



Crown Castle
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065

January 3, 2017

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

RE: Notice of Exempt Modification for AT&T/ LTE 3C Crown Site BU: 841793
AT&T Site ID: CT1137
50 Pine Lane, Windsor, CT 06095
Latitude: 41° 49' 11.1" / Longitude: -72° 40' 1.1"

Dear Ms. Bachman:

AT&T currently maintains nine (9) antennas at the 130-foot level of the existing 150-foot monopole at 50 Pine Lane in Windsor, CT. The tower is owned by Crown Castle. The property is owned by the Town of Windsor. AT&T now intends to replace three (3) RRU11/A2s with three (3) RRU32/B2s. AT&T also intends to install six (6) triplexers.

This facility was approved by the Windsor Town Planning and Zoning Commission in Special Use Application #547 on November 30, 2000. This approval included waivers regarding tower height and no conditional statements.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.S.C.A. § 16-50j-73, a copy of this letter is being sent to The Honorable Donald S. Trinks, Mayor for the Town of Windsor, as well as the property owner, and Crown Castle is the tower owner.

1. The proposed modifications will not result in an increase in the height of the existing tower.
2. The proposed modifications will not require the extension of the site boundary.
3. The proposed modification will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.

Melanie A. Bachman

January 3, 2017

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5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, AT&T respectfully submits that the proposed modifications to the above-reference telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Please send approval/rejection letter to Attn: Jeffrey Barbadora.

Sincerely,

Jeffrey Barbadora
Real Estate Specialist
12 Gill Street, Suite 5800, Woburn, MA 01801
781-729-0053
Jeff.Barbadora@crowncastle.com

Attachments:

Tab 1: Exhibit-1: Compound plan and elevation depicting the planned changes

Tab 2: Exhibit-2: Structural Modification Report

Tab 3: Exhibit-3: General Power Density Table Report (RF Emissions Analysis Report)

cc: The Honorable Donald S. Trinks, Mayor, Town of Windsor
Town of Windsor
275 Broad Street
Windsor, CT 06095

Town of Windsor
275 Broad St.
Attn: Accounts Receivable
Windsor, CT 06095



RECEIVED

SEP 08 2000

TOWN OF WINDSOR
PLANNING DEPT.

SU#547

A.M.
T+ZC
10-10-00

Application for a
Special Use

Town Planning and Zoning Commission

Your Name Town of Windsor Your Phone # 860-285-1877
AT&T Wireless PCS, LLC 203-831-4011

Your Address 275 Broad Street, Windsor, Connecticut 06095
149 Water Street, Norwalk, Connecticut 06854

Are You the..... (X) Owner () Optionee () Buyer () Agent (X) Other
If Other please explain Lessee

Owner's Name (If other than applicant) Town of Windsor Owner's Phone # 860-285-1877

Owner's Address 275 Broad Street, Windsor, Connecticut 06095

Address of Subject Parcel(s) 50 Pine Lane

Size of Subject Parcel(s) 258,311 Sq. Ft. Zone of Subject Parcel(s) NZ

Please describe the Special Use Wilson Firehouse Municipal Tower Facility/Wireless Facility Co-location

Applicable Section(s) of Zoning Regulations 12.2 & 2.2.19E(1)

Please describe how the Special Use will benefit the Town of Windsor (feel free to use the other side).
Additional material to be supplied.

Your Signature Christopher B. Fisher
Attorney for the Applicant

September 5, 2000
Date

Owner's Signature J. M. Mahon

9/6/00
Date

Office Use Only *****
Fee Paid _____ Application# _____ Application Received By _____

Date of Action _____ Approved _____ Disapproved _____

I, Anita M. Mips, Chairperson of the Windsor Town Planning and Zoning Commission, hereby certify that on October 10, 2000 the Planning and Zoning Commission of the Town of Windsor granted approval of Special Use Application #547 for a Wireless Telecommunications Tower with a monopole height of 150 feet plus 13-foot Town public service whip antennas for a total height of 163 feet, under Zoning Regulations Sections 12.2 & 2.2.19E(1).

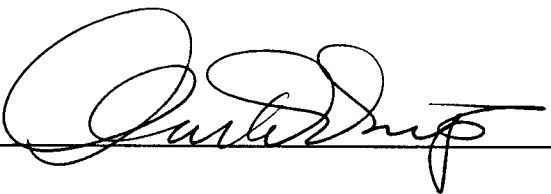
This approval also includes the following waivers in accordance with Zoning Regulations Section 12.1:

- 1) a waiver of the fall zone distance requirement for 73 feet in relation to the distance of the tower from the easterly property line, 163 feet being required and 90 feet being proposed;
- 2) a waiver of the fall zone distance requirement for 236 feet in relation to the distance of the tower from I-91 to the east, 326 feet being required and 90 feet being proposed;
- 3) a waiver of the fall zone distance requirement for 245 feet in relation to the distance of the tower from the residential zone to the north, 576 feet being required and 331 feet being proposed; and
- 4) a waiver of the fall zone requirement for 52 feet in relation to the distance of the tower from Putnam Memorial Highway to the south, 326 feet being required and 274 feet being proposed.

Said Special Use was granted for the property located at: 50 Pine Lane

The owner of record of said parcel is: Town of Windsor

Dated at Windsor, Connecticut, this 30th day of November, 2000

 Chairperson

Public Act #75-317

Received for Record this _____ day of _____, 2000

_____ Attest: Town Clerk

BUILDING PERMIT APPLICATION

Town Hall • Windsor, CT 06095-2994

PERMIT #: B-041172

ADDRESS OF WORK LOCATION: 50 PINE LANE WINDSOR, CT

TYPE OF PERMIT (Check One)

BUILDING (List size or sq. ft.)

Foundation 12' x 20'

Addition NA

Acc. Structure 12' x 20'

Deck NA

Roofing/Siding (# Squares) NA

Pool: Aboveground: NA Inground: NA

Other NA

ELECTRICAL

S. Change

New Residential

New Commercial

Addition

Pool Wiring

Temporary Service

Low Voltage

Other

PLUMBING

New Residential

New Commercial

Addition

Fire Suppression

Water Heater

Other

HVAC

New Residential

New Commercial

Addition

Central Air

Replace/Repair

Other

New Residential (Total Gross Square Feet) NA

Residential Renovation NA

New Commercial (Total Gross Square Feet) 240 SQ FT

Commercial Renovation (Square Feet of Renovated Space) NA

Signs (size & type) NA

DESCRIPTION OF WORK (must fill out for all permits):

Addition of Cingular Wireless antennas and pre-tab concrete equipment shelter to existing ATT Wireless monopole and compound.

Retail Market Value \$ 40,500

Fee: 550

Work Start Date: 5-24-04

Owner: ATT WIRELESS (land), of Windsor (land)

Applicant: CINGULAR WIRELESS (TIM BURKS)

Address: (ATT) 15 East Midland Ave

Address: 500 Enterprise Drive Suite 3A

5th Floor PARAMUS, NJ Zip 07652

ROCKY HILL, CT Zip 06067

Phone # (Days): 201-576-2416

Phone # (Days): 860 513 7218

License #: MCO 90157 Type: MAJOR COMMERCIAL Exp.: 6-30-04

CFM CONSTRUCTION ✓ OK

I understand that applying for this permit does not guarantee that it will be issued, and no work shall be done prior to the issuance of said permit or the approval of the **Building Official**. I agree to be in compliance with all applicable codes, standards, statutes, and ordinances which may pertain.

Applicant's Signature: Timothy M. Burks

Print Name: TIMOTHY M. BURKS

Date: 5/12/04

STAFF MEMBER Check Pertinent Items and initial:

Zoning OK TP+2

Taxes Exempt/OK

Worker's Comp. OK - CFM

Wetlands OK - 6/18/04

Other: Septic

Sewer Letter of Authorization

✓ T.O.W.

Use Group: S-1

Construction Type: 2-C

Fee: Check Cash

Transaction/Receipt #: 1172

Blanket Not Electrical

Special Conditions or Comments: All Work Per '99 CT State Bldg Code Regmts Incl. Section 114 Threshold Structures & Section 1705 Spec Insp. All Elec/Mech Work Reg's Seper. Permits. Call For Inspections Noted - Allow 48HR Notice. Completion Letters + Documentation Req'd. for C/O PRIOR TO USE. This Is Cingular Co Locate.

Reviewed & Issued By: Stephen Dupre

PBO

Date: June 17, 2004

Copy to FMD ✓

Property Cards

Address Search : [Clear Search](#)

Your search returned multiple addresses

Additional addresses:

[50 PINE LN](#)

50 Pine Ln

Property Owner:

Windsor Town Of

Property Co-Owner

C/O At&T Mobility

Mailing Address:

575 Morosgo Dr Suite 13-F
Atlanta, GA
30324

File Code

735.01

Map:

69

Block:

442

Lot:

102

Census Tract:

4731.00

Property Type:

Cell Tower

Land Area (Acres):

0.05

Zone:

NZ



Construction Details

Year Built:

0

Building Style:

Stories:

Living Area:

0 Sq/Ft

Building ID

100452

Grade

Exterior Wall

Total Rooms:

Bedrooms:

Bathrooms:

Half Baths:

Heating Type

Heating Fuel

AC Type

Valuation

Assessed Land Value:
\$114,800

Assessed Building Value:
\$169,610

Total Assessed Value:
\$284,410

Appraised Land Value:
\$164,000

Appraised Building Value:
\$242,300

Total Appraised Value:
\$406,300

Last Sale

Last Sale Date:
Monday, May 17th, 1993

Last Sale Price:
\$0

Qualified Sale:
U

Book/Page:
941/ 16

Prior Owners

Sale Date	Owner Name	Sale Price	Book / Page

Parcel Sketch

Sub Area Detail

Code	Gross Area (Sq Ft)	Living Area (Sq Ft)
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Outbuildings & Extra Features

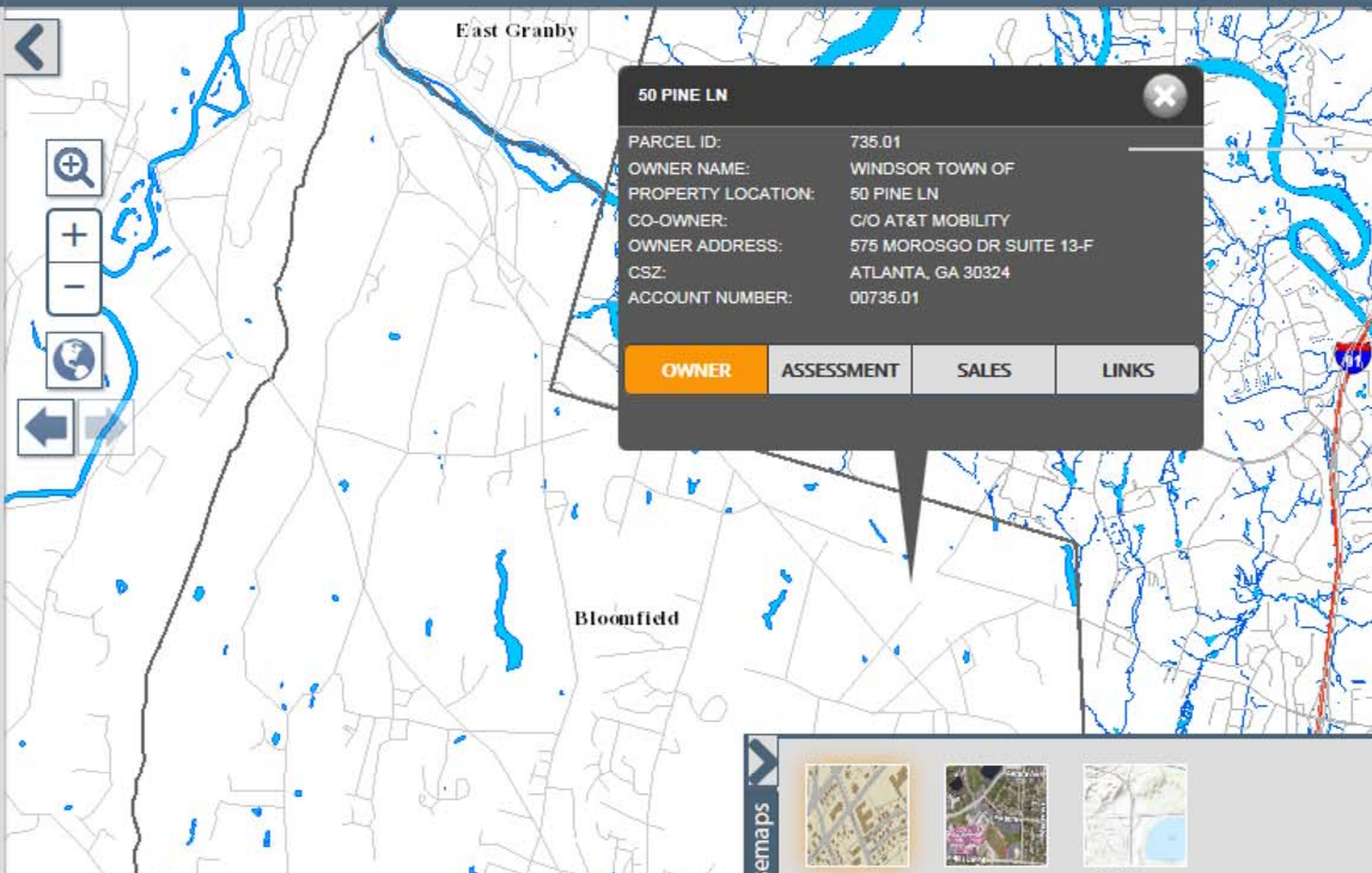
Code	Description	Appraised Value	Assessed Value
CB3	PerCastConCel	\$119700.00	\$83790.00
CB3	PerCastConCel	\$84000.00	\$58800.00

AOF Office Area	APT Apartment	BAS First Floor
CAN Canopy	CDN Canopy (Det)	CLP Loading Platform (Finished)
EAF Attic (Expan)(Finished)	EAU Attic (Expan)(Unfinished)	FAT Attic (Finished)
FBM Basement (Finished)	FCB Cabana (Encl)(Finished)	FCP Carport (Framed)
FDC Carport (Det)(Framed)	FDS Porch (Scrn)(Det)(Finished)	FDU Utility (Det)(Finished)
FEP Porch (Encl)(Finished)	FGR Garage (Framed)	FHS Half-Story (Finished)
FLL Lower Level (Finished)	FOP Porch (Open)(Finished)	FSP Porch (Screen)(Finished)
FST Utility (Finished)	FUS Upper-Story (Finished)	PTO Patio
SDA Store Display Area	SFB Base (Semi-Finished)	SPA Service Prod Area
TQS Three-Qtr Story	UAT Attic (Unfinished)	UBM Basement (Unfinished)
UCB Cabana (Encl)(Unfinished)	UDS Porch (Scrn)(Dedt)(Unfinished)	UDU Utility (Det)(Unfinished)
UEP Porch (Encl)(Unfinished)	UHS Half-Story (Unfinished)	ULP Loading Platform (Unfinished)
UOP Porch (Open)(Unfinished)	USP Porch (Scrn)(Unfinished)	UST Utility (Strg)(Unfinished)
UUS Upper-Story (Unfinished)	WDK Wood Deck	



[*Advanced Search >>](#)

- Selection Results
- ts [Export](#)
- Owner ▲
- WINDSOR TOWN OF**
 - RIBEIRO HENRIQUE N
 - CARVALHO ALVARO J & MARIA L JT
 - VIEIRA JULIO &
 - GREENE HENRY J
 - CENNAMO JOSEPH N &
 - LYN SHAU H &
 - PORRI ROBERT F & JANICE L JS
 - MILLER JOHN T &
 - TOWN LINE MARINE LLC
 - CORBETT PATRICIA A
 - CANALES JOSE ANTHONY



50 PINE LN

PARCEL ID:	735.01
OWNER NAME:	WINDSOR TOWN OF
PROPERTY LOCATION:	50 PINE LN
CO-OWNER:	C/O AT&T MOBILITY
OWNER ADDRESS:	575 MOROSGO DR SUITE 13-F
CSZ:	ATLANTA, GA 30324
ACCOUNT NUMBER:	00735.01

