

# Pinnacle Wireless

800 Marshall Phelps Rd  
Building 2A  
Windsor, CT 06095

July 11, 2014

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

RECEIVED  
JUL 14 2014

CONNECTICUT  
SITING COUNCIL

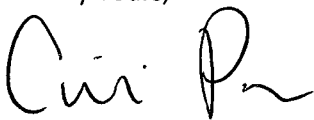
RE: **EM-CING-126-110628** – New Cingular Wireless PCS, LLC notification of completion of construction at 17 Daybreak Lane, Shelton, CT.

Dear Ms. Bachman:

This letter is submitted on behalf of New Cingular Wireless PCS, LLC ("AT&T"), whose notice of intent to modify an existing telecommunications facility was acknowledged by the Connecticut Siting Council ("Council") on July 15<sup>th</sup>, 2013.

Please accept this letter as notification of completion of construction by AT&T as required as a condition of the Council's acknowledgement. In addition, please refer to the attached documentation from AT&T's Engineer confirming that the installation was completed as designed.

Respectfully Yours,



Cecilia Post  
Project Coordinator

Cc: Kevin Mason, AT&T

# CEN TEK engineering

Centered on Solutions™

August 24, 2012

**Mr. Mark Roberts**  
Nexlink Global Services  
800 Marshall Phelps Road  
Windsor, Connecticut 06095

**Re: Existing Telecommunications Facility Tower Modification Certification Letter**

**Project:** AT&T ~ CT2044  
17 Daybreak Lane  
Shelton, CT

**Tower Owner:** Northeast Utilities  
107 Selden Street  
Berlin, CT 06037

**Engineer:** Centek Engineering  
63-2 North Branford Road Branford, CT

**Centek Project No.:** 11107.CO25

Dear Mr. Roberts,

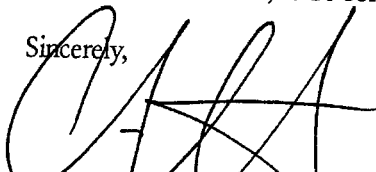
We are providing this "Existing Telecommunications Facility Tower Modification Certification Letter" with regard to the antenna upgrade by AT&T at the above referenced project.

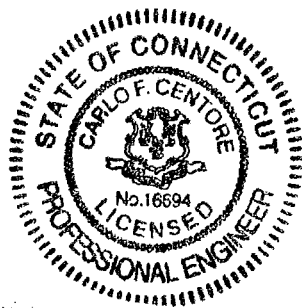
The following are the basis for substantiating compliance with the design documents prepared by this office:

- Review of the Centek Engineering structural analysis dated 06/17/2011.
- Field observations by Centek personnel of installation on 7/26/2012 which determined the upgrade was installed in compliance with the structural analysis report prepared by Centek Engineering on 06/17/2011.

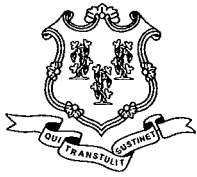
The work under this Contract has been reviewed and found, to the Engineer's best knowledge, information and belief, to be completed in general compliance with the documents referenced above.

Sincerely,

  
Carlo F. Centore, PE  
Principal ~ Structural Engineer



CC: Brian Paul (Nexlink)



STATE OF CONNECTICUT  
CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: [siting.council@ct.gov](mailto:siting.council@ct.gov)

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

July 15, 2011

Douglas L. Culp, Real Estate Consultant  
New Cingular Wireless PCS, LLC  
500 Enterprise Drive  
Rocky Hill, CT 06067-3900

RE: **EM-CING-126-110628** - New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 17 Daybreak Lane, Shelton, Connecticut.

Dear Mr. Culp:

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:

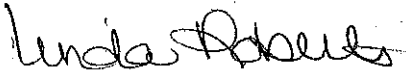
- The tower be modified in accordance with recommendations made in the Structural Analysis, Rev 1, prepared by Centek Engineering dated June 17, 2011 and stamped by Carlo Centore; and
- Prior to antenna installation, a signed letter from a Professional Engineer duly licensed in the State of Connecticut shall be submitted to the Council to certify that the recommended modifications have been completed and the tower and foundation will not exceed 100 percent of the post-construction structural rating.
- 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 June 28, 2011. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.



This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Thank you for your attention and cooperation.

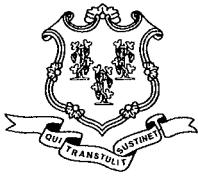
Very truly yours,



Linda Roberts  
Executive Director

LR/CDM/laf

- c: The Honorable Mark A. Laretti, Mayor, City of Shelton  
Richard Schultz, Planning Administrator, City of Shelton  
Robert D. Gray, Program Administrator, Third Party Attachments Trans. Projects, Northeast Utilities Service Co.



STATE OF CONNECTICUT  
*CONNECTICUT SITING COUNCIL*

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: [siting.council@ct.gov](mailto:siting.council@ct.gov)

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

June 29, 2011

The Honorable Mark A. Lauretti  
Mayor  
City of Shelton  
54 Hill Street  
P. O. Box 364  
Shelton, CT 06484

RE: **EM-CING-126-110628** - New Cingular Wireless PCS, LLC notice of intent to install a temporary cellular telecommunications facility located at 17 Daybreak Lane, Shelton, Connecticut.

Dear Mayor Lauretti:

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 15, 2011.

Thank you for your cooperation and consideration.

Very truly yours,

Linda Roberts  
Executive Director

LR/jbw

Enclosure: Notice of Intent

c: Richard Schultz, Planning Administrator, City of Shelton

EM-CING-126-110628



New Cingular Wireless PCS, LLC  
10 Enterprise Drive  
Rocky Hill, Connecticut 06067-3900  
Phone: (860) 463-5511  
Fax: (860) 513-7190

**Douglas L. Culp**  
Real Estate Consultant

HAND DELIVERED

June 28, 2011

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



Re: New Cingular Wireless PCS, LLC notice of intent to modify an existing tele-communications facility located at 17 Daybreak Lane Shelton, CT (owner Northeast Utilities – CL&P).

Dear Ms. Roberts:

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

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

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

Attached is a summary of the planned modifications, including power density calculations reflecting the change in AT&T’s operations at the site. Also included is documentation of the structural sufficiency of the tower to accommodate the revised antenna configuration.

The changes to the facility do not constitute modifications 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 or altered. 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.
2. The proposed changes will not extend the site boundaries. There will be no effect on the site compound other than some enlarged equipment pads as may be noted in the attachments.
3. The proposed changes will not increase the noise level at the existing facility by six decibels or more.
4. Radio frequency power density may increase due to use of one or more GSM channel for UMTS transmissions. Moreover, LTE will utilize additional radio frequencies newly-licensed by the FCC for cellular mobile communications. However, the changes 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.

For the foregoing reasons, New Cingular Wireless respectfully submits that the proposed changes at the referenced site constitute exempt modifications under R.C.S.A. Section 16-50j-72(b)(2).

Please feel free to call me at (860) 463-5511 with questions concerning this matter. Thank you for your consideration.

Sincerely,

A handwritten signature in blue ink, appearing to read "D. L. Culp", with a stylized flourish at the end.

Douglas L. Culp  
Real Estate Consultant

Attachments

**NEW CINGULAR WIRELESS PCS, LLC  
Equipment Modification**

17 Daybreak Lane Shelton, CT  
Site Number CT2044  
Exempt Modification

**Tower Owner/Manager:** Northeast Utilities – CL&P

**Equipment configuration:** Transmission Line Powermount

**Current and/or approved:** Six PowerWave P7770 antennas @ 98 ft  
Twelve PowerWave TMA's @98 ft  
Twelve runs 7/8 inch coax to 98 ft  
Equipment Shelter

**Planned Modifications:** Retain existing PowerWave P7770 Antenna's and TMA's @ 98 ft  
Retain all Coax Cabling  
Install six 7/8 inch runs of coax @ 98 ft  
Install three PowerWave P65-15 antennas or equivalent @ 98 ft  
Install three PowerWave TTAW-07BP111-001 equivalent @ 98 ft

**Power Density:**

Worst-case calculations for existing wireless operations at the site, using standard parameters for other carriers, indicate a radio frequency electromagnetic radiation power density, measured at ground level beside the Tower, of approximately 34.4% of the standard adopted by the FCC. As depicted in the second table below, the total radio frequency electromagnetic radiation power density following proposed modifications would be approximately 38.2% of the standard.

**Existing**

Company	Centerline Ht (feet)	Frequency (MHz)	Number of Channels	Power Per Channel (Watts)	Power Density (mW/cm <sup>2</sup> )	Standard Limits (mW/cm <sup>2</sup> )	Percent of Limit
Other Users							N/A
AT&T UMTS	98	1900 Band	2	500	0.0374	1.0000	3.74
AT&T UMTS	98	800 Band	1	500	0.0187	0.5867	3.19
AT&T GSM	98	800Band	12	296	0.1330	0.5867	22.67
AT&T GSM	98	1900 Band	3	427	0.0480	1.0000	4.80
<b>Total</b>							<b>34.4%</b>

\* Data for other users are from Siting Council records.



## Proposed

Company	Centerline Ht (feet)	Frequency (MHz)	Number of Channels	Power Per Channel (Watts)	Power Density (mW/cm <sup>2</sup> )	Standard Limits (mW/cm <sup>2</sup> )	Percent of Limit
Other Users							N/A
AT&T UMTS	98	800 Band	1	500	0.0187	0.5867	3.19
AT&T UMTS	98	1900 Band	2	500	0.0374	1.0000	3.74
AT&T GSM	98	1900 Band	3	427	0.0480	1.0000	4.80
AT&T GSM	98	800Band	12	296	0.1330	0.5867	22.67
AT&T LTE	98	740 - 746	1	500	0.0187	0.4933	3.79
<b>Total</b>							<b>38.2%</b>

\* Data for other users are from Siting Council records.

### Structural information:

The attached structural analysis demonstrates that the monopole and foundation have adequate structural capacity to accommodate the proposed modifications. (CENTEK dated 6-17-11).



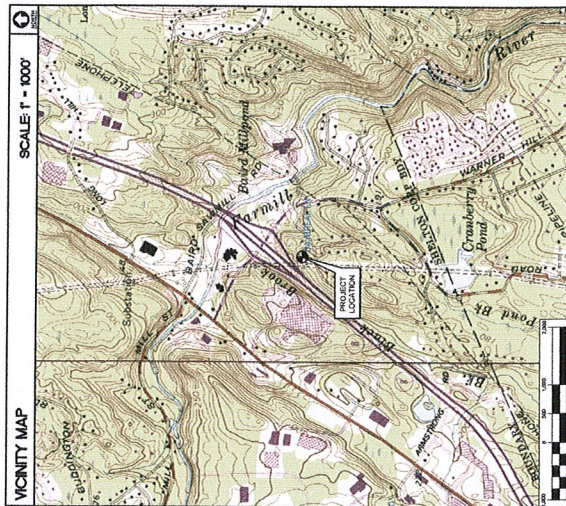
# WIRELESS COMMUNICATIONS FACILITY

## CT2044 SHELTON PWR MT CL&P STRUCT. NO. 1340 17 DAYBREAK LANE SHELTON, CT 06484

SITE DIRECTIONS	
FROM: 500 ENTERPRISE DRIVE BOOTH HILL, CONNECTICUT	TO: 17 DAYBREAK LANE SHELTON, CT 06484
1. Start out going on an enterprise drive toward capital bank.	
2. Turn left onto road 1.7 mi.	
3. Turn left onto road 1.7 mi.	
4. Merge onto I-95 S and take exit 33 toward daybreak.	
5. Merge onto CT-24 N on exit 33 toward daybreak.	
6. Merge onto I-95 N on exit 33 toward daybreak.	
7. Turn right onto road 1.7 mi.	
8. Turn right onto road 1.7 mi.	
9. Turn right onto road 1.7 mi.	
10. Turn left onto road 1.7 mi.	
11. Turn right onto road 1.7 mi.	

