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

EM-CING-033-120705

HPC WIRELESS SERVICES

RIGINAL

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
179 Shunpike Road, Cromwell, 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 First Selectman of the Town of Cromwell.

AT&T plans to modify the existing wireless communications facility owned by Cromwell Fire District and located at 179 Shunpike Road in the Town of Cromwell (coordinates 41°-37'-23.63" N, 72°-40'-44.5" W). Attached are a compound plan and elevation depicting the planned changes. A structural analysis for the addition of the proposed antenna configuration is also attached. As noted there in, the analysis assumes a reserve capacity of 7.2% which, when taken into account, results in a theoretical failure of the tower. The analysis confirms that, without requiring the reserve capacity, the tower is structurally sufficient to support the proposed modification. AT&T is discussion with the tower owner regarding its proposal and the reserve capacity. Also included is a power density report reflecting the modification to AT&T's operations at the site.

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

1. AT&T will add three (3) LTE panel antennas to the existing antenna mounts with a center line of approximately 115'. Six (6) RRUs (remote radio units) and a surge arrestor will be mounted to the tower legs behind the antennas approximately the same height. 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 170' lattice 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 2.43%; the combined site operations will result in a total power density of approximately 44.84%.

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.

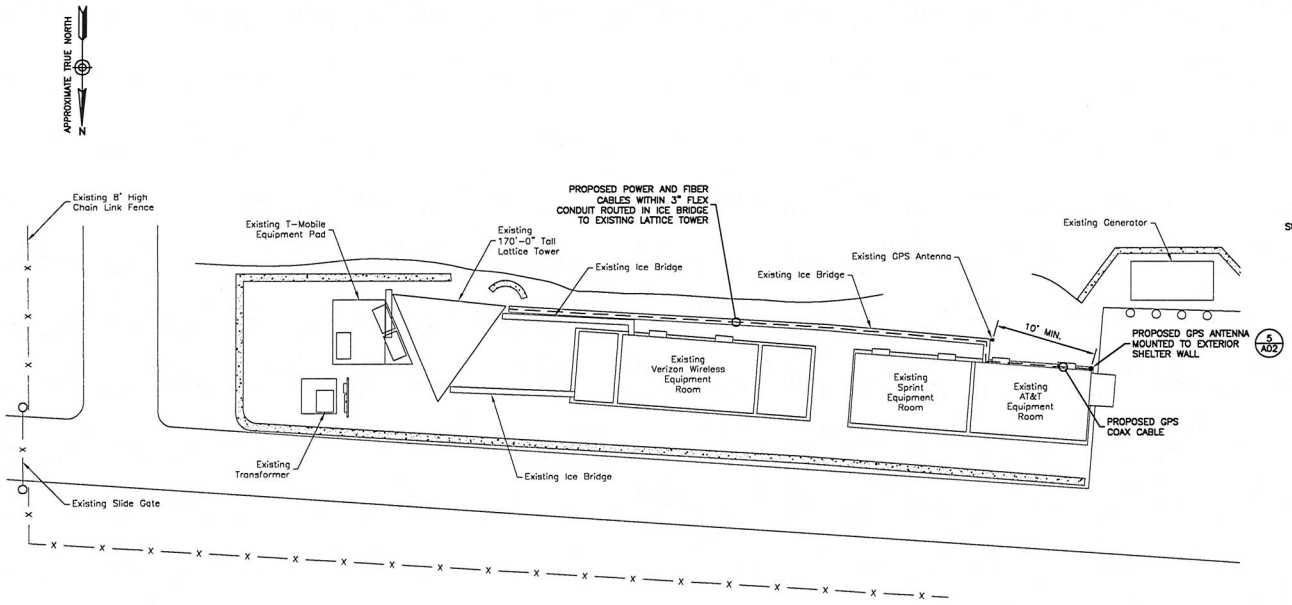
Respectfully yours,

Jennifer Young Gaudet

Jennifer Young Gaudet

Attachments

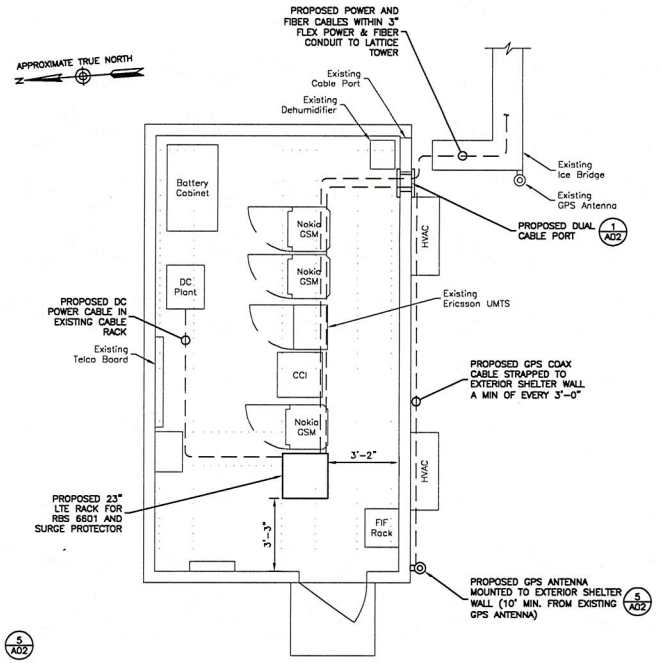
cc: Honorable Mertie Terry, First Selectman, Town of Cromwell
Cromwell Fire District (underlying property owner)



SITE PLAN

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

0' 10' 20'



SHELTER LAYOUT DETAIL

SCALE: 3/16"=1' FOR 11"x17"
3/8"=1' 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-Goodkind, 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

CROMWELL US MIL
SITE NO. CT1141
179 SHUNPIKE ROAD
CROMWELL, CT 06416

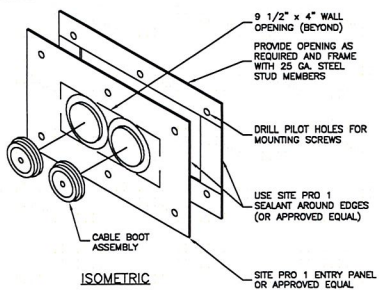
at&t
500 ENTERPRISE DRIVE,
SUITE 3A
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
A	06/27/12	ISSUED FOR SUBMITTAL	RSA	GMN	GHN
0	03/05/12	PRELIMINARY SUBMISSION	RSA	GMN	GHN

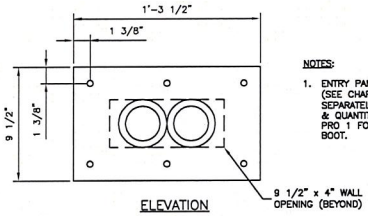
SCALE: AS SHOWN | DESIGNED BY: GMN | DRAWN BY: RSA

SITE PLAN & SHELTER LAYOUT

DEWBERRY NO.	DRAWING NUMBER	REV
50048347/50048372	A01	1



ISOMETRIC



ELEVATION

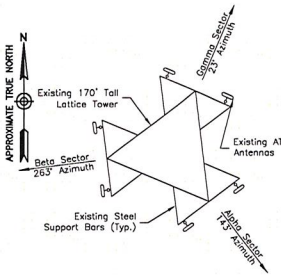
CABLE ENTRY PANEL CHART
SITE PRO 1 E1448 FOR (2 PORTS)

NOTES:

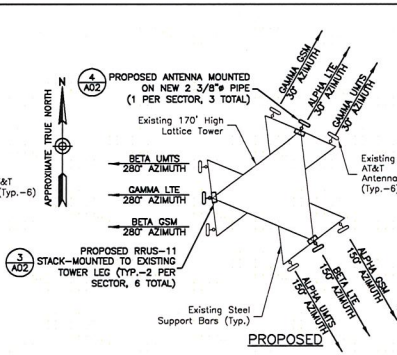
1. ENTRY PANEL AND BOOTS BY SITE PRO 1 (SEE CHART FOR PART #). ORDER BOOTS SEPARATELY FOR SPECIFIC CABLE SIZE(S) & QUANTITY. PROVIDE PLUGS BY SITE PRO 1 FOR EACH UNUSED HOLE IN BOOT.

DUAL COAX PORT 1

SCALE: N.T.S.



EXISTING



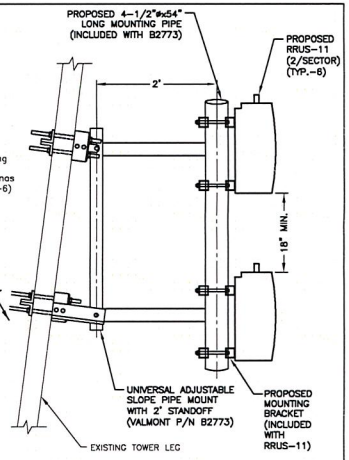
PROPOSED

NOTES:

1. AZIMUTHS BASED ON TRUE NORTH.
2. ROTATE BOOM GATES TO MATCH PROPOSED LTE AZIMUTHS.

PLATFORM ANTENNA ORIENTATION 2

SCALE: N.T.S.