OWNER ASSESSMENT SALES LINKS



Basemaps ▼

- Base Map
- Imagery
- ESRI Topo



WIRELESS COMMUNICATIONS FACILITY

CT1137 - LTE BWE

WINDSOR PINE LANE

CROWN CASTLE SITE NO.: 841793

50 PINE LANE

WINDSOR, CT 06095

GENERAL NOTES

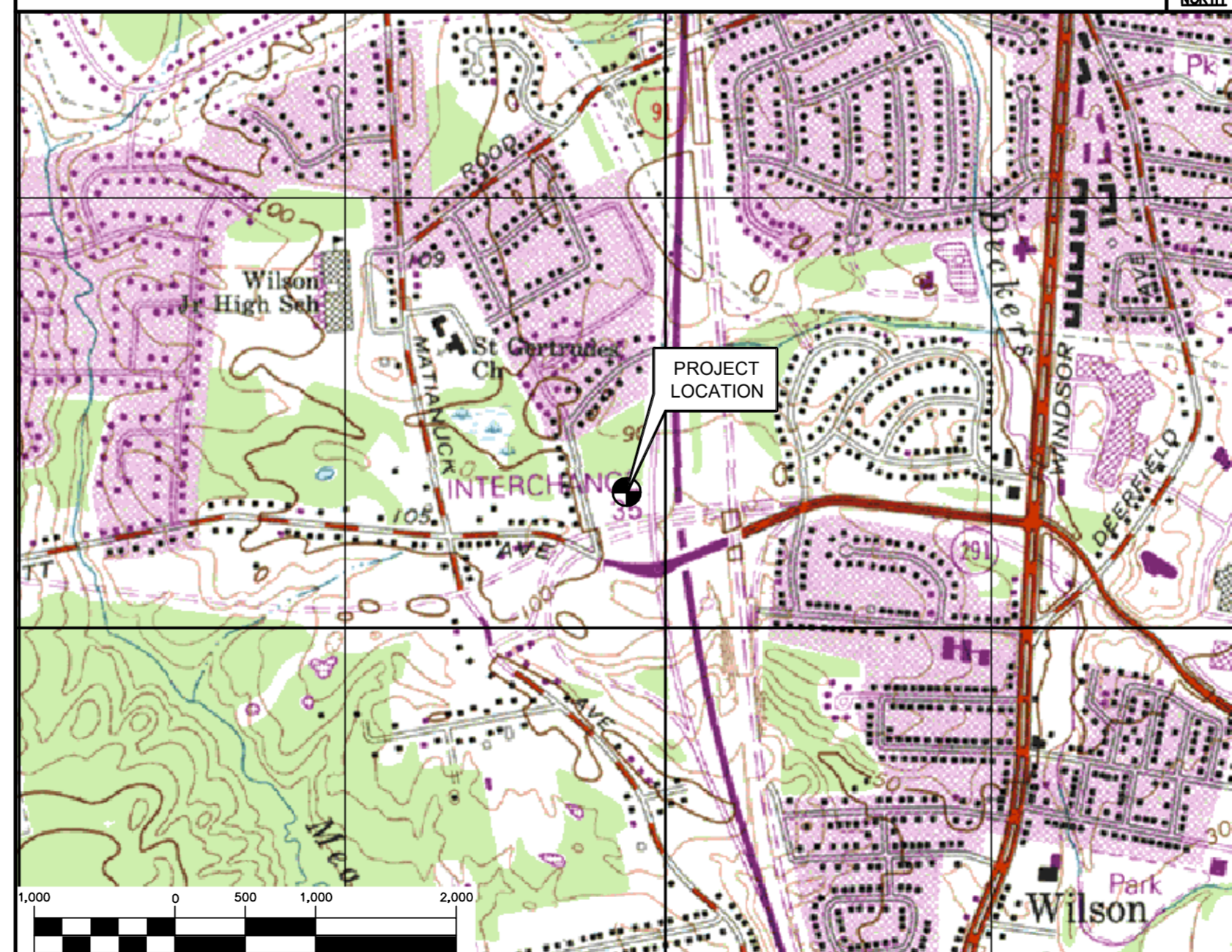
1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2012 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2016 CONNECTICUT STATE BUILDING CODE, INCLUDING THE TIA-222 REVISION "G" STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES, 2016 CONNECTICUT FIRE SAFETY CODE AND, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. THE COMPOUND, TOWER, PRIMARY GROUND RING, ELECTRICAL SERVICE TO THE METER BANK AND TELEPHONE SERVICE TO THE DEMARCATION POINT ARE PROVIDED BY SITE OWNER. AS BUILT FIELD CONDITIONS REGARDING THESE ITEMS SHALL BE CONFIRMED BY THE CONTRACTOR. SHOULD ANY FIELD CONDITIONS PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL NOT PROCEED WITH ANY AFFECTED WORK.
3. CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
4. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
5. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
6. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION, PLUMBING, ELECTRICAL AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
7. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN "AS-BUILT" SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
8. LOCATION OF EQUIPMENT, AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
9. 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 BUILDING'S/PROPERTY'S OPERATIONS, COORDINATE WORK WITH BUILDING/PROPERTY OWNER.
10. 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.
11. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
12. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MFR.'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
13. ANY AND ALL ERRORS, DISCREPANCIES, AND "MISSED" ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE AT&T CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO "EXTRA" WILL BE ALLOWED FOR MISSED ITEMS.
14. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
15. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
16. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
17. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUIT AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
18. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUB-CONTRACTORS FOR ANY CONDITION PER THE MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
19. 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.
20. THE CONTRACTOR SHALL CONTACT "CALL BEFORE YOU DIG" AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1-800-922-4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED PRIOR TO ANY EXCAVATION WORK. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
21. CONTRACTOR SHALL COMPLY WITH OWNERS ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.

SITE DIRECTIONS

FROM:	TO:
500 ENTERPRISE DRIVE ROCKY HILL, CONNECTICUT	50 PINE LANE WINDSOR, CONNECTICUT
1. HEAD NORTHEAST ON ENTERPRISE DR TOWARD CAPITAL BLVD	0.31 MI
2. TURN LEFT ONTO CAPITAL BLVD	0.27 MI
3. TURN LEFT ONTO WEST ST	0.16 MI
4. TURN LEFT TO MERGE ONTO I-91 1 TOWARD HARTFORD	12.62 MI
5. TAKE EXIT 35B TOWARD WINDSOR/BLOOMFIELD	0.60 MI
6. TURN LEFT ONTO CT-218	0.19 MI
7. TURN RIGHT ONTO PINE LANE	0.06 MI

VICINITY MAP

SCALE: 1" = 1000'



PROJECT SUMMARY

1. THE PROPOSED SCOPE OF WORK CONSISTS OF A MODIFICATION TO THE EXISTING UNMANNED TELECOMMUNICATIONS FACILITY INCLUDING THE FOLLOWING:
 - A. REMOVE AND REPLACE (3) EXISTING RRUS-11+A2'S FOR (3) NEW RRUS-32 B2'S.

PROJECT INFORMATION

AT&T SITE NUMBER:	CT1137
AT&T SITE NAME:	WINDSOR PINE LANE
SITE ADDRESS:	CROWN CASTLE SITE NO.: 841793 50 PINE LANE WINDSOR, CT 06095
LESSEE/APPLICANT:	AT&T MOBILITY 500 ENTERPRISE DRIVE, SUITE 3A ROCKY HILL, CT 06067
ENGINEER:	CENTEK ENGINEERING, INC. 63-2 NORTH BRANFORD RD. BRANFORD, CT 06405
PROJECT COORDINATES:	LATITUDE: 41°-49'-11.381" N LONGITUDE: 72°-40'-01.877" W GROUND ELEVATION: ±104' AMSL SITE COORDINATES REFERENCED FROM AT&T RFDS. GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

SHEET INDEX

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C-1	PLANS AND ELEVATION	0
C-2	LTE BWE EQUIPMENT DETAILS	0
E-1	TYPICAL ELECTRICAL DETAILS AND NOTES	0

PROFESSIONAL ENGINEER SEAL



CENTEK engineering
Centered on Solutions™
(203) 488-0360
(203) 488-8387 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

AT&T MOBILITY
WIRELESS COMMUNICATIONS FACILITY
WINDSOR PINE LANE
CT1137 - LTE BWE
50 PINE LANE
WINDSOR, CT 06095

DATE: 11/07/16
SCALE: AS NOTED
JOB NO. 16071.57

TITLE SHEET

T-1
Sheet No. 1 of 5

REV. DATE DRAWN BY CHK'D BY CAG
0 11/30/16 KAWUR
CONSTRUCTION DOCUMENTS - ISSUED FOR CONSTRUCTION

NOTES AND SPECIFICATIONS

DESIGN BASIS:

GOVERNING CODE: 2012 INTERNATIONAL BUILDING (IBC) AS MODIFIED BY THE 2016 CT STATE BUILDING CODE AND AMENDMENTS.

- DESIGN CRITERIA:
 - WIND LOAD: PER EIA/TIA 222 G-05 (ANTENNA MOUNTS): 90-105 MPH (3 SECOND GUST)
 - RISK CATEGORY: II (BASED ON IBC TABLE 1604.5)
 - BASIC WIND SPEED (OTHER STRUCTURE): 97 MPH (NOMINAL DESIGN WIND SPEED) (EXPOSURE B/IMPORTANCE FACTOR 1.0 BASED ON ASCE 7-10) PER 2012 INTERNATIONAL BUILDING CODE (IBC) AS MODIFIED BY THE 2016 CONNECTICUT SUPPLEMENT AND AMENDMENTS.
 - SEISMIC LOAD (DOES NOT CONTROL): PER ASCE 7-10 MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES.

GENERAL NOTES:

- ALL CONSTRUCTION SHALL BE IN COMPLIANCE WITH THE GOVERNING BUILDING CODE.
- 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.
- 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.
- DIMENSIONS AND DETAILS SHALL BE CHECKED AGAINST EXISTING FIELD CONDITIONS.
- THE CONTRACTOR SHALL VERIFY AND COORDINATE THE SIZE AND LOCATION OF ALL OPENINGS, SLEEVES AND ANCHOR BOLTS AS REQUIRED BY ALL TRADES.
- 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.
- 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.
- THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE SAFETY CODES AND REGULATIONS DURING ALL PHASES OF CONSTRUCTION. 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.
- 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
- 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.
- 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.
- 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.
- NO DRILLING WELDING OR TAPING ON CL&P OWNED EQUIPMENT.
- REFER TO DRAWING T1 FOR ADDITIONAL NOTES AND REQUIREMENTS.

STRUCTURAL STEEL

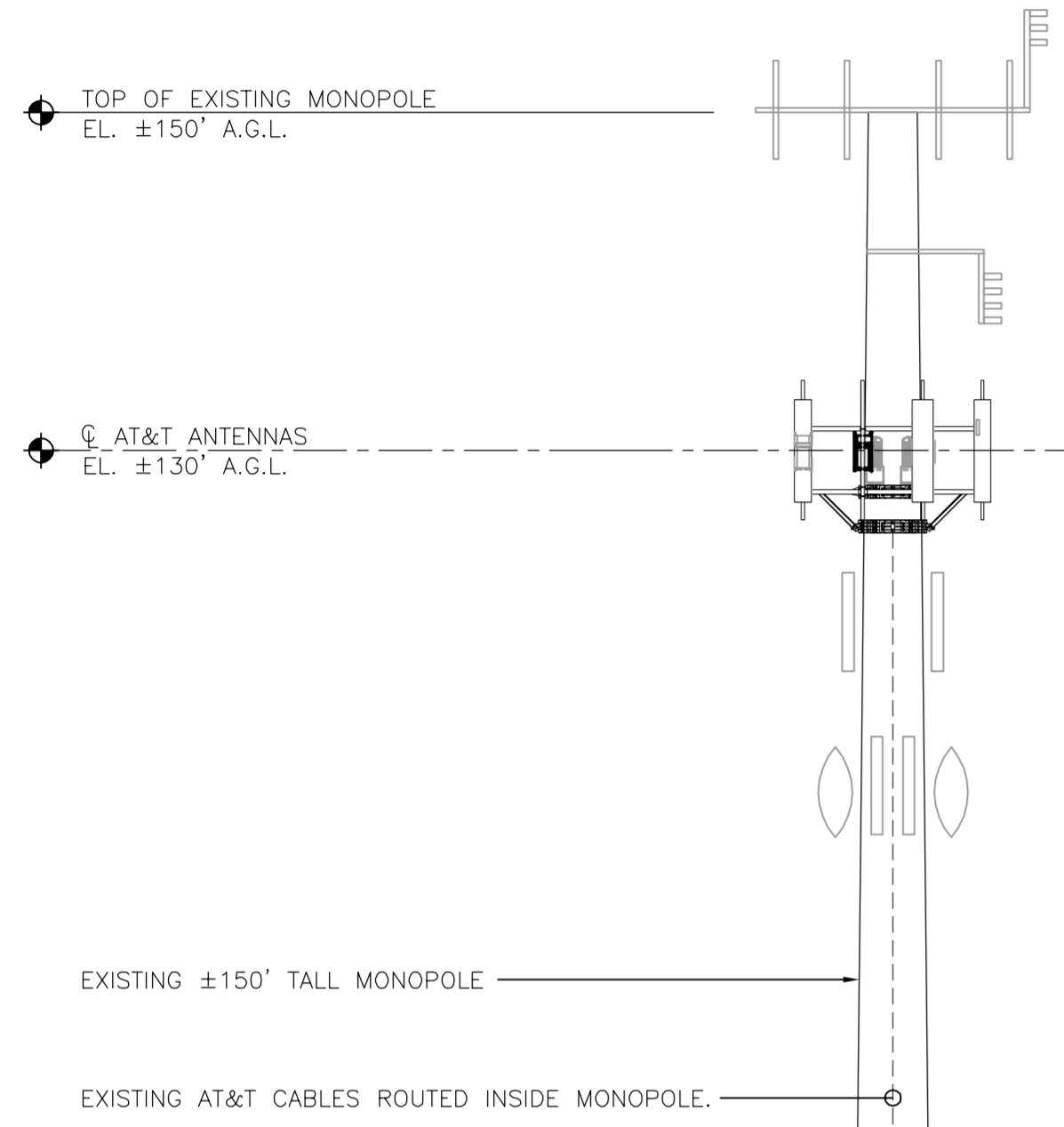
- ALL STRUCTURAL STEEL IS DESIGNED BY ALLOWABLE STRESS DESIGN (ASD)
 - STRUCTURAL STEEL (W SHAPES)---ASTM A992 (FY = 50 KSI)
 - STRUCTURAL STEEL (OTHER SHAPES)---ASTM A36 (FY = 36 KSI)
 - STRUCTURAL HSS (RECTANGULAR SHAPES)---ASTM A500 GRADE B, (FY = 46 KSI)
 - STRUCTURAL HSS (ROUND SHAPES)---ASTM A500 GRADE B, (FY = 42 KSI)
 - PIPE---ASTM A53 (FY = 35 KSI)
 - CONNECTION BOLTS---ASTM A325-N
 - U-BOLTS---ASTM A36
 - ANCHOR RODS---ASTM F 1554
 - WELDING ELECTRODE---ASTM E 70XX
- 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.
- STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AISC MANUAL OF STEEL CONSTRUCTION.
- PROVIDE ALL PLATES, CLIP ANGLES, CLOSURE PIECES, STRAP ANCHORS, MISCELLANEOUS PIECES AND HOLES REQUIRED TO COMPLETE THE STRUCTURE.
- FIT AND SHOP ASSEMBLE FABRICATIONS IN THE LARGEST PRACTICAL SECTIONS FOR DELIVERY TO SITE.
- INSTALL FABRICATIONS PLUMB AND LEVEL, ACCURATELY FITTED, AND FREE FROM DISTORTIONS OR DEFECTS.
- AFTER ERECTION OF STRUCTURES, TOUCHUP ALL WELDS, ABRASIONS AND NON-GALVANIZED SURFACES WITH A 95% ORGANIC ZINC RICH PAINT IN ACCORDANCE WITH ASTM 780.
- 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.
- ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE".
- THE ENGINEER SHALL BE NOTIFIED OF ANY INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON CONFORMING MATERIALS OR CONDITIONS TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER REVIEW.
- CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES.
- 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.
- LOCK WASHER ARE NOT PERMITTED FOR A325 STEEL ASSEMBLIES.
- SHOP CONNECTIONS SHALL BE WELDED OR HIGH STRENGTH BOLTED.
- MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.
- FABRICATE BEAMS WITH MILL CAMBER UP.
- 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.
- COMMENCEMENT OF STRUCTURAL STEEL WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.
- INSPECTION AND TESTING OF ALL WELDING AND HIGH STRENGTH BOLTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY.
- FOUR COPIES OF ALL INSPECTION TEST REPORTS SHALL BE SUBMITTED TO THE ENGINEER WITHIN TEN (10) WORKING DAYS OF THE DATE OF INSPECTION.