### GENERAL NOTES

- ALL WORK SHALL BE IN ACCORDANCE WITH THE 2003 INTERNATIONAL BUILDING CODE AS AMENDED BY THE 2009 CONNECTICUT SUPPLEMENT, INCLUDING THE 1A, 1B, 222, REVISION 1 "STRUCTURAL STANDARDS FOR CONSTRUCTION OF STEEL DECK AND CONCRETE SLAB" AND THE 2009 CONNECTICUT FIRE SAFETY CODE AND 2009 AMENDMENTS, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
- STAKE TO THE WATER BOUNDARY SURROUNDING THE EXISTING FOUNDATION SHALL BE PROVIDED BY THE OWNER. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING FOUNDATIONS AND ALL RELATED PARTS. THE SUBCONTRACTORS SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION OF ALL EXISTING FOUNDATIONS AND ALL RELATED PARTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION OF ALL EXISTING FOUNDATIONS AND ALL RELATED PARTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION OF ALL EXISTING FOUNDATIONS AND ALL RELATED PARTS.
- CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL AND ELECTRICAL COMPONENTS OR IN THE WRITTEN SPECIFICATIONS OR INDICATED ON THE DRAWINGS.
- CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH THE WRITTEN SPECIFICATIONS OR INDICATED ON THE DRAWINGS.
- CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
- CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF ALL DRAWINGS AND SPECIFICATIONS TO ALL SUBCONTRACTORS AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING A SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
- LOCATION OF EQUIPMENT, AND WORK SUPPLIED BY OTHERS THAT IS DETERMINED BY THE CONTRACTOR IN THE DRAWINGS SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE THE LOCATION AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
- CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION OF ALL EXISTING FOUNDATIONS AND ALL RELATED PARTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION OF ALL EXISTING FOUNDATIONS AND ALL RELATED PARTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION OF ALL EXISTING FOUNDATIONS AND ALL RELATED PARTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION OF ALL EXISTING FOUNDATIONS AND ALL RELATED PARTS.
- CONTRACTOR SHALL COMPLY WITH ALL ENVIRONMENTAL REGULATIONS AND REQUIREMENTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS.



**PROJECT SUMMARY**

- THE PROPOSED SCOPE OF WORK GENERALLY CONSISTS OF THE INSTALLATION OF ONE (1) TIA ANTENNA & (1) TIA PER SECTOR CL&P STRUCTURE. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING FOUNDATIONS AND ALL RELATED PARTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION OF ALL EXISTING FOUNDATIONS AND ALL RELATED PARTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION OF ALL EXISTING FOUNDATIONS AND ALL RELATED PARTS.
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**PROJECT INFORMATION**

AT&T SITE NUMBER: CT2044  
 AT&T SITE NAME: SHELTON PWR MT  
 SITE ADDRESS: CL&P STRUCT. NO. 1340  
 17 DAYBREAK LANE  
 SHELTON, CT 06484

LESSEE/APPLICANT: AT&T MOBILITY  
 100 ENTERPRISE DRIVE SUITE 2A  
 BOOTH HILL, CT 06034

ENGINEER: CENTEK ENGINEERING, INC.  
 85-2 NORTH BRANFORD RD.  
 BRANFORD, CT 06405  
 PHONE: 203-787-0587  
 FAX: 203-787-0587  
 PROJECT COORDINATE: GROUND ELEVATION: 5160' AMSL

**SHEET INDEX**

SHT NO.	DESCRIPTION	REV
T-1	TITLE SHEET	1
N-1	NOTES AND SPECIFICATIONS	1
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C-2	LITE SYSTEM EQUIPMENT PLANS & DETAILS	1
S-1	STRUCTURAL REINFORCEMENT DETAILS	1
E-1	ELECTRICAL DETAILS AND NOTES	1
E-2	ELECTRICAL DETAILS	1

DESIGNED BY: CC	DATE: 3/27/11	
DRAWN BY: CC	DATE: 3/27/11	
CHECKED BY: CC	DATE: 3/27/11	
REV. DATE	BY	DESCRIPTION
0	CC	CONSTRUCTION - CLIENT REVIEW

AT&T  
 SAI  
 CENTEK ENGINEERING

AT&T MOBILITY  
 100 ENTERPRISE DRIVE SUITE 2A  
 BOOTH HILL, CT 06034  
 PHONE: 203-787-0587  
 FAX: 203-787-0587  
 www.atandt.com

AT&T MOBILITY  
 SITE NUMBER: CT2044  
 SITE NAME: SHELTON PWR MT  
 CL&P STRUCT. NO. 1340

DATE: 3/27/11  
 SCALE: AS NOTED  
 JOB NO.: 11021.004

TITLE SHEET  
 T-1  
 of 2

## STRUCTURAL SPECIFICATIONS

### DESIGN BASIS

GOVERNING CODE: 2005 INTERNATIONAL BUILDING CODE, PART AS INCORPORATED BY THE 2005 CONNECTICUT STATE BUILDING CODE AND 2005 AMENDMENTS.

- DESIGN CRITERIA
  - WIND LOAD: PER ENR/TM 223 F-46 & N1 CRITERIA (ANTENNA MOUNTS); 85 MPH (W/STRET MILE) EQUIVALENT TO 105 MPH (3 SECOND GUST).
  - BASIC WIND SPEED (OTHER STRUCTURES): 110 MPH (3 SECOND GUST) (EPOSUBURE PERFORMANCE FACTOR 1.0 BASED ON ASCE 7-02) PER 2005 INTERNATIONAL BUILDING CODE AS AMENDED BY THE 2005 CONNECTICUT SUPPLEMENT AND 2005 AMENDMENT.
  - SEISMIC LOAD (GUSES NOT CONTROL): PER ASCE 7-95 MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES.

### GENERAL NOTES

- IF ANY FIELD CONDITIONS EXIST WHICH PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL PROCEED WITH AFFECTED WORK AFTER CONSULT IS SATISFACTORILY RESOLVED.
- SHIP DRAWINGS AND DETAILS SHALL BE CHECKED AGAINST THE PRE MANUFACTURED EQUIPMENT BUILDING AND ANCHOR BOLTS AS REQUIRED BY ALL TRADES.
- THE CONTRACTOR SHALL VERIFY AND COORDINATE THE SIZE AND LOCATION OF ALL OPENINGS, SLEEKES AND ANCHOR BOLTS AS REQUIRED BY ALL TRADES.
- REFER TO DRAWING T1 FOR ADDITIONAL NOTES AND REQUIREMENTS.

### SITE NOTES

- THE CONTRACTOR SHALL CALL UTILITIES PRIOR TO THE START OF CONSTRUCTION.
- ACTIVE EXISTING UTILITIES, WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY IN WRITING OF ANY CHANGES TO THE EXISTING UTILITY PRIOR TO THE COMPLETION OF THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
- ALL RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED OFF SITE AND BE LEGALLY DEPOSITED, AT NO ADDITIONAL COST.
- THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE EQUIPMENT AND THE ADJACENT PROPERTY.
- NO FILL OR ENHANCEMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND, FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR ENHANCEMENT.
- THE SUBGRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
- CONTRACTOR SHALL MAINTAIN DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. REGIONAL CONTROL MEASURES SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.

### EARTHWORK NOTES

- COMPACTED GRAVEL FILL SHALL BE FURNISHED AND PLACED AS A FOUNDATION FOR STRUCTURES, WHERE SHOWN ON THE CONTRACT DRAWINGS OR DIRECTED BY THE ENGINEER.
- GRAVEL FILL SHALL BE PLACED IN 12" MAX. LIFTS AND CONSOLIDATED USING A HAND OPERATED COMPACTOR MEETING THE REQUIREMENTS OF A MINIMUM 400 LB. WEIGHT AND 2" PASSES OF COMPACTOR PER LIFT.
- COMPACTED GRAVEL FILL TO BE WELL GRADED BANK RUN GRAVEL MEETING THE FOLLOWING GRADATION

SIZE DESCRIPTION	% PASSING
No. 10	100
No. 20	80-100
No. 40	40-75
No. 60	20-50
No. 100	10-30

SIZE DESCRIPTION	% PASSING
No. 20	90-100
No. 40	40-75
No. 60	20-50
No. 100	10-30

- SELECT BACKFILL FOR FOUNDATION WALLS SHALL BE FREE OF ORGANIC MATERIAL, TOPSOIL, DEBRIS AND Boulders LARGER THAN 6".
- GRAVEL AND GRANULAR FILL SHALL BE INSTALLED IN 8" MAX. LIFTS, COMPACTED TO 95% MIN. AT MAX. DRY DENSITY.
- NON-WOVEN GEOTEXTILE FOR SEPARATION PURPOSES SHALL BE MWRF1 140N, OR ENGINEER APPROVED EQUAL.

### FOUNDATION CONSTRUCTION NOTES

- ALL FOOTINGS SHALL BE PLACED ON REMEDIATED, UNCOMPACTED GRAVEL, SAND, GRAVEL, BEARING CAPACITY AND FREE OF ORGANIC CONTENT, CLAY, OR OTHER UNSUITABLE MATERIAL. ADDITIONAL EXCAVATION MAY BE REQUIRED BELOW FOOTING ELEVATIONS INDICATED IF UNSUITABLE MATERIAL IS ENCOUNTERED.
- FOR ALL FOUNDATIONS, THE CONTRACTOR SHALL VERIFY AND COORDINATE THE SIZE AND LOCATION OF ALL OPENINGS, SLEEKES AND ANCHOR BOLTS AS REQUIRED BY ALL TRADES.
- FOR ALL FOUNDATIONS, THE CONTRACTOR SHALL VERIFY AND COORDINATE THE SIZE AND LOCATION OF ALL OPENINGS, SLEEKES AND ANCHOR BOLTS AS REQUIRED BY ALL TRADES.
- FOR ALL FOUNDATIONS, THE CONTRACTOR SHALL VERIFY AND COORDINATE THE SIZE AND LOCATION OF ALL OPENINGS, SLEEKES AND ANCHOR BOLTS AS REQUIRED BY ALL TRADES.
- FOR ALL FOUNDATIONS, THE CONTRACTOR SHALL VERIFY AND COORDINATE THE SIZE AND LOCATION OF ALL OPENINGS, SLEEKES AND ANCHOR BOLTS AS REQUIRED BY ALL TRADES.