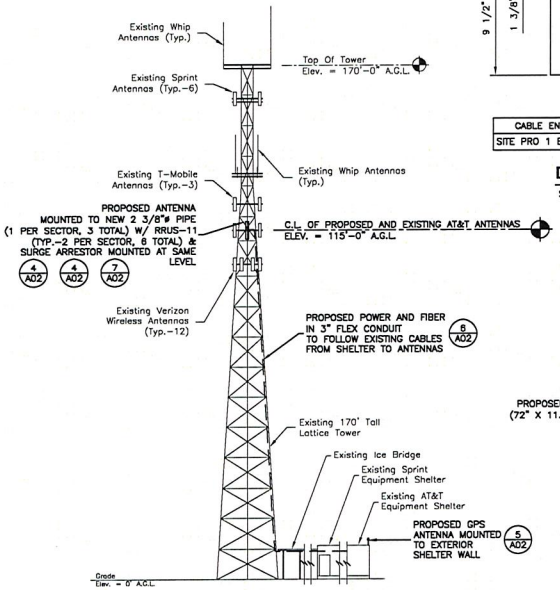


NOTE:

1. MOUNT PER STRUCTURAL ANALYSIS AND MANUFACTURER SPECIFICATIONS

RRUS-11 MOUNTING DETAIL 3

SCALE: N.T.S.

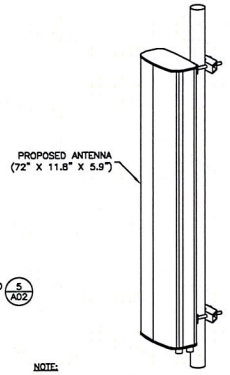


A.G.L. = ABOVE GRADE LEVEL
C.L. = CENTER LINE

ELEVATION LOOKING WEST

SCALE: 1"=40' FOR 11"x17"
1"=20' FOR 22"x34"

0' 20' 40'

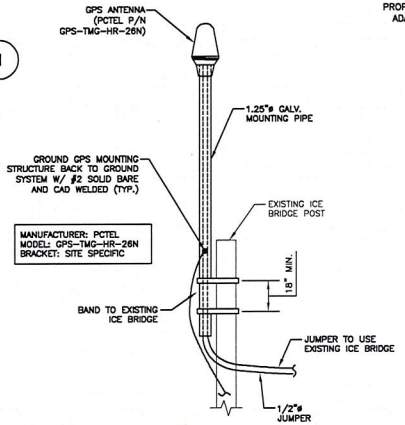


NOTE:

1. PLEASE SEE RFDS FOR SPECIFIC ANTENNA MODEL.

ISOMETRIC ANTENNA DETAIL 4

SCALE: N.T.S.

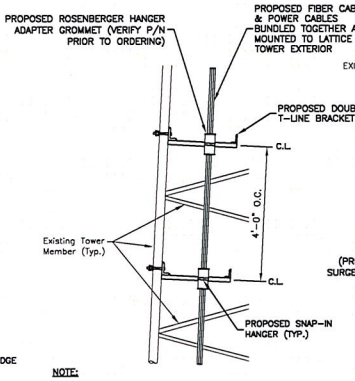


GPS ANTENNA NOTES:

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.

GPS ANTENNA MOUNT 5

SCALE: N.T.S.

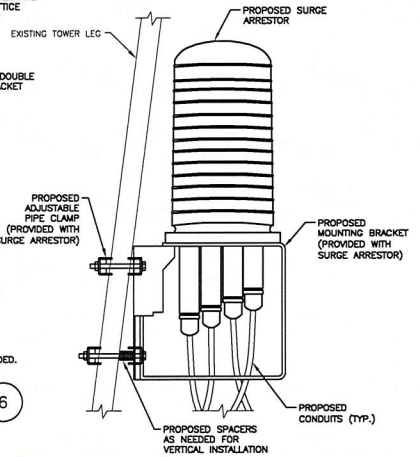


NOTE:

1. MODIFY OR IMPROVE EXISTING CABLE LADDER AS NEEDED.

VERTICAL CONDUCTOR DETAIL 6

SCALE: N.T.S.



NOTE:

1. MOUNT PER STRUCTURAL ANALYSIS AND MANUFACTURER SPECIFICATIONS

SURGE ARRESTOR MOUNTING DETAIL 7

SCALE: N.T.S.

