STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

December 19, 2011

Douglas Talmadge, Real Estate Consultant
New Cingular Wireless PCS, LLC
500 Enterprise Drive, Suite 3A
Rocky Hill, CT 06067-3900

RE: **EM-CING-018-111129** - New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 2 Huckleberry Hill Road, Brookfield, Connecticut.

Dear Mr. Talmadge:

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:

- AT&T shall submit to the Council a Radio Frequency Exposure Report with field measurements taken in the vicinity of this facility within three months after the installation described in this notice of exempt modification has been completed.
- Any deviation from the proposed modification as specified in this notice and supporting materials with Council shall render this acknowledgement invalid;
- Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
- Not less than 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
- The validity of this action shall expire one year from the date of this letter; and
- The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration;

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated November 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.

CSC
CONNECTICUT SITING COUNCIL

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

Linda Roberts
Executive Director

LR/CDM/laf

c: The Honorable Bill Davidson, First Selectman, Town of Brookfield
Katherine Daniel, Community Development Director, Town of Brookfield
Alice Dew, Zoning Enforcement Officer, Town of Brookfield
Christopher B. Fisher, Esq., Cuddy & Feder LLP

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

December 5, 2011

The Honorable Bill Davidson
First Selectman
Town of Brookfield
Brookfield Municipal Center
Pocono Road
P. O. Box 5106
Brookfield, CT 06804-5106

RE: **EM-CING-018-111129** - New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 2 Huckleberry Hill Road, Brookfield, Connecticut.

Dear First Selectman Davidson:

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 December 19, 2011.

Thank you for your cooperation and consideration.

Very truly yours,

Linda Roberts

Linda Roberts
Executive Director

LR/jbw

Enclosure: Notice of Intent

c: Katherine Daniel, Community Development Director, Town of Brookfield
Alice Dew, Zoning Enforcement Officer, Town of Brookfield

EM-CING-018-111129

New Cingular Wireless PCS, LLC
500 Enterprise Dr, STE 3A
Rocky Hill, CT 06067
Phone: (203)-410-4531
Douglas Talmadge
Real Estate Consultant

November 28, 2011

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

RE: New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 2 Huckleberry Hill Rd, Brookfield, CT 06804.

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 its attachments is being sent to the chief elected official of the municipality in which affected cell site is located.

UMTS 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.

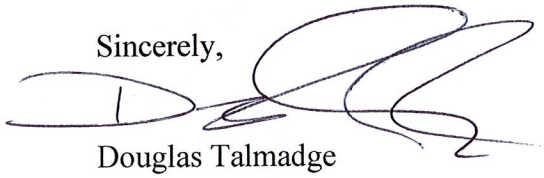
The changes to the facility do not constitute modification as defined Connecticut General Statues ("C.G.S.") Section 16-50i(d) because the general physical characteristics of the facility will not be significantly changed or altered. Rather, the planned changes to the facility fall squarely within those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

1. The height of the overall structure will not be affected.
2. The proposed changes will not extend the site boundaries. The equipment will be located near the existing concrete equipment pad on proposed H-Frame.
3. The proposed changes will not increase the noise level at the existing facility by 6 decibels or more.
4. Radio Frequency power density may increase due to the use of one or more GSM channels 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 PCS, LLC 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 (203)-410-4531 or email DTalmadge@Transcendwireless.com with questions concerning this matter. Thank you for your consideration.

Sincerely,



Douglas Talmadge
Real Estate Consultant

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

Calculated Radio Frequency Emissions

at&t

CT5075

2 Huckleberry Hill Rd, Brookfield, CT 06804

November 2, 2011

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1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for the proposed modifications to the existing AT&T antenna arrays mounted on the existing stealth flagpole located at 2 Huckleberry Hill Road in Brookfield, CT. The coordinates of the flagpole are 41-27-8.65 N, 73-24-14.41 W.

AT&T is proposing the following modifications:

1) Add 850 MHz GSM frequencies;
2) Add 700 MHz LTE frequencies;
3) Replace all existing antennas with three dualband (Cellular/PCS) antennas at the 57' centerline (one per sector);
4) Install three 750 MHz LTE antennas at the 51' centerline (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
AT&T UMTS	57	880	2	565	0.1251	0.5867	2.13%
AT&T UMTS	57	1900	2	875	0.1937	1.0000	1.94%
AT&T LTE	51	734	1	1117	0.1544	0.4893	3.16%
AT&T GSM	57	880	1	296	0.0328	0.5867	0.56%
AT&T GSM	57	1900	4	525	0.2324	1.0000	2.32%
						Total	**10.11%**

Table 1: Carrier Information[1]

[1] The nominal 10 dB off-beam loss factor for AT&T is derived from the specific AT&T antennas for this site and their associated antenna patterns which are presented in Attachment C.

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 and existing transmit antennas at the existing facility is below the limits for the general public. The highest expected percent of Maximum Permissible Exposure at the base of the tower is 10.11% 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

November 2, 2011
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[2]

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[3]

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)

[2] 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

[3] 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

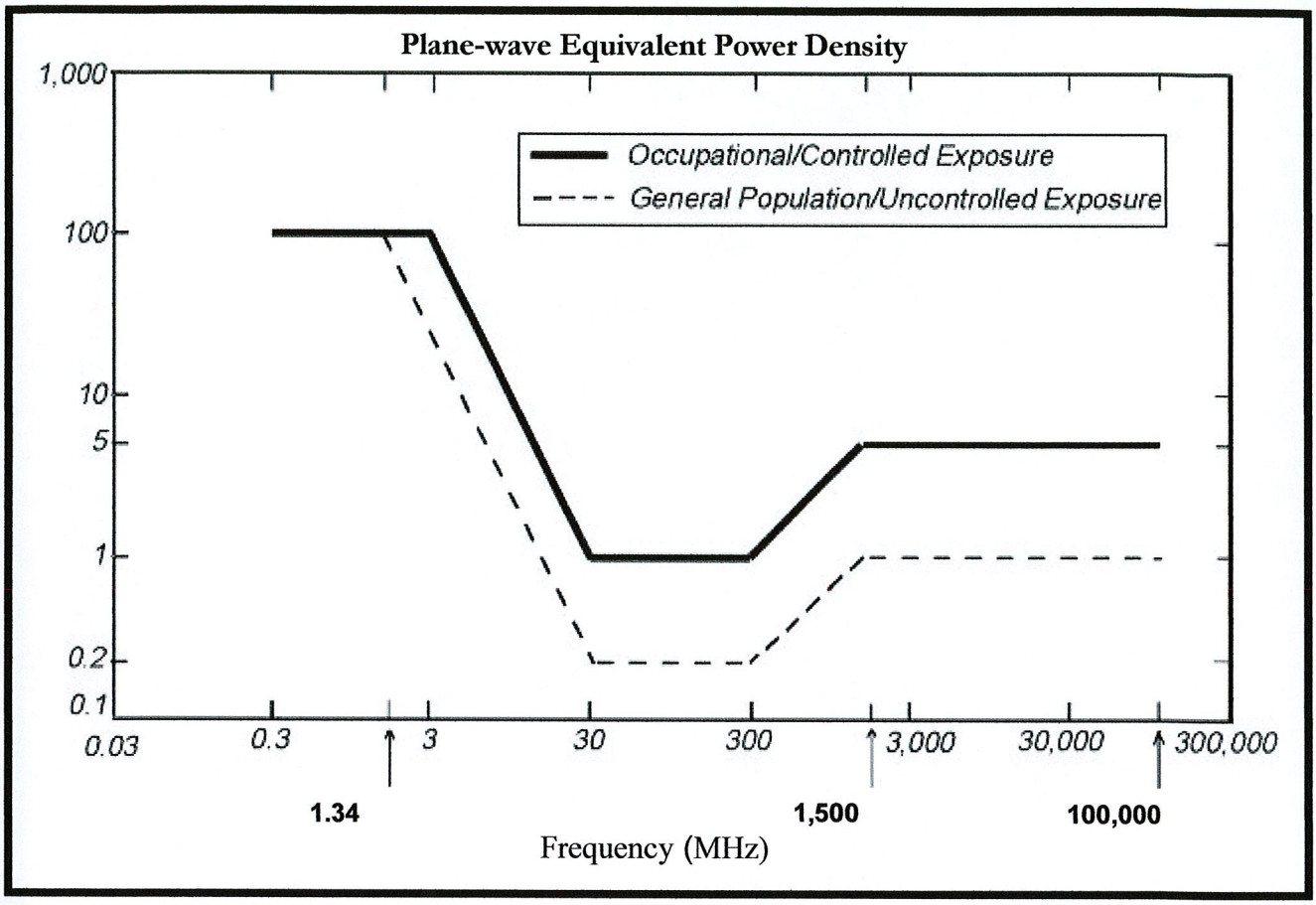
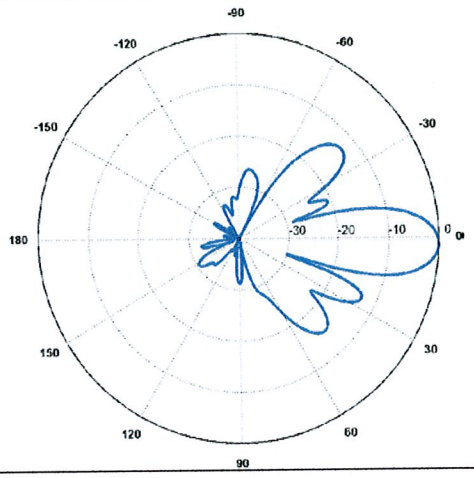


Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

Attachment C: AT&T's Antenna Model Data Sheets and Electrical Patterns

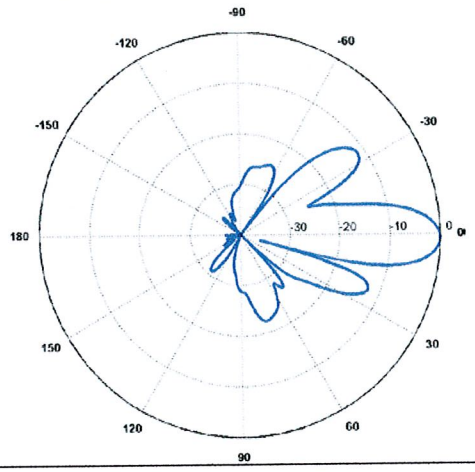
700 MHz

Manufacturer:	Kathrein-Scala
Model #:	80010764
Frequency Band:	698-806 MHz
Gain:	12.2 dBd
Vertical Beamwidth:	15 deg
Horizontal Beamwidth:	68 deg
Polarization:	± 45 deg
Size L x W x D:	55.2" x 11.8" x 6"



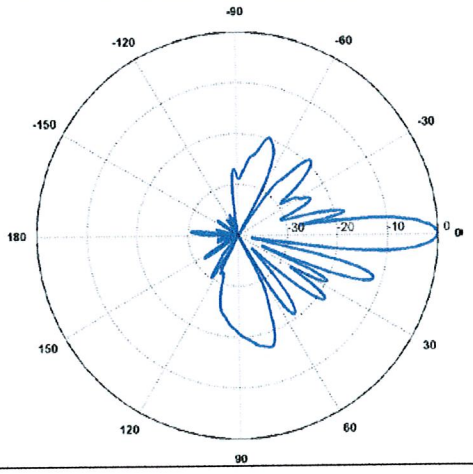
850 MHz

Manufacturer:	Kathrein-Scala
Model #:	80010764
Frequency Band:	824-894 MHz
Gain:	12.7 dBd
Vertical Beamwidth:	13.5 deg
Horizontal Beamwidth:	65 deg
Polarization:	+- 45 deg
Size L x W x D:	55.2" x 11.8" x 6"



1900 MHz

Manufacturer:	Kathrein-Scala
Model #:	80010764
Frequency Band:	1850-1990 MHz
Gain:	15.4 dBd
Vertical Beamwidth:	7.5 deg
Horizontal Beamwidth:	61 deg
Polarization:	+- 45 deg
Size L x W x D:	55.2" x 11.8" x 6"