### CONCRETE CONSTRUCTION NOTES

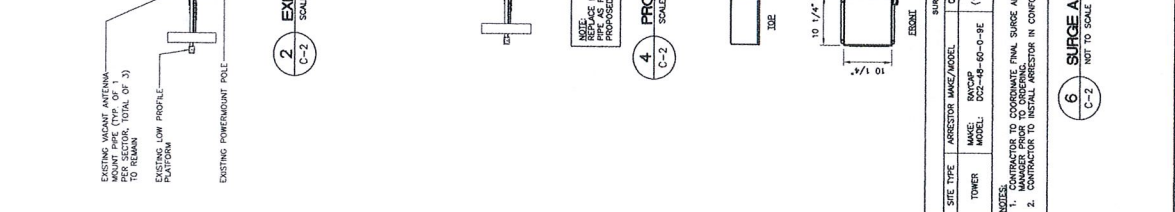
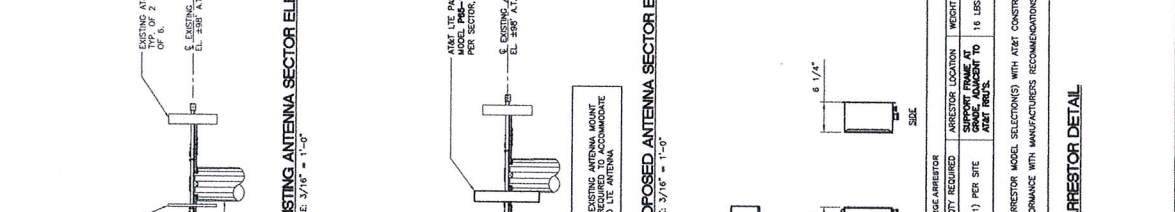
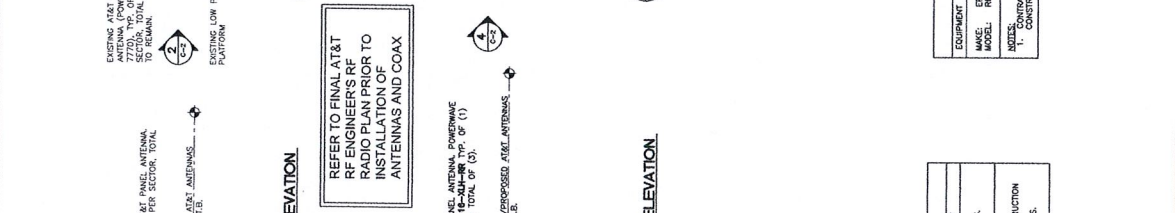
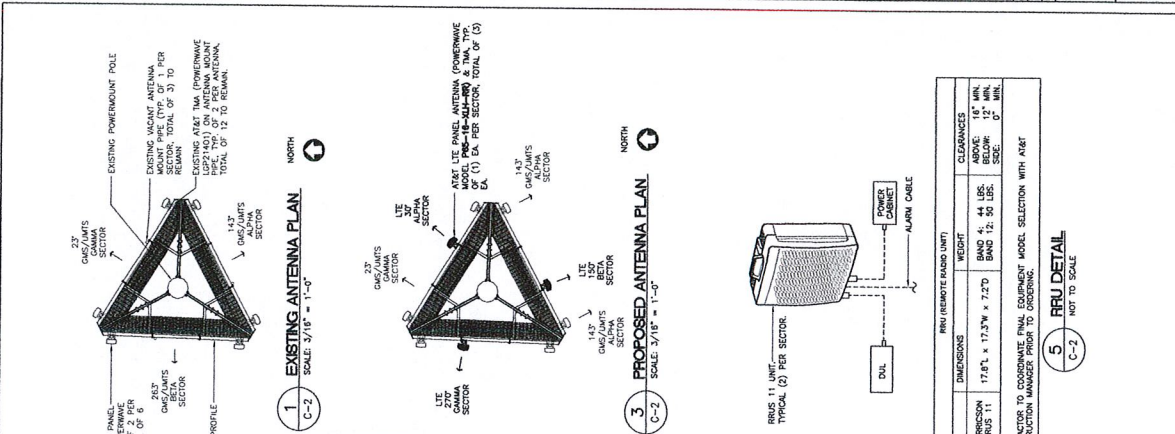
- CONCRETE CONSTRUCTION SHALL CONFORM TO THE FOLLOWING STANDARDS:
  - ACI 211 - STANDARD PRACTICE FOR SELECTING PROPORTIONS FOR NORMAL AND HEAVYWEIGHT CONCRETE.
  - ACI 301 - SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BALANCE.
  - ACI 302 - GUIDE FOR CONCRETE FLOOR AND SLAB CONSTRUCTION.
  - ACI 304 - STANDARD PRACTICE FOR MEASURING, MIXING, TRANSPORTING, AND PLACING CONCRETE.
  - ACI 308.1 - STANDARD SPECIFICATION FOR COLD WEATHER CONCRETING.
  - ACI 318 - BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE.
- CONCRETE SHALL DEVELOP COMPRESSIVE STRENGTH IN 28 DAYS AS FOLLOWS:
  - SLAB ON GRADE: 3,000 PSI
  - ALL OTHER CONCRETE: 4,000 PSI
  - PORTLAND CEMENT, ASTM C150, TYPE II (940 LBS./CU. YARD)
  - AGGREGATE, ASTM C686, NO. 67, FINISH, MAXIMUM COARSENESS OF .55
  - CEMENT TO AGGREGATE RATIO OF 1.0
  - W/C RATIO OF 0.45
  - W/RETARDING AGENT CONFORMING TO ASTM C494, TYPE A IN ALL CONCRETE, CALCIUM CHLORIDE MAY NOT BE USED TO ACCELERATE THE CONCRETE SETTING TIME.
- REINFORCING STEEL SHALL BE 60,000 PSI YIELD STRENGTH.
  - WELDED WIRE FABRIC SHALL CONFORM TO ASTM-A-182.
- ALL DETAILING, FABRICATION, AND SECTION OF REINFORCING BARS, UNLESS OTHERWISE NOTED, MUST CONFORM TO THE REQUIREMENTS OF THE ACI 318. THE CONTRACTOR SHALL FURNISH A MANUAL OF STANDARD PRACTICE FOR REINFORCING CONCRETE STRUCTURES.
- CONCRETE COVER OVER REINFORCING SHALL CONFORM TO THE FOLLOWING, UNLESS OTHERWISE SHOWN:
  - BOTTOM OF FOOTINGS: 3 INCHES
  - SUBGRADE NOT EXPOSED TO DRAIN: 1-1/2 INCHES OR MORE
- NO STEEL WIRE, METAL FORM TIES, OR ANY OTHER METAL SHALL REMAIN WITHIN THE REQUIRED COVER OF ANY CONCRETE SURFACE.
- ALL REINFORCEMENT SHALL BE CONTINUOUS UNLESS OTHERWISE NOTED. SPLICES SHALL BE WELL LAPED AT JOINTS. SUCH DETAILS SHALL CONFORM WITH ACI 318 RECOMMENDATIONS UNLESS OTHERWISE SHOWN.
- NO TACK WELDING OF REINFORCING WILL BE PERMITTED.
- NO CALCIUM CHLORIDE OR ADMIXTURES CONTAINING MORE THAN 1% CHLORIDE BY WEIGHT OF ADMIXTURE SHALL BE USED IN THE CONCRETE.
- UNLESS OTHERWISE NOTED, ALL LAP SPLICES SHALL BE 48 BAR DIAMETERS.
- SLAB ON GRADE FINISHES:
  - EXTERIOR SLAB: NON-SLIP BROOM FINISH
  - INTERIOR SLAB: STEEL TROWEL FINISH

### GENERAL NOTES (REFERENCE)

CONTRACTOR TO REFER TO THE GENERAL NOTES ON SHEET T-1 FOR ADDITIONAL INFORMATION.

DATE: 3/27/11	AT&T MOBILITY
SCALE: AS NOTED	SITE NUMBER: C12044
JOB NO.: 11021.C04	SITE NAME: SHELTON PWR MT
	CL&P STRCT. NO. 1340
	WIRELESS COMMUNICATIONS FACILITY
	384
	11 OVERPASS 11
	SHELTON CT 06068
	www.21century.com
3031 4602077th	
5000 KENNEDY BLVD	
HOUSTON TX 77056	
SAIT	
at&t	
PROFESSIONAL ENGINEER SEAL	
NO. 11021.C04	
DATE: 3/27/11	
REV. 0	
6/21/11	
7/2/11	
CONSTRUCTION - CLIENT REVIEW	
DRAWN BY: [ ]	
CHECKED BY: [ ]	
DATE: [ ]	
DESIGNED BY: [ ]	
DATE: [ ]	
JOB NO.: [ ]	
DRAWN BY: [ ]	
DATE: [ ]	

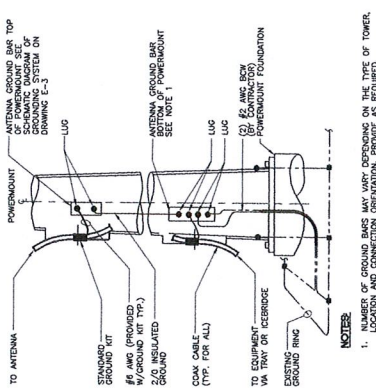






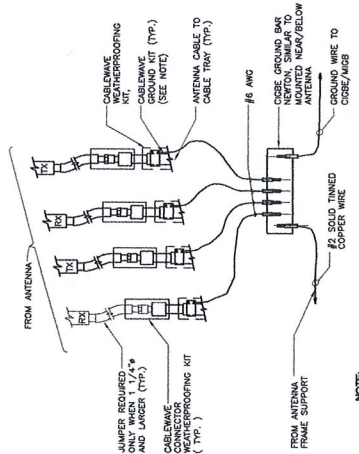


DESIGNED BY:	CHKD BY:	DATE:	REV:	REASON FOR CHANGE:
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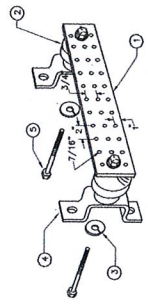
- NOTES:**
- NUMBER OF GROUND BARS MAY VARY DEPENDS ON THE TYPE OF TOWER, LOCATION AND CONNECTION ORIENTATION. PROVIDE AS REQUIRED.
  - A SEPARATE GROUND BAR TO BE USED FOR GPS ANTENNA IF REQUIRED.

**1 ANTENNA CABLE GROUNDING - POWERMOUNT**  
E-2 NOT TO SCALE



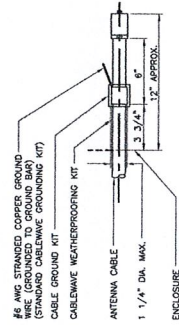
- NOTE:**
- DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND.

**3 CONNECTION OF GROUND WIRES TO GROUND BAR**  
E-2 NOT TO SCALE



- LEGEND**
- TINNED COPPER GROUND BAR, 1/4" x 4" x .207, NEWTON INSTRUMENT CO. HOLE CENTERS TO MATCH HEMA DOUBLE LUG.
  - INSULATORS, NEWTON INSTRUMENT CAT. NO. 2, 3061-4.
  - 3/8" LOCK WASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8.
  - WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT. NO. A-008.
  - STAINLESS STEEL SECURITY SCREWS.

**2 GROUND BAR DETAIL**  
E-2 NOT TO SCALE



- NOTE:**
- DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.

**4 ANTENNA CABLE GROUNDING DETAIL**  
E-2 NOT TO SCALE

**AT&T MOBILITY**  
WIRELESS COMMUNICATIONS FACILITY  
SHELTON CT 06444  
17 GAVENWAY LANE  
SHELTON CT 06444

**SITE NAME: SHELTON PWR MT**  
**CL&P STRUCT. NO. 1340**

**DATE:** 3/2/03  
**SCALE:** AS NOTED  
**JOB NO.:** 110271204

**ELECTRICAL DETAILS**

**E-2**  
Sheet No. 2 of 2

at&t

**SIALI**  
SHELL INTERNATIONAL ASSOCIATES, INC.

**CENITEK**  
Construction Technology Resources

12000 BROADWAY  
NEWTON, MASSACHUSETTS 02459  
425 North Street Road  
Portland, CT 06465  
www.cenitekg.com



**Structural Analysis of  
Powermount and CL&P Tower**

AT&T Site Ref: CT2044: Shelton-NU

CL&P Structure No. 1340  
81' Electric Transmission Lattice Tower

17 Daybreak Lane  
Shelton, CT

CEN TEK Project No. 11021.CO4

~~Date: May 2, 2011~~  
Rev 1: June 17, 2011



**Prepared for:**  
AT&T Mobility  
500 Enterprise Drive, Suite 3A  
Rocky Hill, CT 06067

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- ANCHOR BOLT ANALYSIS
- FOUNDATION ANALYSIS.

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## Introduction

The purpose of this report is to analyze the existing powermount and 81' CL&P tower located at 17 Daybreak Lane in Shelton, CT for the proposed antenna and equipment upgrade by AT&T.

The proposed loads consist of the following:

- **AT&T (Existing to remain):**  
**Antennas:** Six (6) Powerwave 7770 panel antennas and twelve (12) Powerwave LGP214 TMA's mounted on a low profile platform to the existing FWT Powermount with a RAD center elevation of 98-ft above tower base plate.  
**Coax Cables:** Twelve (12) 7/8"  $\varnothing$  coax cables running on the inside of the existing FWT Powermount.
- **AT&T (Proposed):**  
**Antennas:** Three (3) Powerwave P65-16-XHL-RR panel antennas and three (3) Powerwave TTAW-07BP111-001 TMA's mounted on the existing low profile platform to the FWT Powermount with a RAD center elevation of 98-ft above tower base plate.  
**Coax Cables:** Six (6) 7/8"  $\varnothing$  coax cables running on the inside of the existing FWT Powermount.

## Primary assumptions used in the analysis

- Allowable steel stresses are defined by AISC-ASD 9<sup>th</sup> edition for design of the Powermount and antenna supporting elements.
- ASCE Manual No. 10-97, "Design of Latticed Steel Transmission Structures", defines allowable steel stresses for evaluation of the CL&P utility tower.
- All utility tower members are adequately protected to prevent corrosion of steel members.
- All proposed antenna mounts are modeled as listed above.
- All coaxial cable will be installed within the powermount unless specified otherwise.
- Powermount will be properly installed and maintained.
- No residual stresses exist due to incorrect tower erection.
- All bolts are appropriately tightened providing the necessary connection continuity.
- All welds conform to the requirements of AWS D1.1.
- Powermount and utility tower will be in plumb condition.
- Utility tower was properly installed and maintained and all members were properly designed, detailed, fabricated, and installed and have been properly maintained since erection.
- Any deviation from the analyzed loading will require a new analysis for verification of structural adequacy.

## A n a l y s i s

Structural analysis of the existing *Powermount* was independently completed using the current version of RISA-3D computer program licensed to CENTEK Engineering, Inc.

The existing FWT powermount consisting of a 12" Std. pipe conforming to ASTM A500 Grade C ( $F_y = 50\text{ksi}$ ) connected at five points to the existing tower was analyzed for its ability to resist loads prescribed by the TIA/EIA standard. Section 5 of this report details these gravity and lateral wind loads. NESC prescribed loads were also applied to the powermount in order to obtain reactions needed for analyzing the CL&P tower structure. These loads are developed in Section 7 of this report. Load cases and combinations used in RISA-3D for TIA/EIA loading and for NESC/NU loading are listed in report Sections 6 and 8, respectively.

An envelope solution was first made to determine maximum and minimum forces, stresses, and deflections to confirm the selected section as adequate. Additional analyses were then made to determine the NESC forces to be applied to the CL&P tower structure.