Dewberry
Dewberry-Goodkind, 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

CROMWELL US MIL
SITE NO. CT1141
179 SHUNPIKE ROAD
CROMWELL, CT 06416

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
A	06/27/12	ISSUED FOR SUBMITTAL	RSA	GMN	GHN
0	03/05/12	PRELIMINARY SUBMISSION	RSA	GMN	GHN

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

ELEVATION & CONSTRUCTION DETAILS

DEWBERRY NO.	DRAWING NUMBER	REV
50048347/50048372	A02	1

DETAILED STRUCTURAL ANALYSIS AND EVALUATION OF AN EXISTING 170' SELF SUPPORTING LATTICE TOWER AND FOUNDATION FOR PROPOSED ANTENNA ARRANGEMENT

AT&T Site ID: **CT1141**
Address: **179 Shunpike Road**
Cromwell, CT

prepared for

AT&T
500 Enterprise Drive, Suite 3A
Rocky Hill, CT 06067

prepared by

URS CORPORATION
500 ENTERPRISE DRIVE, SUITE 3B
ROCKY HILL, CT 06067
TEL. 860-529-8882

CFD-003
36924489.00000

May 31, 2012

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY

This report summarizes the structural analysis of the existing 170' self supporting lattice tower located at 179 Shunpike Road in Cromwell, Connecticut. The analysis was conducted in accordance with the 2005 Connecticut State Building Code which requires a three second gust wind speed of 100 mph which converts to an 80 mph fastest mile per 2003 IBC (Table 1609.3.1) and the TIA/EIA-222-F standard for a wind velocity of 85 mph (fastest mile). The wind speed from the Connecticut State Building Code governs the design at 85 mph (fastest mile) and 74 mph (fastest mile) concurrent with ½ " ice. The antenna loading considered in the analysis consists of all existing and proposed antennas, transmission lines, and ancillary items as outlined in the Introduction Section of this report.

Proposed Antenna and Mount	Carrier	Antenna Center Elevation
Install:		
(3) KMW AM-X-CD-16-65-00T-RET **(6) RRU** **(1) Surge Suppressor** **(3) Optic Fiber & (6) DC Cables** **(Located within 3" dia Flex Conduit)**	**AT&T (Proposed)**	**@ 115'**

Note: Existing (6) Powerwave 7770 & (12) TMAs to remain.

The results of the analysis indicate that the tower structure's capacity has exceeded the tower owner's limitation set to maintain reserve capacity (see note 3 below). **The foundation is considered structurally adequate for the proposed loading, however the tower is not considered structurally adequate for the proposed antenna loading with the wind load classification specified in Section 2. See Section 4 for detailed information.**

This analysis is based on:

1) The tower structure's theoretical capacity, not including any assessment of the condition of the tower.
2) Tower geometry, structural member sizes, and Foundation information taken from a tower report prepared by PiROD Inc., ENG. File No. A-116398, dated November 18, 1999.
3) Tower owner's directive to maintain reserve capacity of 7.2% (No increase in loading beyond 92.8%, refer to previous URS structural analysis MXN-004 dated August 16, 2010 listed below).
4) Preliminary Construction Drawings prepared by Dewberry-Goodkind, Inc., project number 50048347 / 50048372 dated March 5, 2012.
5) Existing inventory taken from a tower mapping and inventory prepared by Northeast Towers, Inc performed on February 9, 2012.
6) Structural analysis performed by URS Corp, project number MXN-004 / 36924397 signed and sealed August 16, 2010.
7) Structural analysis performed by URS Corp, project number TW4-004 / 36924372 signed and sealed April 13, 2010.
8) Foundation modification drawings prepared by Teconic, dated May 5, 2004.
9) Proposed additional antenna and mount configuration as specified in Section 2 of this report.

1. EXECUTIVE SUMMARY (continued)

This report is only valid as per the assumptions and data utilized in this report for antenna inventory, mounts and associated cables. The user of this report shall field verify the assumption of the antenna and mount configuration as well as the physical condition of the tower and connections. Notify the engineer in writing immediately if any of the information in this report is found to be other than specified.

If you should have any questions, please call.

Sincerely,

URS Corporation

Richard A. Sambor, P.E.
Senior Structural Engineer

RAS/kab

2. INTRODUCTION

The subject tower is located at 179 Shunpike Road in Cromwell, Connecticut. The structure is a 170' self supporting lattice tower designed and manufactured by PiROD Inc.