PROJECT INFORMATION

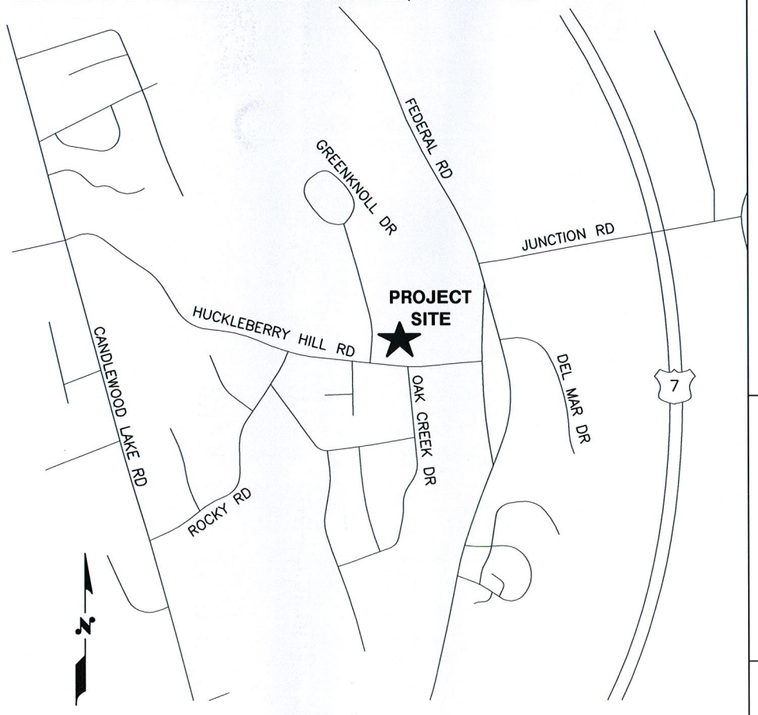
SCOPE OF WORK:	UNMANNED TELECOMMUNICATIONS FACILITY MODIFICATIONS
SITE ADDRESS:	2 HUCKLEBERRY HILL ROAD BROOKFIELD, CT 06804
LATITUDE:	41.452592 N 41° 27' 09.33" N
LONGITUDE:	−73.403899 W 73° 24' 14.04" W
JURISDICTION:	NATIONAL, STATE & LOCAL CODES OR ORDINANCES
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY
NOC#	866−915−5600

SITE NUMBER: CT5075
SITE NAME: BROOKFIELD WEST

DRAWING INDEX

VICINITY MAP

DIRECTIONS TO SITE:
HEAD NORTHEAST ON ENTERPRISE DR TOWARD CAPITOL BLVD. 0.4 MILES. TURN LEFT ONTO CAPITOL BLVD. 0.3 MILES. TURN LEFT ONTO WEST ST. 0.3 MILES. MERGE ONTO I−91 S VIA THE RAMP ON THE LEFT TOWARD NEW HAVEN. 9.1 MILES. MERGE ONTO I−691 W VIA EXIT 18 TOWARD MERIDEN/ WATERBURY. 8.0 MILES. MERGE ONTO I−84 W VIA EXIT 1 ON THE LEFT TOWARD WATERBURY/ DANBURY. 33.1 MILES. MERGE ONTO US−7 N VIA EXIT 7 TOWARD NEW MILFORD/ BROOKFIELD. 0.9 MILES. TAKE EXIT 11 TOWARD FEDERAL ROAD. 0.2 MILES. TURN LEFT ONTO WHITE TURKEY RD. 0.2 MILES. TURN RIGHT ONTO FEDERAL RD/ US−202. 1.2 MILES. TURN SLIGHT LEFT ONTO OLD NEW MILFORD RD. 0.2 MILES. TURN LEFT ONTO HUCKLEBERRY HILL RD. 0.0 MILES. END AT 2 HUCKLEBERRY HILL RD BROOKFIELD, CT 06804−2219



GENERAL NOTES

1. THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF AT&T. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. DUPLICATION AND USE BY GOVERNMENT AGENCIES FOR THE PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.
2. THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
3. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE AT&T REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

CALL

BEFORE YOU DIG

CALL TOLL FREE 800−922−4455

UNDERGROUND SERVICE ALERT

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 2-101
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

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

SITE NUMBER: CT5075
SITE NAME: BROOKFIELD WEST
2 HUCKLEBERRY HILL ROAD
BROOKFIELD, CT 06804
FAIRFIELD COUNTY

at&t
500 ENTERPRISE DRIVE
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK
0	11/17/11	ISSUED FOR CONSTRUCTION	NB	DC

SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: NB

STATE OF CONNECTICUT
DANIEL P. CHAMA
No. 24178
LICENSED PROFESSIONAL ENGINEER

AT&T

TITLE SHEET
(LTE)

JOB NUMBER	DRAWING NUMBER	REV
5075.01	T−1	0

GROUNDING NOTES

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.

2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.

3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.

4. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.

5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS 2 AWG STRANDED COPPER FOR OUTDOOR BTS.

6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.

7. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.

8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.

9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.

10. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.

11. METAL CONDUIT SHALL BE MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWS COPPER

ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF 1/2 IN. OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BARE TINNED COPPER GROUND WIRE, PER NEC 250.50

GENERAL NOTES

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
CONTRACTOR – NEXLINK
SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
OWNER – AT&T MOBILITY

2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.

3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.

4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.

5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.

6. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.

7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.

8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.

9. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.

10. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.

11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.

12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.

13. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.

14. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS. ALL CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.

15. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy = 36 ksi) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (Fy = 36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCHUP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.

16. CONSTRUCTION SHALL COMPLY WITH UMTS SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T MOBILITY SITES."

17. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.

18. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.

19. SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

20. APPLICABLE BUILDING CODES:
SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.
BUILDING CODE: 2003 IBC WITH 2005 CT SUPPLEMENT & 2009 CT AMENDMENTS
ELECTRICAL CODE: REFER TO ELECTRICAL DRAWINGS
LIGHTENING CODE: REFER TO ELECTRICAL DRAWINGS

SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:

AMERICAN CONCRETE INSTITUTE (ACI) 318; BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE;

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

MANUAL OF STEEL CONSTRUCTION, ASD, NINTH EDITION;

TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-F, STRUCTURAL STANDARDS FOR STEEL

ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES; REFER TO ELECTRICAL DRAWINGS FOR SPECIFIC ELECTRICAL STANDARDS.

FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

ABBREVIATIONS

AGL	ABOVE GRADE LEVEL	G.C.	GENERAL CONTRACTOR	RF	RADIO FREQUENCY
AWG	AMERICAN WIRE GAUGE	MGB	MASTER GROUND BUS		
BCW	BARE COPPER WIRE	MIN	MINIMUM	TBD	TO BE DETERMINED
BTS	BASE TRANSCEIVER STATION	PROPOSED	NEW	TBR	TO BE REMOVED
EXISTING	EXISTING	N.T.S.	NOT TO SCALE	TBRR	TO BE REMOVED AND REPLACED
EG	EQUIPMENT GROUND	REF	REFERENCE		
EGR	EQUIPMENT GROUND RING	REQ	REQUIRED	TYP	TYPICAL

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SITE NUMBER: CT5075
SITE NAME: BROOKFIELD WEST
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BROOKFIELD, CT 06804
FAIRFIELD COUNTY

at&t
500 ENTERPRISE DRIVE
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
0	11/17/11	ISSUED FOR CONSTRUCTION	NB	DC	DPD

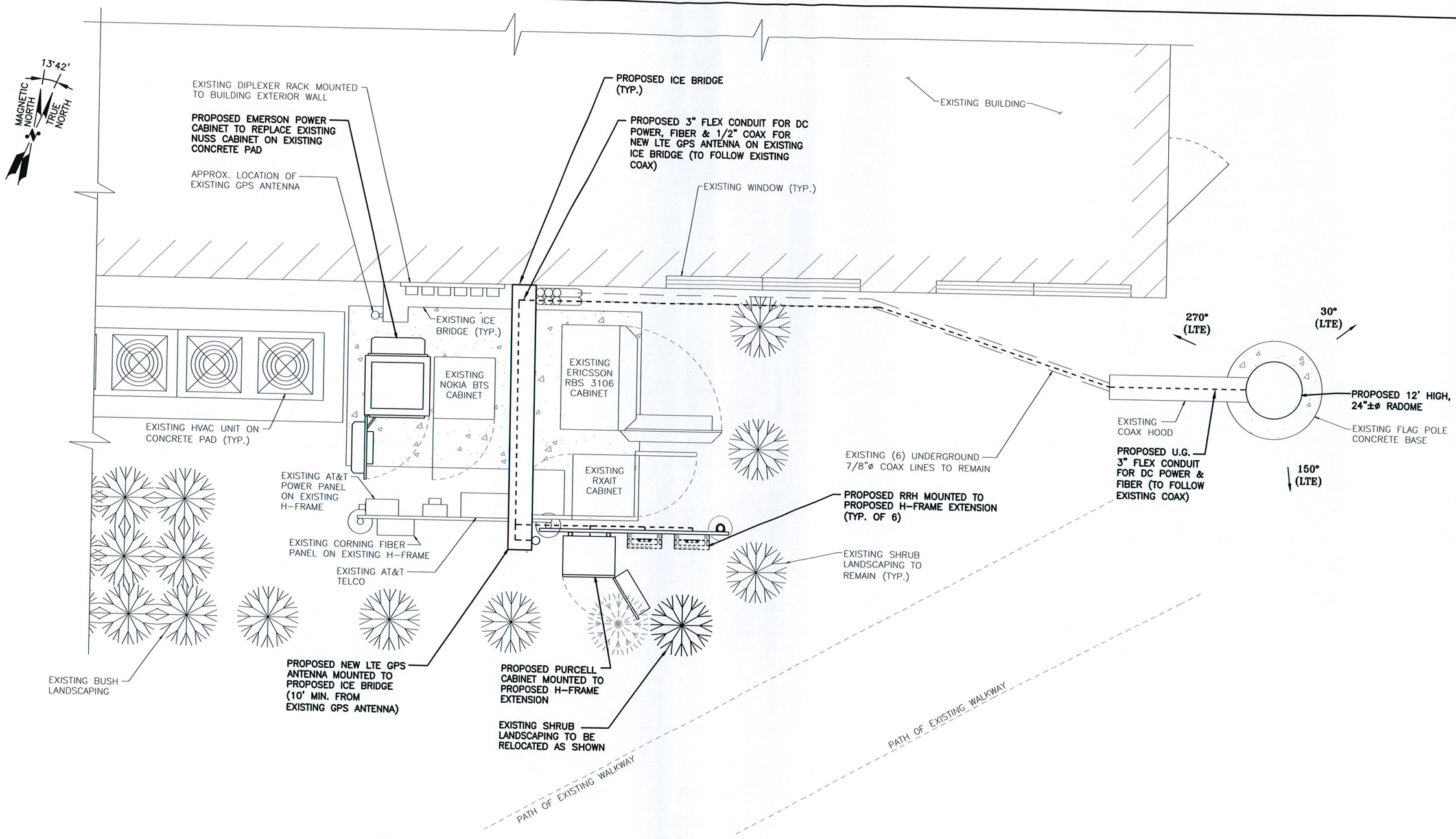
SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: NB

STATE OF CONNECTICUT
DANIEL P. HAMM
NO. 24170
LICENSED PROFESSIONAL ENGINEER

AT&T

GENERAL NOTES (LTE)

JOB NUMBER	DRAWING NUMBER	REV
5075.01	GN-1	0



COMPOUND PLAN

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

0 1'-0" 2'-0" 4'-0" 6'-0"

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0	11/17/11	ISSUED FOR CONSTRUCTION	NB	DC	DPH

SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: NB

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

AT&T

COMPOUND PLAN (LTE)

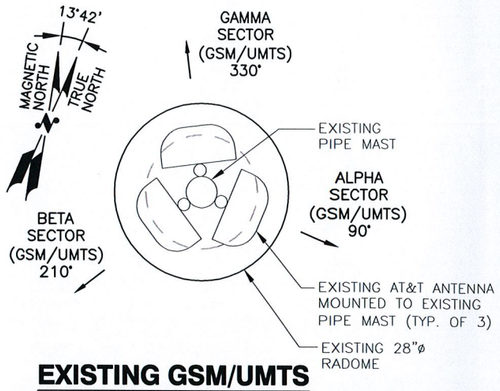
JOB NUMBER	DRAWING NUMBER	REV
5075.01	A-1	0

NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.