The RISA-3D program contains a library of all AISC shapes and corresponding section properties are computed and applied directly within the program. The program's Steel Code Check option was also utilized. The forces calculated in RISA-3D using NESC guidelines were then applied to the CL&P pole using PLS-Pole. Maximum usage for the pole was calculated considering the additional forces from the mast and associated appurtenances.

## D e s i g n B a s i s

Our analysis was performed in accordance with EIA-222-F-1996, ASCE Manual No. 10-97, "Design of Latticed Steel Transmission Structures", NESC C2-2007 and Northeast Utilities Design Criteria.

The CL&P tower structure, considering existing and future conductor and shield wire loading, with the proposed antenna mast was analyzed under two conditions:

### ▪ UTILITY TOWER ANALYSIS

The purpose of this analysis is to determine the adequacy of the existing utility structure to support the proposed antenna loads. The loading and design requirements were analyzed in accordance with the NU Design Criteria Table, NESC C2-2007 ~ Construction Grade B, and ASCE Manual No. 10-97, "Design of Latticed Steel Transmission Structures".

Load cases considered:

#### Load Case 1: NESC Heavy

Wind Pressure.....	4.0 psf
Vertical Overload Capacity Factor.....	1.50
Wind Overload Capacity Factor.....	2.50
Wire Tension Overload Capacity Factor.....	1.65

#### Load Case 2: NESC Extreme

Wind Speed.....	110 mph <sup>(1)</sup>
Radial Ice Thickness.....	0"

Note 1: NESC C2-2007, Section 25, Rule 250C: Extreme Wind Loading, 1.25 x Gust Response Factor (wind speed: 3-second gust)

▪ POWERMOUNT ANALYSIS

Powermount, appurtenances and connections to the utility tower were analyzed and designed in accordance with the NU Design Criteria Table, TIA/EIA-222-F, and AISC-ASD standards.

Load cases considered:

Load Case 1:

Wind Speed..... 85 mph <sup>(2)</sup>  
 Radial Ice Thickness..... 0"

Load Case 2:

Wind Pressure..... 75% of 85 mph wind pressure  
 Radial Ice Thickness..... 0.5"

| Note 2: Per NU Mast Design Criteria Exception 1.

Results

▪ POWERMOUNT

The existing powermount was determined to be structurally **adequate**.

FWT Powermount	Stress Ratio (% of capacity)	Result
12" Std. Pipe	69.5%	PASS

▪ UTILITY TOWER

This analysis finds that the subject utility structure is adequate to support the existing powermount and related appurtenances. The tower stresses meet the requirements set forth by the ASCE Manual No. 10-97, "Design of Latticed Steel Transmission Structures", for the applied NESC Heavy and Hi-Wind load cases. The detailed analysis results are provided in Section 9 of this report. The analysis results are summarized as follows:

A maximum usage of **90.09%** occurs in the utility tower under the **NESC Extreme** loading condition.

TOWER SECTION:

The utility tower was found to be within allowable limits.

Tower Member	Stress Ratio (% of capacity)	Result
Angle g38Y	90.09%	PASS

▪ FOUNDATION AND ANCHORS

The existing foundation consists of four (4) 2-ft square tapering to 5-ft square x 5-ft-8" long reinforced concrete piers and four (4) 8-ft square x 2-ft thick reinforced concrete pads. The base of the tower is connected to the foundation by four (4) 1-1/4" Ø ASTM A36 anchor bolts per leg. Foundation information was obtained from NUSCO drawing # 01021-60001.

Review of the foundation design consisted of verification of applied loads obtained from the tower design calculations and code checks of allowable stresses:

**BASE REACTIONS:**

From PLS-Tower analysis of CL&P tower based on NESC/NU prescribed loads.

Load Case	Shear	Uplift	Compression
NESC Heavy Wind	7.7 kips	20.3 kips	35.8 kips
NESC Extreme Wind	11.8 kips	47.9 kips	54.5 kips

Note 1 – 10% increase to be applied to the above tower base reactions for foundation verification per OTRM 051

**ANCHOR BOLTS:**

The anchor bolts were found to be within allowable limits.

Tower Component	Design Limit	Stress Ratio (percentage of capacity)	Result
Anchor Bolts	Tension	57.2%	PASS

**FOUNDATION:**

The foundation was found to be within allowable limits.

Foundation	Design Limit	Allowable Limit	Proposed Loading <sup>(2)</sup>	Result
Reinf. Conc. Pad & Pier	Uplift	1.0 FS <sup>(1)</sup>	1.38 FS <sup>(1)</sup>	PASS
	Bearing Pressure	4 ksf	1.41 ksf	PASS

Note 1: FS denotes Factor of Safety

Note 2: 10% increase to PLS base reactions used in foundation analysis per OTRM 051.

Conclusions and Recommendations

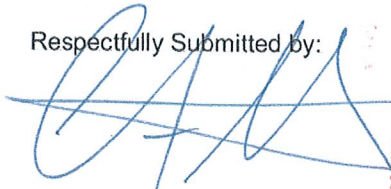
This analysis shows that the subject utility tower with the proposed Powermount brace replacement is **adequate** to support the proposed AT&T equipment upgrade.

Replacement of the existing Powermount connection at 81-ft AGL and 76-ft AGL will be required prior to the AT&T equipment upgrade. The Powermount connection reinforcement design is included in this report.

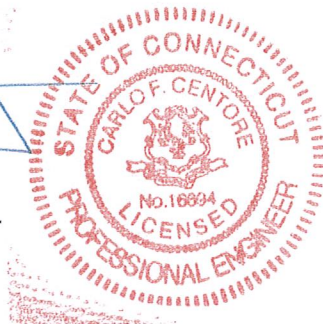
The analysis is based, in part on the information provided to this office by Northeast Utilities and AT&T Mobility. If the existing conditions are different than the information in this report, CENTEK engineering, Inc. must be contacted for resolution of any potential issues.

Please feel free to call with any questions or comments.

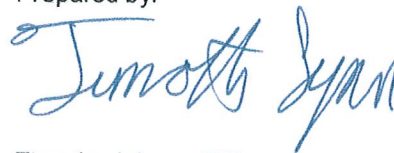
Respectfully Submitted by:



Carlo F. Centore, PE  
 Principal ~ Structural Engineer



Prepared by:



Timothy J. Lynn, EIT  
 Structural Engineer

STANDARD CONDITIONS FOR FURNISHING OF  
PROFESSIONAL ENGINEERING SERVICES ON  
EXISTING STRUCTURES

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

- Information supplied by the client regarding the structure itself, its foundations, the soil conditions, the antenna and feed line loading on the structure and its components, or other relevant information.
- Information from the field and/or drawings in the possession of CENTEK engineering, Inc. or generated by field inspections or measurements of the structure.
- It is the responsibility of the client to ensure that the information provided to CENTEK engineering, Inc. and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and are in an un-corroded condition and have not deteriorated. It is therefore assumed that its capacity has not significantly changed from the "as new" condition.
- All services will be performed to the codes specified by the client, and we do not imply to meet any other codes or requirements unless explicitly agreed in writing. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement. In the absence of information to the contrary, all work will be performed in accordance with the latest revision of ANSI/ASCE10 & ANSI/EIA-222.
- All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. CENTEK engineering, Inc. is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.



## GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM ~ RISA - 3D

RISA-3D Structural Analysis Program is an integrated structural analysis and design software package for buildings, bridges, tower structures, etc.

### Modeling Features:

- Comprehensive CAD-like graphic drawing/editing capabilities that let you draw, modify and load elements as well as snap, move, rotate, copy, mirror, scale, split, merge, mesh, delete, apply, etc.
- Versatile drawing grids (orthogonal, radial, skewed)
- Universal snaps and object snaps allow drawing without grids
- Versatile general truss generator
- Powerful graphic select/unselect tools including box, line, polygon, invert, criteria, spreadsheet selection, with locking
- Saved selections to quickly recall desired selections
- Modification tools that modify single items or entire selections
- Real spreadsheets with cut, paste, fill, math, sort, find, etc.
- Dynamic synchronization between spreadsheets and views so you can edit or view any data in the plotted views or in the spreadsheets
- Simultaneous view of multiple spreadsheets
- Constant in-stream error checking and data validation
- Unlimited undo/redo capability
- Generation templates for grids, disks, cylinders, cones, arcs, trusses, tanks, hydrostatic loads, etc.
- Support for all units systems & conversions at any time
- Automatic interaction with RISASection libraries
- Import DXF, RISA-2D, STAAD and ProSteel 3D files
- Export DXF, SDF and ProSteel 3D files

### Analysis Features:

- Static analysis and P-Delta effects
- Multiple simultaneous dynamic and response spectra analysis using Gupta, CQC or SRSS mode combinations
- Automatic inclusion of mass offset (5% or user defined) for dynamic analysis
- Physical member modeling that does not require members to be broken up at intermediate joints
- State of the art 3 or 4 node plate/shell elements
- High-end automatic mesh generation — draw a polygon with any number of sides to create a mesh of well-formed quadrilateral (NOT triangular) elements.
- Accurate analysis of tapered wide flanges - web, top and bottom flanges may all taper independently
- Automatic rigid diaphragm modeling
- Area loads with one-way or two-way distributions
- Multiple simultaneous moving loads with standard AASHTO loads and custom moving loads for bridges, cranes, etc.
- Torsional warping calculations for stiffness, stress and design
- Automatic Top of Member offset modeling
- Member end releases & rigid end offsets
- Joint master-slave assignments
- Joints detachable from diaphragms
- Enforced joint displacements
- 1-Way members, for tension only bracing, slipping, etc.

- 1-Way springs, for modeling soils and other effects
- Euler members that take compression up to their buckling load, then turn off.
- Stress calculations on any arbitrary shape
- Inactive members, plates, and diaphragms allows you to quickly remove parts of structures from consideration
- Story drift calculations provide relative drift and ratio to height
- Automatic self-weight calculations for members and plates
- Automatic subgrade soil spring generator

Graphics Features:

- Unlimited simultaneous model view windows
- Extraordinary “true to scale” rendering, even when drawing
- High-speed redraw algorithm for instant refreshing
- Dynamic scrolling stops right where you want
- Plot & print virtually everything with color coding & labeling
- Rotate, zoom, pan, scroll and snap views
- Saved views to quickly restore frequent or desired views
- Full render or wire-frame animations of deflected model and dynamic mode shapes with frame and speed control
- Animation of moving loads with speed control
- High quality customizable graphics printing

Design Features:

- Designs concrete, hot rolled steel, cold formed steel and wood
- ACI 1999/2002, BS 8110-97, CSA A23.3-94, IS456:2000, EC 2-1992 with consistent bar sizes through adjacent spans
- Exact integration of concrete stress distributions using parabolic or rectangular stress blocks
- Concrete beam detailing (Rectangular, T and L)
- Concrete column interaction diagrams
- Steel Design Codes: AISC ASD 9th, LRFD 2nd & 3rd, HSS Specification, CAN/CSA-S16.1-1994 & 2004, BS 5950-1-2000, IS 800-1984, Euro 3-1993 including local shape databases
- AISI 1999 cold formed steel design
- NDS 1991/1997/2001 wood design, including Structural Composite Lumber, multi-ply, full sawn
- Automatic spectra generation for UBC 1997, IBC 2000/2003
- Generation of load combinations: ASCE, UBC, IBC, BOCA, SBC, ACI
- Unbraced lengths for physical members that recognize connecting elements and full lengths of members
- Automatic approximation of K factors
- Tapered wide flange design with either ASD or LRFD codes
- Optimization of member sizes for all materials and all design codes, controlled by standard or user-defined lists of available sizes and criteria such as maximum depths
- Automatic calculation of custom shape properties
- Steel Shapes: AISC, HSS, CAN, ARBED, British, Euro, Indian, Chilean
- Light Gage Shapes: AISI, SSMA, Dale / Incor, Dietrich, MarinoWARE
- Wood Shapes: Complete NDS species/grade database
- Full seamless integration with RISAFoot (Ver 2 or better) for advanced footing design and detailing
- Plate force summation tool

Results Features:

- Graphic presentation of color-coded results and plotted designs
- Color contours of plate stresses and forces with quadratic smoothing, the contours may also be animated
- Spreadsheet results with sorting and filtering of: reactions, member & joint deflections, beam & plate forces/stresses, optimized sizes, code designs, concrete reinforcing, material takeoffs, frequencies and mode shapes
- Standard and user-defined reports
- Graphic member detail reports with force/stress/deflection diagrams and detailed design calculations and expanded diagrams that display magnitudes at any dialed location
- Saved solutions quickly restore analysis and design results.

## GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM ~ PLS-TOWER

PLS-TOWER is a Microsoft Windows program for the analysis and design of steel latticed towers used in electric power lines or communication facilities. Both self-supporting and guyed towers can be modeled. The program performs design checks of structures under user specified loads. For electric power structures it can also calculate maximum allowable wind and weight spans and interaction diagrams between different ratios of allowable wind and weight spans.

### Modeling Features:

- Powerful graphics module (stress usages shown in different colors)
- Graphical selection of joints and members allows graphical editing and checking
- Towers can be shown as lines, wire frames or can be rendered as 3-d polygon surfaces
- Can extract geometry and connectivity information from a DXF CAD drawing
- CAD design drawings, title blocks, drawing borders or photos can be tied to structure model
- XML based post processor interface
- Steel Detailing Neutral File (SDNF) export to link with detailing packages
- Can link directly to line design program PLS-CADD
- Automatic generation of structure files for PLS-CADD
- Databases of steel angles, rounds, bolts, guys, etc.
- Automatic generation of joints and members by symmetries and interpolations
- Automated mast generation (quickly builds model for towers that have regular repeating sections) via graphical copy/paste
- Steel angles and rounds modeled either as truss, beam or tension-only elements
- Guys are easily handled (can be modeled as exact cable elements)

### Analysis Features:

- Automatic handling of tension-only members
- Automatic distribution of loads in 2-part suspension insulators (v-strings, horizontal vees, etc.)
- Automatic calculation of tower dead, ice, and wind loads as well as drag coefficients according to:
  - ASCE 74-1991
  - NESC 2002
  - NESC 2007
  - IEC 60826:2003
  - EN50341-1:2001 (CENELEC)
  - EN50341-3-9:2001 (UK NNA)
  - EN50341-3-17:2001 (Portugal NNA)
  - ESAA C(b)1-2003 (Australia)
  - TPNZ (New Zealand)
  - REE (Spain)
  - EIA/TIA 222-F
  - ANSI/TIA 222-G
  - CSA S37-01
- Automated microwave antenna loading as per EIA/TIA 222-F and ANSI/TIA 222-G
- Minimization of problems caused by unstable joints and mechanisms
- Automatic bandwidth minimization and ability to solve large problems
- Design checks according to (other standards can be added easily):
  - ASCE Standard 10-90

- AS 3995 (Australian Standard 3995)
- BS 8100 (British Standard 8100)
- EN50341-1 (CENELEC, both empirical and analytical methods are available)
- ECCS 1985
- NGT-ECCS
- PN-90/B-03200
- EIA/TIA 222-F
- ANSI/TIA 222-G
- CSA S37-01
- EDF/RTE Resal
- IS 802 (India Standard 802)

Results Features:

- Design summaries printed for each group of members
  - Easy to interpret text, spreadsheet and graphics design summaries
  - Automatic determination of allowable wind and weight spans
  - Automatic determination of interaction diagrams between allowable wind and weight spans
  - Capability to batch run multiple tower configurations and consolidate the results
  - Automated optimum angle member size selection and bolt quantity determination
- Tool for interactive angle member sizing and bolt quantity determination.

Criteria for Design of PCS Facilities On or  
Extending Above Metal Electric Transmission  
Towers & Analysis of Transmission Towers  
Supporting PCS Masts <sup>(1)</sup>

Introduction

This criteria is the result from an evaluation of the methods and loadings specified by the separate standards, which are used in designing telecommunications towers and electric transmission towers. That evaluation is detailed elsewhere, but in summary; the methods and loadings are significantly different. This criteria specifies the manner in which the appropriate standard is used to design PCS facilities including masts and brackets (hereafter referred to as “masts”), and to evaluate the electric transmission towers to support PCS masts. The intent is to achieve an equivalent level of safety and security under the extreme design conditions expected in Connecticut and Massachusetts.

ANSI Standard TIA/EIA-222 covering the design of telecommunications structures specifies a working strength/allowable stress design approach. This approach applies the loads from extreme weather loading conditions, and designs the structure so that it does not exceed some defined percentage of failure strength (allowable stress).

ANSI Standard C2-2007 (National Electrical Safety Code) covering the design of electric transmission metal structures is based upon an ultimate strength/yield stress design approach. This approach applies a multiplier (overload capacity factor) to the loads possible from extreme weather loading conditions, and designs the structure so that it does not exceed its ultimate strength (yield stress).

Each standard defines the details of how loads are to be calculated differently. Most of the NU effort in “unifying” both codes was to establish what level of strength each approach would provide, and then increasing the appropriate elements of each to achieve a similar level of security under extreme weather loadings.

Two extreme weather conditions are considered. The first is an extreme wind condition (hurricane) based upon a 50-year recurrence (2% annual probability). The second is a winter condition combining wind and ice loadings.

The following sections describe the design criteria for any PCS mast extending above the top of an electric transmission tower, and the analysis criteria for evaluating the loads on the transmission tower from such a mast from the lower portions of such a mast, and loads on the pre-existing electric lower portions of such a mast, and loads on the pre-existing electric transmission tower and the conductors it supports.

| Note 1: Prepared from documentation provide from Northeast Utilities.

## P C S M a s t

The PCS facility (mast, external cable/trays, including the initial and any planned future support platforms, antennas, etc. extending the full height above the top level of the electric transmission structure) shall be designed in accordance with the provisions of TIA/EIA Standard 222 with two exceptions:

1. An 85 mph extreme wind speed shall be used for locations in all counties throughout the NU system.
2. The stress increase of TIA Section 3.1.1.1 is disallowed. The combined wind and ice condition shall consider ½" radial ice in combination with the wind load (0.75  $W_i$ ) as specified in TIA section 2.3.16.

## E L E C T R I C T R A N S M I S S I O N T O W E R

The electric transmission tower shall be analyzed using yield stress theory in accordance with the attached table titled "NU Design Criteria". This specifies uniform loadings (different from the TIA loadings) on the each of the following components of the installed facility:

- PCS mast for its total height above ground level, including the initial and planned future support platforms, antennas, etc. above the top of an electric transmission structure.
- Conductors are related devices and hardware.
- Electric transmission structure. The loads from the PCS facility and from the electric conductors shall be applied to the structure at conductor and PCS mast attachment points, where those load transfer to the tower.

The uniform loadings and factors specified for the above components in the table are based upon the National Electrical Safety Code 2007 Edition Extreme Wind (Rule 250C) and Combined Ice and Wind (Rule 250B-Heavy) Loadings. These provide equivalent loadings compared to TIA and its loads and factors with the exceptions noted above. (Note that the NESC does not require the projected wind surfaces of structures and equipment to be increased by the ice covering.)

In the event that the electric transmission tower is not sufficient to support the additional loadings of the PCS mast, reinforcement will be necessary to upgrade the strength of the overstressed members.

# Northeast Utilities Overhead Transmission Standards

## Attachment A

### NU Design Criteria

		Basic Wind Speed	Pressure	Height Factor	Gust Factor	Load or Stress Factor	Force Coef - Shape Factor	
		V (MPH)	Q (PSF)	Kz	Gh			
<b>Ice Condition</b>	TIA/EIA	Antenna Mount	TIA	TIA (75W)	TIA	TIA	TIA Section 3.1.1.1 disallowed for connection design	TIA
	<b>NESC Heavy</b>	Tower/Pole Analysis with antennas extending above top of Tower/Pole (Yield Stress)	----	4	1.00	1.00	2.50	1.6 Flat Surfaces 1.3 Round Surfaces
		Tower/Pole Analysis with Antennas below top of Tower/Pole (on two faces)	---	4	1.00	1.00	2.50	1.6 Flat Surfaces 1.3 Round Surfaces
Conductors:		Conductor loads provided by NU						
<b>High Wind Condition</b>	TIA/EIA	Antenna Mount	85	TIA	TIA	TIA	TIA Section 3.1.1.1 disallowed for connection design	TIA
	<b>NESC Extreme Wind</b>	Tower/Pole Analysis with antennas extending above top of Tower/Pole	Use NESC C2-2007, Section 25, Rule 250C: Extreme Wind Loading 1.25 x Gust Response Factor Height above ground level based on top of Mast/Antenna					1.6 Flat Surfaces 1.3 Round Surfaces
		Tower/Pole Analysis with Antennas below top of Tower/Pole	Use NESC C2-2007, Section 25, Rule 250C: Extreme Wind Loading Height above ground level based on top of Tower/Pole					1.6 Flat Surfaces 1.3 Round Surfaces
Conductors:		Conductor loads provided by NU						
<b>NESC Extreme Ice with Wind Condition*</b>	<b>NESC Extreme Ice with Wind Condition*</b>	Tower/Pole Analysis with antennas extending above top of Tower/Pole	Use NESC C2-2007, Section 25, Rule 250D: Extreme Ice with Wind Loading 4PSF Wind Load 1.25 x Gust Response Factor Height above ground level based on top of Mast/Antenna					1.6 Flat Surfaces 1.3 Round Surfaces
		Tower/Pole Analysis with Antennas below top of Tower/Pole	Use NESC C2-2007, Section 25, Rule 250D: Extreme Ice with Wind Loading 4PSF Wind Load Height above ground level based on top of Tower/Pole					1.6 Flat Surfaces 1.3 Round Surfaces
	Conductors:		Conductor loads provided by NU					

\* Only for Structures Installed after 2007

### Communication Antennas on Transmission Structures (CL&P & WMECo Only)

<b>Northeast Utilities</b> Approved by: DEH (NU)	<b>Design</b>	<b>OTRM 059</b> Page 7 of 9	<b>Rev.0</b> 11/17/2009
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## Northeast Utilities Overhead Transmission Standards

- 2) STEP 2 - The electric transmission structure analysis and evaluation shall be performed in accordance with NESC requirements and shall include the mast and antenna loads determined from NESC applied loading conditions (not TIA/EIA Loads) on the structure and mount as specified below, and shall include the wireless communication mast and antenna loads per NESC criteria)

The structure shall be analyzed using yield stress theory in accordance with Attachment A, "NU Design Criteria." This specifies uniform loadings (different from the TIA loadings) on each of the following components of the installed facility:

- a) Wireless communication mast for its total height above ground level, including the initial and any planned future equipment (Support Platforms, Antennas, TMA's etc.) above the top of an electric transmission structure.
- b) Conductors and related devices and hardware (wire loads will be provided by NU).
- c) Electric Transmission Structure
  - i) The loads from the wireless communication equipment components based on NESC and NU Criteria in Attachment A, and from the electric conductors shall be applied to the structure at conductor and wireless communication mast attachment points, where those loads transfer to the tower.
  - ii) Shape Factor Multiplier:

NESC Structure Shape	Cd
Polyround (for polygonal steel poles)	1.3
Flat	1.6
Open Lattice	3.2

- iii) When Coaxial Cables are mounted along side the pole structure, the shape multiplier shall be:

Mount Type	Cable Cd	Pole Cd
Coaxial Cables on outside periphery (One layer)	1.45	1.45
Coaxial Cables mounted on stand offs	1.6	1.3

- d) The uniform loadings and factors specified for the above components in Attachment A, "NU Design Criteria" are based upon the National Electric Safety Code 2007 Edition Extreme Wind (Rule 250C) and Combined Ice and Wind (Rule 250B-Heavy) Loadings. These provide equivalent loadings compared to the TIA and its loads and factors with the exceptions noted above.

**Note:** The NESC does not require ice load be included in the supporting structure. (Ice on conductors and shield wire only, and NU will provide these loads).

- e) Mast reaction loads shall be evaluated for local effects on the transmission structure members at the attachment points.

If the electric transmission structure is not sufficient to support the additional loadings of the wireless communication mast, reinforcement will be required to upgrade the strength of the overstressed members. Any reinforcement design will be reviewed by NU TL&CE to determine the feasibility of construction and its impact on the use of the structure as a transmission structure.

