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for in R.C.S.A. Section 16-50j-72(b)(2).

1. AT&T will replace the two (2) existing panel antennas with nine (9) panel antennas, three (3) each for GSM, UMTS and LTE technology. The antennas will be attached to existing mounts, with center lines of approximately 126'. Six (6) RRUs

(remote radio units) and a surge arrestor will be mounted to tower legs at approximately the same height as the antennas. AT&T will also place a DC power and fiber run from the equipment to the antennas along the existing coaxial cable run. The proposed modifications will not extend the height of the approximately 160' guyed structure.

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

3. The proposed changes will not increase the noise level at the existing facility by six decibels or more. The incremental effect of the proposed changes will be negligible.

4. The changes to the facility will not increase the calculated "worst case" power density for the combined operations at the site to a level at or above the applicable standard for uncontrolled environments as calculated for a mixed frequency site. As indicated on the attached report prepared by C Squared Systems, LLC, AT&T's operations at the site will result in a power density of approximately 3.23%; the combined site operations will result in a total power density of approximately 56.42%.

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

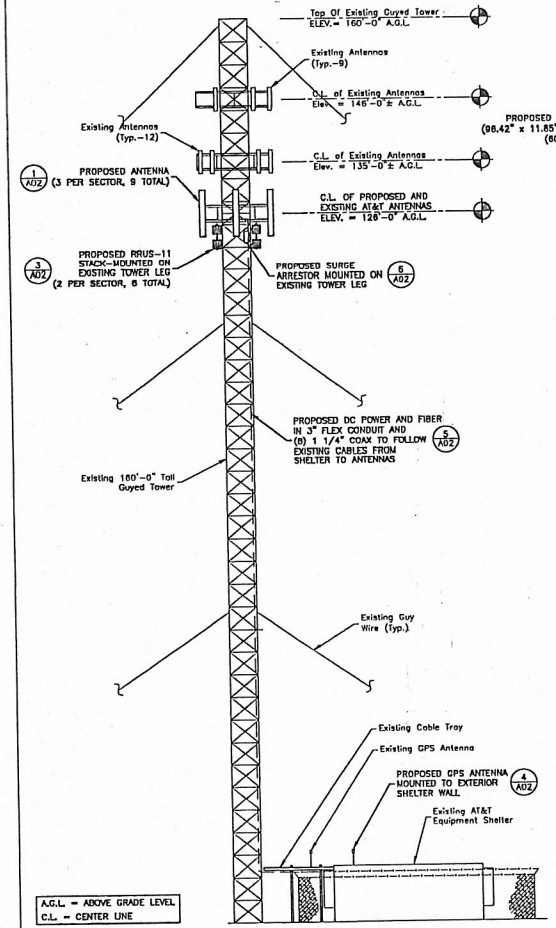
Respectfully yours,

Jennifer Young Gaudet

Jennifer Young Gaudet

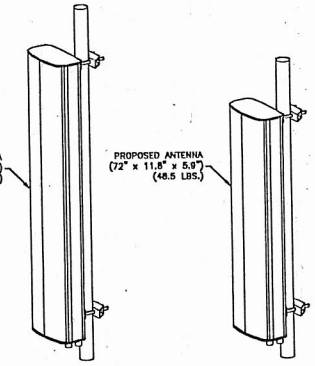
Attachments

cc: Honorable Robert J. Chatfield, Mayor, Town of Prospect
Charles Bradshaw (underlying property owner)



ELEVATION LOOKING SOUTH

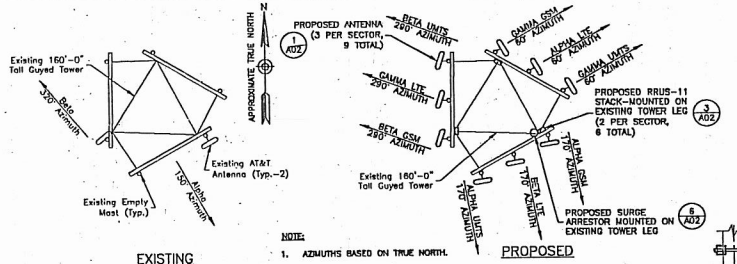
SCALE: 1"=20' FOR 11"x17"
1"=10' FOR 22"x34"
0' 10' 20'



NOTE:
1. PLEASE SEE RFDS FOR SPECIFIC ANTENNA MODEL.

ISOMETRIC ANTENNA DETAIL 1

SCALE: N.T.S.

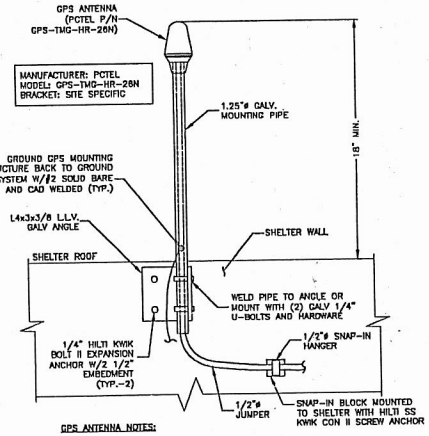


EXISTING PROPOSED

NOTE:
1. AZIMUTHS BASED ON TRUE NORTH.