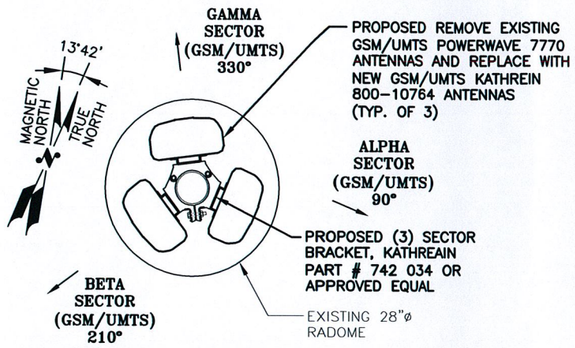
NOTE:*

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



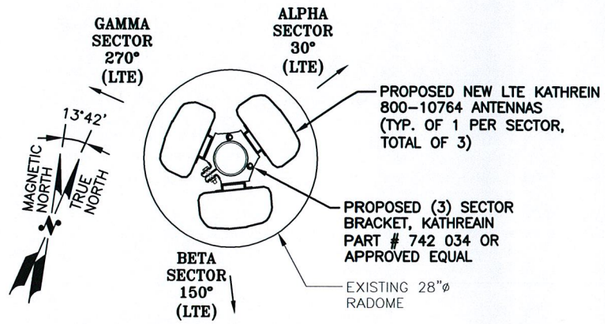
EXISTING GSM/UMTS ANTENNA PLAN @ 57' R.C.L.

SCALE: N.T.S.



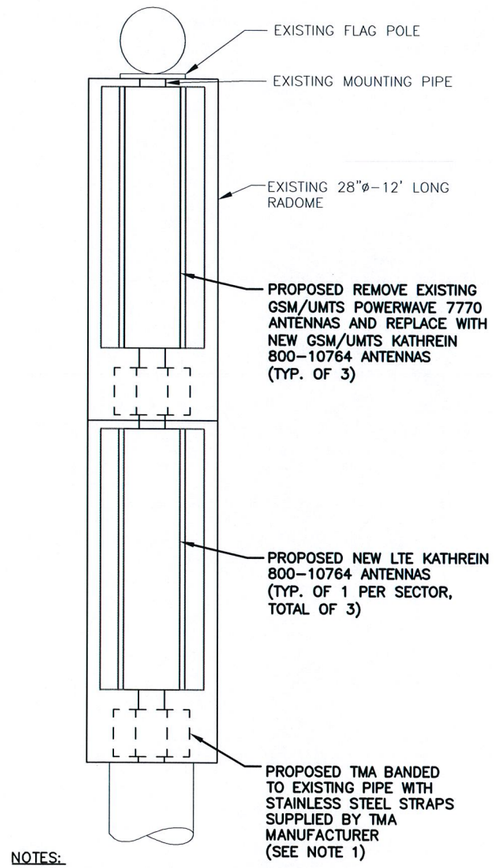
PROPOSED GSM/UMTS ANTENNA PLAN @ 57' R.C.L.

SCALE: N.T.S.



PROPOSED LTE ANTENNA PLAN @ 51' R.C.L.

SCALE: N.T.S.

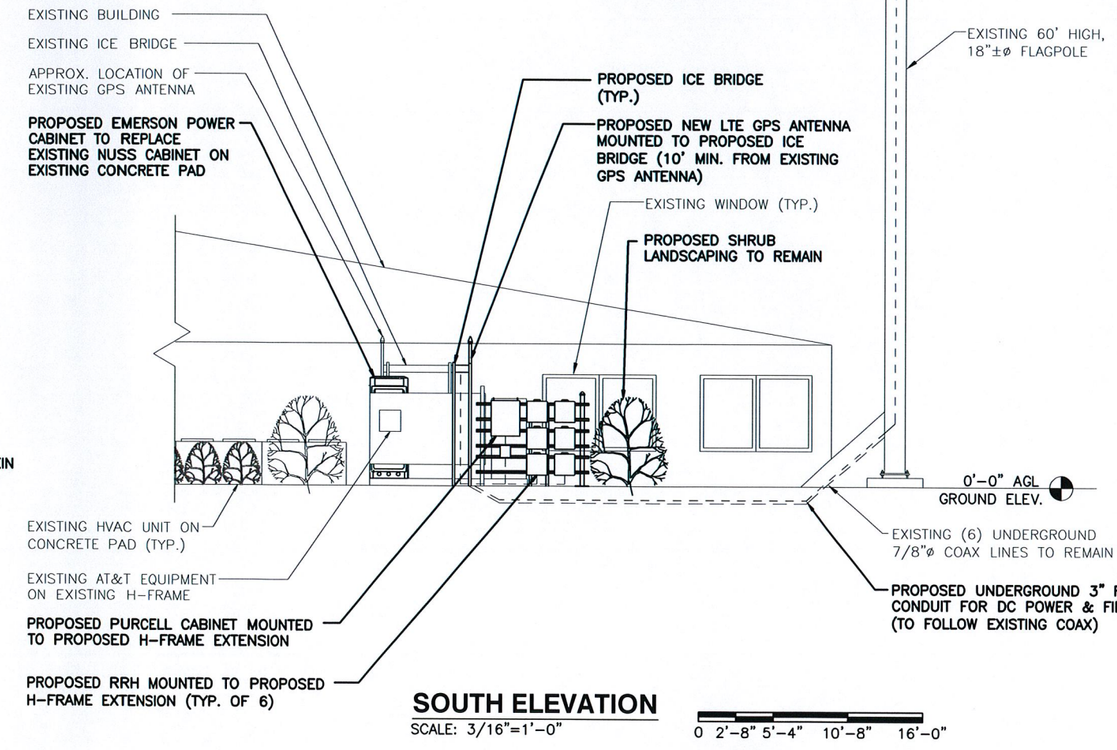


NOTES:

1. REFER TO RF CONFIG & SECTOR SCHEMATICS FOR QUANTITY REQUIRED PER SECTOR

PROPOSED ANTENNA DETAIL

SCALE: N.T.S.



SOUTH ELEVATION

SCALE: 3/16"=1'-0"

0 2'-8" 5'-4" 10'-8" 16'-0"

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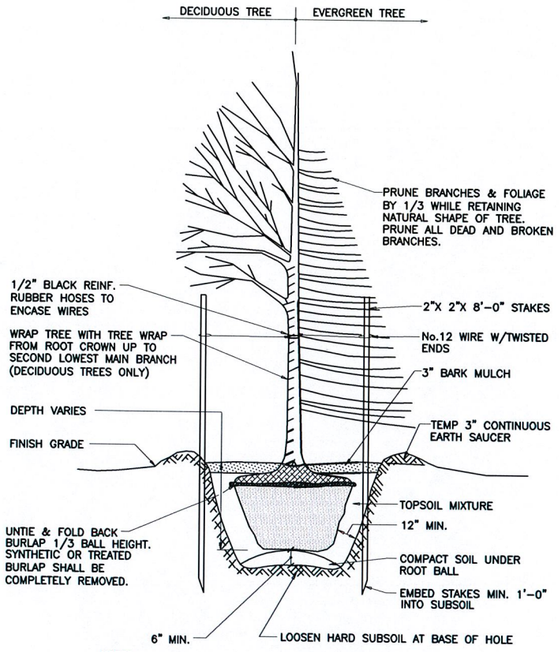
ANTENNA PLAN AND ELEVATION (LTE)

JOB NUMBER	DRAWING NUMBER	REV
36075.01	A-2	0

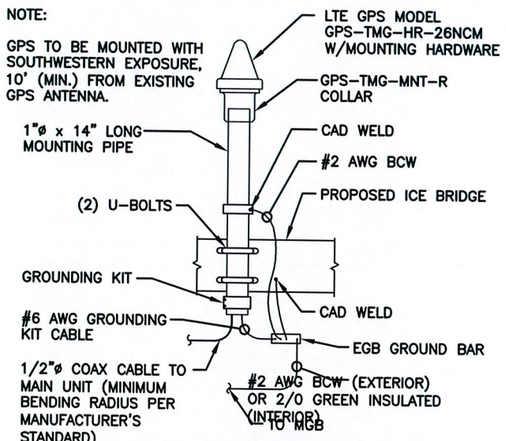


NOTES:

1. LANDSCAPE TREES SHALL BE A MINIMUM OF 6'-0" IN HEIGHT WHEN PLANTED.
2. SPECIES PROPOSED THUJA OCCIDENTALIS PYRAMIDAL (PYRAMIDAL ARBORVITAE)

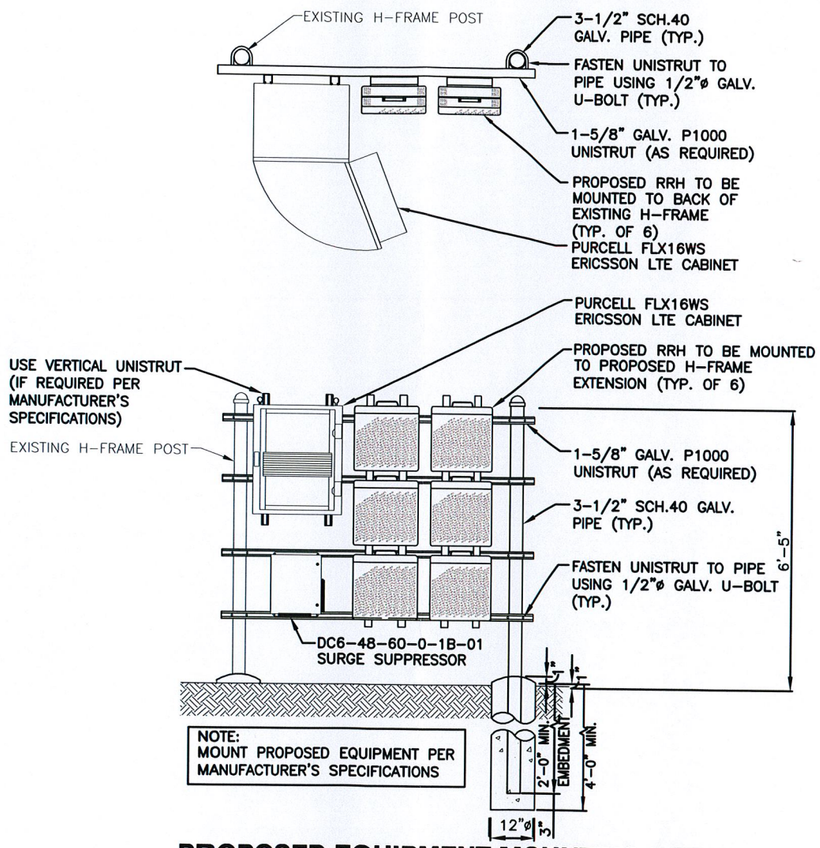
PLANTING DETAIL

SCALE: N.T.S.



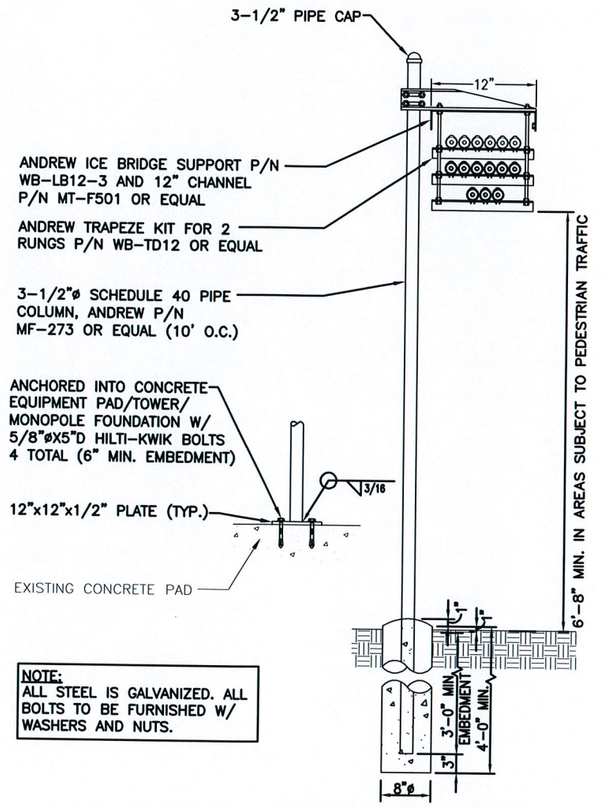
GPS MOUNTING DETAIL

SCALE: N.T.S.