The current inventory with proposed modification is summarized in the table below:

Antenna Type	*Carrier*	*Mount*	*Antenna Centerline Elevation*	*Cable*
(1) Tx Rx 101-90-08 antenna	Town (existing)	15' Mast pipe on 9 Arm Halo Mount	183'	(1) 7/8"
(1) 8 Bay Dipole (3" dia x 20')	Town (existing)	9 Arm Halo Mount	178'	(1) 7/8"
(1) 2 ½" dia x 20' Whip	Town (existing)	9 Arm Halo Mount	178'	(1) 1 1/2"
(1) OD12-2400	Town (existing)	9 Arm Halo Mount	175'6"	(1) 3/8"
(3) 2 ½" dia x 15' Whip	Town (existing)	9 Arm Halo Mount	175'	(3) 7/8"
1 ½" dia x 12' Whip	Town (existing)	9 Arm Halo Mount	174'	(1) 7/8"
(1) SU-RA-HP-2.4 (1' x 1' Antenna)	Town (existing)	9 Arm Halo Mount	168'	(1) 3/8"
(6) Decibel 950G65VTZE-M antennas	Sprint (existing)	9 Arm Halo Mount	168'	(6) 1 5/8"
(3) APXV18-206517S	Unknown (existing)	Leg Mount	159'6"	(6) 1 5/8"
3 ½" dia x 9' Whip	Town (Existing)	Leg Mount	158'6"	(1) 1 5/8"
(2) 3" dia x 20' Whip	Town (existing)	20' Platform	144'	(2) 7/8"
(1) 2 ½" x 20' Whip	Town (existing)	20' Platform	144'	(1) 1/2"
2" dia x 15' Whip	Town (existing)	20' Platform	141'	(1) 1/2"
(1) 1.5" dia x 10' Whip	Town (existing)	20' Platform	139'	(1) 1/2"
(1) 3.5" dia x 9' Whip	Town (existing)	20' Platform	138'6"	---
(3) Argus LLPX310R antennas (3) Samsung Remote Radio Heads U-RAS	Clearwire (existing)	20' Platform	134'	(6) CAT 5 cable
(3) Andrew VHLP2.5 dish (2.5' dia.) (1) Andrew VHLP2 dish (2' dia.): Gamma Sector		20' Platform	134'	(4) 1/2"
(3) RFS APX16DWV-16DWVS-A20 antennas w/ (3) Twin AWS TMAs. (3) RFS APX16DWV-16DWV-S w/ (3) Twin PCS TMAs.	T-Mobile (existing)	(3) Existing T-Frames	125'	(18) 1 5/8"
(6) Powerwave 7770 (12) TMA's	AT&T (existing)	(3) T-Frames	115'	(12) 1 5/8"
(3) KMW AM-X-CD-16-65-00T-RET (6) RRU (1) Surge Suppressor	**AT&T (proposed)**	**Shared with Above**	**115'**	**(3) Optic Fiber & (6) DC Cables (Located within 3" dia Flex Conduit)**

Antenna Type	*Carrier*	*Mount*	*Antenna Centerline Elevation*	*Cable*
(6) Antel RWA 80014 and (6) Antel LPA 185063/12CF-2 antennas	Verizon (existing)	(3) T-Frames (PiROD part #800093)	101'	(12) 1 5/8"
(1) 3" x 2" x 22" Panel (1) TMA	AT&T (existing)	Pipe Mount	87'	(2) CAT 5
(1) 3' Dish (1) TMA	AT&T (existing)	3' Stand-off	83'	(2) CAT 5
(1) 3" x 2" x 22" Panel (1) TMA	AT&T (existing)	3' Stand-off	80'	(2) CAT 5
(1) Camera	Unknown (existing)	Leg Mounted	30'	(2) 1/2" (estimated from photographs)
(1) 3' Yagi	Unknown (existing)	Leg Mounted	24'	(1) 1/2"

This structural analysis of the communications tower was performed by URS Corporation (URS) for AT&T. The purpose of this analysis was to investigate the structural integrity of the existing tower with its existing and proposed antenna loads. This analysis was conducted to evaluate stress on the tower and the effect of forces to the foundation of the tower resulting from existing and proposed antenna arrangements.

3. ANALYSIS METHODOLOGY AND LOADING CONDITIONS

The structural analysis was done in accordance with the Connecticut State Building Code, TIA/EIA-222-F - Structural Standard for Steel Antenna Towers and Antenna Supporting Structures, and the American Institute of Steel Construction (AISC) Manual of Steel Construction – Allowable Stress Design (ASD).

The analysis was conducted using TNX Tower 6.0. Two load conditions were evaluated as shown below which were compared to allowable stresses according to AISC and TIA/EIA.

Basic Wind Speed:

- Middlesex County; v = **85** mph (fastest mile) [Section 16 of TIA/EIA-222-F-1996]
- Cromwell; v = 100mph (3 second gust) equivalent to 80mph (fastest mile) [Appendix K, 2005 Connecticut State Building Code Supplement]

Loading Cases:

Load Condition 1 = 85 mph (fastest mile) Wind Load (without ice) + Tower Dead Load
Load Condition 2 = 74 mph (fastest mile) Wind Load (with ice) + Ice Load + Tower Dead Load

Please note that wind pressure is a function of velocity squared. Under Load Condition 2, a 25 percent reduction in wind pressure is allowed by code to account for the unlikelihood of the full wind pressure and ice load occurring at the same time. The same results may be achieved by utilizing a lower wind pressure without taking the 25 percent reduction, as shown above.