PLATFORM ANTENNA ORIENTATION 2

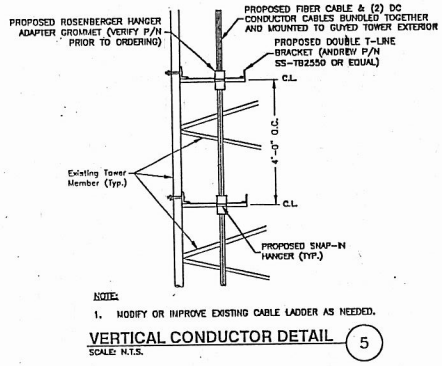
SCALE: N.T.S.



GPS ANTENNA NOTES:
1. GROUND ANTENNAS AND MOUNTS PER MANUFACTURERS RECOMMENDATIONS AND AT&T STANDARDS.
2. FIELD LOCATE GPS ANTENNA A MINIMUM OF 10 FEET HORIZONTALLY FROM EXISTING GPS ANTENNA WITH AT&T CM APPROVAL.
3. SEAL ALL WALL PENETRATIONS WILL SILICONE SEALANT.

GPS ANTENNA 4

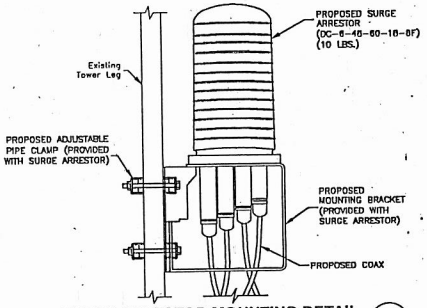
SCALE: N.T.S.



NOTE:
1. MODIFY OR IMPROVE EXISTING CABLE LADDER AS NEEDED.

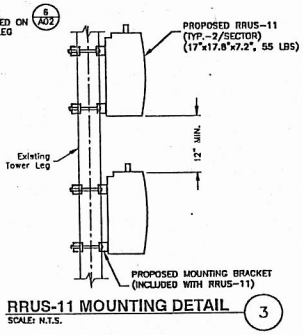
VERTICAL CONDUCTOR DETAIL 5

SCALE: N.T.S.



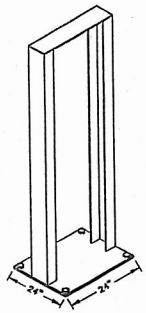
SURGE ARRESTOR MOUNTING DETAIL 6

SCALE: N.T.S.



RRUS-11 MOUNTING DETAIL 3

SCALE: N.T.S.



ISOMETRIC

NOTES:
1. CONTRACTOR SHALL SECURE RACK AS PER MANUFACTURER RECOMMENDATIONS.

24" x 24" INDOOR RACK 7

N.T.S

Dewberry
Dewberry Engineers Inc.
600 PARSIPPANY ROAD
SUITE 301
PARSIPPANY, NJ 07054
PHONE: 973.739.9400
FAX: 973.739.9710

NEXLINK GLOBAL SERVICES
800 MARSHALL PHELPS ROAD, #2A
WINDSOR, CT 06095

PROSPECT-BRADSHAW TOWER
SITE NO. CT2218
54 WATERBURY ROAD
PROSPECT, CT 06712

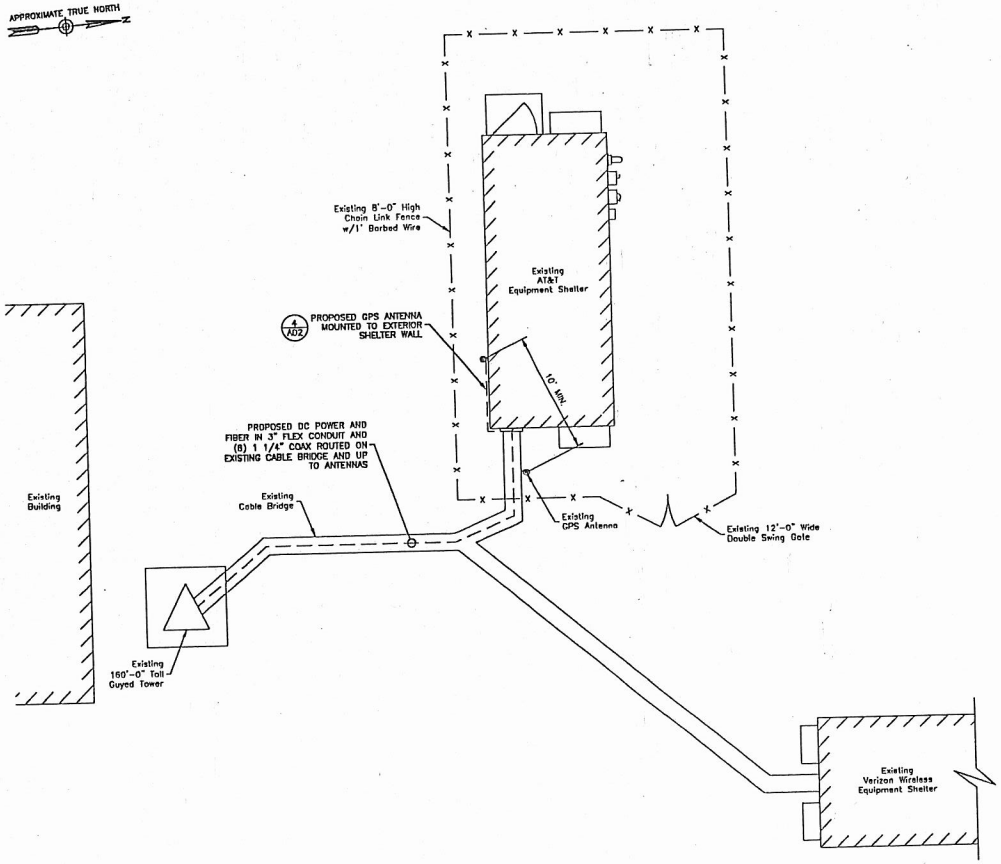
at&t
500 ENTERPRISE DRIVE,
SUITE 3A
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	06/26/12	ISSUED FOR CONSTRUCTION	JC	JWS	CHN
0	06/01/12	PRELIMINARY SUBMISSION	JRF	JWS	CHN