PAINT NOTES

PAINTING SCHEDULE:

- ANTENNA PANELS:**
 - SHERWIN WILLIAMS POLANE-B
 - COLOR TO BE MATCHED WITH EXISTING TOWER STRUCTURE.
 - COAXIAL CABLES:**
 - ONE COAT OF DTM BONDING PRIMER (2-5 MILS. DRY FINISH)
 - TWO COATS OF DTM ACRYLIC PRIMER/FINISH (2.5-5 MILS. DRY FINISH)
 - COLOR TO BE FIELD MATCHED WITH EXISTING STRUCTURE.
- EXAMINATION AND PREPARATION:**
- DO NOT APPLY PAINT IN SNOW, RAIN, FOG OR MIST OR WHEN RELATIVE HUMIDITY EXCEEDS 85%. DO NOT APPLY PAINT TO DAMP OR WET SURFACES.
 - VERIFY THAT SUBSTRATE CONDITIONS ARE READY TO RECEIVE WORK. EXAMINE SURFACE SCHEDULED TO BE FINISHED PRIOR TO COMMENCEMENT OF WORK. REPORT ANY CONDITION THAT MAY POTENTIALLY AFFECT PROPER APPLICATION.
 - TEST SHOP APPLIED PRIMER FOR COMPATIBILITY WITH SUBSEQUENT COVER MATERIALS.
 - PERFORM PREPARATION AND CLEANING PROCEDURE IN STRICT ACCORDANCE WITH COATING MANUFACTURER'S INSTRUCTIONS FOR EACH SUBSTRATE CONDITION.
 - CORRECT DEFECTS AND CLEAN SURFACES WHICH AFFECT WORK OF THIS SECTION. REMOVE EXISTING COATINGS THAT EXHIBIT LOOSE SURFACE DEFECTS.
 - IMPERVIOUS SURFACE: REMOVE MILDEW BY SCRUBBING WITH SOLUTION OF TRI-SODIUM PHOSPHATE AND BLEACH. RINSE WITH CLEAN WATER AND ALLOW SURFACE TO DRY.
 - ALUMINUM SURFACE SCHEDULED FOR PAINT FINISH: REMOVE SURFACE CONTAMINATION BY STEAM OR HIGH-PRESSURE WATER. REMOVE OXIDATION WITH ACID ETCH AND SOLVENT WASHING. APPLY ETCHING PRIMER IMMEDIATELY FOLLOWING CLEANING.
 - FERROUS METALS: CLEAN UNGALVANIZED FERROUS METAL SURFACES THAT HAVE NOT BEEN SHOP COATED; REMOVE OIL, GREASE, DIRT, LOOSE MILL SCALE, AND OTHER FOREIGN SUBSTANCES. USE SOLVENT OR MECHANICAL CLEANING METHODS THAT COMPLY WITH THE STEEL STRUCTURES PAINTING COUNCIL'S (SSPC) RECOMMENDATIONS. TOUCH UP BARE AREAS AND SHOP APPLIED PRIME COATS THAT HAVE BEEN DAMAGED. WIRE BRUSH, CLEAN WITH SOLVENTS RECOMMENDED BY PAINT MANUFACTURER, AND TOUCH UP WITH THE SAME PRIMER AS THE SHOP COAT.
 - GALVANIZED SURFACES: CLEAN GALVANIZED SURFACES WITH NON-PETROLEUM-BASED SOLVENTS SO SURFACE IS FREE OF OIL AND SURFACE CONTAMINANTS. REMOVE PRETREATMENT FROM GALVANIZED SHEET METAL FABRICATED FROM COIL STOCK BY MECHANICAL METHODS.
 - ANTENNA PANELS: REMOVE ALL OIL, DUST, GREASE, DIRT, AND OTHER FOREIGN MATERIAL TO ENSURE ADEQUATE ADHESION. PANELS MUST BE WIPED WITH METHYL ETHYL KETONE (MEK).
 - COAXIAL CABLES: REMOVE ALL OIL, DUST, GREASE, DIRT, AND OTHER FOREIGN MATERIAL TO ENSURE ADEQUATE ADHESION.
- CLEANING:**
- COLLECT WASTE MATERIAL, WHICH MAY CONSTITUTE A FIRE HAZARD, PLACE IN CLOSED METAL CONTAINERS AND REMOVE DAILY FROM SITE.
- APPLICATION:**
- APPLY PRODUCTS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
 - DO NOT APPLY FINISHES TO SURFACES THAT ARE NOT DRY.
 - APPLY EACH COAT TO UNIFORM FINISH.
 - APPLY EACH COAT OF PAINT SLIGHTLY DARKER THAN PRECEDING COAT UNLESS OTHERWISE APPROVED.
 - SAND METAL LIGHTLY BETWEEN COATS TO ACHIEVE REQUIRED FINISH.
 - VACUUM CLEAN SURFACES FREE OF LOOSE PARTICLES. USE TACK CLOTH JUST PRIOR TO APPLYING NEXT COAT.
 - ALLOW APPLIED COAT TO DRY BEFORE NEXT COAT IS APPLIED.
- COMPLETED WORK:**
- SAMPLES: PREPARE 24" X 24" SAMPLE AREA FOR REVIEW.
 - MATCH APPROVED SAMPLES FOR COLOR, TEXTURE AND COVERAGE. REMOVE REFINISH OR REPAINT WORK NOT IN COMPLIANCE WITH SPECIFIED REQUIREMENTS.

PROFESSIONAL ENGINEER SEAL					AT&T MOBILITY WIRELESS COMMUNICATIONS FACILITY WINDSOR PINE LANE CT1137 - LTE BWE 50 PINE LANE WINDSOR, CT 06095	CONSTRUCTION DOCUMENTS - ISSUED FOR CONSTRUCTION CAG DRAWN BY/CHK'D BY KAWUR DATE 11/30/16 REV.
DATE: 11/07/16		SCALE: AS NOTED		JOB NO. 16071.57		
NOTES AND SPECIFICATIONS						
N-1						
Sheet No. 2 of 5						

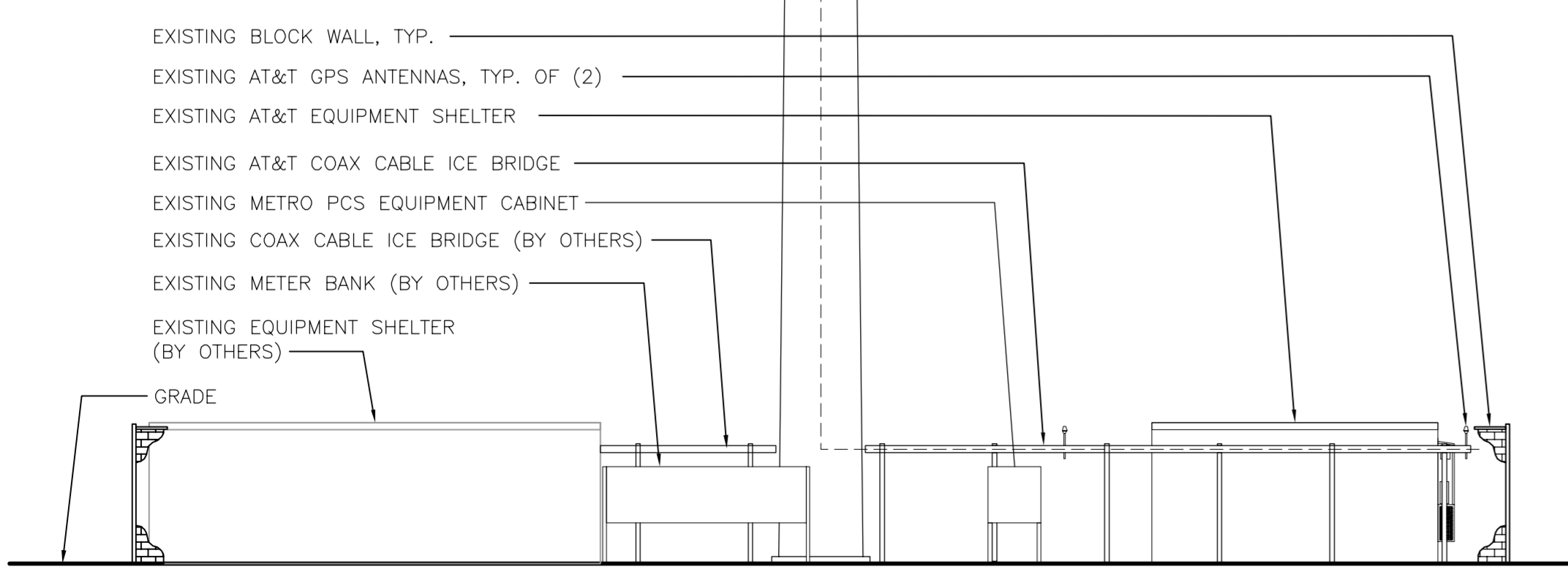


TOWER STRUCTURAL NOTES:

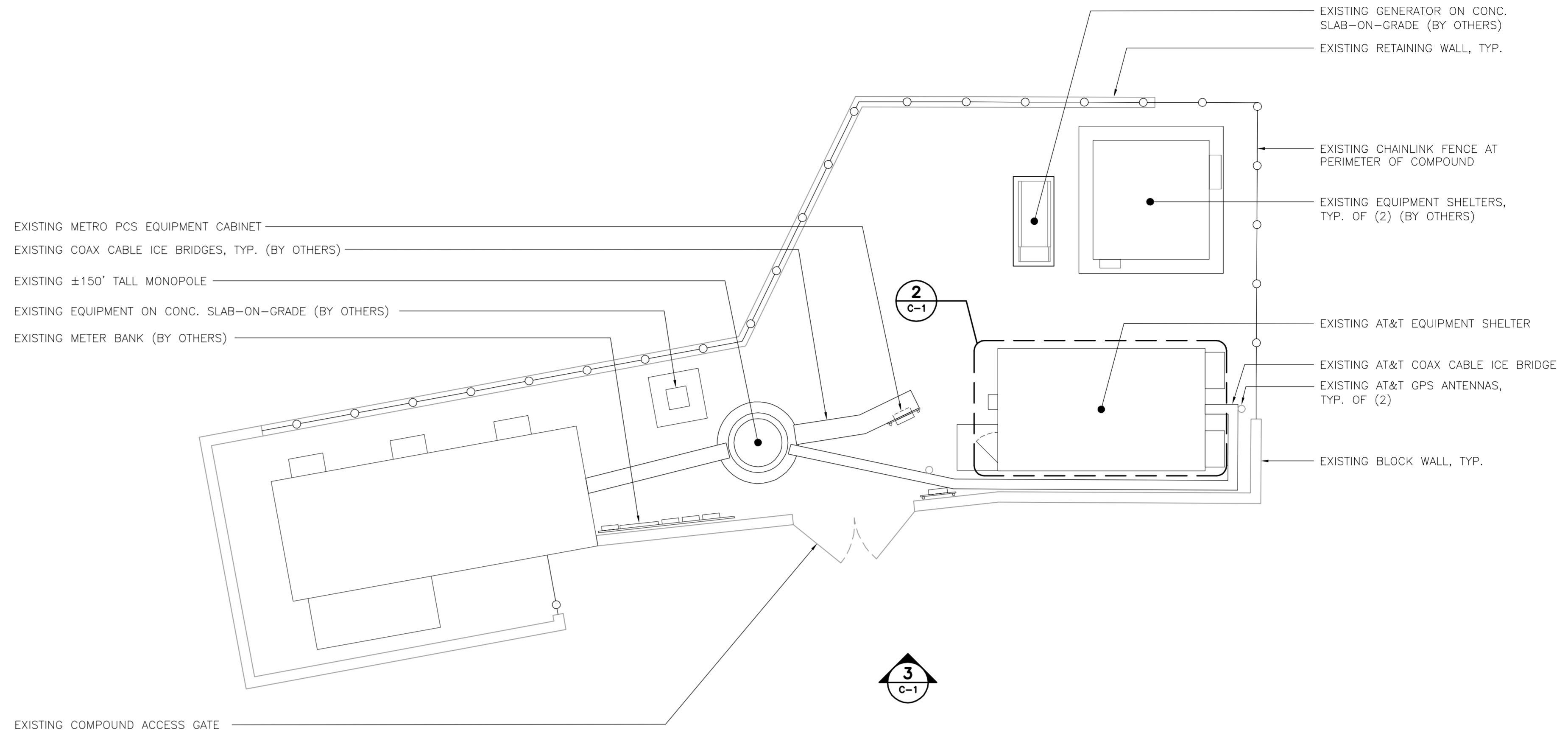
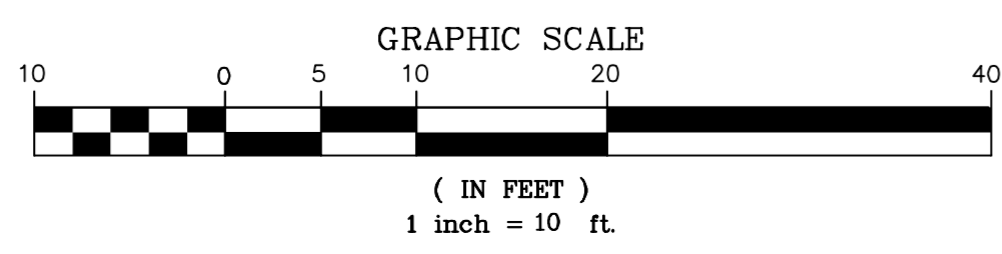
- TOWER STRUCTURAL ANALYSIS SIGNED AND SEALED BY A STRUCTURAL ENGINEER LICENSED IN THE STATE OF CONNECTICUT TO BE PROVIDED PRIOR TO INSTALLATION OF THE ADDITIONAL TOWER LOADING DEPICTED HEREIN.
- ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE, INC. AND FINAL AT&T RF DATA SHEET.

NOTES:

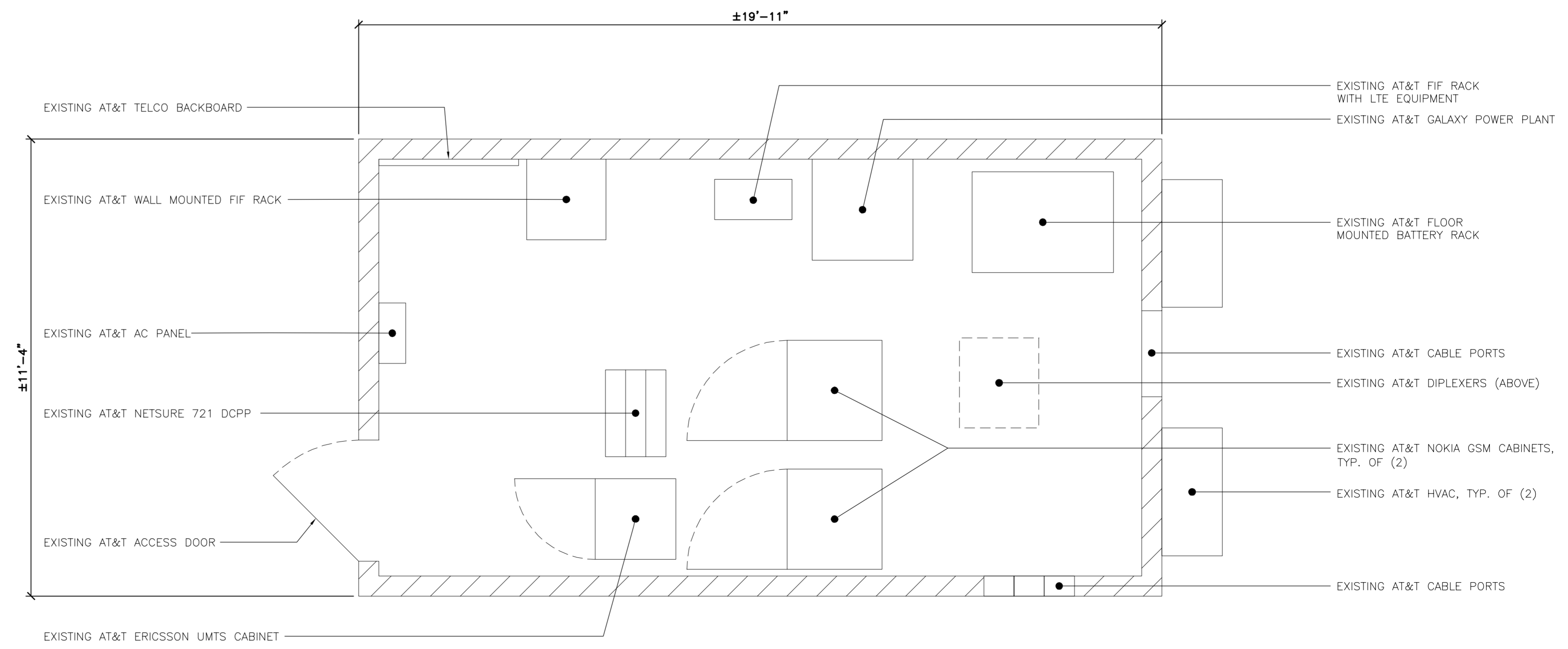
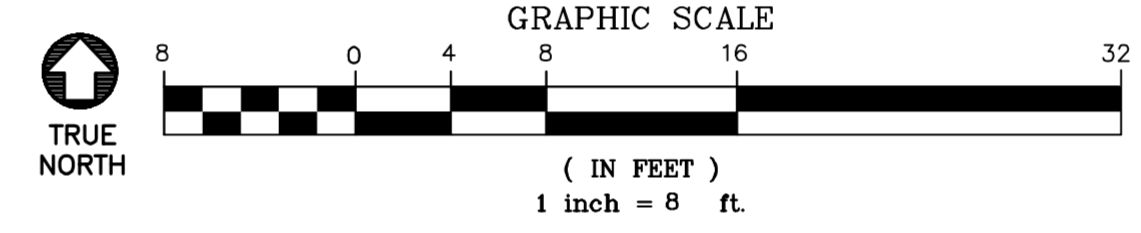
- A.G.L. = ABOVE GRADE LEVEL