<b>Communication Antennas on Transmission Structures (CL&amp;P &amp; WMECo Only)</b>			
<b>Northeast Utilities</b> Approved by: DEH (NU)	<b>Design</b>	OTRM 059	Rev.0
		Page 3 of 9	11/17/2009



Job :  
Description:

Spec. Number  
Computed by  
Checked by

Page of  
Sheet of  
Date 3/22/11  
Date

**INPUT DATA**

TOWER ID: 1340

Structure Height (ft) : 81

Wind Zone : Central CT (green)

Wind Speed : 110 mph

Tower Type :  Suspension  
 Strain

Extreme Wind Model : PCS Addition

**Shield Wire Properties:**

	BACK	AHEAD
NAME =	3/8 AW ✓	3/8 AW ✓
DESCRIPTION =	3/8	3/8
STRANDING =	7 #8 Al Weld	7 #8 Al Weld
DIAMETER =	0.385 in	0.385 in
WEIGHT =	0.262 lb/ft	0.262 lb/ft

**Conductor Properties:**

		BACK	AHEAD		
Number of Conductors per phase	NAME =	TERN ✓	TERN ✓	Number of Conductors per phase	
1		795.000	795.000	1	
		45/7 ACSR	45/7 ACSR		
	DIAMETER =	1.063 in	1.063 in		
	WEIGHT =	0.895 lb/ft	0.895 lb/ft		

Insulator Weight = 0 lbs

Broken Wire Side = AHEAD SPAN

**Horizontal Line Tensions:**

	BACK		AHEAD	
	Shield	Conductor	Shield	Conductor
NESC HEAVY =	3,800 ✓	7,000 ✓	3,800 ✓	7,000 ✓
EXTREME WIND =	3,689 ✓	8,275 ✓	3,689 ✓	8,275 ✓
LONG. WIND =	na	na	na	na
250D COMBINED =	na	na	na	na
NESC W/O OLF =	na	na	na	na
60 DEG F NO WIND =	1,517 ✓	3,103 ✓	1,517 ✓	3,103 ✓

**Line Geometry:**

	BACK		AHEAD		SUM
LINE ANGLE (deg) =	BACK:	1	AHEAD:	1	2
WIND SPAN (ft) =	BACK:	360	AHEAD:	360	720
WEIGHT SPAN (ft) =	BACK:	470	AHEAD:	470	940



Job :  
Description:

Spec. Number  
Computed by  
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Page of  
Sheet of  
Date 3/22/11  
Date

**WIRE LOADING AT ATTACHMENTS**

TOWER ID:

Wind Span =   
Weight Span =   
Total Angle =

Broken Wire Span =   
Type of Insulator Attachment =

**1. NESC RULE 250B Heavy Loading:**

	INTACT CONDITION			BROKEN WIRE CONDITION		
	Horizontal	Longitudinal	Vertical	Horizontal	Longitudinal	Vertical
Shield Wire =	1,050 lb	0 lb	1,145 lb	525 lb	6,269 lb	573 lb
Conductor =	1,641 lb	0 lb	2,632 lb	820 lb	11,548 lb	1,316 lb

**2. NESC RULE 250C Transverse Extreme Wind Loading:**

	Horizontal	Longitudinal	Vertical
Shield Wire =	782 lb	0 lb	246 lb
Conductor =	2,091 lb	0 lb	841 lb

**3. NESC RULE 250C Longitudinal Extreme Wind Loading:**

	Horizontal	Longitudinal	Vertical
Shield Wire =	#VALUE!	#VALUE!	246 lb
Conductor =	#VALUE!	#VALUE!	841 lb

**4. NESC RULE 250D Extreme Ice & Wind Loading:**

	Horizontal	Longitudinal	Vertical
Shield Wire =	#VALUE!	#VALUE!	1,865 lb
Conductor =	#VALUE!	#VALUE!	3,253 lb

**5. NESC RULE 250B w/o OLF's**

	Horizontal	Longitudinal	Vertical
Shield Wire =	#VALUE!	#VALUE!	763 lb
Conductor =	#VALUE!	#VALUE!	1,755 lb

**6. 60 Deg. F, No Wind**

	Horizontal	Longitudinal	Vertical
Shield Wire =	53 lb	0 lb	246 lb
Conductor =	108 lb	0 lb	841 lb

**7. Construction**

	Horizontal	Longitudinal	Vertical
Shield Wire =	53 lb	0 lb	246 lb
Conductor =	108 lb	0 lb	841 lb



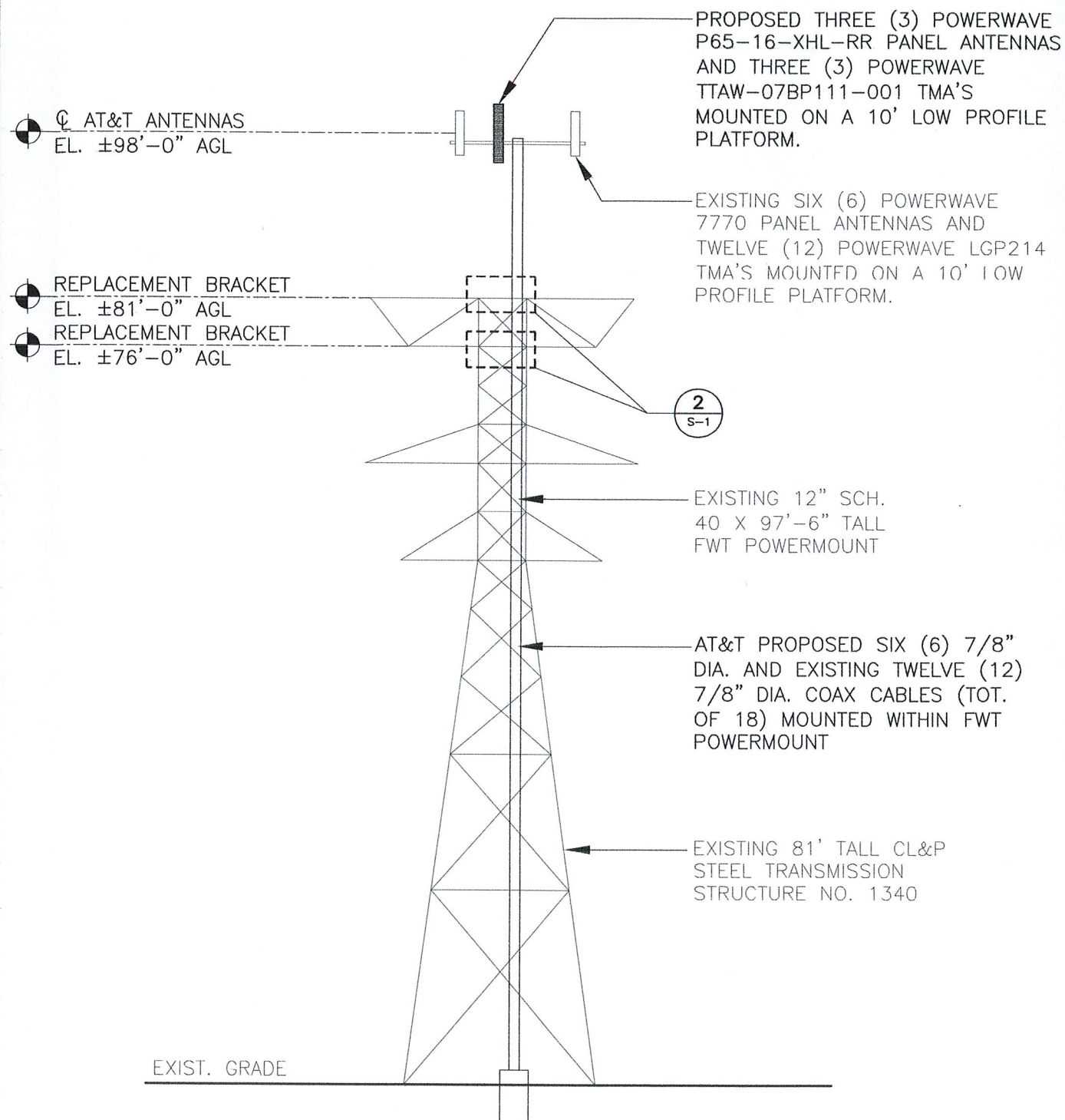
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Description:

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Date 3/22/11  
Date

**NOTE: All loads include required overload factors (OLF's).**

LC 1		HORIZONTAL	LONGITUDINAL	VERTICAL
NESC Heavy	shield - back	524.9265884	6269.045049	572.5090597
	shield - ahead	524.9265884	-6269.045049	572.5090597
	<b>SHIELD - SUM</b>	<b>1049.853177</b>	<b>0</b>	<b>1145.018119</b>
	conductor - back	820.4752944	11548.24088	1316.116597
	conductor - ahead	820.4752944	-11548.24088	1316.116597
	<b>CONDUCTOR - SUM</b>	<b>1640.950589</b>	<b>0</b>	<b>2632.233194</b>
LC 2		HORIZONTAL	LONGITUDINAL	VERTICAL
Extreme Wind	shield - back	390.7505901	3688.438147	123.046
	shield - ahead	390.7505901	-3688.438147	123.046
	<b>SHIELD - SUM</b>	<b>781.5011803</b>	<b>0</b>	<b>246.092</b>
	conductor - back	1045.535257	8273.739677	420.65
	conductor - ahead	1045.535257	-8273.739677	420.65
	<b>CONDUCTOR - SUM</b>	<b>2091.070514</b>	<b>0</b>	<b>841.3</b>
LC 3		HORIZONTAL	LONGITUDINAL	VERTICAL
Long. Wind	shield - back	#VALUE!	#VALUE!	123.046
	shield - ahead	#VALUE!	#VALUE!	123.046
	<b>SHIELD - SUM</b>	<b>#VALUE!</b>	<b>#VALUE!</b>	<b>246.092</b>
	conductor - back	#VALUE!	#VALUE!	420.65
	conductor - ahead	#VALUE!	#VALUE!	420.65
	<b>CONDUCTOR - SUM</b>	<b>#VALUE!</b>	<b>#VALUE!</b>	<b>841.3</b>
LC 4		HORIZONTAL	LONGITUDINAL	VERTICAL
RULE 250D	shield - back	#VALUE!	#VALUE!	932.5329796
	shield - ahead	#VALUE!	#VALUE!	932.5329796
	<b>SHIELD - SUM</b>	<b>#VALUE!</b>	<b>#VALUE!</b>	<b>1865.065959</b>
	conductor - back	#VALUE!	#VALUE!	1626.405696
	conductor - ahead	#VALUE!	#VALUE!	1626.405696
	<b>CONDUCTOR - SUM</b>	<b>#VALUE!</b>	<b>#VALUE!</b>	<b>3252.811392</b>
LC 5		HORIZONTAL	LONGITUDINAL	VERTICAL
NESC w/o OLF's	shield - back	#VALUE!	#VALUE!	381.6727065
	shield - ahead	#VALUE!	#VALUE!	381.6727065
	<b>SHIELD - SUM</b>	<b>#VALUE!</b>	<b>#VALUE!</b>	<b>763.3454129</b>
	conductor - back	#VALUE!	#VALUE!	877.4110646
	conductor - ahead	#VALUE!	#VALUE!	877.4110646
	<b>CONDUCTOR - SUM</b>	<b>#VALUE!</b>	<b>#VALUE!</b>	<b>1754.822129</b>
LC 6		HORIZONTAL	LONGITUDINAL	VERTICAL
Raking	shield - back	26.47530057	1516.768954	123.046
	shield - ahead	26.47530057	-1516.768954	123.046
	<b>SHIELD - SUM</b>	<b>52.95060113</b>	<b>0</b>	<b>246.092</b>
	conductor - back	54.15481717	3102.527398	420.65
	conductor - ahead	54.15481717	-3102.527398	420.65
	<b>CONDUCTOR - SUM</b>	<b>108.3096343</b>	<b>0</b>	<b>841.3</b>
LC 6		HORIZONTAL	LONGITUDINAL	VERTICAL
60 DEG F NO WIND	shield - back	26.47530057	1516.768954	123.046
	shield - ahead	26.47530057	-1516.768954	123.046
	<b>SHIELD - SUM</b>	<b>52.95060113</b>	<b>0</b>	<b>246.092</b>
	conductor - back	54.15481717	3102.527398	420.65
	conductor - ahead	54.15481717	-3102.527398	420.65
	<b>CONDUCTOR - SUM</b>	<b>108.3096343</b>	<b>0</b>	<b>841.3</b>



⊕ AT&T ANTENNAS  
EL. ±98'-0" AGL

⊕ REPLACEMENT BRACKET  
EL. ±81'-0" AGL  
⊕ REPLACEMENT BRACKET  
EL. ±76'-0" AGL

PROPOSED THREE (3) POWERWAVE P65-16-XHL-RR PANEL ANTENNAS AND THREE (3) POWERWAVE TTAW-07BP111-001 TMA'S MOUNTED ON A 10' LOW PROFILE PLATFORM.

EXISTING SIX (6) POWERWAVE 7770 PANEL ANTENNAS AND TWELVE (12) POWERWAVE LGP214 TMA'S MOUNTED ON A 10' LOW PROFILE PLATFORM.