SCALE: AS SHOWN | DESIGNED BY: JWS | DRAWN BY: RSA

ELEVATION & CONSTRUCTION DETAILS

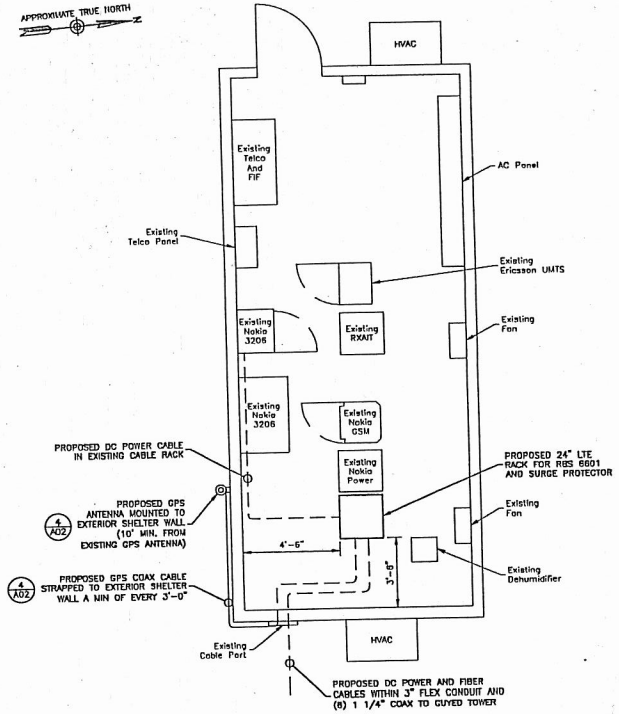
DEWBERRY NO.	DRAWING NUMBER	REV
50048347/50048363	A02	1



SITE PLAN

SCALE: 1"=10' FOR 11"x17"
1"=5' FOR 22"x34"

0' 5' 10'



SHELTER LAYOUT DETAIL

SCALE: 3/16" = 1'-0" FOR 11"x17"
3/8" = 1'-0" FOR 22"x34"

0' 2' 4' 6'

NOTES:

1. NORTH SHOWN AS APPROXIMATE.
2. MOUNT ALL ANTENNAS, COAX, SURGE ARRESTORS, RRU'S, ETC. IN ACCORDANCE WITH STRUCTURAL ANALYSIS BY OTHERS.
3. NOT ALL INFORMATION SHOWN FOR CLARITY.

Dewberry
Dewberry Engineers Inc.
800 PARSIPPANY ROAD
SUITE 301
PARSIPPANY, NJ 07054
PHONE: 973.739.9400
FAX: 973.739.9715

NEXLINK GLOBAL SERVICES
800 MARSHALL PHELPS ROAD, #2A
WINDSOR, CT 06005

PROSPECT-BRADSHAW TOWER
SITE NO. CT2218
54 WATERBURY ROAD
PROSPECT, CT 06712

at&t
500 ENTERPRISE DRIVE,
SUITE 3A
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	06/26/12	ISSUED FOR CONSTRUCTION	JC	JWS	CHN
0	06/01/12	PRELIMINARY SUBMISSION	JRF	JWS	CHN

SCALE: AS SHOWN | DESIGNED BY: JWS | DRAWN BY: RSA

SITE PLAN & SHELTER LAYOUT

DEWBERRY NO.	DRAWING NUMBER	REV
50048347/50048363	A01	1

CT2218

FDH Engineering, Inc., 6521 Meridien Drive Raleigh, NC 27616, Ph. 919.755.1012

Structural Analysis for SBA Network Services, Inc.