PROPOSED EQUIPMENT MOUNTING DETAIL

SCALE: N.T.S.



COAX ICE BRIDGE DETAIL

SCALE: N.T.S.

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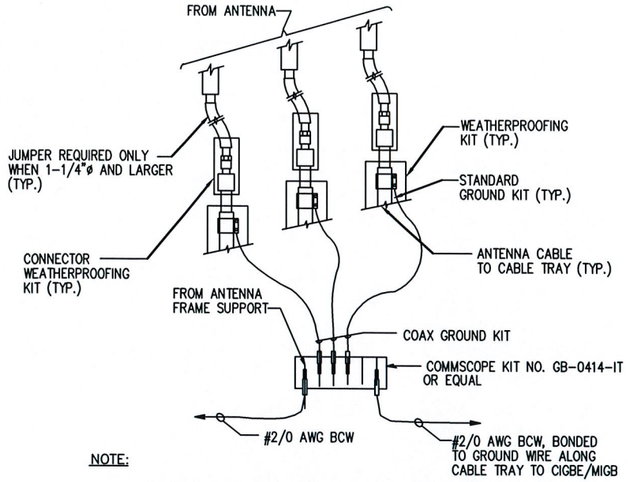
DETAILS (LTE)

JOB NUMBER	DRAWING NUMBER	REV
36075.01	A-3	0

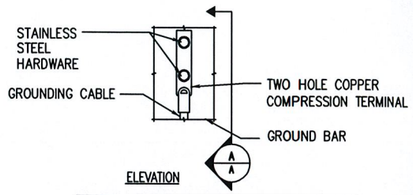


NOTE:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE.

1 — GROUND WIRE TO GROUND BAR CONNECTION DETAIL

N.T.S.

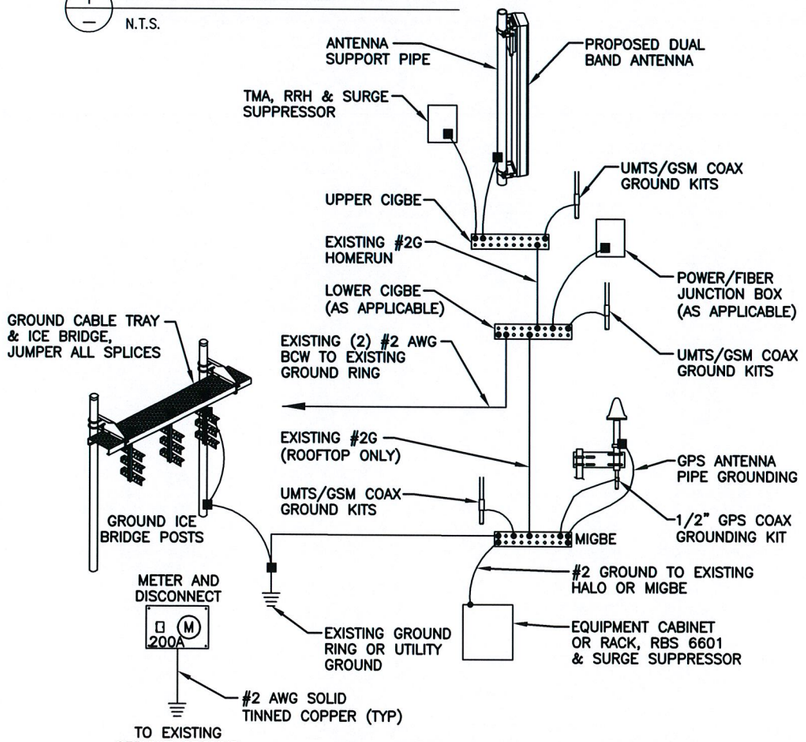


NOTE:

1. "DOUBLING UP" OR "STACKING " OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB, AND MGB.

2 — TYPICAL GROUND BAR CONNECTION DETAIL

N.T.S.



3 — GROUNDING RISER DIAGRAM

N.T.S.

EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

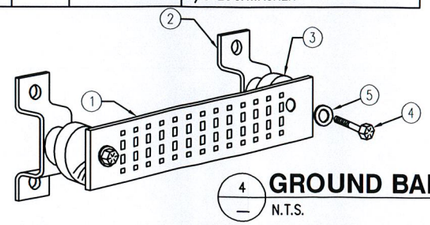
SECTION "P" – SURGE PRODUCERS

CABLE ENTRY PORTS (HATCH PLATES) (#2)
GENERATOR FRAMEWORK (IF AVAILABLE) (#2)
TELCO GROUND BAR
COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (#2)
+24V POWER SUPPLY RETURN BAR (#2)
-48V POWER SUPPLY RETURN BAR (#2)
RECTIFIER FRAMES.

SECTION "A" – SURGE ABSORBERS

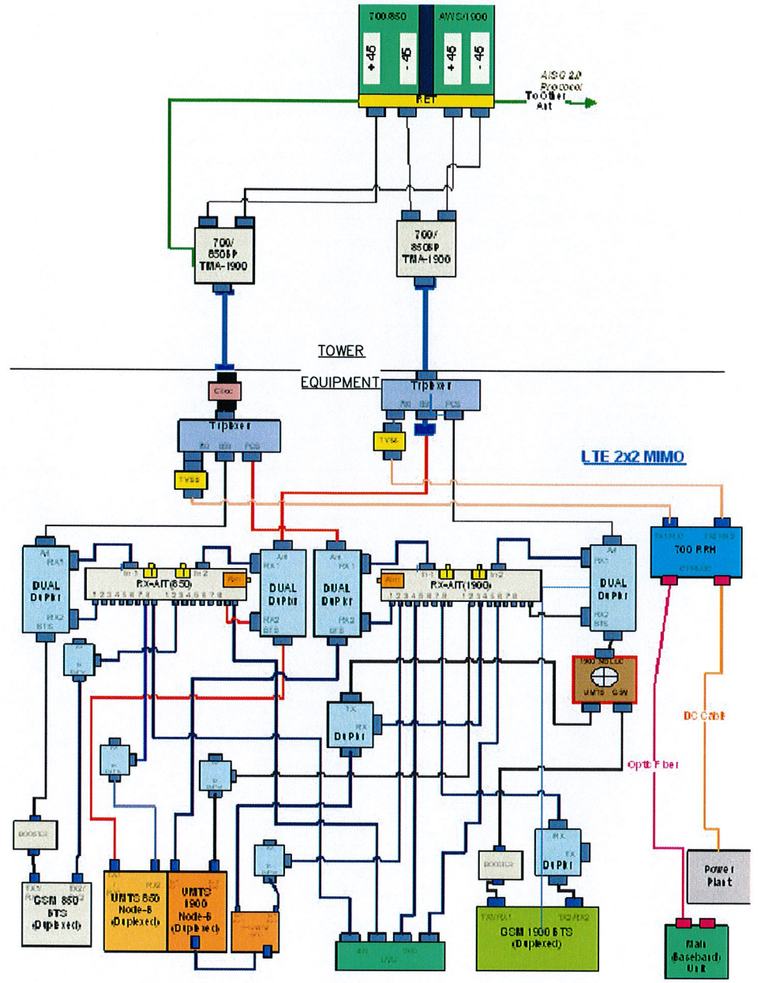
INTERIOR GROUND RING (#2)
EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2)
METALLIC COLD WATER PIPE (IF AVAILABLE) (#2)
BUILDING STEEL (IF AVAILABLE) (#2)

WIRELESS SOLUTIONS INC.			
NO.	REQ.	PART NO.	DESCRIPTION
1	1	HLGB-0420-IS	SOLID GND. BAR (20"x4"x1/4")
2	2	———	WALL MTG. BRKT.
3	2	———	INSULATORS
4	4	———	5/8"-11x1" H.H.C.S.
5	4	———	5/8 LOCKWASHER



4 — GROUND BAR - DETAIL

N.T.S.



5 — PLUMBING DIAGRAM

N.T.S.

NOTES:

1. CONTRACTOR TO CONFIRM ALL PARTS.
2. INSTALL ALL EQUIPMENT TO MANUFACTURER'S RECOMMENDATIONS.

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0	11/17/11	ISSUED FOR CONSTRUCTION	NB	DC DBH

SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: NB

STATE OF CONNECTICUT · DANIEL P. HAMM · No. 24173 · LICENSED PROFESSIONAL ENGINEER

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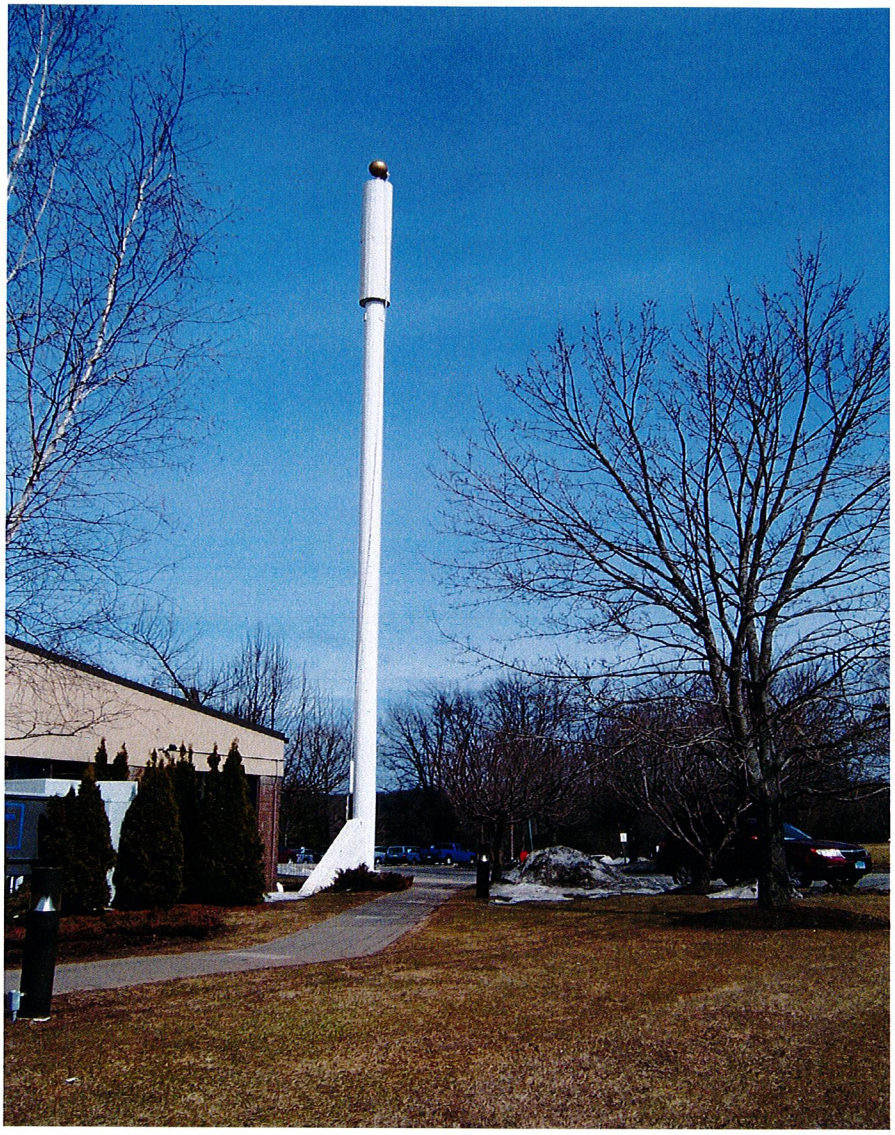
PLUMBING DIAGRAM & DETAILS (LTE)

JOB NUMBER	DRAWING NUMBER	REV
5075.01	G-1	0

Brookfield-West Monopole

CT5075

Fairfield County, Connecticut



Prepared for:

New Cingular Wireless PCS, LLC

500 Enterprise Drive

Rocky Hill, CT 06067

May 4, 2011

CHA

2139 Silas Deane Highway

Suite 212

Rocky Hill, CT 06067-2336

Tel: (860) 257-4557

CHA Project No. 22702.1027.28000

May 4, 2011

New Cingular Wireless PCS, LLC
500 Enterprise Drive
Rocky Hill, CT 06067

RE: ***Structural Analysis of the Brookfield-West Monopole***
CT5075
Located in Fairfield County, CT
CHA Project No. 22702.1027.28000

To Whom It May Concern:

CHA has performed a structural analysis under the provisions of TIA-EIA-222-G of the referenced monopole for the purpose of evaluating its ability to support the existing equipment loads in addition to the new equipment proposed by New Cingular Wireless PCS, LLC. In summary, our analysis indicates that the tower ***is*** structurally capable of supporting the existing and proposed loads upon installation per our Construction Documents.