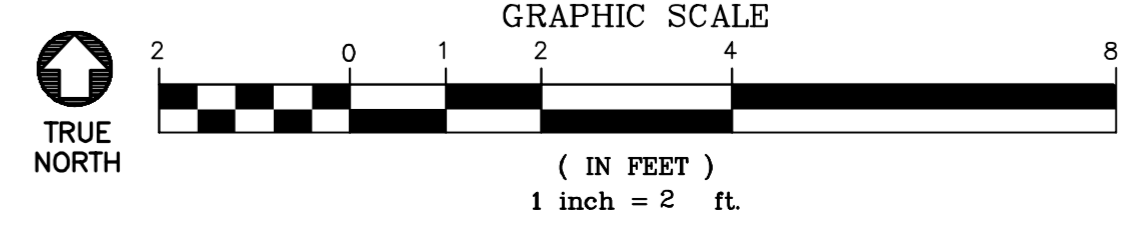
3 NORTH TOWER ELEVATION
SCALE: 1" = 10'



1 COMPOUND PLAN
SCALE: 1" = 8'



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



REV.	DATE	BY	CHK'D	CAG	CONSTRUCTION DOCUMENTS - ISSUED FOR CONSTRUCTION
0	11/30/16	KAWUR			



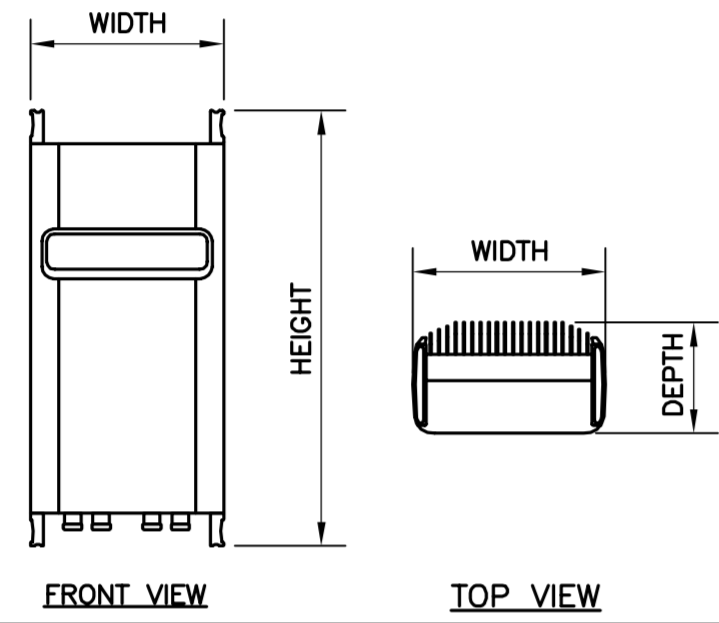
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(203) 488-8387 Fax
63-2 North Branford Road
Branford, CT 06405
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AT&T MOBILITY
WIRELESS COMMUNICATIONS FACILITY
WINDSOR PINE LANE
CT1137 - LTE BWE
50 PINE LANE
WINDSOR, CT 06095

DATE: 11/07/16
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JOB NO. 16071.57

PLANS AND ELEVATION

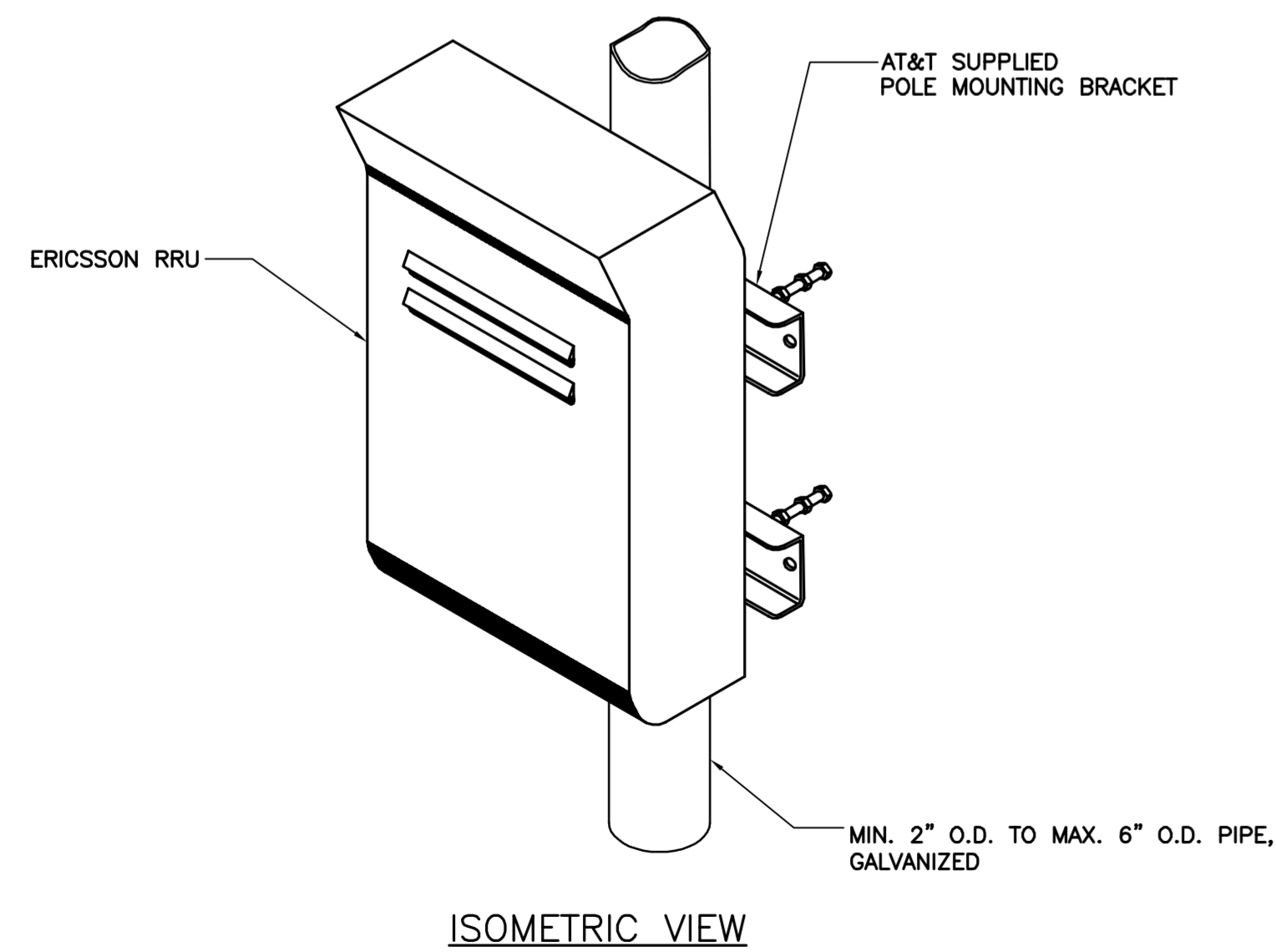
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RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RRU-32 B2	27.17"H x 12.05"W x 7.01"D	52.91 LBS.	ABOVE: 16" MIN. BELOW: 12" MIN. FRONT: 36" MIN.

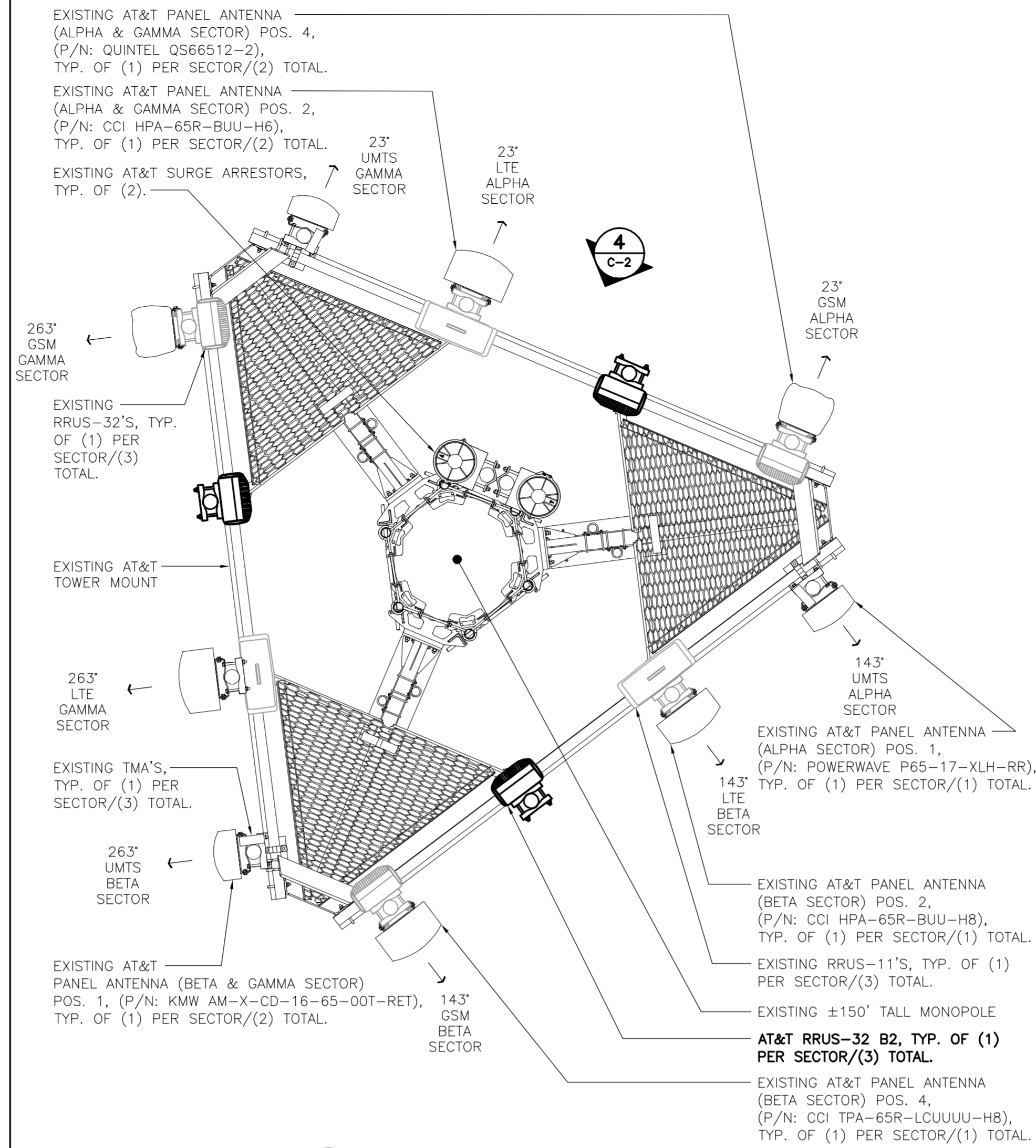
NOTES:
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.

5 ERICSSON RRU-32 B2 DETAIL
SCALE: 1" = 1'-0"

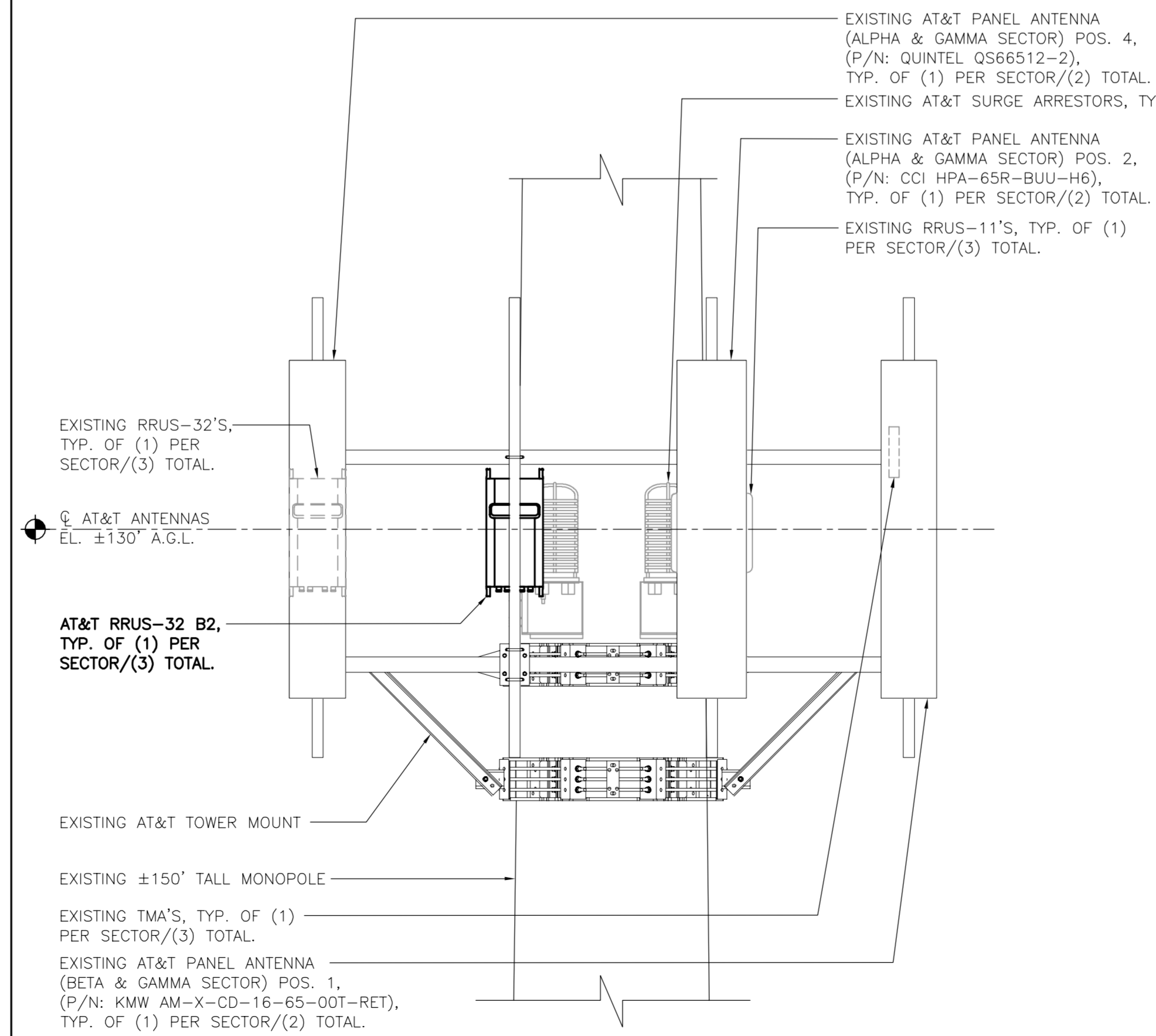


NOTES:
1. AT&T SHALL SUPPLY RRU, AND RRU POLE-MOUNTING BRACKET. CONTRACTOR SHALL SUPPLY POLE/PIPE AND INSTALL ALL MOUNTING HARDWARE INCLUDING ERICSSON RRU POLE-MOUNTING BRACKET. CONTRACTOR SHALL INSTALLS RRU AND MAKES CABLE TERMINATIONS.
2. NO PAINTING OF THE RRU OR SOLAR SHIELD IS ALLOWED.