157' Monopole Tower

SBA Site Name: Prospect
SBA Site ID: CT00252-S-03
Verizon Site Name: Prospect

FDH Project Number 1327001400 (R1)

Analysis Results

Tower Components	97.2%	Sufficient
Foundation	58.6%	Sufficient

Prepared By:

Adam Bryan, EI
Project Engineer I

Reviewed By:

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

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

STATE OF CONNECTICUT
Christopher Michael Murphy
No. 25842
LICENSED PROFESSIONAL ENGINEER
4/30/13

April 30, 2013

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

TABLE OF CONTENTS

EXECUTIVE SUMMARY

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

- Fred A. Nudd Corporation (Project No. 6820) original design drawings dated May 20, 1999
- SAGE Environmental, Inc. (Project No. M130) geotechnical engineering report dated May 5, 1998
- Semaan Engineering Solutions (Project No. CT-00252S) Structural Analysis and Modification Package dated April 18, 2002
- FDH, Inc. (Job No. 08-09035T) TIA Inspection Report dated January 9, 2009
- FDH Engineering, Inc. (Project No. 10-01014E N1) Dispersive Wave Propagation Testing and Rebar Investigation of an Existing Tower Foundation dated May 11, 2010
- SBA Network Services, Inc.

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

Conclusions

With the existing and proposed antennas from Verizon in place at 132 ft, the tower meets the requirements of the *TIA/EIA-222-F* standards and *2005 CBC* provided the **Recommendations** listed below are satisfied. Furthermore, given the foundation dimensions (see FDH Engineering, Inc. Project No. 10-01014E N1) and given soil parameters (see SAGE Environmental, Inc. Project No. M130), the foundation should have the necessary capacity to support the existing and proposed loading. For a more detailed description of the analysis of the tower, see the **Results** section of this report.

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

Recommendations

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

1. The proposed coax should be installed inside the monopole's shaft.
2. The existing diplexers should be installed directly behind the existing and proposed panel antennas.

APPURTENANCE LISTING

The proposed and existing antennas with their corresponding cables/coax lines are shown in **Table 1**. *If the actual layout determined in the field deviates from the layout, FDH Engineering, Inc. should be contacted to perform a revised analysis.*

Table 1 - Appurtenance Loading

Existing Loading:

Antenna Elevation (ft)	Description	Coax and Lines[1]	Carrier	Mount Elevation (ft)	Mount Type
158.5	(6) Andrew SBNH-1D6565C (3) Kathrein 800-10121 (6) CCI DTMABP 7819VG12A TMAs (6) Kathrein 860-10025 RETs (6) Powerwave LGP21901 Diplexers	(12) 1-1/4" (7) 1/2" (1) 10mm Fiber[2] (2) DC Cables[2]	AT&T	157	(1) 16' Low Profile Platform
155.5	(6) Andrew RRUS11 RRUs (1) Raycap Dome DC6-48-60-18-8-F Surge Arrestor			155.5	(1) Valmont Ring Mount
140	(9) Decibel DB844H90E-XY	(9) 1-5/8"	Nextel	140	(3) 12.5' T-Frames
132	(6) Decibel DB844F65ZAXY (3) Powerwave P65-16-XL-2 (3) Rymsa MGD3-800T0 (6) RFS FD9R6004/2C-3L Diplexers	(12) 1-5/8"	Verizon	132	(1) 14' Low Profile Platform
100	(3) Kathrein 742 213	(6) 1-5/8"	Pocket	100	(3) Pipe Mounts

1. Coax installed inside pole's shaft unless otherwise noted.
2. AT&T has (1) 10 mm Fiber and (2) DC Cables installed inside (1) 3" Flexible Conduit inside the pole shaft

Proposed Loading:

Antenna Elevation (ft)	Description	Coax and Lines	Carrier	Mount Elevation (ft)	Mount Type
132	(3) Antel BXA-70063/6CF-2	(12) 1-5/8"	Verizon	132	(1) 14' Low Profile Platform

RESULTS

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

Table 2 - Material Strength

Member Type	Yield Strength
Tower Shaft Sections	42 ksi
Channel Reinforcement	65 ksi
Base Plate	36 ksi
Anchor Bolts	Fu = 90 ksi and 150 ksi

Table 3 displays the summary of the ratio (as a percentage) of force in the member to their capacities. Values greater than 100% indicate locations where the maximum force in the member exceeds its capacity. **Table 4** displays the maximum foundation reactions.

If the assumptions outlined in this report differ from actual field conditions, FDH Engineering, Inc. should be contacted to perform a revised analysis. Furthermore, as no information pertaining to the allowable twist and sway requirements for the existing or proposed appurtenances was provided, deflection and rotation were not taken into consideration when performing this analysis.

See the **Appendix** for detailed modeling information.