Our analysis and design is based on the following information:

- Tower member sizes and configuration obtained from a previous structural analysis report by DaVinci Engineering, Inc., prepared for Cingular Wireless / AT&T dated June 18, 2008.
- Proposed equipment information, including antenna models and elevations, provided by New Cingular Wireless PCS, LLC.

Our analysis includes data for the following proposed antennas:

New Cingular Wireless:

- (3) Powerwave P90-14-XLH-RR panel antennas mounted on existing downtilt brackets within the existing concealment enclosure, to replace the existing (3) Powerwave 7770 antennas, at an antenna centerline elevation of 57'.
- (3) Twin BP TMA's mounted on existing mounts within the existing concealment enclosure in the upper radome.
- (3) Powerwave P65-15-XLH-RR panel antennas mounted on existing downtilt brackets within the existing concealment enclosure at an antenna centerline elevation of 51'.

III Winners Circle, PO Box 5269, Albany, NY 12205-0269
T 518.453.4500 • F 518.458.1735 • www.chacompanies.com

- (3) Twin LTE TMA's mounted on existing brackets within the existing concealment enclosure, to replace (6) existing TMA's in the lower radome.

The existing and proposed antenna elevations and coaxial cable sizes have been listed in the attached Executive Summary.

With this information, TIA/EIA-222-G, *Structural Standards for Steel Antenna Towers and Antenna Supporting Structures,* and the Connecticut State Building Code the analysis was performed to determine the structural integrity of the tower. Based on the data provided, section properties, member strengths, and projected areas, applicable loads were calculated. Knowing the projected area of the tower and all of its appurtenances, 110 mph wind loads were calculated with and without radial ice loads of 3/4". These wind and ice loads were then reduced to member forces in the tower components through RISA Tower structural analysis software. The member forces were then compared to the maximum allowable stress for each member type.

The analysis indicates that the existing tower ***is*** capable of supporting the existing and proposed loads under TIA/EIA-222-G.

Reactions at the base of the monopole due to the existing and proposed loads are larger than the reactions provided in the structural analysis report by DaVinci Engineering, dated June 18, 2008. A foundation analysis was performed by CHA, per the information provided in the previous analysis report. Based on this information, it can be concluded that the tower foundation is adequate for supporting the existing and proposed loads provided that the foundation was built per the design documents and applicable codes.

As requested, we have included a copy of the governing structural analysis calculations referenced above for your review and use. If you have any questions, or if we can be of further assistance, please do not hesitate to call.

Very truly yours,

STATE OF CONNECTICUT
THOMAS L. O'BRIEN
No. 18210
LICENSED
PROFESSIONAL ENGINEER

Thomas L. O'Brien, P.E.
Partner

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CHA

EXECUTIVE SUMMARY

Brookfield-West Monopole
CT5075

May 4, 2011

Tower Information:

Tower Owner:	Unknown
Tower Manufacturer:	Penn Summit Tubular
Tower Height:	48 feet
Tower Type:	Monopole

Proposed Antenna Data:

New Cingular Wireless:

- (3) Powerwave P90-14-XLH-RR panel antennas mounted on existing downtilt brackets within the existing concealment enclosure, to replace the existing (3) Powerwave 7770 antennas, at an antenna centerline elevation of 57'.
- (3) Twin BP TMA's mounted on existing mounts within the existing concealment enclosure in the upper radome.
- (3) Powerwave P65-15-XLH-RR panel antennas mounted on existing downtilt brackets within the existing concealment enclosure at an antenna centerline elevation of 51'.
- (3) Twin LTE TMA's mounted on existing brackets within the existing concealment enclosure, to replace (6) existing TMA's in the lower radome.

Existing Antenna and Appurtenance Data:

Town

- (1) One 12' x 18' Flag mounted to the monopole on a standard flag mounting kit at a centerline elevation of 54'.

*Cingular/AT&T:

- (3) Three Powerwave 7770.0 panel antennas, with (6) six LGP21401 TMA's and (6) six LGP13519 Diplexers mounted within a 6' x 28" diameter concealment cylinder at an antenna centerline elevation of 51' with (6) six 7/8" coaxial cables inside the pole.

*All existing panel antennas, TMA's and Diplexers are to be replaced with proposed.

Code Data:

Applicable Code: - TIA/EIA-222-G, Structural Standards for Steel Antenna Towers and Antenna Supporting Structures
- Connecticut State Building Code

Load Cases:

(1) Weight of Tower, Antennas, and Appurtenances plus Wind Load without radial ice at a wind speed of 110 mph.
(2) Weight of Tower, Antennas, and Appurtenances plus Wind Load on iced tower plus weight of 3/4" radial ice in conjunction with a wind speed of 50 mph.

CHA

Monopole Shaft Members: (A607 Gr. 65 ksi steel)

Tower Section	Length	Base Diameter	Top Diameter	Wall Thickness	Splice Length
1	48'	18.00"	18.00"	3/16"	0'

Foundation Reactions: (Existing and Proposed Equipment)

A foundation analysis was performed. Proposed reactions are within the capacity of the existing foundation (see attached calculations). Capacities are based on a soil bearing pressure of 4 ksf and a minimum factor of safety of 1.5 against overturning.

Conclusion:

The analysis indicates that the existing tower is structurally capable of supporting the existing and proposed loads.

Tower Superstructure:

The tower section is stressed at the following governing capacities for the load cases 1, 2, & 3:

	Stress Ratio (%)
*Section 1	74.4

*The governing tower member is stressed at 74.4%.

FOUNDATION ANALYSIS RESULTS

****
*

* CAISSON - Pier Foundations Analysis and Design - Copyright Power Line Systems, Inc. 1993-2010 *
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****

Project Title: Brookfield-West
Project Notes: 22702-1027

Calculation Method: Full 8CD

******* I N P U T D A T A

Pier Properties

Diameter (ft)	Distance of Top of Pier above Ground (ft)	Concrete Strength (ksi)	Steel Yield Strength (ksi)
4.00	0.50	4.00	65.00

Soil Properties

Layer	Type	Thickness (ft)	Depth at Top of Layer (ft)	Density (lbs/ft^3)	CU (psf)	KP	PHI (deg)
1	Sand	3.00	0.00	100.0		1.000	
2	Sand	3.79	3.00	125.0		3.537	34.00
3	Sand	5.00	6.79	125.0		3.537	34.00

Design (Factored) Loads at Top of Pier

Moment (ft-k)	Axial Load (kips)	Shear Load (kips)	Additional Safety Factor Against Soil Failure
211.0	7.8	4.90	1.50

******* R E S U L T S

Calculated Pier Properties

Length (ft)	Weight (kips)	End Bearing Pressure (psf)
10.500	19.792	620.7

LENGTH = 10.5' < 15.5' (MIN) ✓(OK)

Ultimate Resisting Forces Along Pier

Type	Distance of Top of Layer to Top of Pier (ft)	Thickness (ft)	Density (lbs/ft^3)	CU (psf)	KP	Force (kips)	Arm (ft)
Sand	0.50	3.00	100.0		1.000	5.40	2.50
Sand	3.50	3.79	125.0		3.537	86.36	5.67
Sand	7.29	0.70	125.0		3.537	24.28	7.65
Sand	7.99	2.51	125.0		3.537	108.47	9.31

Shear and Moments Along Pier

Distance below Top of Pier (without Safety Factor) (ft)	Moment (with Safety Factor) (ft-k)	Shear (with Safety Factor) (kips)	Moment (without Safety Factor) (ft-k)	Shear (kips)
0.00	213.8	7.6	320.6	5.0
1.05	219.0	7.4	328.6	4.9
2.10	223.8	6.0	335.7	4.0
3.15	227.2	3.4	340.8	2.2
4.20	226.6	-8.0	339.8	5.4
5.25	214.2	-28.2	321.3	18.8
6.30	185.7	-54.3	278.5	36.2
7.35	136.9	-86.2	205.3	57.4
8.40	67.9	-93.0	101.8	62.0
9.45	17.6	-49.4	26.5	33.0
10.50	-0.0	0.0	-0.0	0.0

Reinforcement and Capacity

Total Reinforcement Percent	Reinforcement Area (in^2)	Usable Axial Capacity (kips)	Usable Moment Capacity (ft-k)
0.34	6.15	7.8	594.5

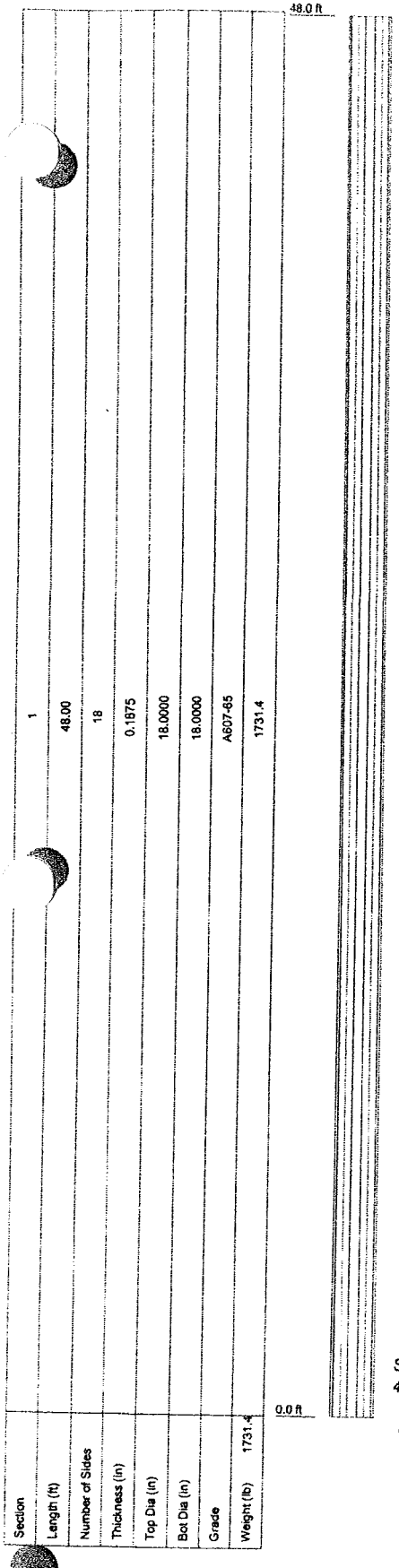
> 211 K·ft (ACTUAL) ✓ OK

↳ 12.0 in² PROVIDED

S Standard Re-Bars (Select one of the following)

Quantity	Name	Area (in^2)	Diameter (in)	Spacing (in)
31	#4	0.20	0.500	3.85
20	#5	0.31	0.625	5.97
14	#6	0.44	0.750	8.53
11	#7	0.60	0.875	10.85
8	#8	0.79	1.000	14.92
7	#9	1.00	1.128	17.05
5	#10	1.27	1.270	23.88
4	#11	1.56	1.410	29.85
3	#14	2.25	1.693	39.79

TOWER ELEVATION



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
12' x 18' Polyester FLAG	60	12' Shroud	54
p90-14-XLH-RR	57	Twin LTE TMA	51
p90-14-XLH-RR	57	Twin LTE TMA	51
p90-14-XLH-RR	57	P65-15-XLH-RR	51
Twin BP TMA	57	P65-15-XLH-RR	51
Twin BP TMA	57	P65-15-XLH-RR	51
Twin BP TMA	57	Twin LTE TMA	51

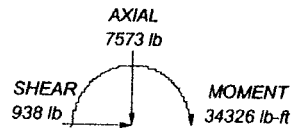
MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-65	65 ksi	80 ksi			

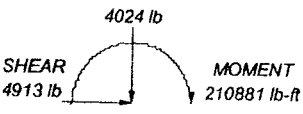
TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 110 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. Weld together tower sections have flange connections.
9. Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.
10. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
11. Welds are fabricated with ER-70S-6 electrodes.