The TIA/EIA standard permits a one-third increase in allowable stresses for towers and monopoles less than 700 feet tall. For the purposes of this analysis, in computing the load capacity the allowable stresses of the tower members were increased by one-third.

4. FINDINGS AND EVALUATION

The stresses on the tower structure were evaluated to compare with the allowable stress in accordance with AISC. The results of the analysis indicates that the calculated stresses under the proposed loading exceed the owner's limitation set to maintain reserve capacity (see tables below). The anchor bolts and foundation were found to be within the allowable limits.

TABLE 1: Tower Component Stress vs. Capacity Summary:

Component/ (Section No.)	Existing Component Size	Controlling Component/Elevation	Stress (Force / capacity)	Percent Capacity (See Note)	Pass/Fail
Tower Leg (T7)	PiROD Truss Leg	Compression 60'-80'	94.8%	**102.2%**	**FAIL**
Diagonal (T7)	L3x3x5/16	Compression 60'-80'	99.5%	**107.2%**	**FAIL**
Top Girt (T1)	7/8" SR	Compression 150'-170'	3.5%	**3.8%**	**Pass**
Bottom Girt (T1)	7/8" SR	Compression 150'-170'	3.7%	**4.0%**	**Pass**
Mid Girt (T4)	L3x3x3/16	Compression 100'-120'	25.0%	**26.9%**	**Pass**
Bolt Checks					
Anchor Bolts	(6) 1-1/4"	Tension	72%	**77.6%**	**Pass**

Note: Tower owner requested to maintain a reserved capacity of 7.2% (Maximum percent capacity shall not exceed 92.8%)

TABLE 2: Foundation Summary

Foundation	Component	Stress (% capacity/FOS)	Pass/Fail	Comments:
Drilled Concrete Caisson	Uplift	93.7%/2.30	**Pass**	Min. F.O.S of 2.0 req'd per IBC 2003 Section 3108.4.2

Note: Percent capacity listed above accounts for reserved capacity.

5. CONCLUSIONS AND RECOMMENDATIONS

The results of the analysis indicate that the tower structure's capacity has exceeded the tower owner's limitation set to maintain reserve capacity. **The foundation is considered structurally adequate for the proposed loading, however the tower is not considered structurally adequate for the proposed antenna loading with the wind load classification specified in Section 2. See Section 4 for detailed information.**

Limitations/Assumptions:

This report is based on the following:

1. Tower inventory as listed in this report.
2. Tower is properly installed and maintained.
3. All members are as specified in the original design documents and are in good condition.
4. All required members are in place.
5. All bolts are in place and are properly tightened.
6. Tower is in plumb condition.
7. All member protective coatings are in good condition.
8. All tower members were properly designed, detailed, fabricated, and installed and have been properly maintained since erection.
9. Foundations were properly constructed to support original design loads as specified in the original design documents.
10. All coaxial cable is installed as specified in Section 6 of this report.

URS is not responsible for any modifications completed prior to or hereafter in which URS is not or was not directly involved. Modifications include but are not limited to:

A. Adding antennas
B. Removing/replacing antennas
C. Adding coaxial cables

URS hereby states that this document represents the entire report and that it assumes no liability for any factual changes that may occur after the date of this report. All representations, recommendations, and conclusions are based upon information contained and set forth herein. If you are aware of any information which conflicts with that which is contained herein, or you are aware of any defects arising from original design, material, fabrication, or erection deficiencies, you should disregard this report and immediately contact URS. URS disclaims all liability for any representation, recommendation, or conclusion not expressly stated herein.

Ongoing and Periodic Inspection and Maintenance:

After the Contractor has successfully completed the installation and the work has been accepted, the owner will be responsible for the ongoing and periodic inspection and maintenance of the tower.

The owner shall refer to TIA/EIA-222-F for recommendations for maintenance and inspection. The frequency of the inspection and maintenance intervals is to be determined by the owner based upon actual site and environmental conditions. It is recommended that a complete and thorough inspection of the entire tower structural system be performed at least yearly and more frequently as conditions warrant. According to TIA/EIA-222-F section 14.1, Note 1: It is recommended that the structure be inspected after severe wind and/or ice storms or other extreme loading conditions.