Table 3 - Summary of Working Percentage of Structural Components

Section No.	Elevation ft	Component Type	Size	% Capacity*	Pass Fail
L1	157 - 110	Pole	TP34.3125x18x0.25	86.0	Pass
L2	110 - 95	Pole w/ Mod	TP38.6563x32.0771x0.25	69.0	Pass
L3	95 - 75	Pole w/ Mod	TP45.1875x38.6563x0.3125	75.9	Pass
L4	75 - 71	Pole w/ Mod	TP45.825x42.6031x0.3125	82.1	Pass
L5	71 - 65	Pole w/ Mod	TP58.875x45.825x0.375	84.1	Pass
	65 - 50	Pole		88.2	Pass
	50 - 31	Pole w/ Mod		78.1	Pass
L6	31 - 20	Pole w/ Mod	TP61.649x55.515x0.375	70.6	Pass
L7	20 - 15	Pole w/ Mod	TP68.1875x61.649x0.4375	72.7	Pass
	15 – 0	Pole		83.7	Pass
		Anchor Bolts**	(6) 1.375" Ø w/ BC = 92"	74.9	Pass
		Anchor Bolts	(18) 2" Ø w/ BC = 62"	83.6	Pass
		Base Plate	67.3125" Ø PL x 1.75" thk.	97.2	Pass

* Capacities include 1/3 allowable increase for wind.
** Semaan Engineering Solutions specifies that the modified anchor bolts were to be pre-tensioned to 120 kips. This analysis assumes this work was performed and the anchor bolts have 120 kip capacity.

Table 4 - Maximum Base Reactions

Base Reactions	Current Analysis* *(TIA/EIA-222-F)*	Original Design *(TIA/EIA-222-F)*
Axial	41 k	45 k
Shear	36 k	34 k
Moment	3,561 k-ft	3,435 k-ft

* Foundation determined adequate per independent analysis.

GENERAL COMMENTS

This engineering analysis is based upon the theoretical capacity of the structure. It is not a condition assessment of the tower and its foundation. It is the responsibility of SBA Network Services, Inc. to verify that the tower modeled and analyzed is the correct structure (with accurate antenna loading information) modeled. If there are substantial modifications to be made or the assumptions made in this analysis are not accurate, FDH Engineering, Inc. should be notified immediately to perform a revised analysis.

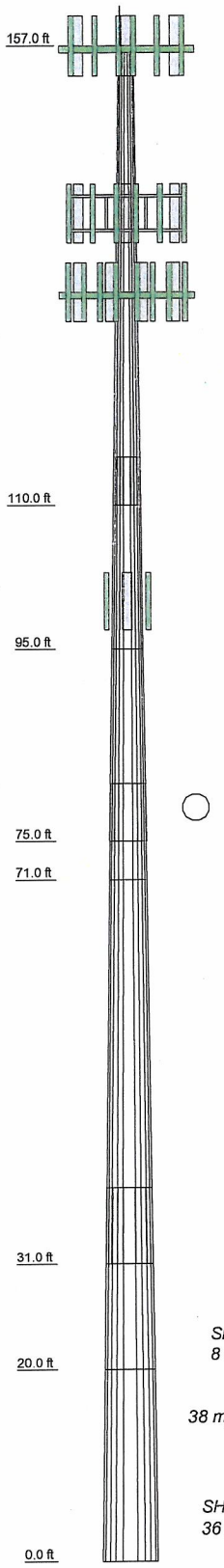
LIMITATIONS

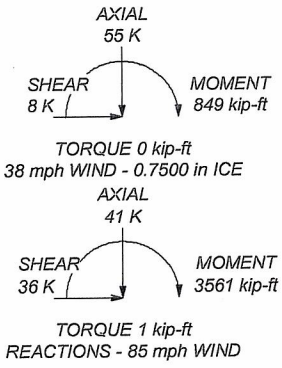
All opinions and conclusions are considered accurate to a reasonable degree of engineering certainty based upon the evidence available at the time of this report. All opinions and conclusions are subject to revision based upon receipt of new or additional/updated information. All services are provided exercising a level of care and diligence equivalent to the standard and care of our profession. No other warranty or guarantee, expressed or implied, is offered. Our services are confidential in nature and we will not release this report to any other party without the client's consent. The use of this engineering work is limited to the express purpose for which it was commissioned and it may not be reused, copied, or distributed for any other purpose without the written consent of FDH Engineering, Inc.

APPENDIX

Section	1	2	3	4	5	6	7
Length (ft)	47.00	20.00	20.00	10.00	40.00	19.00	20.00
Number of Sides	12	12	12	12	12	12	12
Thickness (in)	0.2500	0.2500	0.3125	0.3125	0.3750	0.3750	0.4375
Socket Length (ft)	5.00		6.00		8.00		
Top Dia (in)	18.0000	32.0771	38.6563	42.6031	45.8250	55.5150	61.6490
Bot Dia (in)	34.3125	38.6563	45.1875	45.8250	58.8750	61.6490	68.1875
Grade	A36M-42						
Weight (K)	3.3	1.9	2.8	1.5	8.5	4.5	6.2