ALL REACTIONS ARE FACTORED



50 mph WIND - 0.7500 in ICE



REACTIONS - 110 mph WIND

CHA Consulting, Inc.
3 Winners Circle
Albany, NY
Phone: (518)453-8761
FAX: (518)453-4712

Job: ***22702-1027 CT5075***			
Project: ***Brookfield - West***			
Client: New Cingular Wireless	Drawn by: Tony Marruso	App'd:	
Code: TIA-222-G	Date: 04/27/11	Scale: NTS	
Path: W:\SAI Cingular\22702\Sites\1027_5075\Struct\Model\Model.eri		Dwg No. E-1	

ANALYSIS SUMMARY
PER TIA/EIA-222-G
(Existing and Proposed Equipment)

Tower Input Data

There is a pole section.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in Fairfield County, Connecticut.
Basic wind speed of 110 mph.
Structure Class II.
Exposure Category C.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
Weld together tower sections have flange connections..
Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications..
Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards..
Welds are fabricated with ER-70S-6 electrodes..
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs	Distribute Leg Loads As Uniform	√ Treat Feedline Bundles As Cylinder
Consider Moments - Horizontals	Assume Legs Pinned	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Diagonals	√ Assume Rigid Index Plate	Calculate Redundant Bracing Forces
Use Moment Magnification	√ Use Clear Spans For Wind Area	Ignore Redundant Members in FEA
√ Use Code Stress Ratios	√ Use Clear Spans For KL/r	SR Leg Bolts Resist Compression
√ Use Code Safety Factors - Guys	Retension Guys To Initial Tension	√ All Leg Panels Have Same Allowable
Escalate Ice	Bypass Mast Stability Checks	Offset Girt At Foundation
Always Use Max Kz	√ Use Azimuth Dish Coefficients	√ Consider Feedline Torque
Use Special Wind Profile	√ Project Wind Area of Appurt.	Include Angle Block Shear Check
Include Bolts In Member Capacity	Autocalc Torque Arm Areas	Poles
Leg Bolts Are At Top Of Section	SR Members Have Cut Ends	Include Shear-Torsion Interaction
Secondary Horizontal Braces Leg	Sort Capacity Reports By Component	Always Use Sub-Critical Flow
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Use Top Mounted Sockets
Add IBC .6D+W Combination		

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	48.00-0.00	48.00		18	18.0000	18.0000	0.1875	0.7500	A607-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	18.2777	10.6007	424.9328	6.3234	9.1440	46.4712	850.4248	5.3013	2.8380	15.136
	18.2777	10.6007	424.9328	6.3234	9.1440	46.4712	850.4248	5.3013	2.8380	15.136

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 48.00-0.00				1	1	1		

Monopole Base Plate Data

Base Plate Data	
Base plate is square	√
Base plate is grouted	√
Anchor bolt grade	A615-75
Anchor bolt size	2.2500 in
Number of bolts	4
Embedment length	72.0000 in
f'_c	4 ksi
Grout space	2.0000 in
Base plate grade	A572-55
Base plate thickness	1.7500 in
Bolt circle diameter	24.0000 in
Outer diameter	22.0000 in
Inner diameter	16.5000 in
Base plate type	Plain Plate

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
VXL5-50 (7/8 FOAM)	C	No	Inside Pole	48.00 - 8.00	12	No Ice	0.00	0.29
						1/2" Ice	0.00	0.29
						1" Ice	0.00	0.29

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	48.00-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	139.20

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	48.00-0.00	A	1.459	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	139.20

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	48.00-0.00	0.0000	0.0000	0.0000	0.0000

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice

User Defined Loads

Description	Elevation ft	Offset From Centroid ft	Azimuth Angle °		Weight lb	F_x lb	F_z lb	Wind Force lb	C_AA_C ft^2
12' x 18' Polyester FLAG	60.00	0.00	0.0000	No Ice	50.00	0.00	0.00	768.00	**20.87**
				Ice	300.00	0.00	0.00	100.00	**13.16**
				Service	100.00	0.00	0.00	480.00	**49.01**

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
12' Shroud	C	None		0.0000	54.00	No Ice	24.00	24.00	1060.00
						1/2" Ice	24.97	24.97	1308.04
						1" Ice	25.96	25.96	1566.61
p90-14-XLH-RR	A	None		0.0000	57.00	No Ice	0.00	0.00	50.00
						1/2" Ice	0.00	0.00	82.50
						1" Ice	0.00	0.00	119.48
p90-14-XLH-RR	B	None		0.0000	57.00	No Ice	0.00	0.00	50.00
						1/2" Ice	0.00	0.00	82.50
						1" Ice	0.00	0.00	119.48
p90-14-XLH-RR	C	None		0.0000	57.00	No Ice	0.00	0.00	50.00
						1/2" Ice	0.00	0.00	82.50
						1" Ice	0.00	0.00	119.48
Twin BP TMA	A	None		0.0000	57.00	No Ice	0.00	0.00	17.60
						1/2" Ice	0.00	0.00	19.50
						1" Ice	0.00	0.00	22.51
Twin BP TMA	B	None		0.0000	57.00	No Ice	0.00	0.00	17.60
						1/2" Ice	0.00	0.00	19.50
						1" Ice	0.00	0.00	22.51
Twin BP TMA	C	None		0.0000	57.00	No Ice	0.00	0.00	17.60
						1/2" Ice	0.00	0.00	19.50
						1" Ice	0.00	0.00	22.51
Twin LTE TMA	A	None		0.0000	51.00	No Ice	0.00	0.00	6.60
						1/2" Ice	0.00	0.00	9.26
						1" Ice	0.00	0.00	13.07
Twin LTE TMA	B	None		0.0000	51.00	No Ice	0.00	0.00	6.60
						1/2" Ice	0.00	0.00	9.26
						1" Ice	0.00	0.00	13.07
Twin LTE TMA	C	None		0.0000	51.00	No Ice	0.00	0.00	6.60
						1/2" Ice	0.00	0.00	9.26
						1" Ice	0.00	0.00	13.07
P65-15-XLH-RR	A	None		0.0000	51.00	No Ice	0.00	0.00	50.00
						1/2" Ice	0.00	0.00	82.50
						1" Ice	0.00	0.00	119.48
P65-15-XLH-RR	B	None		0.0000	51.00	No Ice	0.00	0.00	50.00
						1/2" Ice	0.00	0.00	82.50
						1" Ice	0.00	0.00	119.48
P65-15-XLH-RR	C	None		0.0000	51.00	No Ice	0.00	0.00	50.00
						1/2" Ice	0.00	0.00	82.50
						1" Ice	0.00	0.00	119.48

Tower Pressures - No Ice

$G_H = 1.100$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1 48.00-0.00	25.09	0.946	28	73.111	A	0.000	73.111	73.111	100.00	0.000	0.000
					B	0.000	73.111		100.00	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
					C	0.000	73.111		100.00	0.000	0.000

Tower Pressure - With Ice

$G_H = 1.100$

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 48.00-0.00	25.09	0.946	6	1.4595	84.787	A	0.000	84.787	84.787	100.00	0.000	0.000
						B	0.000	84.787		100.00	0.000	0.000
						C	0.000	84.787		100.00	0.000	0.000

Tower Pressure - Service

$G_H = 1.100$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 48.00-0.00	25.09	0.946	7	73.111	A	0.000	73.111	73.111	100.00	0.000	0.000
					B	0.000	73.111		100.00	0.000	0.000
					C	0.000	73.111		100.00	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1 48.00-0.00	139.20	1731.45	A	1	0.65	28	1	1	73.111	1438.82	29.98	C
			B	1	0.65		1	1	73.111			
			C	1	0.65		1	1	73.111			
Sum Weight:	139.20	1731.45						OTM	36107.14 lb-ft	1438.82		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1 48.00-0.00	139.20	1731.45	A	1	0.65	28	1	1	73.111	1438.82	29.98	C
			B	1	0.65		1	1	73.111			
			C	1	0.65		1	1	73.111			
Sum Weight:	139.20	1731.45						OTM	36107.14 lb-ft	1438.82		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1 48.00-0.00	139.20	1731.45	A	1	0.65	28	1	1	73.111	1438.82	29.98	C
			B	1	0.65		1	1	73.111			
			C	1	0.65		1	1	73.111			
Sum Weight:	139.20	1731.45						OTM	36107.14 lb-ft	1438.82		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1 48.00-0.00	139.20	3414.14	A	1	1.2	6	1	1	84.787	636.47	13.26	C
			B	1	1.2		1	1	84.787			
			C	1	1.2		1	1	84.787			
Sum Weight:	139.20	3414.14						OTM	15972.09 lb-ft	636.47		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1 48.00-0.00	139.20	3414.14	A	1	1.2	6	1	1	84.787	636.47	13.26	C
			B	1	1.2		1	1	84.787			
			C	1	1.2		1	1	84.787			
Sum Weight:	139.20	3414.14						OTM	15972.09 lb-ft	636.47		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation	Add Weight	Self Weight	Face	e	C_F	q_z psf	D_F	D_R	A_E	F	w	Ctrl. Face
ft	lb	lb							ft^2	lb	plf	
L1 48.00-0.00	139.20	3414.14	A	1	1.2	6	1	1	84.787	636.47	13.26	C
			B	1	1.2		1	1	84.787			
			C	1	1.2		1	1	84.787			
Sum Weight:	139.20	3414.14						OTM	15972.09 lb-ft	636.47		

Tower Forces - Service - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	Face	e	C_F	q_z psf	D_F	D_R	A_E	F	w	Ctrl. Face
ft	lb	lb							ft^2	lb	plf	
L1 48.00-0.00	139.20	1731.45	A	1	0.65	7	1	1	73.111	383.02	7.98	C
			B	1	0.65		1	1	73.111			
			C	1	0.65		1	1	73.111			
Sum Weight:	139.20	1731.45						OTM	9611.82 lb-ft	383.02		

Tower Forces - Service - Wind 60 To Face

Section Elevation	Add Weight	Self Weight	Face	e	C_F	q_z psf	D_F	D_R	A_E	F	w	Ctrl. Face
ft	lb	lb							ft^2	lb	plf	
L1 48.00-0.00	139.20	1731.45	A	1	0.65	7	1	1	73.111	383.02	7.98	C
			B	1	0.65		1	1	73.111			
			C	1	0.65		1	1	73.111			
Sum Weight:	139.20	1731.45						OTM	9611.82 lb-ft	383.02		

Tower Forces - Service - Wind 90 To Face

Section Elevation	Add Weight	Self Weight	Face	e	C_F	q_z psf	D_F	D_R	A_E	F	w	Ctrl. Face
ft	lb	lb							ft^2	lb	plf	
L1 48.00-0.00	139.20	1731.45	A	1	0.65	7	1	1	73.111	383.02	7.98	C
			B	1	0.65		1	1	73.111			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
Sum Weight:	139.20	1731.45	C	1	0.65		1	1 OTM	73.111 9611.82 lb-ft	383.02		