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

Calculated Radio Frequency Emissions

CT1141

(Cromwell-FD)

179 Shunpike Road, Cromwell, CT 06416

June 26, 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 lattice tower located at 179 Shunpike Rd in Cromwell, CT. The coordinates of the tower are 41° 37' 23.65" N, -72° 40' 44.29" W.

AT&T is proposing the following modifications:

1) Install three 700 MHz LTE antennas (one per sector).

2. FCC Guidelines for Evaluating RF Radiation Exposure Limits

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

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

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

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

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

3. RF Exposure Prediction Methods

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

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

Where:

EIRP = Effective Isotropic Radiated Power

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

H = Horizontal Distance from antenna in meters

V = Vertical Distance from radiation center of antenna in meters

Ground reflection factor of 1.6

Off Beam Loss is determined by the selected antenna pattern

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

4. Calculation Results

Table 1 below outlines the power density information for the site. Because the proposed AT&T antennas are directional in nature, the majority of the RF power is focused out towards the horizon. As a result, there will be less RF power directed below the antennas relative to the horizon, and consequently lower power density levels around the base of the tower. Please refer to Attachment C for the vertical 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 - GSM	*114*	*880*	*2*	*296*	*0.0164*	*0.5867*	*2.79%*
Cingular - GSM	*114*	*1930*	*2*	*497*	*0.0275*	*1.0000*	*2.75%*
Cingular UMTS	*114*	*1935*	*1*	*500*	*0.0138*	*1.0000*	*1.38%*
Pocket	160	2130	3	631	0.0266	1.0000	2.66%
T-Mobile GSM	125	1945	8	131	0.0241	1.0000	2.41%
T-Mobile UMTS	125	2100	2	740	0.0341	1.0000	3.41%
CR Police Dept	159	635	1	635	0.0090	0.4233	2.13%
CR Fire Dept	128	46	1	100	0.0022	0.2000	1.10%
CR Fire Dept	135	154	1	110	0.0022	0.2000	1.09%
CR Fire Alarm	127	460	1	500	0.0111	0.3067	3.63%
Clearwire	134	2496	2	153	0.0061	1.0000	0.61%
Clearwire	134	11 GHz	1	211	0.0042	1.0000	0.42%
Sprint	170	1962.5	11	359	0.0491	1.0000	4.91%
Verizon cellular	100	880	9	285	0.0922	0.5867	15.72%
Verizon PCS	100	1900	3	400	0.0431	1.0000	4.31%
AT&T UMTS	115	880	2	565	0.0031	0.5867	0.52%
AT&T UMTS	115	1900	2	875	0.0048	1.0000	0.48%
AT&T LTE	115	734	1	1313	0.0036	0.4893	0.73%
AT&T GSM	115	880	1	283	0.0008	0.5867	0.13%
AT&T GSM	115	1900	4	525	0.0057	1.0000	0.57%
						Total	**44.84%**

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 identically match the total value reflected in the table.

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

[3] Antenna height listed for AT&T is in reference to the URS Corporation Structural Analysis dated May 31, 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 **44.84% 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 26, 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