28.9





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod	157	Valmont Ring Mount MNT	155.5
16' LP Platform	157	(3) DB844H90E-XY w/Mount Pipe	140
(2) SBNH-1D6565C w/ Mount Pipe	157	(3) DB844H90E-XY w/Mount Pipe	140
(2) SBNH-1D6565C w/ Mount Pipe	157	(3) DB844H90E-XY w/Mount Pipe	140
(2) SBNH-1D6565C w/ Mount Pipe	157	(3) 12.5' T-Frames	140
800 10121 w/ Mount Pipe	157	(2) DB844F65ZAXY w/Mount Pipe	132
800 10121 w/ Mount Pipe	157	(2) DB844F65ZAXY w/Mount Pipe	132
800 10121 w/ Mount Pipe	157	(2) DB844F65ZAXY w/Mount Pipe	132
(2) DTMABP7819VG12A TMA	157	BXA-70063/6CF-2 w/ Mount Pipe	132
(2) DTMABP7819VG12A TMA	157	BXA-70063/6CF-2 w/ Mount Pipe	132
(2) DTMABP7819VG12A TMA	157	BXA-70063/6CF-2 w/ Mount Pipe	132
(2) 860 10025 RET	157	MGD3-800T0 w/ mount pipe	132
(2) 860 10025 RET	157	MGD3-800T0 w/ mount pipe	132
(2) 860 10025 RET	157	MGD3-800T0 w/ mount pipe	132
(2) LGP21901	157	(2) FD9R6004/2C-3L Diplexer	132
(2) LGP21901	157	(2) FD9R6004/2C-3L Diplexer	132
(2) LGP21901	157	(2) FD9R6004/2C-3L Diplexer	132
(2) RRUS-11	155.5	14' LP Platform	132
(2) RRUS-11	155.5	742 213 w/ mount pipe	100
(2) RRUS-11	155.5	742 213 w/ mount pipe	100
DC6-48-60-18-8F Surge Arrestor	155.5	742 213 w/ mount pipe	100

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A36M-42	42 ksi	60 ksi			

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. Tower model shown for analysis purposes only. See the modification drawings (Semaan Engineering Solutions, Inc. Project No. CT-00252S) for actual tower layout.

FDH Engineering, Inc.
6521 Meridien Drive, Suite 107
Raleigh, NC 27616
Phone: 919-7551012
FAX: 919-7551031
Tower Analysis

Job: Prospect, CT00252-S-03			
Project: 1327001400 (R1)			
Client: SBA Network Services, Inc.	Drawn by: Adam Bryan	App'd:	
Code: TIA/EIA-222-F	Date: 04/30/13	Scale: NTS	
Path:		Dwg No. E-1	

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

Calculated Radio Frequency Emissions

at&t

CT2218 – Prospect-Bradshaw Tower

54 Waterbury Road, Prospect, CT 06712

June 25, 2012

Table of Contents

List of Tables

List of Figures

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 guy wire tower located at 54 Waterbury Road in Prospect, CT. The coordinates of the tower are 41° 30' 40.35" N, 72° 58' 57.09" W.

AT&T is proposing the following modifications:

1) Remove two existing dual-band (850/1900 MHz) panel antennas (1 per sector, 2 sectors currently)
2) Install six multi-band (700/850/1900/2100) antennas (2 per sector, 3 sectors proposed)

2. FCC Guidelines for Evaluating RF Radiation Exposure Limits

In 1985, the FCC established rules to regulate radio frequency (RF) exposure from FCC licensed antenna facilities. In 1996, the FCC updated these rules, which were further amended in August 1997 by OET Bulletin 65 Edition 97-01. These new rules include Maximum Permissible Exposure (MPE) limits for transmitters operating between 300 kHz and 100 GHz. The FCC MPE limits are based upon those recommended by the National Council on Radiation Protection and Measurements (NCRP), developed by the Institute of Electrical and Electronics Engineers, Inc., (IEEE) and adopted by the American National Standards Institute (ANSI).

The FCC general population/uncontrolled limits set the maximum exposure to which most people may be subjected. General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

Public exposure to radio frequencies is regulated and enforced in units of milliwatts per square centimeter (mW/cm^2). The general population exposure limits for the various frequency ranges are defined in the attached "FCC Limits for Maximum Permissible Exposure (MPE)" in Attachment B of this report.

Higher exposure limits are permitted under the occupational/controlled exposure category, but only for persons who are exposed as a consequence of their employment and who have been made fully aware of the potential for exposure, and they must be able to exercise control over their exposure. General population/uncontrolled limits are five times more stringent than the levels that are acceptable for occupational, or radio frequency trained individuals. Attachment B contains excerpts from OET Bulletin 65 and defines the Maximum Exposure Limit.

Finally, it should be noted that the MPE limits adopted by the FCC for both general population/uncontrolled exposure and for occupational/controlled exposure incorporate a substantial margin of safety and have been established to be well below levels generally accepted as having the potential to cause adverse health effects.