2  
S-1

EXISTING 12" SCH. 40 X 97'-6" TALL FWT POWERMOUNT

AT&T PROPOSED SIX (6) 7/8" DIA. AND EXISTING TWELVE (12) 7/8" DIA. COAX CABLES (TOT. OF 18) MOUNTED WITHIN FWT POWERMOUNT

EXISTING 81' TALL CL&P STEEL TRANSMISSION STRUCTURE NO. 1340

EXIST. GRADE

**1** TOWER & MAST ELEVATION  
EL-1 SCALE: NOT TO SCALE

REVISIONS	
A	5/2/11 ISSUED FOR NU REVIEW
0	6/17/11 CONSTRUCTION

**CEN TEK** engineering  
Centered on Solutions™  
www.CentekEng.com  
(203) 488-0580  
(203) 488-9587 Fax  
63-2 North Branford Road, Branford, CT 06405

CT2044  
SHELTON-NU  
CL&P 1340  
17 DAYBREAK LANE  
SHELTON, CT 06484

PROJECT NO: 11021.CO4  
DRAWN BY: TJL  
CHECKED BY: CFC  
SCALE: AS NOTED  
DATE: 5/2/11



TOWER AND MAST ELEVATION  
**EL-1**  
DWG. 1 OF 4

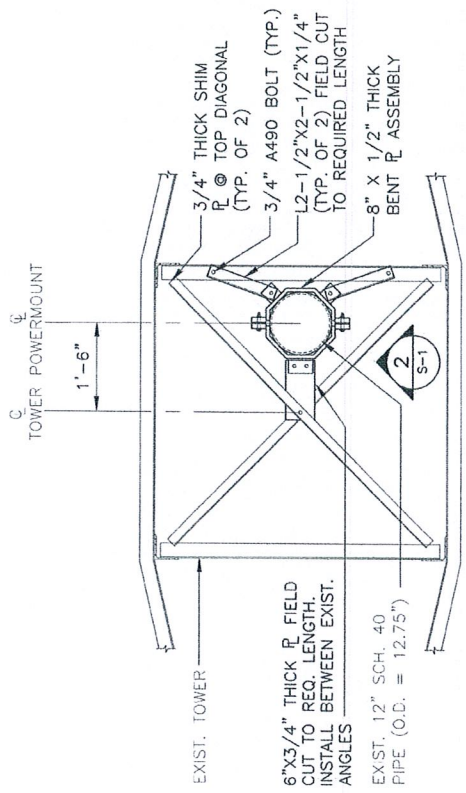
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DRAWN BY:	OC
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DATE:	
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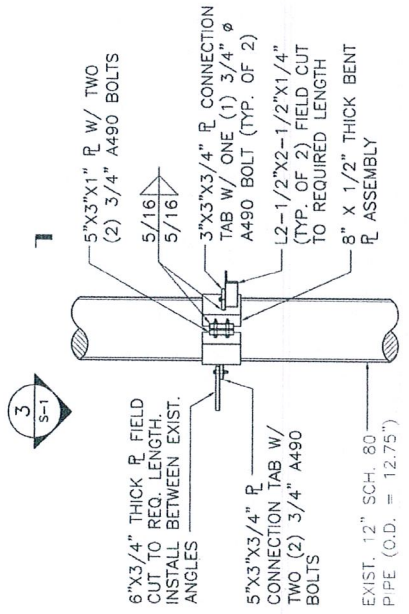
**CENTEK** Engineering, Inc.  
 123 North Hartford Road  
 Hartford, CT 06105  
 www.Centek.com

AT&T MOBILITY  
 PROJECT NO. 110212049  
 DATE: 5/2/11  
 SCALE: AS SHOWN  
 JOB NO. 110212049

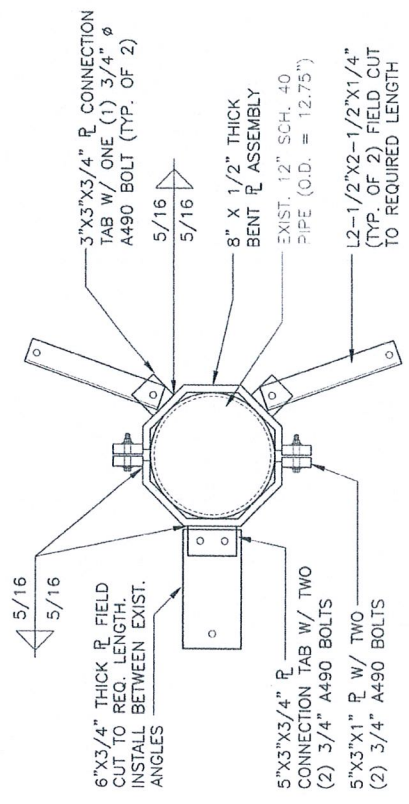
POWERMOUNT CONNECTION DETAILS  
 SHEET NO. S-1  
 OF 2



**1 BRACKET PLAN**  
 SCALE: 1/2" = 1'-0"



**2 BRACKET ELEVATION**  
 SCALE: 1/2" = 1'-0"



**3 BRACKET DETAIL**  
 SCALE: 1/2" = 1'-0"

**DESIGN BASIS:**

1. GOVERNING CODE: 2003 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2005 CT STATE BUILDING CODE.
2. DESIGN CRITERIA
  - WIND LOAD: (RCS MAST)
  - BASIC WIND SPEED (V) = 85 MPH (FASTEST WILEY); BASED ON TIA/EIA-222F AND NU MAST DESIGN CRITERIA EXCEPTION 1.
  - WIND LOAD: (UTILITY POLE & FOUNDATION)
  - BASIC WIND SPEED (V) = 110 MPH (3-SECOND GUST) BASED ON NESC C2-2007, SECTION 25 RULE 250C.

**GENERAL NOTES:**

1. ALL CONSTRUCTION SHALL BE IN COMPLIANCE WITH THE GOVERNING BUILDING CODE.
2. BEFORE BEGINNING THE WORK, THE CONTRACTOR IS RESPONSIBLE FOR MAKING SUCH INVESTIGATIONS CONCERNING PHYSICAL CONDITIONS (SURFACE AND SUBSURFACE) AT OR CONTIGUOUS TO THE SITE WHICH MAY AFFECT PERFORMANCE AND COST OF THE WORK.
3. AS THE WORK PROGRESSES, THE CONTRACTOR SHALL NOTIFY THE OWNER OF ANY CONDITIONS WHICH ARE IN CONFLICT OR OTHERWISE NOT CONSISTENT WITH THE CONSTRUCTION DOCUMENTS AND SHALL NOT PROCEED WITH SUCH WORK UNTIL THE CONFLICT IS SATISFACTORILY RESOLVED.
4. THE STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER FOUNDATION REMEDIATION WORK IS COMPLETE. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE AND TO ENSURE THE SAFETY OF THE STRUCTURE AND ITS COMPONENT PARTS DURING ERECTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, TEMPORARY BRACING, GUYS OR TIEDOWNS, WHICH MIGHT BE NECESSARY.
5. THE CONTRACTOR SHALL LIMIT THE DURATION OF THE FOUNDATION REINFORCEMENT WORK. THE EXISTING CAISSON WITHIN THE SHOWN LIMITS IS STABLE FOR WIND SPEEDS LESS THAN 50MPH WITHOUT ICE LOADING. IF HIGHER WIND SPEED OR ICE EVENT IS EXPECTED, THE EXCAVATION AREA SHALL BE FILLED WITH COMPACT FILL MATERIAL.
6. ALL DIMENSIONS, ELEVATIONS, AND OTHER REFERENCES TO EXISTING STRUCTURES, SURFACE, AND SUBSURFACE CONDITIONS ARE APPROXIMATE. NO GUARANTEE IS MADE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THE CONTRACTOR SHALL VERIFY AND COORDINATE ALL DIMENSIONS, ELEVATIONS, ANGLES WITH EXISTING CONDITIONS AND WITH ARCHITECTURAL AND SITE DRAWINGS BEFORE PROCEEDING WITH ANY WORK.
7. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE SAFETY CODES AND REGULATIONS DURING ALL PHASES OF CONSTRUCTION.
8. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR PROVIDING AND MAINTAINING ADEQUATE SHORING, BRACING, AND BARRICADES AS MAY BE REQUIRED FOR THE PROTECTION OF EXISTING PROPERTY, CONSTRUCTION WORKERS, AND FOR PUBLIC SAFETY.
9. SHOP DRAWINGS, CONCRETE MIX DESIGNS, TEST REPORTS, AND OTHER SUBMITTALS PERTAINING TO STRUCTURAL WORK SHALL BE FORWARDED TO THE OWNER FOR REVIEW BEFORE FABRICATION AND/OR INSTALLATION IS MADE. SHOP DRAWINGS SHALL INCLUDE ERECTION DRAWINGS AND COMPLETE DETAILS OF CONNECTIONS AS WELL AS MANUFACTURER'S SPECIFICATION DATA WHERE APPROPRIATE. SHOP DRAWINGS SHALL BE CHECKED BY THE CONTRACTOR AND BEAR THE CHECKER'S INITIALS BEFORE BEING SUBMITTED FOR REVIEW.
10. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY. MAINTAIN EXISTING SITE OPERATIONS. COORDINATE WORK WITH NORTHEAST UTILITIES.
11. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
12. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
13. NO DRILLING WELDING OR TAPING ON CL&P OWNED EQUIPMENT

SHEET NO. <b>N-1</b> OF 1	AT&T MOBILITY REPAIRED WIRELESS COMMUNICATIONS FACILITY <b>CT2044</b> CL&P STRUCTURE 1340 17 DAYBREEZE LANE BELTON CT 06104	DATE: 5/2/11 SCALE: AS SHOWN JOB NO.: 11071.C04	CENTEK Engineering Certified in Solutions 200 486-0200 200 486-8067 Fax 627 North Bedford Road Bristol, CT 06033 www.CentekEng.com	PROFESSIONAL ENGINEER SEAL CARLOS G. GONZALEZ LICENSE NO. 10000 STATE OF CONNECTICUT	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>NO.</th> <th>DATE</th> <th>BY</th> <th>CHK'D BY</th> <th>DESCRIPTION</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>6/27/11</td> <td>T.A.</td> <td>CFC</td> <td>ISSUED FOR CONSTRUCTION</td> </tr> <tr> <td>2</td> <td>5/2/11</td> <td>T.A.</td> <td>CFC</td> <td>ISSUED FOR NU REVIEW</td> </tr> </tbody> </table>	NO.	DATE	BY	CHK'D BY	DESCRIPTION	1	6/27/11	T.A.	CFC	ISSUED FOR CONSTRUCTION	2	5/2/11	T.A.	CFC	ISSUED FOR NU REVIEW
NO.	DATE	BY	CHK'D BY	DESCRIPTION																
1	6/27/11	T.A.	CFC	ISSUED FOR CONSTRUCTION																
2	5/2/11	T.A.	CFC	ISSUED FOR NU REVIEW																

NOTES



**STRUCTURAL STEEL**

1. ALL STRUCTURAL STEEL IS DESIGNED BY ALLOWABLE STRESS DESIGN (ASD)
  - A. STRUCTURAL STEEL (W SHAPES)---ASTM A992 (FY = 50 KSI)
  - B. STRUCTURAL STEEL (OTHER SHAPES)---ASTM A36 (FY = 36 KSI)
  - C. STRUCTURAL HSS (RECTANGULAR SHAPES)---ASTM A500 GRADE B, (FY = 46 KSI)
  - D. STRUCTURAL HSS (ROUND SHAPES)---ASTM A500 GRADE B, (FY = 42 KSI)
  - E. PIPE---ASTM A53 (FY = 35 KSI)
  - F. CONNECTION BOLTS---ASTM A325-N
  - G. U-BOLTS---ASTM A36
  - H. ANCHOR RODS---ASTM F 1554
  - I. WELDING ELECTRODE---ASTM E 70XX
2. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE ENGINEER FOR REVIEW. SHOP DRAWINGS SHALL INCLUDE THE FOLLOWING: SECTION PROFILES, SIZES, CONNECTION ATTACHMENTS, REINFORCING, ANCHORAGE, SIZE AND TYPE OF FASTENERS AND ACCESSORIES. INCLUDE ERECTION DRAWINGS, ELEVATIONS AND DETAILS.
3. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AISC MANUAL OF STEEL CONSTRUCTION.
4. PROVIDE ALL PLATES, CLIP ANGLES, CLOSURE PIECES, STRAP ANCHORS, MISCELLANEOUS PIECES AND HOLES REQUIRED TO COMPLETE THE STRUCTURE.
5. FIT AND SHOP ASSEMBLE FABRICATIONS IN THE LARGEST PRACTICAL SECTIONS FOR DELIVERY TO SITE.
6. INSTALL FABRICATIONS PLUMB AND LEVEL, ACCURATELY FITTED, AND FREE FROM DISTORTIONS OR DEFECTS.
7. AFTER ERECTION OF STRUCTURES, TOUCHUP ALL WELDS, ABRASIONS AND NON-GALVANIZED SURFACES WITH A 95% ORGANIC ZINC RICH PAINT IN ACCORDANCE WITH ASTM 750.
8. ALL STEEL MATERIAL (EXPOSED TO WEATHER) SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT DIPPED GALVANIZED) COATINGS" ON IRONS AND STEEL PRODUCTS.
9. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE".
10. CONTRACTOR SHALL COMPLY WITH AWS CODE FOR PROCEDURES APPEARANCE AND QUALITY OF WELDS, AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS "STANDARD QUALIFICATION PROCEDURES". ALL WELDING SHALL BE DONE USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC AND D1.1 WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION" 9TH EDITION. AT THE COMPLETION OF WELDING, ALL DAMAGE TO GALVANIZED COATING SHALL BE REPAIRED.
11. THE ENGINEER SHALL BE NOTIFIED OF ANY INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISMATCHING OR NON CONFORMING MATERIALS OR CONDITIONS TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER REVIEW.
12. CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES.
13. STRUCTURAL CONNECTION BOLTS SHALL CONFORM TO ASTM A325. ALL BOLTS SHALL BE 3/4" DIAMETER MINIMUM AND SHALL HAVE A MINIMUM OF TWO BOLTS, UNLESS OTHERWISE ON THE DRAWINGS.