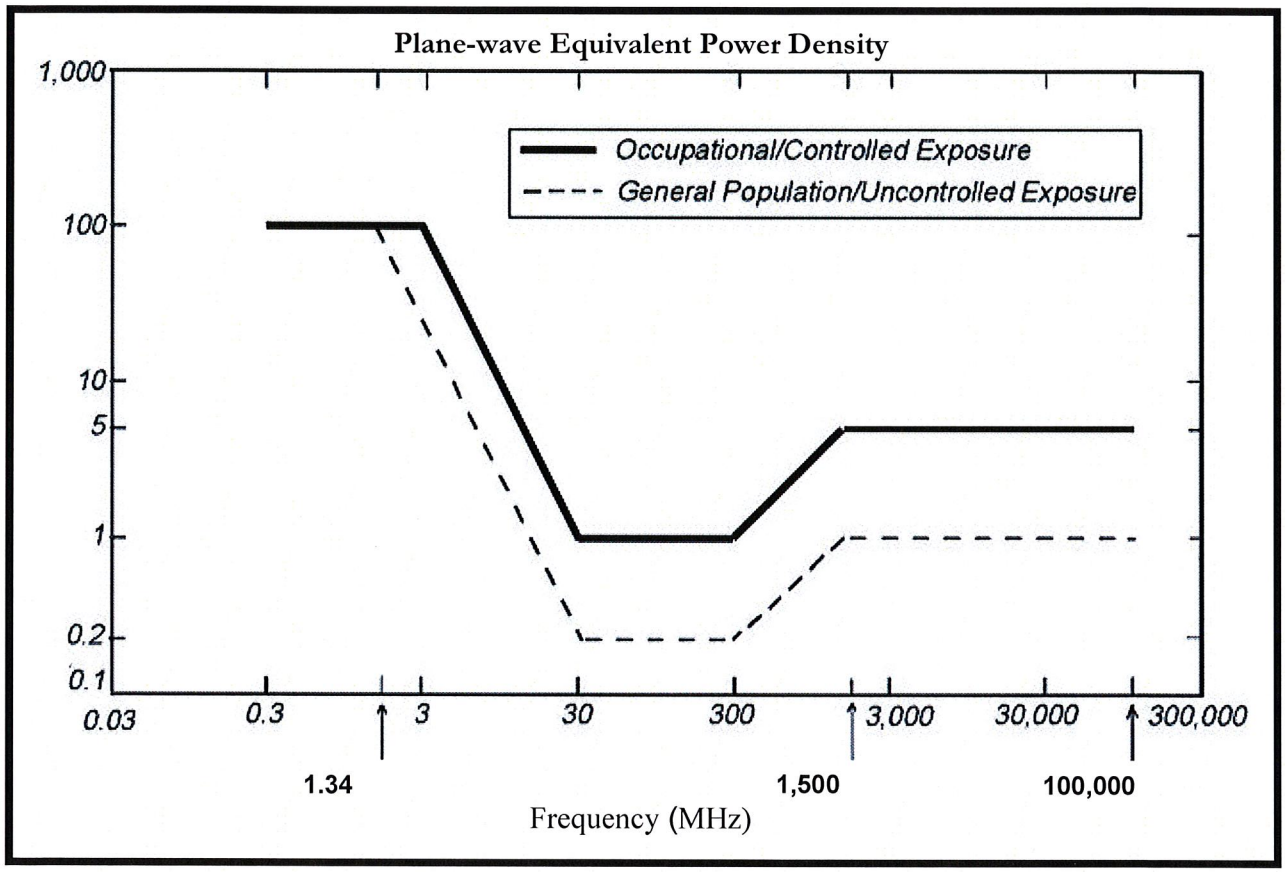
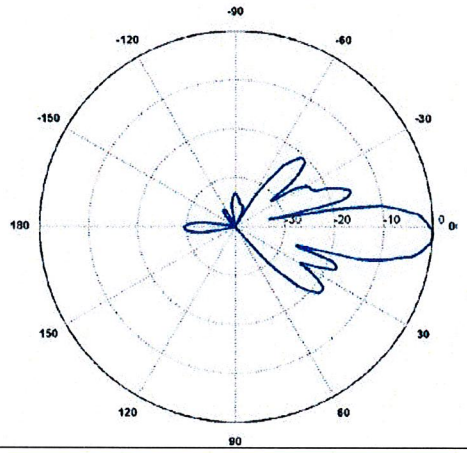


Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

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

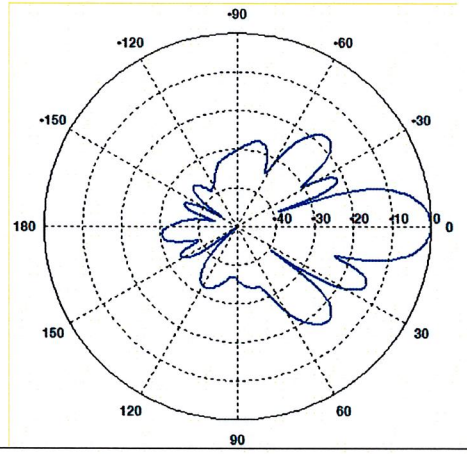
700 MHz

Manufacturer:	KMW Communications
Model #:	AM-X-CD-16-65-00T
Frequency Band:	698-806 MHz
Gain:	13.4 dBd
Vertical Beamwidth:	12.3°
Horizontal Beamwidth:	65°
Polarization:	Dual Slant ± 45°
Size L x W x D:	72.0" x 11.8" x 5.9"



850 MHz

Manufacturer:	Powerwave
Model #:	7770
Frequency Band:	824-896 MHz
Gain:	11.5 dBd
Vertical Beamwidth:	15°
Horizontal Beamwidth:	85°
Polarization:	Dual Linear ±45°
Size L x W x D:	55.4" x 11.0" x 5.0"



1900 MHz

Manufacturer:	Powerwave
Model #:	7770
Frequency Band:	1850-1990 MHz
Gain:	13.4 dBd
Vertical Beamwidth:	7°
Horizontal Beamwidth:	90°
Polarization:	Dual Linear ±45°
Size L x W x D:	55.4" x 11.0" x 5.0"