3. RF Exposure Prediction Methods

The emission field calculation results displayed in the following figures were generated using the following formula as outlined in FCC bulletin OET 65:

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

Where:

EIRP = Effective Isotropic Radiated Power

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

H = Horizontal Distance from antenna in meters

V = Vertical Distance from radiation center of antenna in meters

Ground reflection factor of 1.6

Off Beam Loss is determined by the selected antenna pattern

These calculations assume that the antennas are operating at 100 percent capacity and power, and that all channels are transmitting simultaneously. Obstructions (trees, buildings, etc.) that would normally attenuate the signal are not taken into account. The calculations assume even terrain in the area of study and do not take into account actual terrain elevations which could attenuate the signal. As a result, the predicted signal levels reported below are much higher than the actual signal levels will be from the finished modifications.

4. Calculation Results

Table 1 below outlines the power density information for the site. Because the proposed AT&T antennas are directional in nature, the majority of the RF power is focused out towards the horizon. As a result, there will be less RF power directed below the antennas relative to the horizon, and consequently lower power density levels around the base of the tower. Please refer to Attachment C for the vertical pattern of the proposed AT&T antennas. The calculated results for AT&T in Table 1 include a nominal 10 dB off-beam pattern loss to account for the lower relative gain below the antennas.

Carrier	Antenna Height (Feet)	Operating Frequency (MHz)	Number of Trans.	ERP Per Transmitter (Watts)	Power Density (mw/cm^2)	Limit	%MPE
Cingular TDMA	*124*	*880*	*16*	*100*	*0.0374*	*0.5867*	*6.38%*
Cingular GSM	*124*	*880*	*2*	*296*	*0.0138*	*0.5867*	*2.36%*
Cingular GSM	*124*	*1930*	*2*	*427*	*0.0200*	*1.0000*	*2.00%*
Verizon cellular	135	869	9	348	0.0618	0.5793	10.67%
Verizon PCS	135	1970	7	370	0.0511	1.0000	5.11%
Verizon LTE	135	757	1	722	0.0142	0.5047	2.82%
F&S Oil	-	451	-	-	0.0031	0.3007	1.03%
New Haven Transit	-	451	-	-	0.0031	0.3007	1.03%
US Post Office	-	415	-	-	0.0031	0.2767	1.12%
Central Comm.	-	452	-	-	0.0031	0.3013	1.03%
CT Motor Club	-	150.92	-	-	0.0381	0.2000	19.05%
Sprint-Nextel iDEN	146	851	9	100	0.0152	0.5673	2.68%
Sprint-Nextel CDMA	146	1962.5	11	421	0.0781	1.0000	7.81%
Clearwire	146	2496	2	153	0.0052	1.0000	0.52%
Clearwire	151	23 GHz	1	211	0.0033	1.0000	0.33%
AT&T UMTS	126	880	2	1077	0.0049	0.5867	0.83%
AT&T UMTS	126	1900	2	1556	0.0070	1.0000	0.70%
AT&T LTE	126	734	1	1375	0.0031	0.4893	0.64%
AT&T GSM	126	880	1	538	0.0012	0.5867	0.21%
AT&T GSM	126	1900	4	934	0.0085	1.0000	0.85%
						Total	**56.42%**

Table 1: Carrier Information[1 2 3]

[1]The existing CSC filing for Cingular should be removed and replaced with the updated AT&T technologies and values provided in Table 1. The power density information for carriers other than AT&T was taken directly from the CSC database dated 3/29/2012. Please note that %MPE values listed are rounded to two decimal points. The total %MPE listed is a summation of each unrounded contribution. Therefore, summing each rounded value may not reflect the total value listed in the table.

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

[3] Antenna height listed for AT&T is in reference to the Armor Tower Engineering Structural Analysis Report dated 5/30/2012.

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 **56.42% 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

June 25, 2012
Date

Attachment A: References

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

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

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

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

(A) Limits for Occupational/Controlled Exposure[4]

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

(B) Limits for General Population/Uncontrolled Exposure[5]