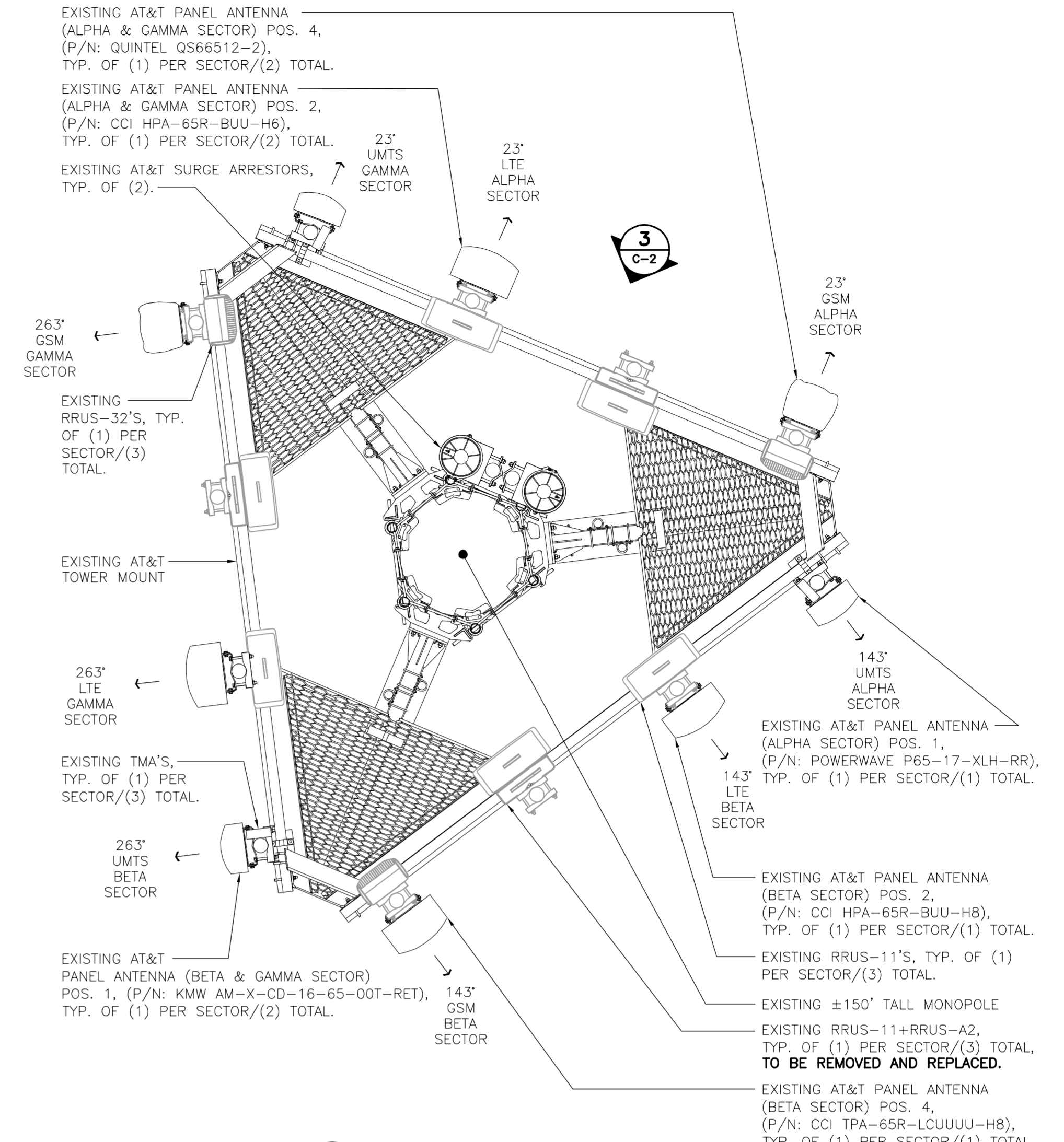
6 TYPICAL RRU MOUNTING DETAILS
SCALE: NTS



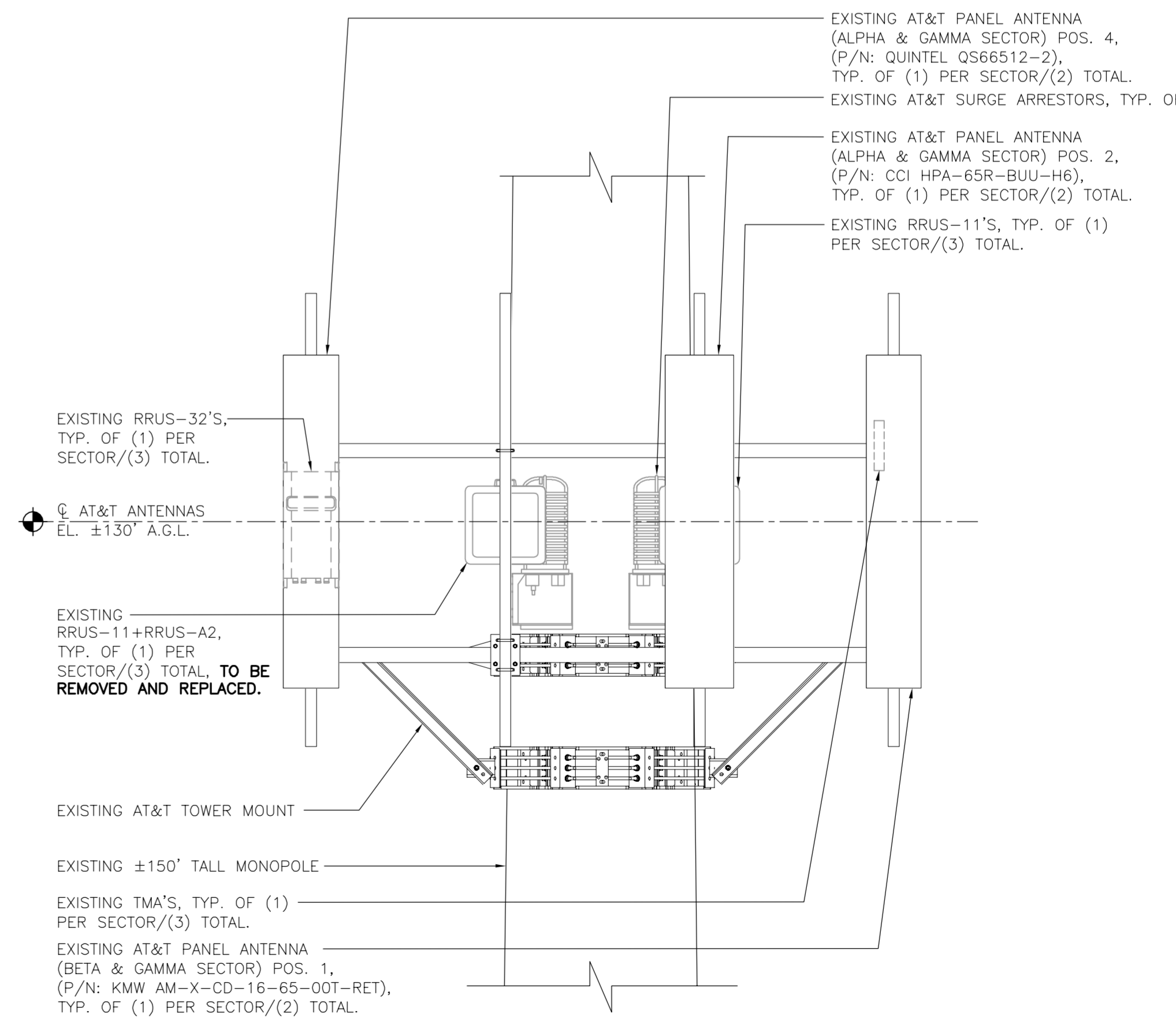
2 PROPOSED ANTENNA PLAN
SCALE: 1/2" = 1'-0"
NORTH



4 PROPOSED ANTENNA ELEVATION
SCALE: 1/2" = 1'-0"



1 EXISTING ANTENNA PLAN
SCALE: 1/2" = 1'-0"
NORTH



3 EXISTING ANTENNA ELEVATION
SCALE: 1/2" = 1'-0"

CONSTRUCTION DOCUMENTS - ISSUED FOR CONSTRUCTION

DATE: 11/07/16
DRAWN BY: KAWUR
CHK'D BY: CAG

PROFESSIONAL ENGINEER SEAL

at&t
EMPIRE telecom

CENTEK engineering
Wireless on Solutions
203 489-0860
203 489-8387 Fax
652 North Branford Road
Branford, CT 06405
www.CentekEng.com

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DATE: 11/07/16
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LTE BWE EQUIPMENT DETAILS

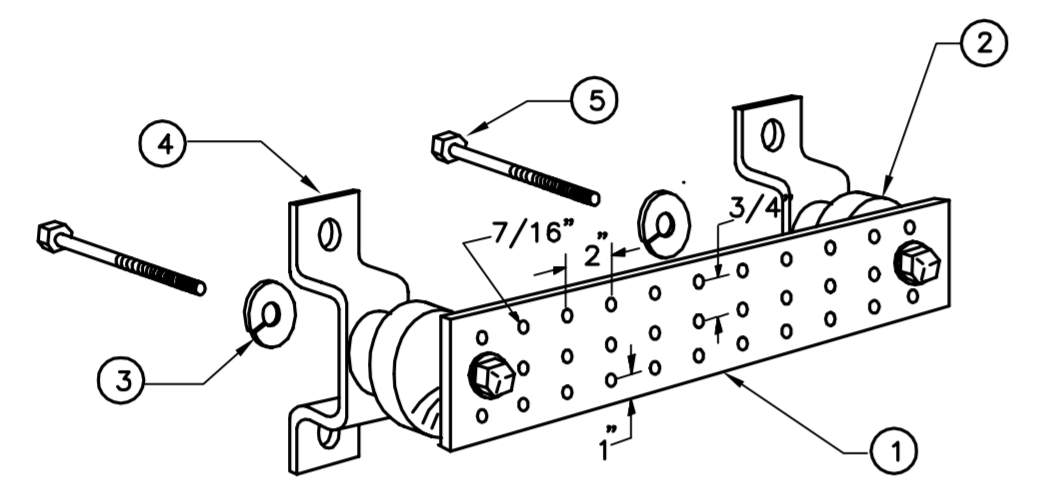
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ELECTRICAL NOTES

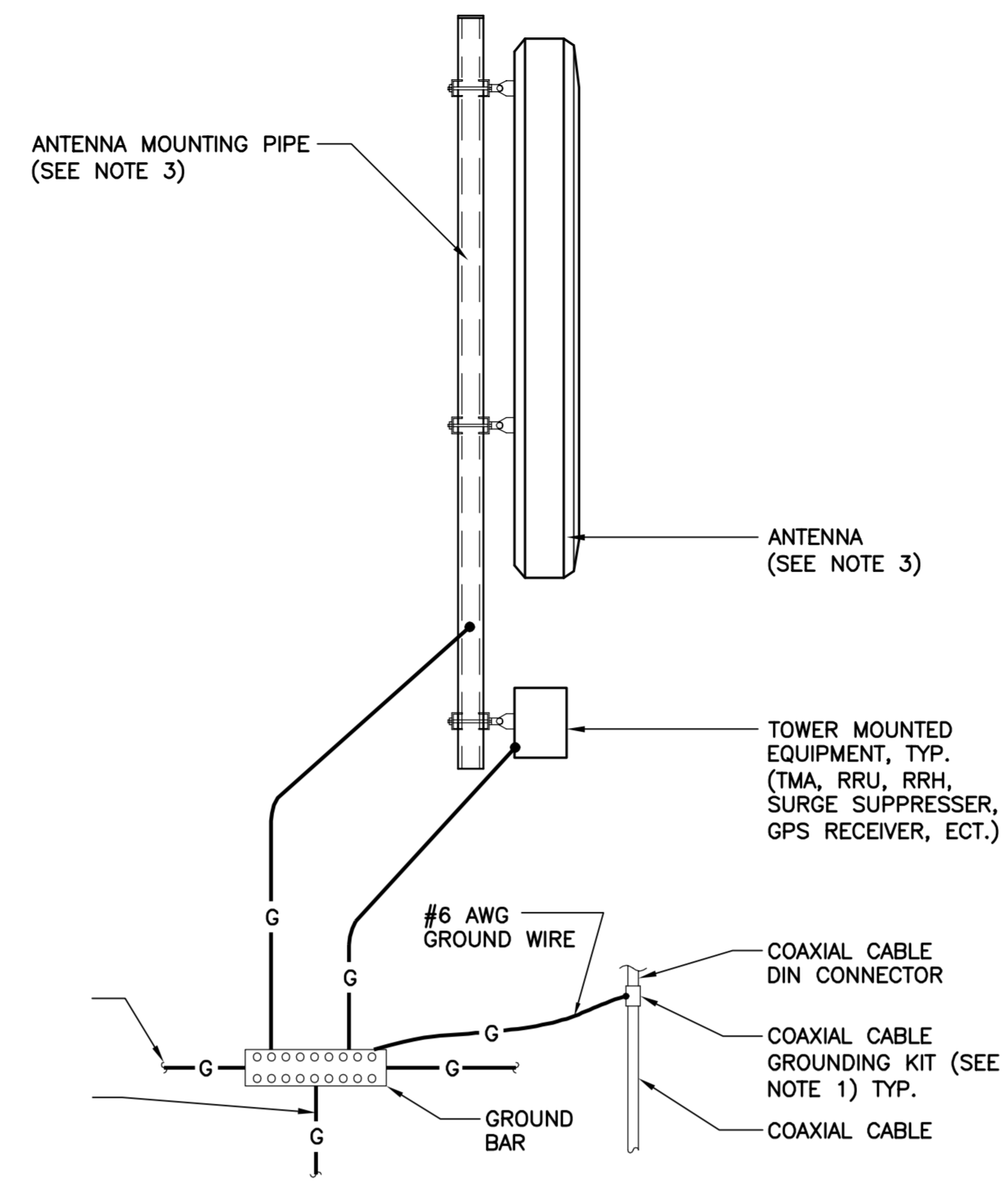
1. PRIOR TO START OF CONSTRUCTION CONTRACTOR SHALL COORDINATE WITH OWNER FOR ALL CONSTRUCTION STANDARDS AND SPECIFICATIONS, AND ALL MANUFACTURER DOCUMENTATION FOR ALL EQUIPMENT TO BE INSTALLED.
2. INSTALL ALL EQUIPMENT IN ACCORDANCE WITH LOCAL BUILDING CODE, NATIONAL ELECTRIC CODE, OWNER AND MANUFACTURER'S SPECIFICATIONS.
3. CONNECT ALL NEW EQUIPMENT TO EXISTING TELCO AS REQUIRED BY MANUFACTURER.
4. MAINTAIN ALL CLEARANCES REQUIRED BY NEC AND EQUIPMENT MANUFACTURER.
5. PRIOR TO INSTALLATION CONTRACTOR SHALL MEASURE EXISTING ELECTRICAL LOAD AND VERIFY EXISTING AVAILABLE CAPACITY FOR PROPOSED INSTALLATION. IF INADEQUATE CAPACITY IS AVAILABLE, CONTRACTOR SHALL COORDINATE WITH LOCAL ELECTRIC UTILITY COMPANY TO UPGRADE EXISTING ELECTRIC SERVICE.
6. CONTRACTOR SHALL INSPECT EXISTING GROUNDING AND LIGHTNING PROTECTION SYSTEM AND ENSURE THAT IT IS IN COMPLIANCE WITH NEC, AND SITE OWNER'S SPECIFICATIONS. THE RESULTS OF THIS INSPECTION SHALL BE PRESENTED TO OWNERS REPRESENTATIVE, AND ANY DEFICIENCIES SHALL BE CORRECTED.
7. ALL TRANSMISSION TOWER SITES CONTAIN AN EXTENSIVE BURIED GROUNDING SYSTEM. ALL GROUNDING WORK MUST BE COORDINATED WITH, AND APPROVED BY, THE TOWER OWNER'S SITE REPRESENTATIVE. ALL OF THE TOWER OWNER'S SPECIFICATIONS MUST BE STRICTLY FOLLOWED.
8. PROVIDE AND INSTALL GROUND KITS FOR ALL NEW COAXIAL CABLES AND BOND TO EXISTING OWNERS GROUNDING SYSTEM PER OWNERS SPECIFICATIONS AND NEC.
9. ALL CONDUCTORS SHALL BE TYPE THWN (INT. APPLICATION) AND XHHW (EXT. APPLICATION), 75 DEGREE C, 600 VOLT INSULATION, SOFT ANNEALED STRANDED COPPER. #10 AWG AND SMALLER SHALL BE SPLICED USING ACCEPTABLE SOLDERLESS PRESSURE CONNECTORS. #8 AWG AND LARGER SHALL BE SPLICED USING COMPRESSION SPLIT-BOLT TYPE CONNECTORS, #12 AWG SHALL BE THE MINIMUM SIZE CONDUCTOR FOR LINE VOLTAGE BRANCH CIRCUITS. REFER TO PANEL SCHEDULE FOR BRANCH CIRCUIT CONDUCTOR SIZE(S). CONDUCTORS SHALL BE COLOR CODED FOR CONSISTENT PHASE IDENTIFICATION.
10. MINIMUM BENDING RADIUS FOR CONDUCTORS SHALL BE 12 TIMES THE LARGEST DIAMETER OF BRANCH CIRCUIT CONDUCTOR.
11. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE MADE IN STRICT ACCORDANCE WITH ALL LOCAL, STATE AND NATIONAL CODES AND REGULATIONS WHICH MAY APPLY AND NOTHING IN THE DRAWINGS OR SPECIFICATIONS SHALL BE INTERPRETED AS AN INFRINGEMENT OF SUCH CODES OR REGULATIONS.
12. THE ELECTRICAL CONTRACTOR IS TO BE RESPONSIBLE FOR THE COMPLETE INSTALLATION AND COORDINATION OF THE ENTIRE ELECTRICAL SERVICE. ALL ACTIVITIES TO BE COORDINATED THROUGH OWNER'S REPRESENTATIVE, DESIGN ENGINEER AND OTHER AUTHORITIES HAVING JURISDICTION OF TRADES.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND PAY ALL FEES AS MAY BE REQUIRED FOR THE ELECTRICAL WORK AND FOR SCHEDULING OF ALL INSPECTIONS AS MAY BE REQUIRED BY THE LOCAL AUTHORITY.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH THE SITE AND/OR BUILDING OWNER FOR NEW AND/OR DEMOLITION WORK INVOLVED.
15. THE CONTRACTOR SHALL GUARANTEE ALL NEW WORK FOR A PERIOD OF ONE YEAR FROM THE ACCEPTANCE DATE BY THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING WARRANTIES FROM ALL EQUIPMENT MANUFACTURERS FOR SUBMISSION TO THE OWNER.
16. DRAWINGS INDICATE GENERAL ARRANGEMENT OF WORK INCLUDED IN CONTRACT. CONTRACTOR SHALL WITHOUT EXTRA CHARGE, MAKE MODIFICATIONS TO THE LAYOUT OF THE WORK TO PREVENT CONFLICT WITH WORK OF OTHER TRADES AND FOR THE PROPER INSTALLATION OF WORK. CHECK ALL DRAWINGS AND VISIT JOB SITE TO VERIFY SPACE AND TYPE OF EXISTING CONDITIONS IN WHICH WORK WILL BE DONE, PRIOR TO SUBMITTAL OF BID.
17. ALL NON-CURRENT CARRYING PARTS OF THE ELECTRICAL AND TELEPHONE CONDUIT SYSTEMS SHALL BE MECHANICALLY AND ELECTRICALLY CONNECTED TO PROVIDE AN INDEPENDENT RETURN PATH TO THE EQUIPMENT GROUNDING SOURCES.
18. GROUNDING SYSTEM WILL BE IN ACCORDANCE WITH THE LATEST ACCEPTABLE EDITION OF THE NATIONAL ELECTRICAL CODE AND REQUIREMENTS PER LOCAL INSPECTOR HAVING JURISDICTION.
19. EACH EQUIPMENT GROUND CONDUCTOR SHALL BE SIZED IN ACCORDANCE WITH THE N.E.C. ARTICLE 250-122. (MIN. #12 AWG).
20. CONTRACTOR SHALL PROVIDE A CELLULAR GROUNDING SYSTEM WITH THE MAXIMUM AC RESISTANCE TO GROUND OF 5 OHM BETWEEN ANY POINT ON THE GROUNDING SYSTEM AS MEASURED BY 3-POINT GROUNDING TEST. (REFER TO SECTION 16960).