Discrete Appurtenance Pressures - No Ice $G_H = 1.100$

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
12' Shroud	0.0000	1060.00	0.00	0.00	54.00	1.112	33	24.00	24.00
p90-14-XLH-RR	0.0000	50.00	0.00	0.00	57.00	1.124	33	0.00	0.00
p90-14-XLH-RR	0.0000	50.00	0.00	0.00	57.00	1.124	33	0.00	0.00
p90-14-XLH-RR	0.0000	50.00	0.00	0.00	57.00	1.124	33	0.00	0.00
Twin BP TMA	0.0000	17.60	0.00	0.00	57.00	1.124	33	0.00	0.00
Twin BP TMA	0.0000	17.60	0.00	0.00	57.00	1.124	33	0.00	0.00
Twin BP TMA	0.0000	17.60	0.00	0.00	57.00	1.124	33	0.00	0.00
Twin LTE TMA	0.0000	6.60	0.00	0.00	51.00	1.098	32	0.00	0.00
Twin LTE TMA	0.0000	6.60	0.00	0.00	51.00	1.098	32	0.00	0.00
Twin LTE TMA	0.0000	6.60	0.00	0.00	51.00	1.098	32	0.00	0.00
P65-15-XLH-RR	0.0000	50.00	0.00	0.00	51.00	1.098	32	0.00	0.00
P65-15-XLH-RR	0.0000	50.00	0.00	0.00	51.00	1.098	32	0.00	0.00
P65-15-XLH-RR	0.0000	50.00	0.00	0.00	51.00	1.098	32	0.00	0.00
	Sum Weight:	1432.60							

Discrete Appurtenance Pressures - With Ice $G_H = 1.100$

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2	t_z in
12' Shroud	0.0000	1882.90	0.00	0.00	54.00	1.112	7	27.11	27.11	1.5757
p90-14-XLH-RR	0.0000	170.98	0.00	0.00	57.00	1.124	7	0.00	0.00	1.5843
p90-14-XLH-RR	0.0000	170.98	0.00	0.00	57.00	1.124	7	0.00	0.00	1.5843
p90-14-XLH-RR	0.0000	170.98	0.00	0.00	57.00	1.124	7	0.00	0.00	1.5843
Twin BP TMA	0.0000	28.44	0.00	0.00	57.00	1.124	7	0.00	0.00	1.5843
Twin BP TMA	0.0000	28.44	0.00	0.00	57.00	1.124	7	0.00	0.00	1.5843
Twin BP TMA	0.0000	28.44	0.00	0.00	57.00	1.124	7	0.00	0.00	1.5843
Twin LTE TMA	0.0000	19.79	0.00	0.00	51.00	1.098	7	0.00	0.00	1.5667
Twin LTE TMA	0.0000	19.79	0.00	0.00	51.00	1.098	7	0.00	0.00	1.5667
Twin LTE TMA	0.0000	19.79	0.00	0.00	51.00	1.098	7	0.00	0.00	1.5667
P65-15-XLH-RR	0.0000	169.44	0.00	0.00	51.00	1.098	7	0.00	0.00	1.5667
P65-15-XLH-RR	0.0000	169.44	0.00	0.00	51.00	1.098	7	0.00	0.00	1.5667
P65-15-XLH-RR	0.0000	169.44	0.00	0.00	51.00	1.098	7	0.00	0.00	1.5667
	Sum Weight:	3048.87								

Discrete Appurtenance Pressures - Service $G_H = 1.100$

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
12' Shroud	0.0000	1060.00	0.00	0.00	54.00	1.112	9	24.00	24.00
p90-14-XLH-RR	0.0000	50.00	0.00	0.00	57.00	1.124	9	0.00	0.00
p90-14-XLH-RR	0.0000	50.00	0.00	0.00	57.00	1.124	9	0.00	0.00
p90-14-XLH-RR	0.0000	50.00	0.00	0.00	57.00	1.124	9	0.00	0.00
Twin BP TMA	0.0000	17.60	0.00	0.00	57.00	1.124	9	0.00	0.00
Twin BP TMA	0.0000	17.60	0.00	0.00	57.00	1.124	9	0.00	0.00
Twin BP TMA	0.0000	17.60	0.00	0.00	57.00	1.124	9	0.00	0.00
Twin LTE TMA	0.0000	6.60	0.00	0.00	51.00	1.098	9	0.00	0.00
Twin LTE TMA	0.0000	6.60	0.00	0.00	51.00	1.098	9	0.00	0.00
Twin LTE TMA	0.0000	6.60	0.00	0.00	51.00	1.098	9	0.00	0.00
P65-15-XLH-RR	0.0000	50.00	0.00	0.00	51.00	1.098	9	0.00	0.00
P65-15-XLH-RR	0.0000	50.00	0.00	0.00	51.00	1.098	9	0.00	0.00
P65-15-XLH-RR	0.0000	50.00	0.00	0.00	51.00	1.098	9	0.00	0.00
	Sum Weight:	1432.60							

Force Totals

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Leg Weight	1731.45					
Bracing Weight	0.00					
Total Member Self-Weight	1731.45			0.00	0.00	
Total Weight	3353.25			0.00	0.00	
Wind 0 deg - No Ice		0.00	-3070.43	-128822.08	0.00	0.00
Wind 30 deg - No Ice		1535.22	-2659.07	-111563.19	-64411.04	0.00
Wind 60 deg - No Ice		2659.07	-1535.22	-64411.04	-111563.19	0.00
Wind 90 deg - No Ice		3070.43	0.00	0.00	-128822.08	0.00
Wind 120 deg - No Ice		2659.07	1535.22	64411.04	-111563.19	0.00
Wind 150 deg - No Ice		1535.22	2659.07	111563.19	-64411.04	0.00
Wind 180 deg - No Ice		0.00	3070.43	128822.08	0.00	0.00
Wind 210 deg - No Ice		-1535.22	2659.07	111563.19	64411.04	0.00
Wind 240 deg - No Ice		-2659.07	1535.22	64411.04	111563.19	0.00
Wind 270 deg - No Ice		-3070.43	0.00	0.00	128822.08	0.00
Wind 300 deg - No Ice		-2659.07	-1535.22	-64411.04	111563.19	0.00
Wind 330 deg - No Ice		-1535.22	-2659.07	-111563.19	64411.04	0.00
Member Ice	1682.69					
Total Weight Ice	6902.20			0.00	0.00	
Wind 0 deg - Ice		0.00	-938.00	-32854.77	0.00	0.00
Wind 30 deg - Ice		469.00	-812.33	-28453.07	-16427.39	0.00
Wind 60 deg - Ice		812.33	-469.00	-16427.39	-28453.07	0.00
Wind 90 deg - Ice		938.00	0.00	0.00	-32854.77	0.00
Wind 120 deg - Ice		812.33	469.00	16427.39	-28453.07	0.00
Wind 150 deg - Ice		469.00	812.33	28453.07	-16427.39	0.00
Wind 180 deg - Ice		0.00	938.00	32854.77	0.00	0.00
Wind 210 deg - Ice		-469.00	812.33	28453.07	16427.39	0.00
Wind 240 deg - Ice		-812.33	469.00	16427.39	28453.07	0.00
Wind 270 deg - Ice		-938.00	0.00	0.00	32854.77	0.00
Wind 300 deg - Ice		-812.33	-469.00	-16427.39	28453.07	0.00
Wind 330 deg - Ice		-469.00	-812.33	-28453.07	16427.39	0.00
Total Weight	3403.25			0.00	0.00	
Wind 0 deg - Service		0.00	-1092.91	-50826.16	0.00	0.00
Wind 30 deg - Service		546.46	-946.49	-44016.75	-25413.08	0.00
Wind 60 deg - Service		946.49	-546.46	-25413.08	-44016.75	0.00
Wind 90 deg - Service		1092.91	0.00	0.00	-50826.16	0.00
Wind 120 deg - Service		946.49	546.46	25413.08	-44016.75	0.00

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Wind 150 deg - Service		546.46	946.49	44016.75	-25413.08	0.00
Wind 180 deg - Service		0.00	1092.91	50826.16	0.00	0.00
Wind 210 deg - Service		-546.46	946.49	44016.75	25413.08	0.00
Wind 240 deg - Service		-946.49	546.46	25413.08	44016.75	0.00
Wind 270 deg - Service		-1092.91	0.00	0.00	50826.16	0.00
Wind 300 deg - Service		-946.49	-546.46	-25413.08	44016.75	0.00
Wind 330 deg - Service		-546.46	-946.49	-44016.75	25413.08	0.00

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service

Comb. No.	Description
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
L1	48 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-7572.85	0.00	0.00
			Max. Mx	8	-4009.62	-210881.35	0.00
			Max. My	2	-4009.62	0.00	210881.35
			Max. Vy	8	4924.35	-210881.35	0.00
			Max. Vx	2	-4924.35	0.00	210881.35
			Max. Torque	5			-0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	27	7572.85	0.00	938.00
	Max. H_x	21	3017.92	4912.69	0.00
	Max. H_z	3	3017.92	0.00	4912.69
	Max. M_x	2	210881.35	0.00	4912.69
	Max. M_z	8	210881.35	-4912.69	0.00
	Max. Torsion	13	0.00	-2456.35	-4254.52
	Min. Vert	7	3017.92	-4254.52	2456.35
	Min. H_x	9	3017.92	-4912.69	0.00
	Min. H_z	15	3017.92	0.00	-4912.69
	Min. M_x	14	-210881.35	0.00	-4912.69
	Min. M_z	20	-210881.35	4912.69	0.00
	Min. Torsion	5	-0.00	-2456.35	4254.52

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead Only	3353.25	0.00	0.00	0.00	0.00	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	4023.90	0.00	-4912.69	-210881.35	0.00	0.00
0.9 Dead+1.6 Wind 0 deg - No Ice	3017.92	0.00	-4912.69	-209629.63	0.00	0.00
1.2 Dead+1.6 Wind 30 deg - No Ice	4023.90	2456.35	-4254.52	-182628.67	-105440.71	0.00
0.9 Dead+1.6 Wind 30 deg - No Ice	3017.92	2456.35	-4254.52	-181544.59	-104814.82	0.00

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Ice						
1.2 Dead+1.6 Wind 60 deg - No Ice	4023.90	4254.52	-2456.35	-105440.71	-182628.67	-0.00
0.9 Dead+1.6 Wind 60 deg - No Ice	3017.92	4254.52	-2456.35	-104814.82	-181544.59	-0.00
1.2 Dead+1.6 Wind 90 deg - No Ice	4023.90	4912.69	0.00	0.00	-210881.35	0.00
0.9 Dead+1.6 Wind 90 deg - No Ice	3017.92	4912.69	0.00	0.00	-209629.63	0.00
1.2 Dead+1.6 Wind 120 deg - No Ice	4023.90	4254.52	2456.35	105440.71	-182628.67	0.00
0.9 Dead+1.6 Wind 120 deg - No Ice	3017.92	4254.52	2456.35	104814.82	-181544.59	0.00
1.2 Dead+1.6 Wind 150 deg - No Ice	4023.90	2456.35	4254.52	182628.67	-105440.71	-0.00
0.9 Dead+1.6 Wind 150 deg - No Ice	3017.92	2456.35	4254.52	181544.59	-104814.82	-0.00
1.2 Dead+1.6 Wind 180 deg - No Ice	4023.90	0.00	4912.69	210881.35	0.00	0.00
0.9 Dead+1.6 Wind 180 deg - No Ice	3017.92	0.00	4912.69	209629.63	0.00	0.00
1.2 Dead+1.6 Wind 210 deg - No Ice	4023.90	-2456.35	4254.52	182628.67	105440.71	0.00
0.9 Dead+1.6 Wind 210 deg - No Ice	3017.92	-2456.35	4254.52	181544.59	104814.82	0.00
1.2 Dead+1.6 Wind 240 deg - No Ice	4023.90	-4254.52	2456.35	105440.71	182628.67	-0.00
0.9 Dead+1.6 Wind 240 deg - No Ice	3017.92	-4254.52	2456.35	104814.82	181544.59	-0.00
1.2 Dead+1.6 Wind 270 deg - No Ice	4023.90	-4912.69	0.00	0.00	210881.35	0.00
0.9 Dead+1.6 Wind 270 deg - No Ice	3017.92	-4912.69	0.00	0.00	209629.63	0.00
1.2 Dead+1.6 Wind 300 deg - No Ice	4023.90	-4254.52	-2456.35	-105440.71	182628.67	0.00
0.9 Dead+1.6 Wind 300 deg - No Ice	3017.92	-4254.52	-2456.35	-104814.82	181544.59	0.00
1.2 Dead+1.6 Wind 330 deg - No Ice	4023.90	-2456.35	-4254.52	-182628.67	105440.71	-0.00
0.9 Dead+1.6 Wind 330 deg - No Ice	3017.92	-2456.35	-4254.52	-181544.59	104814.82	-0.00
1.2 Dead+1.0 Ice+1.0 Temp	7572.85	0.00	0.00	0.00	0.00	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	7572.85	0.00	-938.00	-34326.38	0.00	0.00
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	7572.85	469.00	-812.33	-29727.52	-17163.19	0.00
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	7572.85	812.33	-469.00	-17163.19	-29727.52	-0.00
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	7572.85	938.00	0.00	0.00	-34326.38	0.00
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	7572.85	812.33	469.00	17163.19	-29727.52	0.00
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	7572.85	469.00	812.33	29727.52	-17163.19	-0.00
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	7572.85	0.00	938.00	34326.38	0.00	0.00
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	7572.85	-469.00	812.33	29727.52	17163.19	0.00
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	7572.85	-812.33	469.00	17163.19	29727.52	-0.00
1.2 Dead+1.0 Wind 270	7572.85	-938.00	0.00	0.00	34326.38	0.00