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

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

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

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

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

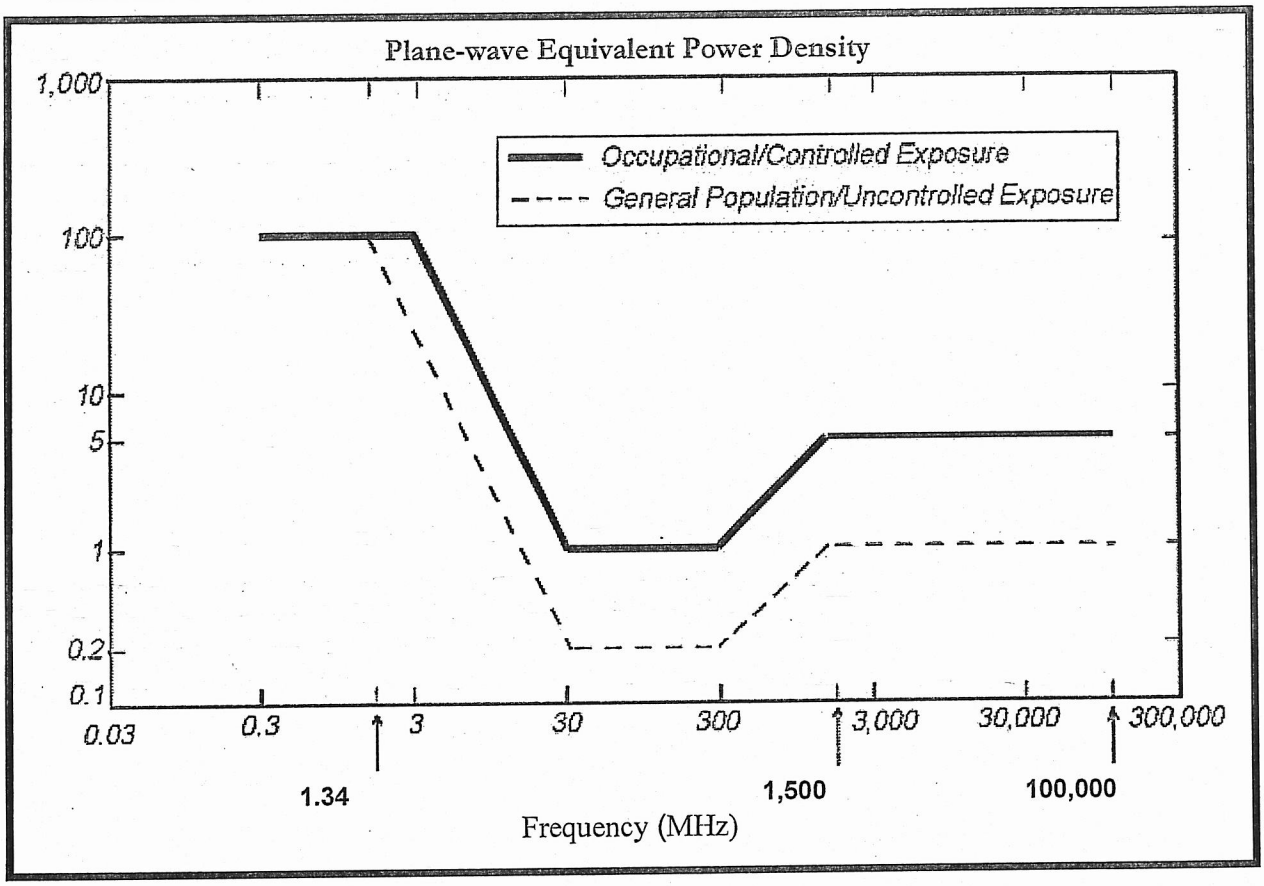
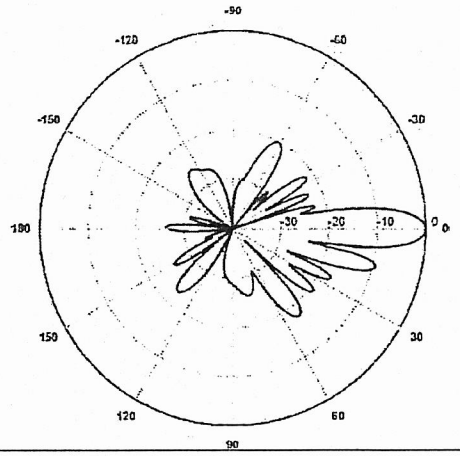


Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

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

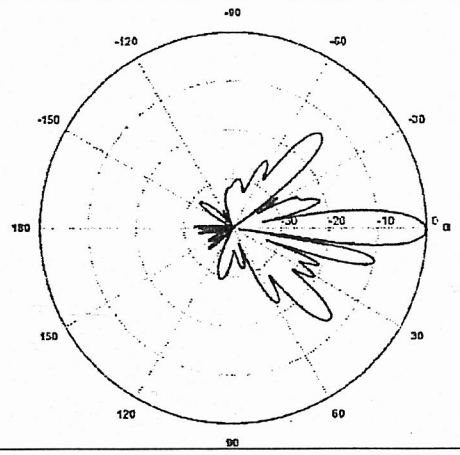
700 MHz

Manufacturer:	Commscope
Model #:	SBNH-1D6565C
Frequency Band:	698-806 MHz
Gain:	13.6 dBd
Vertical Beamwidth:	8.6°
Horizontal Beamwidth:	71°
Polarization:	±45°
Size L x W x D:	96.42" x 11.85" x 7.1"



850 MHz

Manufacturer:	Commscope
Model #:	SBNH-1D6565C
Frequency Band:	806-896 MHz
Gain:	14.3 dBd
Vertical Beamwidth:	7.8°
Horizontal Beamwidth:	67°
Polarization:	±45°
Size L x W x D:	96.42" x 11.85" x 7.1"



1900 MHz

Manufacturer:	Commscope
Model #:	SBNH-1D6565C
Frequency Band:	1850-1990 MHz
Gain:	15.9 dBd
Vertical Beamwidth:	5.1°
Horizontal Beamwidth:	57°
Polarization:	±45°
Size L x W x D:	96.42" x 11.85" x 7.1"