- TESTS BY INDEPENDENT ELECTRICAL TESTING FIRM**
- A. CONTRACTOR SHALL RETAIN THE SERVICES OF A LOCAL INDEPENDENT ELECTRICAL TESTING FIRM (WITH MINIMUM 5 YEARS COMMERCIAL EXPERIENCE IN THE ELECTRICAL TESTING INDUSTRY) AS SPECIFIED BY OWNER TO PERFORM:
 - TEST 1: RESISTANCE TO GROUND TEST ON THE CELLULAR GROUNDING SYSTEM.
 THE TESTING FIRM SHALL INCLUDE THE FOLLOWING INFORMATION WITH THE REPORT:
 1. TESTING PROCEDURE INCLUDING THE MAKE AND MODEL OF TEST EQUIPMENT.
 2. CERTIFICATION OF TESTING EQUIPMENT CALIBRATION WITHIN SIX (6) MONTHS OF DATE OF TESTING. INCLUDE CERTIFICATION LAB ADDRESS AND TELEPHONE NUMBER.
 3. GRAPHICAL DESCRIPTION OF TESTING METHOD ACTUALLY IMPLEMENTED.
 - B. TESTING SHALL BE PERFORMED IN THE PRESENCE AND TO THE SATISFACTION OF OWNERS CONSTRUCTION REPRESENTATIVE. TESTING DATA SHALL BE INITIALED AND DATED BY THE CONSTRUCTION AND INCLUDED WITH THE WRITTEN REPORT/ANALYSIS.
 - C. THE CONTRACTOR SHALL FORWARD SIX (6) COPIES OF THE INDEPENDENT ELECTRICAL TESTING FIRM REPORT/ANALYSIS TO ENGINEER A MINIMUM OF TEN (10) WORKING DAYS PRIOR TO THE JOB TURNOVER.
 - D. CONTRACTOR TO PROVIDE A MINIMUM OF ONE (1) WEEK NOTICE TO OWNER AND ENGINEER FOR ALL TESTS REQUIRING WITNESSING.



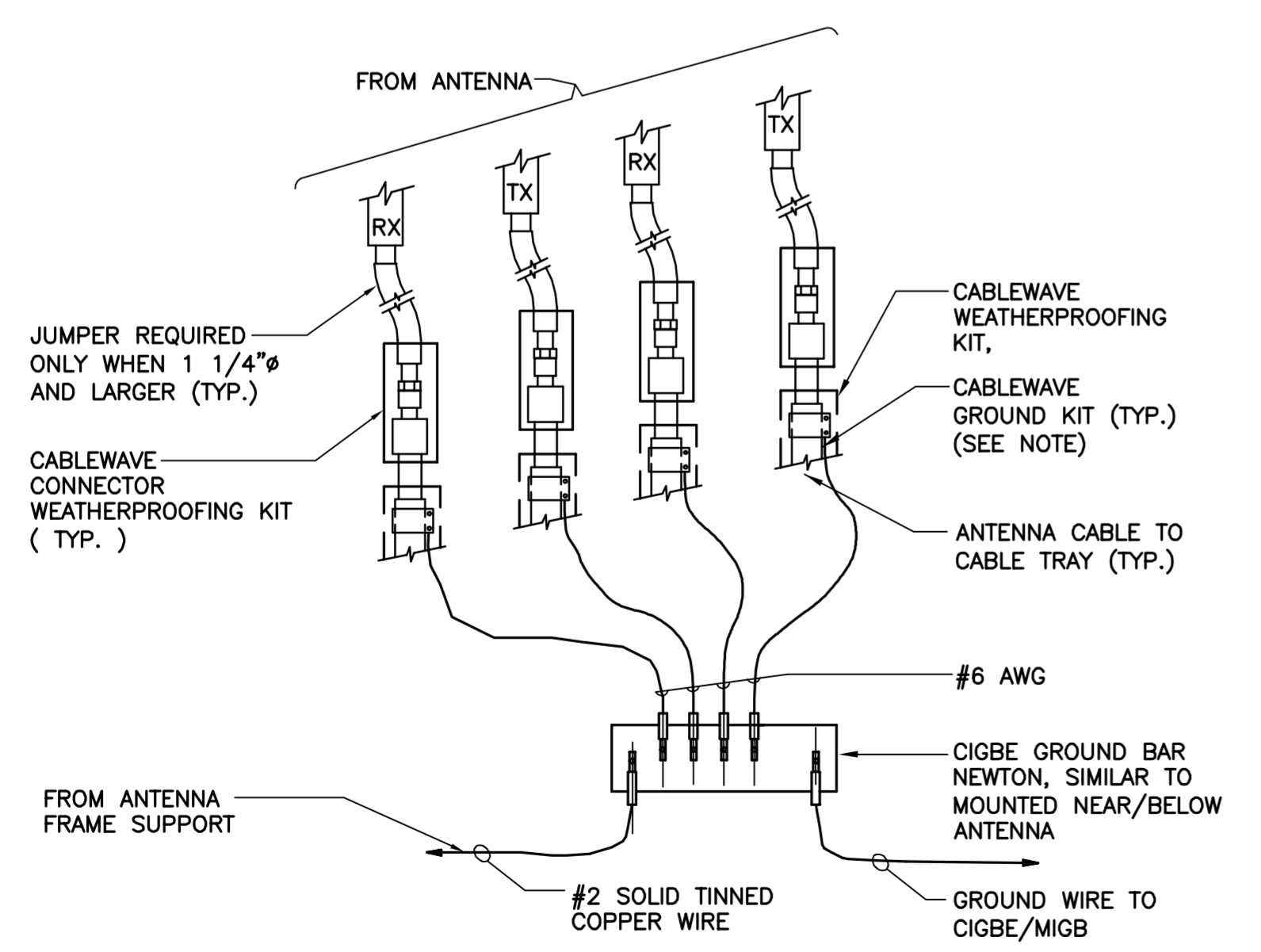
- LEGEND**
1. TINNED COPPER GROUND BAR, 1/4"x 4"x 20", NEWTON INSTRUMENT CO. HOLE CENTERS TO MATCH NEMA DOUBLE LUG .
 2. INSULATORS, NEWTON INSTRUMENT CAT. NO. 2. 3061-4.
 3. 5/8" LOCK WASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8.
 4. WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT. NO. A-6056.
 5. STAINLESS STEEL SECURITY SCREWS.

2 GROUND BAR DETAIL
E-1 NOT TO SCALE



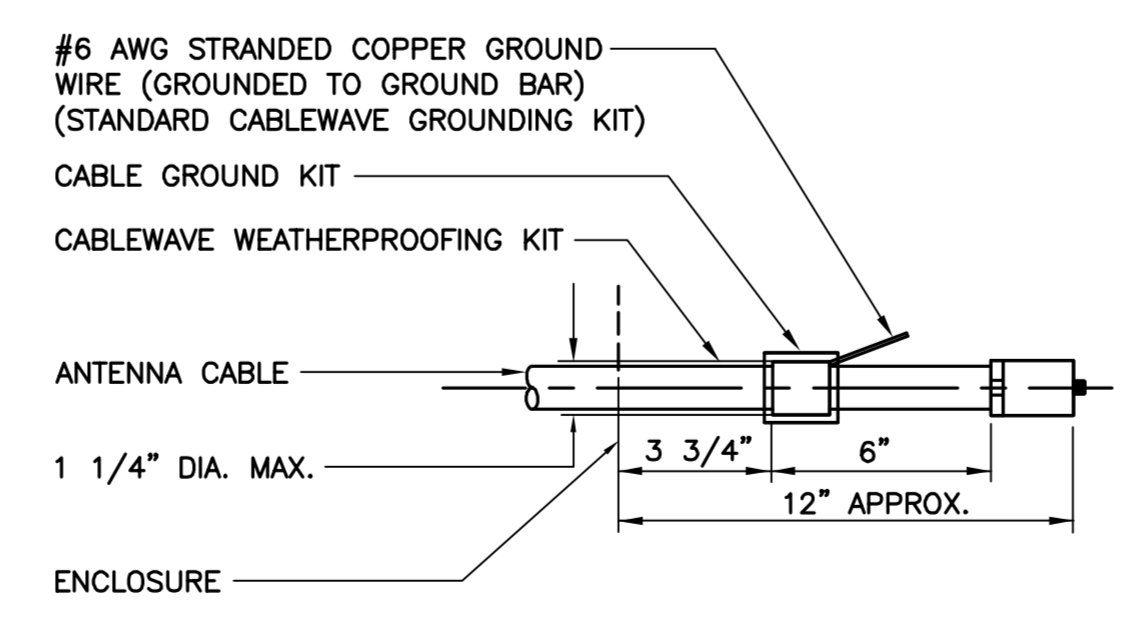
- NOTES:**
1. BOND COAXIAL CABLE GROUND KITS TO EACH OWNER'S GROUND BAR ALONG ENTIRE COAX RUN FROM ANTENNA TO SHELTER.
 2. BOND ALL EQUIPMENT TO GROUND PER NEC AND MANUFACTURERS SPECIFICATIONS.
 3. DETAIL IS TYPICAL FOR ALL ANTENNA SECTORS, INCLUDING GPS ANTENNA.

1 TYPICAL ANTENNA GROUNDING DETAIL
E-1 NOT TO SCALE



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

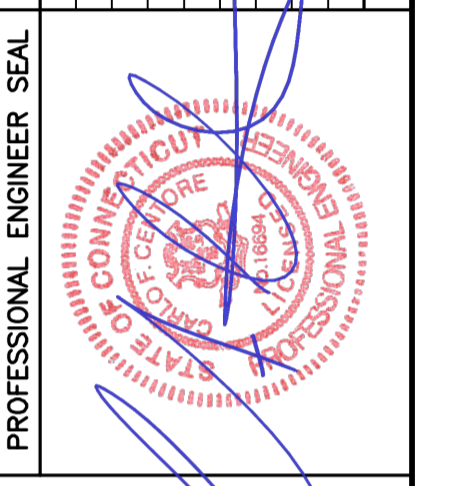
4 CONNECTION OF GROUND WIRES TO GROUND BAR
E-1 NOT TO SCALE



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

3 ANTENNA CABLE GROUNDING DETAIL
E-1 NOT TO SCALE

REV.	DATE	DRAWN BY	CHECK'D BY	DESCRIPTION
0	11/30/16	KAWUR	CAG	CONSTRUCTION DOCUMENTS - ISSUED FOR CONSTRUCTION



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Centred on Solutions™
203) 488-0360
203) 488-8387 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

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50 PINE LANE
WINDSOR, CT 06095

DATE:	11/07/16
SCALE:	AS NOTED
JOB NO.	16071.57

TYPICAL ELECTRICAL DETAILS & NOTES

Date: December 27, 2016

Sean Dempsey
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277

JACOBS[®]
Jacobs Engineering Group, Inc.
5449 Bells Ferry Road
Acworth, GA 30102
(770)701-2500

Subject: Structural Analysis Report

Carrier Designation: AT&T Mobility Co-Locate
Carrier Site Number: CT1137
Carrier Site Name: Windsor Pine Lane

Crown Castle Designation: Crown Castle BU Number: 841793
Crown Castle Site Name: WINDSOR PINE LANE
Crown Castle JDE Job Number: 407806
Crown Castle Work Order Number: 1337819
Crown Castle Application Number: 367947 Rev. 2

Engineering Firm Designation: Jacobs Engineering Group, Inc. Project Number: 1337819

Site Data: 50 PINE LANE, WINDSOR, Hartford County, CT
Latitude 41° 49' 11.43", Longitude -72° 40' 1.88"
147.5 Foot - Monopole Tower

Dear Sean Dempsey,

Jacobs Engineering Group, Inc. is pleased to submit this "Structural Analysis Report" to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 984059, in accordance with application 367947, revision 2.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC5: Existing + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing loading, respectively.

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 125 mph converted to a nominal 3-second gust wind speed of 97 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category C with a maximum topographic factor, Kzt, of 1.000 and Risk Category II were used in this analysis.

All modifications and equipment proposed in this report shall be installed in accordance with the attached drawings for the determined available structural capacity to be effective.

We at Jacobs Engineering Group, Inc. appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted by:



Deepjyoti Chakraborty
Structural Engineer



Reviewed by:

Matthews E. Watkins
Engineering Project Manager

TABLE OF CONTENTS

1) INTRODUCTION

2) ANALYSIS CRITERIA

Table 1 - Proposed Antenna and Cable Information

Table 2 - Existing Antenna and Cable Information

Table 3 - Design Antenna and Cable Information

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

3.1) Analysis Method

3.2) Assumptions

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Table 6 – Tower Components vs. Capacity

4.1) Recommendations

5) APPENDIX A

tnxTower Output

6) APPENDIX B

Base Level Drawing

7) APPENDIX C

Additional Calculations

1) INTRODUCTION

This tower is a 147.5 ft Monopole tower mapped by TEP in January of 2016. The original design standards and wind speed are unknown.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA-222-G Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a 3-second gust wind speed of 97 mph with no ice, 50 mph with 1 inch ice thickness and 60 mph under service loads, exposure category C with topographic category 1.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
130.0	130.0	6	cci antennas	TPX-070821	-	-	-
		3	ericsson	RRUS 32 B2			

Table 2 - Existing Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
149.0	153.0	1	decibel	DB225-C	1	7/8	1
	149.0	1	tower mounts (crown)	Platform Mount [LP 1201-1]			
140.0	140.0	1	andrew	HP2-102	1 2	3/8 3/4	1
		1	tower mounts (crown)	Pipe Mount [PM 601-1]			
139.0	139.0	1	tower mounts (crown)	Side Arm Mount [SO 701-1]	1	7/8	1
	134.0	1	decibel	DB225-C			
130.0	130.0	3	ericsson	RRUS 11	-	-	2
		3	ericsson	RRUS A2			
		6	cci antennas	DTMABP7819VG12A			
		2	cci antennas	HPA-65R-BUU-H6	2 12 4	3/8 1-5/8 3/4	1
		1	cci antennas	HPA-65R-BUU-H8			
		1	cci antennas	TPA-65R-LCUUUU-H8			
		3	ericsson	RRU-11			
		3	ericsson	RRUS 32			
		2	kmw communications	AM-X-CD-16-65-00T-RET			
		1	powerwave technologies	P65-17-XLH-RR			
		2	quintel technology	QS66512-3			
		2	raycap	DC6-48-60-18-8F			
		1	tower mounts (crown)	Platform Mount [LP 1301-1]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
118.0	118.0	3	rfs celwave	APXV18-206517S-C	6	1-5/8	3
		1	tower mounts (crown)	Pipe Mount [PM 601-3]			
108.0	109.0	2	andrew	VHLP800-11	6 4	5/16 1/2	1
	108.0	3	argus technologies	LLPX310R w/ Mount Pipe			
		3	samsung telecommunications	RRH-2WB			
		1	tower mounts (crown)	T-Arm Mount [TA 702-3]			
107.0	2	andrew	VHLP2-18				
85.0	85.0	1	Wade antenna	WH 14-69/S	5	13/32	1
		1	Wade antenna	WL 14-69/S			
		1	tower mounts (crown)	Side Arm Mount [SO 104-3]			
	83.0	2	Wade antenna	WL 14-69/S			
	78.0	1	Wade antenna	J105-HI			

- Notes:
 1) Existing Equipment
 2) Equipment To Be Removed; not considered in this analysis
 3) Abandoned Equipment; considered in this analysis

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
UNKNOWN						

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	WEI	4469790	CCSITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	WEI (Mapping)	4469791	CCSITES
4-TOWER MANUFACTURER DRAWINGS	TEP (Mapping)	6064532	CCSITES

3.1) Analysis Method

tnxTower (version 7.0.6.2), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

- 1) Tower and structures were built in accordance with the manufacturer's specifications.
- 2) The tower and structures have been maintained in accordance with the manufacturer's specification.
- 3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.