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 300	7572.85	-812.33	-469.00	-17163.19	29727.52	0.00
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 330	7572.85	-469.00	-812.33	-29727.52	17163.19	-0.00
deg+1.0 Ice+1.0 Temp						
Dead+Wind 0 deg - Service	3353.25	0.00	-1092.91	-51864.13	0.00	0.00
Dead+Wind 30 deg - Service	3353.25	546.46	-946.49	-44915.66	-25932.07	0.00
Dead+Wind 60 deg - Service	3353.25	946.49	-546.46	-25932.07	-44915.66	-0.00
Dead+Wind 90 deg - Service	3353.25	1092.91	0.00	0.00	-51864.13	0.00
Dead+Wind 120 deg - Service	3353.25	946.49	546.46	25932.07	-44915.66	0.00
Dead+Wind 150 deg - Service	3353.25	546.46	946.49	44915.66	-25932.07	-0.00
Dead+Wind 180 deg - Service	3353.25	0.00	1092.91	51864.13	0.00	0.00
Dead+Wind 210 deg - Service	3353.25	-546.46	946.49	44915.66	25932.07	0.00
Dead+Wind 240 deg - Service	3353.25	-946.49	546.46	25932.07	44915.66	-0.00
Dead+Wind 270 deg - Service	3353.25	-1092.91	0.00	0.00	51864.13	0.00
Dead+Wind 300 deg - Service	3353.25	-946.49	-546.46	-25932.07	44915.66	0.00
Dead+Wind 330 deg - Service	3353.25	-546.46	-946.49	-44915.66	25932.07	-0.00

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
1	0.00	-3353.25	0.00	0.00	3353.25	0.00	0.000%
2	0.00	-4023.90	-4912.69	0.00	4023.90	4912.69	0.000%
3	0.00	-3017.92	-4912.69	0.00	3017.92	4912.69	0.000%
4	2456.35	-4023.90	-4254.52	-2456.35	4023.90	4254.52	0.000%
5	2456.35	-3017.92	-4254.52	-2456.35	3017.92	4254.52	0.000%
6	4254.52	-4023.90	-2456.35	-4254.52	4023.90	2456.35	0.000%
7	4254.52	-3017.92	-2456.35	-4254.52	3017.92	2456.35	0.000%
8	4912.69	-4023.90	0.00	-4912.69	4023.90	0.00	0.000%
9	4912.69	-3017.92	0.00	-4912.69	3017.92	0.00	0.000%
10	4254.52	-4023.90	2456.35	-4254.52	4023.90	-2456.35	0.000%
11	4254.52	-3017.92	2456.35	-4254.52	3017.92	-2456.35	0.000%
12	2456.35	-4023.90	4254.52	-2456.35	4023.90	-4254.52	0.000%
13	2456.35	-3017.92	4254.52	-2456.35	3017.92	-4254.52	0.000%
14	0.00	-4023.90	4912.69	0.00	4023.90	-4912.69	0.000%
15	0.00	-3017.92	4912.69	0.00	3017.92	-4912.69	0.000%
16	-2456.35	-4023.90	4254.52	2456.35	4023.90	-4254.52	0.000%
17	-2456.35	-3017.92	4254.52	2456.35	3017.92	-4254.52	0.000%
18	-4254.52	-4023.90	2456.35	4254.52	4023.90	-2456.35	0.000%
19	-4254.52	-3017.92	2456.35	4254.52	3017.92	-2456.35	0.000%
20	-4912.69	-4023.90	0.00	4912.69	4023.90	0.00	0.000%
21	-4912.69	-3017.92	0.00	4912.69	3017.92	0.00	0.000%
22	-4254.52	-4023.90	-2456.35	4254.52	4023.90	2456.35	0.000%
23	-4254.52	-3017.92	-2456.35	4254.52	3017.92	2456.35	0.000%
24	-2456.35	-4023.90	-4254.52	2456.35	4023.90	4254.52	0.000%
25	-2456.35	-3017.92	-4254.52	2456.35	3017.92	4254.52	0.000%
26	0.00	-7572.85	0.00	0.00	7572.85	0.00	0.000%
27	0.00	-7572.85	-938.00	0.00	7572.85	938.00	0.000%
28	469.00	-7572.85	-812.33	-469.00	7572.85	812.33	0.000%
29	812.33	-7572.85	-469.00	-812.33	7572.85	469.00	0.000%
30	938.00	-7572.85	0.00	-938.00	7572.85	0.00	0.000%
31	812.33	-7572.85	469.00	-812.33	7572.85	-469.00	0.000%
32	469.00	-7572.85	812.33	-469.00	7572.85	-812.33	0.000%
33	0.00	-7572.85	938.00	0.00	7572.85	-938.00	0.000%
34	-469.00	-7572.85	812.33	469.00	7572.85	-812.33	0.000%
35	-812.33	-7572.85	469.00	812.33	7572.85	-469.00	0.000%

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
36	-938.00	-7572.85	0.00	938.00	7572.85	0.00	0.000%
37	-812.33	-7572.85	-469.00	812.33	7572.85	469.00	0.000%
38	-469.00	-7572.85	-812.33	469.00	7572.85	812.33	0.000%
39	0.00	-3353.25	-1092.91	0.00	3353.25	1092.91	0.000%
40	546.46	-3353.25	-946.49	-546.46	3353.25	946.49	0.000%
41	946.49	-3353.25	-546.46	-946.49	3353.25	546.46	0.000%
42	1092.91	-3353.25	0.00	-1092.91	3353.25	0.00	0.000%
43	946.49	-3353.25	546.46	-946.49	3353.25	-546.46	0.000%
44	546.46	-3353.25	946.49	-546.46	3353.25	-946.49	0.000%
45	0.00	-3353.25	1092.91	0.00	3353.25	-1092.91	0.000%
46	-546.46	-3353.25	946.49	546.46	3353.25	-946.49	0.000%
47	-946.49	-3353.25	546.46	946.49	3353.25	-546.46	0.000%
48	-1092.91	-3353.25	0.00	1092.91	3353.25	0.00	0.000%
49	-946.49	-3353.25	-546.46	946.49	3353.25	546.46	0.000%
50	-546.46	-3353.25	-946.49	546.46	3353.25	946.49	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00000001
3	Yes	4	0.00000001	0.00000001
4	Yes	5	0.00000001	0.00000001
5	Yes	4	0.00000001	0.00066810
6	Yes	5	0.00000001	0.00000001
7	Yes	4	0.00000001	0.00066810
8	Yes	4	0.00000001	0.00000001
9	Yes	4	0.00000001	0.00000001
10	Yes	5	0.00000001	0.00000001
11	Yes	4	0.00000001	0.00066810
12	Yes	5	0.00000001	0.00000001
13	Yes	4	0.00000001	0.00066810
14	Yes	4	0.00000001	0.00000001
15	Yes	4	0.00000001	0.00000001
16	Yes	5	0.00000001	0.00000001
17	Yes	4	0.00000001	0.00066810
18	Yes	5	0.00000001	0.00000001
19	Yes	4	0.00000001	0.00066810
20	Yes	4	0.00000001	0.00000001
21	Yes	4	0.00000001	0.00000001
22	Yes	5	0.00000001	0.00000001
23	Yes	4	0.00000001	0.00066810
24	Yes	5	0.00000001	0.00000001
25	Yes	4	0.00000001	0.00066810
26	Yes	4	0.00000001	0.00000001
27	Yes	4	0.00000001	0.00015626
28	Yes	4	0.00000001	0.00016768
29	Yes	4	0.00000001	0.00016768
30	Yes	4	0.00000001	0.00015626
31	Yes	4	0.00000001	0.00016768
32	Yes	4	0.00000001	0.00016768
33	Yes	4	0.00000001	0.00015626
34	Yes	4	0.00000001	0.00016768
35	Yes	4	0.00000001	0.00016768
36	Yes	4	0.00000001	0.00015626

37	Yes	4	0.00000001	0.00016768
38	Yes	4	0.00000001	0.00016768
39	Yes	4	0.00000001	0.00000001
40	Yes	4	0.00000001	0.00000001
41	Yes	4	0.00000001	0.00000001
42	Yes	4	0.00000001	0.00000001
43	Yes	4	0.00000001	0.00000001
44	Yes	4	0.00000001	0.00000001
45	Yes	4	0.00000001	0.00000001
46	Yes	4	0.00000001	0.00000001
47	Yes	4	0.00000001	0.00000001
48	Yes	4	0.00000001	0.00000001
49	Yes	4	0.00000001	0.00000001
50	Yes	4	0.00000001	0.00000001

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	48 - 0	5.740	42	0.9015	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
60.00	12' x 18' Polyester FLAG	42	5.740	0.9015	0.0000	Inf
57.00	p90-14-XLH-RR	42	5.740	0.9015	0.0000	Inf
54.00	12' Shroud	42	5.740	0.9015	0.0000	Inf
51.00	Twin LTE TMA	42	5.740	0.9015	0.0000	Inf

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	48 - 0	22.536	8	3.4739	0.0000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
60.00	12' x 18' Polyester FLAG	8	22.536	3.4739	0.0000	Inf
57.00	p90-14-XLH-RR	8	22.536	3.4739	0.0000	Inf
54.00	12' Shroud	8	22.536	3.4739	0.0000	Inf

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
51.00	Twin LTE TMA	8	22.536	3.4739	0.0000	Inf

Base Plate Design Data

Plate Thickness	Number of Anchor Bolts	Anchor Bolt Size	Actual Allowable Ratio Bolt Tension	Actual Allowable Ratio Concrete Stress	Actual Allowable Ratio Plate Stress	Actual Allowable Ratio Stiffener Stress	Controlling Condition	Critical Ratio
in		in	lb	ksi	ksi	ksi		
1.7500	4	2.2500	85847.00	1.850	23.794		Plate	0.48
			223654.40	4.080	49.500			✓
			0.38	0.45	0.48			

Compression Checks

Pole Design Data

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	lb	lb	
L1	48 - 0 (1)	TP18x18x0.1875	48.00	48.00	91.1	10.6007	-4009.62	357909.00	0.011

Pole Bending Design Data

Section No.	Elevation	Size	M_{ux}	ϕM_{nx}	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy}	ϕM_{ny}	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	ft		lb-ft	lb-ft		lb-ft	lb-ft	
L1	48 - 0 (1)	TP18x18x0.1875	210881.67	287715.00	0.733	0.00	287715.00	0.000

Pole Shear Design Data

Section No.	Elevation	Size	Actual V_u	ϕV_n	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u	ϕT_n	Ratio $\frac{T_u}{\phi T_n}$
	ft		lb	lb		lb-ft	lb-ft	
L1	48 - 0 (1)	TP18x18x0.1875	4924.35	393788.00	0.013	0.00	576133.33	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	48 - 0 (1)	0.011	0.733	0.000	0.013	0.000	0.744 ✓	1.000	4.8.2 ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
L1	48 - 0	Pole	TP18x18x0.1875	1	-4009.62	357909.00	74.4	Pass
							Summary	
						Pole (L1)	74.4	Pass
						Base Plate	48.1	Pass
						RATING =	74.4	**Pass**