14. LOCK WASHER ARE NOT PERMITTED FOR A325 STEEL ASSEMBLIES.
15. SHOP CONNECTIONS SHALL BE WELDED OR HIGH STRENGTH BOLTED.
16. MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.
17. FABRICATE BEAMS WITH MILL CAMBER UP.
18. LEVEL AND PLUMB INDIVIDUAL MEMBERS OF THE STRUCTURE TO AN ACCURACY OF 1:500, BUT NOT TO EXCEED 1/4" IN THE FULL HEIGHT OF THE COLUMN.
19. COMMENCEMENT OF STRUCTURAL STEEL WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.
20. INSPECTION AND TESTING OF ALL WELDING AND HIGH STRENGTH BOLTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY.
21. FOUR COPIES OF ALL INSPECTION TEST REPORTS SHALL BE SUBMITTED TO THE ENGINEER WITHIN TEN (10) WORKING DAYS OF THE DATE OF INSPECTION.

ISSUED BY	TITLE

REV	DATE	BY	CHKD BY	DESCRIPTION
0	6/17/11	TAL	CFC	ISSUED FOR CONSTRUCTION
1	5/2/11	TAL	CFC	ISSUED FOR REVIEW



**CENTEX** engineering  
 Construction Solutions  
 8201 4th Street  
 1220 4th Street  
 43-2 North Branford Road  
 Branford, CT 06405  
 www.CentexEng.com

**AT&T MOBILITY**  
 PROJECTS/DESIGN/CONSTRUCTION FACILITY  
**CT2044**  
 CL&P STRUCTURE 1340  
 17 DAYBREAK LANE  
 WILTON CT 06404

DATE: 5/27/11  
 SCALE: AS SHOWN  
 SHEET NO.: 11021/204

NOTES

PROJECT NO. **N-2**  
 SHEET NO. 2 OF 2

**P65-16-XLH-RR****Dual Broadband Antennas**

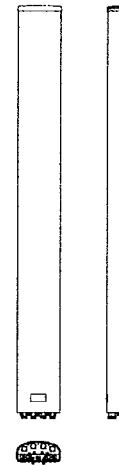
POLARIZATION: Dual linear  $\pm 45^\circ$   
 FREQUENCY (MHz): 698-894, 1710-2170  
 HORIZONTAL BEAM WIDTH ( $^\circ$ ): 65, 65  
 GAIN (dBi/dBd): 15.5/13.4 17.5/15.4  
 TILT: 1-12, 0-8  
 LENGTH: 72"

**ELECTRICAL SPECIFICATIONS\***

	698-894		1710-1880	1710-2170	
	698-806	806-894		1850-1990	1900-2170
Frequency range (MHz)	698-806	806-894	1710-1880	1850-1990	1900-2170
Frequency band (MHz)	698-806	806-894	1710-1880	1850-1990	1900-2170
Gain (dBi/dBd)	14.8/12.7	15.5/13.4	16.9/14.8	17.2/15.1	17.5/15.4
Polarization	Dual Linear +/- 45		Dual Linear +/- 45		
Nominal Impedance ( $\Omega$ )	50		50		
VSWR	< 1.5:1		< 1.5:1		
Horizontal beam width, -3 dB ( $^\circ$ )	66	65	60	63	63
Vertical beam width, -3 dB ( $^\circ$ )	14.7	12.5	6.8	6.4	5.7
Electrical down tilt ( $^\circ$ )	1 to 12		0 to 8		
Side lobe suppression, vertical 1st upper (dB)	> 16	> 16	> 16		
	> 16	> 16			
Isolation between inputs (dB)	> 30	> 30	> 30	> 30	
Inter band Isolation (dB)	> 40		> 40		
Tracking, horizontal plane $\pm 60^\circ$ (dB)	< 2		< 2	< 2	< 2
First null fill (dB)			> -20	> -20	> -20
Vertical beam squint ( $^\circ$ )	< 0.8	< 0.8	< 0.5	< 0.5	< 0.5
Front to back ratio (dB) $180^\circ \pm 30^\circ$ copolar	> 24	> 24	> 30	> 30	> 28
Front to back ratio (dB) $180^\circ \pm 30^\circ$ total power					
Cross polar discrimination (XPD) $0^\circ$ (dB)	> 15	> 15	> 15	> 15	> 15
Cross polar discrimination (XPD) $\pm 60^\circ$ (dB)	> 10	> 10	> 10	> 10	> 10
Far field coupling					
IM3, 2xTx@43dBm (dBc)	< -153		< -153		
IM7, 2xTx@43dBm (dBc)					
Power handling, average per input (W)	500		250		
Power handling, average total (W)	1000		500		

**MECHANICAL SPECIFICATIONS\***

Connector	4 X 7/16 DIN Female, IP67
Connector position	Bottom
Dimensions, HxWxD, mm (ft)	72"x12"x6" (1829x312.5x147.5)
Mounting	Pre-mounted Tilt Brackets
Weight, with brackets, kg (lbs)	29 (64)
Weight, without brackets, kg (lbs)	24 (53)
Wind load, frontal/lateral/rear side 42 m/s Cd=1.6 (N)	708 / 108 / 896
Maximum operational wind speed, m/s (mph)	100 (45)
Survival wind speed, m/s (mph)	150 (67)
Lightning protection	DC Ground
Operating Temperature	-40C to +60C
Radome material	PVC, IP55
Packet size, HxWxD, mm (ft)	87" x 16" x 10" (2225 x 400 x 225)
Radome colour	Light Grey
Shipping weight, kg (lbs)	34 (75)
RET	IRET AISGv1.1, MET and AISGv2.0
Brackets	7256.00, 7454.00A



\*All specifications subject to change without notice. Please contact your Powerwave representative for complete performance data.

**ANTENNA PATTERNS\***

For detailed patterns visit <http://www.powerwave.com/rpa/>.

# TTAW-07BP111-001 TMA Twin Dual Band AWS with 700 Bypass 13 dB AISG

## ELECTRICAL SPECIFICATIONS

UL Frequency Range (MHz)	1710-1770 with 698-746 bypass
UL Rejection	>80 dB TX rejection, >25 dB rejection at 1700 and 1800 MHz
UL Gain(dB)	13
UL Return Loss	>18 dB
UL Noise Figure	<1.6 dB
UL Output 3rd Order Intercept Point(dBm)	>+23 (Input IP3 >+11)
UL Bypass Loss(dB)	<1.9
UL Max Input Power (dBm)	+14 dBm
DL Frequency Range (MHz)	2110-2170 with 698-746 bypass
DL Return Loss	>18 dB
DL Insertion Loss (dB)	<0.4
Intermodulation	<-155 dBc (2x43 dBm TX)
Input Voltage (V)	8.0-30V (AISG Mode 10-30V; Current Alarm Mode 8-17)
Alarm Functionality	AISG compatible or in case of no AISG command received, current alarm mode 170-190 mA
Power Consumption	<1.5 W
Power Handling, RMS	700: 500 W; AWS 300W
AISG Compatibility	AISG 1.1 fully upgradable to AISG 2.0 (AISG version only depended on loaded SW version) TTAW-07BP112-001 has AISG 2.0 loaded from factory

## MECHANICAL SPECIFICATIONS

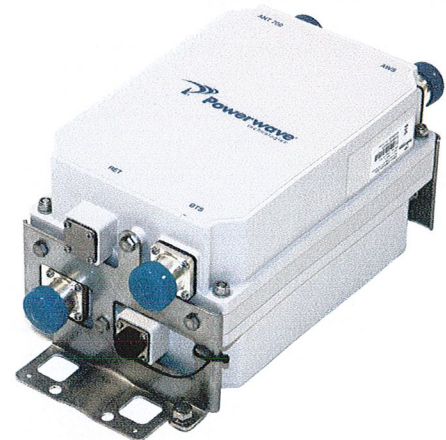
Dimension HxWxD mm(ft)	250x169x139 (9.9"x6.7"x5.4")
Weight(lbs)	<18 (<8 kg)
Colors	Off white (NCS 1502-R)
RF Connectors	Female 7/16 DIN, long neck
Mounting Kit	Mounting kit for pole and wall is included

## ENVIRONMENTAL SPECIFICATIONS

Temperature Range	-40 to +65°C
Operational	ETS 300 019-1-4
Transportation	ETS 300 019-1-2
Storage	ETS 300 019-1-1
Lightning Protection	IEC 61312-1: 2 kA 8/20 $\mu$ s, 3 kA 10/350 $\mu$ s
Housing	Aluminium
MTBF	>1 million hours
Ingress Protection	IP67 minimum

## APPROVAL AND TESTS

Safety	UL 60950; UL 1950, TUV
EMC	FCC part 15



\*All specifications subject to change without notice. Contact your Powerwave representative for complete performance data.



**Northeast  
Utilities System**

107 Selden Street, Berlin, CT 06037

Northeast Utilities Service Company  
P.O. Box 270  
Hartford, CT 06141-0270  
(203) 665-5000

June 22, 2011

Mr. Tim Burks  
AT&T Wireless.  
500 Enterprise Drive  
Rocky Hill, CT 06067

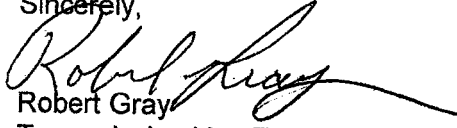
RE: AT&T Antenna Site, CT-2044, 10 17 Day Break Lane, Shelton CT, CL&P structure 1340.

Dear Mr. Burks:

Based on our reviews of the site drawings, the structural and foundation analysis provided by Centek Engineering and, along with a third party review performed by CG Power Solutions we have reviewed for acceptance this modification.

Since there are no outstanding structural issues to resolve at this time please contact Mr. Green (860-665-6926) to resolve any lease issues; once the lease amendment is secured you may contact Mr. Eriks Surmanis directly (860-665-5849) to begin these arrangements.

Sincerely,

  
Robert Gray  
Transmission Line Engineering

ref: CT2044 LTE CD REV-1 06-21-11 eSigned\_Sealed.pdf  
CT2044 LTE Structural 6.17.11.pdf



New Cingular Wireless PCS, LLC  
500 Enterprise Drive  
Rocky Hill, Connecticut 06067-3900  
Phone: (860) 463-5511  
Fax: (860) 513-7190

**Douglas L. Culp**  
Real Estate Consultant

June 28, 2011

Mark A. Lauretti, Mayor  
City Hall, Room 202  
54 Hill Street  
Shelton CT, 06484

Re: Telecommunications Facility – 17 Daybreak Lane Shelton, CT

Dear Mayor Mark A. Lauretti,

In order to accommodate technological changes, implement Uniform Mobile Telecommunications System (“UMTS”) and Long Term Evolution (“LTE”) capabilities, and enhance system performance in the State of Connecticut, New Cingular Wireless PCS, LLC (“AT&T”) will be changing its equipment configuration at certain cell sites.

As required by Regulations of Connecticut State Agencies (“R.C.S.A.”) Section 16-50j-73, the Connecticut Siting Council has been notified of the changes and will review AT&T’s proposal. Please accept this letter as notification under Section 16-50j-73 of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2).

The accompanying letter to the Siting Council fully describes Cingular’s proposal for the referenced cell site. However, if you have any questions or require any further information on our plans or the Siting Council’s procedures; please call me at (860) 463-5511 or Ms. Linda Roberts, Executive Director, Connecticut Siting Council at (860) 827-2935.

Sincerely,

  
Douglas L. Culp  
Real Estate Consultant

Enclosure