This analysis may be affected if any assumptions are not valid or have been made in error. Jacobs Engineering Group, Inc. should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	147.5 - 115.417	Pole	TP31.25x24x0.2188	1	-8.67	1407.90	23.9	Pass
L2	115.417 - 74.2967	Pole	TP37.75x29.9289x0.2188	2	-15.93	1571.94	78.2	Pass
L3	74.2967 - 39.2167	Pole	TP44.625x36.4927x0.3125	3	-23.57	2877.56	67.2	Pass
L4	39.2167 - 0	Pole	TP51.25x42.8598x0.375	4	-37.06	4097.19	68.1	Pass
							Summary	
						Pole (L2)	78.2	Pass
						RATING =	78.2	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	59.6	Pass
1	Base Plate	0	85.7	Pass
1	Base Foundation Structural	0	93.8	Pass
1	Base Foundation Soil Interaction	0	72.2	Pass

Structure Rating (max from all components) =	93.8%
---	--------------

Notes:

- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

4.1) Recommendations

The monopole and its foundation have sufficient capacity to carry the existing and proposed loads. No modifications are required at this time.

APPENDIX A
TNXTOWER OUTPUT

APPENDIX B
BASE LEVEL DRAWING

APPENDIX C
ADDITIONAL CALCULATIONS

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
DB225-C	149	RRU-11	130
(4) 6' x 2" Mount Pipe	149	(2) DC6-48-60-18-8F	130
(4) 6' x 2" Mount Pipe	149	Platform Mount [LP 1301-1]	130
(4) 6' x 2" Mount Pipe	149	HPA-65R-BUU-H6	130
Platform Mount [LP 1201-1]	149	APXV18-206517S-C	118
Pipe Mount [PM 601-1]	140	APXV18-206517S-C	118
HP2-102	140	Pipe Mount [PM 601-3]	118
Side Arm Mount [SO 701-1]	139	6' x 2" Mount Pipe	118
DB225-C	139	6' x 2" Mount Pipe	118
HPA-65R-BUU-H8	130	6' x 2" Mount Pipe	118
HPA-65R-BUU-H6	130	APXV18-206517S-C	118
QS66512-3	130	LLPX310R w/ Mount Pipe	108
QS66512-3	130	LLPX310R w/ Mount Pipe	108
AM-X-CD-16-65-00T-RET	130	RRH-2WB	108
AM-X-CD-16-65-00T-RET	130	RRH-2WB	108
P65-17-XLH-RR	130	RRH-2WB	108
TPA-65R-LCUUUU-H8	130	T-Arm Mount [TA 702-3]	108
(2) TPX-070821	130	LLPX310R w/ Mount Pipe	108
(2) TPX-070821	130	VHLP2-18	108
(2) TPX-070821	130	VHLP800-11	108
RRUS 32 B2	130	VHLP2-18	108
RRUS 32 B2	130	VHLP800-11	108
RRUS 32 B2	130	Side Arm Mount [SO 104-3]	85
RRUS 32	130	WL 14-69/S	85
RRUS 32	130	WH 14-69/S	85
RRUS 32	130	WL 14-69/S	85
(2) DTMABP7819VG12A	130	WL 14-69/S	85
(2) DTMABP7819VG12A	130	J105-HI	85
(2) DTMABP7819VG12A	130	10' x 3" Pipe Mount	81.5
RRU-11	130	10' x 3" Pipe Mount	81.5
RRU-11	130		

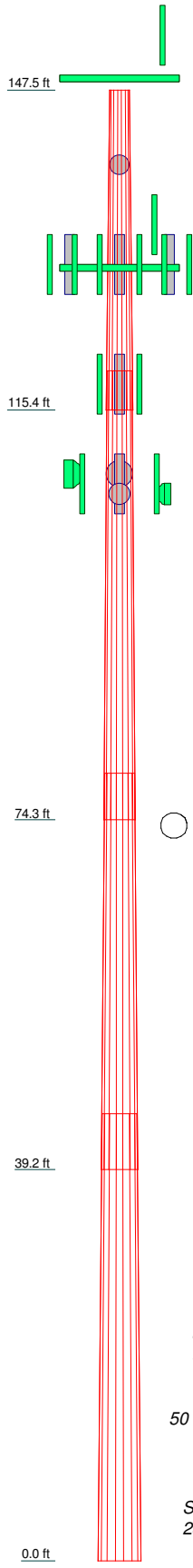
MATERIAL STRENGTH

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

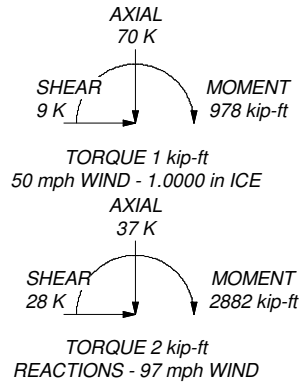
TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 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. TOWER RATING: 78.2%

Section	1	2	3	4	19.5
Length (ft)	32.08	45.03	39.80	44.80	
Number of Sides	18	18	18	18	
Thickness (in)	0.2188	0.2188	0.3125	0.3750	
Socket Length (ft)	3.91	4.72	5.58	42.8598	
Top Dia (in)	24.0000	29.9289	36.4927	51.2500	
Bot Dia (in)	31.2500	37.7500	44.6250		
Grade		A607-65			
Weight (K)	2.1	3.6	5.4	8.5	



ALL REACTIONS
ARE FACTORED



Jacobs Engineering Group, Inc.

5449 Bells Ferry Rd
Acworth, GA 30102
Phone: 770-701-2500
FAX: 770-701-2501

Job: 147.5'-MP-WINDSOR PINE LANE

Project: BU 841793 WO 1337819

Client: Crown Castle Drawn by: J. Earnest App'd:

Code: TIA-222-G Date: 12/27/16 Scale: NTS

Path: C:\Users\EARNES\JIT\Desktop\841793\BU 841793_WO 1337819.er Dwg No. E-1

tnxTower Jacobs Engineering Group, Inc. 5449 Bells Ferry Rd Acworth, GA 30102 Phone: 770-701-2500 FAX: 770-701-2501	Job 147.5'-MP-WINDSOR PINE LANE	Page 1 of 16
	Project BU 841793 WO 1337819	Date 12:29:34 12/27/16
	Client Crown Castle	Designed by J. Earnest

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 Hartford County, Connecticut.

Basic wind speed of 97 mph.

Structure Class II.

Exposure Category C.

Topographic Category 1.

Crest Height 0.00 ft.

Nominal ice thickness of 1.0000 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.

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, feed line supports, and appurtenance mounts are not considered.

Options

<ul style="list-style-type: none"> Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification √ Use Code Stress Ratios √ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile Include Bolts In Member Capacity Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) SR Members Have Cut Ends SR Members Are Concentric 	<ul style="list-style-type: none"> Distribute Leg Loads As Uniform Assume Legs Pinned √ Assume Rigid Index Plate √ Use Clear Spans For Wind Area Use Clear Spans For KL/r Retention Guys To Initial Tension √ Bypass Mast Stability Checks √ Use Azimuth Dish Coefficients √ Project Wind Area of Appurt. Autocalc Torque Arm Areas Add IBC .6D+W Combination Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Treat Feed Line Bundles As Cylinder 	<ul style="list-style-type: none"> Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation √ Consider Feed Line Torque Include Angle Block Shear Check Use TIA-222-G Bracing Resist. Exemption Use TIA-222-G Tension Splice Exemption <li style="background-color: #e0e0e0;">Poles √ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets
--	--	--

Tapered Pole Section Geometry

Section	Elevation	Section Length	Splice Length	Number of Sides	Top Diameter	Bottom Diameter	Wall Thickness	Bend Radius	Pole Grade
	ft	ft	ft		in	in	in	in	
L1	147.50-115.42	32.08	3.91	18	24.0000	31.2500	0.2188	0.8750	A607-65 (65 ksi)
L2	115.42-74.30	45.03	4.72	18	29.9289	37.7500	0.2188	0.8750	A607-65 (65 ksi)

tnxTower Jacobs Engineering Group, Inc. 5449 Bells Ferry Rd Acworth, GA 30102 Phone: 770-701-2500 FAX: 770-701-2501	Job 147.5'-MP-WINDSOR PINE LANE	Page 2 of 16
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	Client Crown Castle	Designed by J. Earnest

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
L3	74.30-39.22	39.80	5.58	18	36.4927	44.6250	0.3125	1.2500	A607-65 (65 ksi)
L4	39.22-0.00	44.80		18	42.8598	51.2500	0.3750	1.5000	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	I/Q in ²	w in	w/t
L1	24.3702	16.5116	1179.7676	8.4423	12.1920	96.7657	2361.0876	8.2574	3.8390	17.55
	31.7321	21.5454	2621.1402	11.0161	15.8750	165.1112	5245.7293	10.7747	5.1150	23.383
L2	31.0802	20.6282	2300.4286	10.5471	15.2039	151.3051	4603.8841	10.3160	4.8825	22.32
	38.3324	26.0584	4637.3676	13.3236	19.1770	241.8192	9280.8371	13.0317	6.2590	28.613
L3	38.0350	35.8862	5934.8185	12.8440	18.5383	320.1383	11877.4461	17.9465	5.8727	18.793
	45.3134	43.9525	10903.6814	15.7309	22.6695	480.9846	21821.7101	21.9804	7.3040	23.373
L4	44.5822	50.5676	11531.2855	15.0821	21.7728	529.6188	23077.7441	25.2886	6.8833	18.356
	52.0406	60.5540	19801.0813	18.0606	26.0350	760.5562	39628.2174	30.2827	8.3600	22.293

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	Double Angle Stitch Bolt Spacing Redundants in
L1 147.50-115.42				1	1	1			
L2 115.42-74.30				1	1	1			
L3 74.30-39.22				1	1	1			
L4 39.22-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C _{AA} ft ² /ft	Weight plf
****147.5**** LDF5-50A(7/8)	C	No	Inside Pole	147.50 - 0.00	1	No Ice 1/2" Ice 1" Ice	0.33 0.33 0.33
140 LDF2-50(3/8)	C	No	Inside Pole	140.00 - 0.00	1	No Ice 1/2" Ice	0.08 0.08

tnxTower Jacobs Engineering Group, Inc. 5449 Bells Ferry Rd Acworth, GA 30102 Phone: 770-701-2500 FAX: 770-701-2501	Job	147.5'-MP-WINDSOR PINE LANE	Page	3 of 16
	Project	BU 841793 WO 1337819	Date	12:29:34 12/27/16
	Client	Crown Castle	Designed by	J. Earnest

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C _{AA} ft ² /ft	Weight plf
WR-VG86T(3/4")	C	No	Inside Pole	140.00 - 0.00	2	1" Ice	0.00	0.08
						No Ice	0.00	0.53
						1/2" Ice	0.00	0.53
2" Conduit	C	No	Inside Pole	140.00 - 0.00	1	1" Ice	0.00	0.53
						No Ice	0.00	1.16
						1/2" Ice	0.00	1.16
139	C	No	Inside Pole	139.00 - 0.00	1	1" Ice	0.00	1.16
No Ice						0.00	0.33	
1/2" Ice						0.00	0.33	
130	C	No	Inside Pole	130.00 - 0.00	12	1" Ice	0.00	0.33
No Ice						0.00	0.82	
1/2" Ice						0.00	0.82	
FB-L98B-034-XXX(3/8)	C	No	Inside Pole	130.00 - 0.00	2	1" Ice	0.00	0.82
No Ice						0.00	0.06	
1/2" Ice						0.00	0.06	
WR-VG86ST-BRD(3/4")	C	No	Inside Pole	130.00 - 0.00	4	1" Ice	0.00	0.06
						No Ice	0.00	0.58
						1/2" Ice	0.00	0.58
118	B	No	Inside Pole	118.00 - 0.00	6	1" Ice	0.00	0.58
No Ice						0.00	0.82	
1/2" Ice						0.00	0.82	
108	A	No	Inside Pole	108.00 - 0.00	4	1" Ice	0.00	0.82
No Ice						0.00	0.15	
1/2" Ice						0.00	0.15	
9207(5/16")	A	No	Inside Pole	108.00 - 0.00	6	1" Ice	0.00	0.15
No Ice						0.00	0.60	
1/2" Ice						0.00	0.60	
2" Conduit	A	No	Inside Pole	108.00 - 0.00	2	1" Ice	0.00	0.60
						No Ice	0.00	1.16
						1/2" Ice	0.00	1.16
85	B	No	Inside Pole	85.00 - 0.00	5	1" Ice	0.00	1.16
No Ice						0.00	0.05	
1/2" Ice						0.00	0.05	
***	A	No	CaAa (Out Of Face)	147.50 - 0.00	1	1" Ice	0.00	0.05
No Ice						0.09	0.40	
1/2" Ice						0.19	1.24	
****	A	No	CaAa (Out Of Face)	147.50 - 0.00	1	1" Ice	0.29	2.70
No Ice						0.09	0.40	
1/2" Ice						0.19	1.24	
****	C	No	Inside Pole	130.00 - 0.00	2	1" Ice	0.00	2.70
No Ice						0.00	1.16	
1/2" Ice						0.00	1.16	
****	C	No	Inside Pole	130.00 - 0.00	2	1" Ice	0.00	1.16
No Ice						0.00	1.16	
1/2" Ice						0.00	1.16	

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	147.50-115.42	A	0.000	0.000	0.000	2.823	0.01
		B	0.000	0.000	0.000	0.000	0.01
		C	0.000	0.000	0.000	0.000	0.29
L2	115.42-74.30	A	0.000	0.000	0.000	3.619	0.24

tnxTower Jacobs Engineering Group, Inc. 5449 Bells Ferry Rd Acworth, GA 30102 Phone: 770-701-2500 FAX: 770-701-2501	Job	147.5'-MP-WINDSOR PINE LANE	Page	4 of 16
	Project	BU 841793 WO 1337819	Date	12:29:34 12/27/16
	Client	Crown Castle	Designed by	J. Earnest

Tower Section	Tower Elevation ft	Face	A_R ft ²	A_F ft ²	C_{AA} In Face ft ²	C_{AA} Out Face ft ²	Weight K
L3	74.30-39.22	B	0.000	0.000	0.000	0.000	0.21
		C	0.000	0.000	0.000	0.000	0.72
		A	0.000	0.000	0.000	3.087	0.24
L4	39.22-0.00	B	0.000	0.000	0.000	0.000	0.18
		C	0.000	0.000	0.000	0.000	0.62
		A	0.000	0.000	0.000	3.451	0.27
		B	0.000	0.000	0.000	0.000	0.20
		C	0.000	0.000	0.000	0.000	0.69

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} In Face ft ²	C_{AA} Out Face ft ²	Weight K
L1	147.50-115.42	A	2.295	0.000	0.000	0.000	17.552	0.32
		B		0.000	0.000	0.000	0.000	0.01
		C		0.000	0.000	0.000	0.000	0.29
L2	115.42-74.30	A	2.222	0.000	0.000	0.000	22.496	0.63
		B		0.000	0.000	0.000	0.000	0.21
		C		0.000	0.000	0.000	0.000	0.72
L3	74.30-39.22	A	2.111	0.000	0.000	0.000	18.674	0.56
		B		0.000	0.000	0.000	0.000	0.18
		C		0.000	0.000	0.000	0.000	0.62
L4	39.22-0.00	A	1.900	0.000	0.000	0.000	20.006	0.58
		B		0.000	0.000	0.000	0.000	0.20
		C		0.000	0.000	0.000	0.000	0.69

Feed Line Center of Pressure

Section	Elevation ft	CP_x in	CP_z in	CP_x Ice in	CP_z Ice in
L1	147.50-115.42	0.0000	-0.1253	0.0000	-0.5782
L2	115.42-74.30	0.0000	-0.1262	0.0000	-0.6116
L3	74.30-39.22	0.0000	-0.1268	0.0000	-0.6241
L4	39.22-0.00	0.0000	-0.1272	0.0000	-0.6207

Shielding Factor Ka

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

Discrete Tower Loads

tnxTower Jacobs Engineering Group, Inc. 5449 Bells Ferry Rd Acworth, GA 30102 Phone: 770-701-2500 FAX: 770-701-2501	Job	147.5'-MP-WINDSOR PINE LANE	Page	5 of 16
	Project	BU 841793 WO 1337819	Date	12:29:34 12/27/16
	Client	Crown Castle	Designed by	J. Earnest

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz Lateral	Vert					
Level 149									
DB225-C	B	From Leg	4.00	0.00	0.000	149.00	No Ice 2.32	2.32	0.03
			0.00				1/2" Ice 4.18	4.18	0.04
			4.00				1" Ice 6.03	6.03	0.04
(4) 6' x 2" Mount Pipe	A	From Leg	4.00	0.00	0.000	149.00	No Ice 1.43	1.43	0.02
			0.00				1/2" Ice 1.92	1.92	0.03
			0.00				1" Ice 2.29	2.29	0.05
(4) 6' x 2" Mount Pipe	B	From Leg	4.00	0.00	0.000	149.00	No Ice 1.43	1.43	0.02
			0.00				1/2" Ice 1.92	1.92	0.03
			0.00				1" Ice 2.29	2.29	0.05
(4) 6' x 2" Mount Pipe	C	From Leg	4.00	0.00	0.000	149.00	No Ice 1.43	1.43	0.02
			0.00				1/2" Ice 1.92	1.92	0.03
			0.00				1" Ice 2.29	2.29	0.05
Platform Mount [LP 1201-1]	C	None			0.000	149.00	No Ice 23.10	23.10	2.10
							1/2" Ice 26.80	26.80	2.50
							1" Ice 30.50	30.50	2.90
Level 140									
Pipe Mount [PM 601-1]	A	From Leg	0.50	0.00	0.000	140.00	No Ice 3.00	0.90	0.07
			0.00				1/2" Ice 3.74	1.12	0.08
			0.00				1" Ice 4.48	1.34	0.09
Level 139									
DB225-C	B	From Leg	3.00	0.00	0.000	139.00	No Ice 2.32	2.32	0.03
			0.00				1/2" Ice 4.18	4.18	0.04
			-5.00				1" Ice 6.03	6.03	0.04
Side Arm Mount [SO 701-1]	B	From Leg	2.00	0.00	0.000	139.00	No Ice 0.85	1.67	0.07
			0.00				1/2" Ice 1.14	2.34	0.08
			0.00				1" Ice 1.43	3.01	0.09
Level 130									
HPA-65R-BUU-H6	A	From Leg	4.00	0.00	0.000	130.00	No Ice 9.66	6.45	0.05
			0.00				1/2" Ice 10.13	6.91	0.11
			0.00				1" Ice 10.61	7.38	0.18
HPA-65R-BUU-H8	C	From Leg	4.00	0.00	0.000	130.00	No Ice 13.59	9.13	0.05
			0.00				1/2" Ice 14.19	9.73	0.13
			0.00				1" Ice 14.80	10.34	0.22
HPA-65R-BUU-H6	B	From Leg	4.00	0.00	0.000	130.00	No Ice 9.66	6.45	0.05
			0.00				1/2" Ice 10.13	6.91	0.11
			0.00				1" Ice 10.61	7.38	0.18
QS66512-3	A	From Leg	4.00	0.00	0.000	130.00	No Ice 8.13	6.80	0.11
			0.00				1/2" Ice 8.59	7.27	0.16
			0.00				1" Ice 9.05	7.72	0.23
QS66512-3	B	From Leg	4.00	0.00	0.000	130.00	No Ice 8.13	6.80	0.11
			0.00				1/2" Ice 8.59	7.27	0.16
			0.00				1" Ice 9.05	7.72	0.23
AM-X-CD-16-65-00T-RET	C	From Leg	4.00	0.00	0.000	130.00	No Ice 8.02	4.64	0.05
			0.00				1/2" Ice 8.48	5.09	0.09
			0.00				1" Ice 8.94	5.54	0.15
AM-X-CD-16-65-00T-RET	B	From Leg	4.00	0.00	0.000	130.00	No Ice 8.02	4.64	0.05
			0.00				1/2" Ice 8.48	5.09	0.09
			0.00				1" Ice 8.94	5.54	0.15
P65-17-XLH-RR	A	From Leg	4.00	0.00	0.000	130.00	No Ice 11.47	6.80	0.06
			0.00				1/2" Ice 12.08	7.38	0.12
			0.00				1" Ice 12.71	7.98	0.19
TPA-65R-LCUUUU-H8	C	From Leg	4.00	0.00	0.000	130.00	No Ice 13.30	8.82	0.08
			0.00				1/2" Ice 13.90	9.42	0.16
			0.00				1" Ice 14.50	10.03	0.25
(2) TPX-070821	A	From Leg	4.00	0.00	0.000	130.00	No Ice 0.47	0.10	0.01
			0.00				1/2" Ice 0.56	0.15	0.01

tnxTower Jacobs Engineering Group, Inc. 5449 Bells Ferry Rd Acworth, GA 30102 Phone: 770-701-2500 FAX: 770-701-2501	Job	147.5'-MP-WINDSOR PINE LANE	Page	6 of 16
	Project	BU 841793 WO 1337819	Date	12:29:34 12/27/16
	Client	Crown Castle	Designed by	J. Earnest

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Lateral					
			0.00						
(2) TPX-070821	B	From Leg	4.00		0.000	130.00	1" Ice 0.66	0.20	0.02
			0.00				No Ice 0.47	0.10	0.01
			0.00				1/2" Ice 0.56	0.15	0.01
(2) TPX-070821	C	From Leg	4.00		0.000	130.00	1" Ice 0.66	0.20	0.02
			0.00				No Ice 0.47	0.10	0.01
			0.00				1/2" Ice 0.56	0.15	0.01
RRUS 32 B2	A	From Leg	4.00		0.000	130.00	1" Ice 0.66	0.20	0.02
			0.00				No Ice 2.73	1.67	0.05
			0.00				1/2" Ice 2.95	1.86	0.07
RRUS 32 B2	B	From Leg	4.00		0.000	130.00	1" Ice 3.18	2.05	0.10
			0.00				No Ice 2.73	1.67	0.05
			0.00				1/2" Ice 2.95	1.86	0.07
RRUS 32 B2	C	From Leg	4.00		0.000	130.00	1" Ice 3.18	2.05	0.10
			0.00				No Ice 2.73	1.67	0.05
			0.00				1/2" Ice 2.95	1.86	0.07
RRUS 32	A	From Leg	4.00		0.000	130.00	1" Ice 3.18	2.05	0.10
			0.00				No Ice 2.86	1.78	0.06
			0.00				1/2" Ice 3.08	1.97	0.08
RRUS 32	B	From Leg	4.00		0.000	130.00	1" Ice 3.32	2.17	0.10
			0.00				No Ice 2.86	1.78	0.06
			0.00				1/2" Ice 3.08	1.97	0.08
RRUS 32	C	From Leg	4.00		0.000	130.00	1" Ice 3.32	2.17	0.10
			0.00				No Ice 2.86	1.78	0.06
			0.00				1/2" Ice 3.08	1.97	0.08
(2) DTMABP7819VG12A	A	From Leg	4.00		0.000	130.00	1" Ice 3.32	2.17	0.10
			0.00				No Ice 0.98	0.34	0.02
			0.00				1/2" Ice 1.10	0.42	0.03
(2) DTMABP7819VG12A	B	From Leg	4.00		0.000	130.00	1" Ice 1.23	0.51	0.04
			0.00				No Ice 0.98	0.34	0.02
			0.00				1/2" Ice 1.10	0.42	0.03
(2) DTMABP7819VG12A	C	From Leg	4.00		0.000	130.00	1" Ice 1.23	0.51	0.04
			0.00				No Ice 0.98	0.34	0.02
			0.00				1/2" Ice 1.10	0.42	0.03
RRU-11	A	From Leg	4.00		0.000	130.00	1" Ice 1.23	0.51	0.04
			0.00				No Ice 1.64	1.26	0.04
			0.00				1/2" Ice 1.80	1.41	0.06
RRU-11	B	From Leg	4.00		0.000	130.00	1" Ice 1.97	1.57	0.08
			0.00				No Ice 1.64	1.26	0.04
			0.00				1/2" Ice 1.80	1.41	0.06
RRU-11	C	From Leg	4.00		0.000	130.00	1" Ice 1.97	1.57	0.08
			0.00				No Ice 1.64	1.26	0.04
			0.00				1/2" Ice 1.80	1.41	0.06
(2) DC6-48-60-18-8F	B	From Leg	4.00		0.000	130.00	1" Ice 1.97	1.57	0.08
			0.00				No Ice 0.92	0.92	0.03
			0.00				1/2" Ice 1.46	1.46	0.05
Platform Mount [LP 1301-1]	C	None	0.00		0.000	130.00	1" Ice 1.64	1.64	0.07
							No Ice 51.70	51.70	2.26
							1/2" Ice 62.70	62.70	2.94
							1" Ice 76.00	76.00	3.81
Level 118									
APXV18-206517S-C	A	From Leg	1.00		0.000	118.00	No Ice 5.17	3.04	0.03
			0.00				1/2" Ice 5.62	3.47	0.05
			0.00				1" Ice 6.08	3.91	0.09
APXV18-206517S-C	B	From Leg	1.00		0.000	118.00	No Ice 5.17	3.04	0.03
			0.00				1/2" Ice 5.62	3.47	0.05
			0.00				1" Ice 6.08	3.91	0.09
APXV18-206517S-C	C	From Leg	1.00		0.000	118.00	No Ice 5.17	3.04	0.03

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	Client	Crown Castle	Designed by	J. Earnest

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Lateral					
			ft	ft					
			0.00			1/2" Ice	5.62	3.47	0.05
			0.00			1" Ice	6.08	3.91	0.09
Pipe Mount [PM 601-3]	C	None			0.000	No Ice	4.39	4.39	0.20
						1/2" Ice	5.48	5.48	0.24
						1" Ice	6.57	6.57	0.28
6' x 2" Mount Pipe	A	From Leg	4.00		0.000	No Ice	1.43	1.43	0.02
			0.00			1/2" Ice	1.92	1.92	0.03
			0.00			1" Ice	2.29	2.29	0.05
6' x 2" Mount Pipe	B	From Leg	4.00		0.000	No Ice	1.43	1.43	0.02
			0.00			1/2" Ice	1.92	1.92	0.03
			0.00			1" Ice	2.29	2.29	0.05
6' x 2" Mount Pipe	C	From Leg	4.00		0.000	No Ice	1.43	1.43	0.02
			0.00			1/2" Ice	1.92	1.92	0.03
			0.00			1" Ice	2.29	2.29	0.05
Level 108									
LLPX310R w/ Mount Pipe	A	From Leg	3.00		0.000	No Ice	4.54	2.98	0.05
			0.00			1/2" Ice	4.89	3.53	0.08
			0.00			1" Ice	5.25	4.09	0.13
LLPX310R w/ Mount Pipe	B	From Leg	3.00		0.000	No Ice	4.54	2.98	0.05
			0.00			1/2" Ice	4.89	3.53	0.08
			0.00			1" Ice	5.25	4.09	0.13
LLPX310R w/ Mount Pipe	C	From Leg	3.00		0.000	No Ice	4.54	2.98	0.05
			0.00			1/2" Ice	4.89	3.53	0.08
			0.00			1" Ice	5.25	4.09	0.13
RRH-2WB	A	From Leg	3.00		0.000	No Ice	2.30	0.78	0.04
			0.00			1/2" Ice	2.50	0.92	0.06
			0.00			1" Ice	2.69	1.06	0.08
RRH-2WB	B	From Leg	3.00		0.000	No Ice	2.30	0.78	0.04
			0.00			1/2" Ice	2.50	0.92	0.06
			0.00			1" Ice	2.69	1.06	0.08
RRH-2WB	C	From Leg	3.00		0.000	No Ice	2.30	0.78	0.04
			0.00			1/2" Ice	2.50	0.92	0.06
			0.00			1" Ice	2.69	1.06	0.08
T-Arm Mount [TA 702-3]	C	None			0.000	No Ice	5.64	5.64	0.34
						1/2" Ice	6.55	6.55	0.43
						1" Ice	7.46	7.46	0.52
*****Level 85P*****									
WL 14-69/S	B	From Leg	2.00		0.000	No Ice	0.63	0.63	0.01
			0.00			1/2" Ice	1.02	1.02	0.02
			-2.00			1" Ice	1.42	1.42	0.04
WH 14-69/S	B	From Leg	2.00		0.000	No Ice	2.32	2.32	0.00
			0.00			1/2" Ice	3.37	3.37	0.00
			0.00			1" Ice	4.42	4.42	0.00
WL 14-69/S	C	From Leg	2.00		0.000	No Ice	0.63	0.63	0.01
			0.00			1/2" Ice	1.02	1.02	0.02
			0.00			1" Ice	1.42	1.42	0.04
WL 14-69/S	C	From Leg	2.00		0.000	No Ice	0.63	0.63	0.01
			0.00			1/2" Ice	1.02	1.02	0.02
			-2.00			1" Ice	1.42	1.42	0.04
J105-HI	B	From Leg	2.00		0.000	No Ice	0.32	4.84	0.01
			0.00			1/2" Ice	0.42	5.21	0.03
			-7.00			1" Ice	0.52	5.59	0.06
Side Arm Mount [SO 104-3]	C	None			0.000	No Ice	3.30	3.30	0.29
						1/2" Ice	4.13	4.13	0.32
						1" Ice	4.96	4.96	0.35
10' x 3" Pipe Mount	B	From Leg	2.00		0.000	No Ice	3.00	3.00	0.08
			0.00			1/2" Ice	4.03	4.03	0.10

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	Client	Crown Castle	Designed by	J. Earnest

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz Lateral	Vert						
			ft	ft	°	ft	ft ²	ft ²	K	
10' x 3" Pipe Mount	C	From Leg	0.00				1" Ice	5.03	5.03	0.13
			2.00	0.000	81.50	No Ice	3.00	3.00	0.08	
			0.00			1/2" Ice	4.03	4.03	0.10	
			0.00			1" Ice	5.03	5.03	0.13	

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets:		Azimuth Adjustment	3 dB Beam Width	Elevation	Outside Diameter	Aperture Area	Weight	
				Horz Lateral	Vert							
				ft	ft	°	°	ft	ft	ft ²	K	
HP2-102	A	Paraboloid w/Radome	From Leg	1.00		0.000		140.00	2.00	No Ice	3.14	0.03
				0.00					1/2" Ice	3.41	0.04	
				0.00					1" Ice	3.68	0.06	

VHLP2-18	A	Paraboloid w/Shroud (HP)	From Leg	3.00		0.000		108.00	2.17	No Ice	3.72	0.03
				0.00					1/2" Ice	4.01	0.05	
				-1.00					1" Ice	4.30	0.07	
VHLP800-11	A	Paraboloid w/Shroud (HP)	From Leg	3.00		0.000		108.00	2.80	No Ice	6.16	0.05
				0.00					1/2" Ice	6.53	0.08	
				1.00					1" Ice	6.90	0.12	
VHLP2-18	B	Paraboloid w/Shroud (HP)	From Leg	3.00		0.000		108.00	2.17	No Ice	3.72	0.03
				0.00					1/2" Ice	4.01	0.05	
				-1.00					1" Ice	4.30	0.07	
VHLP800-11	C	Paraboloid w/Shroud (HP)	From Leg	3.00		0.000		108.00	2.80	No Ice	6.16	0.05
				0.00					1/2" Ice	6.53	0.08	
				1.00					1" Ice	6.90	0.12	

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

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<i>Comb. No.</i>	<i>Description</i>
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
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

<i>Section No.</i>	<i>Elevation ft</i>	<i>Component Type</i>	<i>Condition</i>	<i>Gov. Load Comb.</i>	<i>Axial K</i>	<i>Major Axis Moment kip-ft</i>	<i>Minor Axis Moment kip-ft</i>
L1	147.5 - 115.417	Pole	Max Tension	33	0.00	0.00	0.00
			Max. Compression	26	-23.55	-1.45	-0.51
			Max. Mx	8	-8.72	-199.57	0.87
			Max. My	14	-8.68	0.45	-202.94
			Max. Vy	8	13.00	-199.57	0.87
			Max. Vx	14	13.19	0.45	-202.94
			Max. Torque	16			1.22
L2	115.417 - 74.2967	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-39.18	-1.43	-0.73
			Max. Mx	8	-15.98	-899.16	7.89
			Max. My	14	-15.94	6.50	-914.82
			Max. Vy	8	20.52	-899.16	7.89
			Max. Vx	14	20.96	6.50	-914.82
			Max. Torque	4			-1.82

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L3	74.2967 - 39.2167	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-51.01	-1.43	-0.19
			Max. Mx	8	-23.61	-1660.03	18.00
			Max. My	14	-23.58	14.86	-1690.83
			Max. Vy	8	23.91	-1660.03	18.00
			Max. Vx	14	24.35	14.86	-1690.83
			Max. Torque	4			-1.80
L4	39.2167 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-69.95	-1.43	0.56
			Max. Mx	8	-37.06	-2820.87	31.06
			Max. My	14	-37.06	25.67	-2871.15
			Max. Vy	8	27.69	-2820.87	31.06
			Max. Vx	14	28.12	25.67	-2871.15
			Max. Torque	4			-1.68

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	33	69.95	0.05	-9.30
	Max. H _x	20	37.08	27.64	-0.18
	Max. H _z	2	37.08	-0.27	27.97
	Max. M _x	2	2855.62	-0.27	27.97
	Max. M _z	8	2820.87	-27.67	0.29
	Max. Torsion	16	1.55	13.99	-24.48
	Min. Vert	23	27.81	23.81	13.82
	Min. H _x	8	37.08	-27.67	0.29
	Min. H _z	14	37.08	0.24	-28.09
	Min. M _x	14	-2871.15	0.24	-28.09
	Min. M _z	20	-2815.32	27.64	-0.18
	Min. Torsion	4	-1.55	-14.04	24.34

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead Only	30.90	0.00	0.00	0.15	-0.73	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	37.08	0.27	-27.97	-2855.62	-31.05	1.28
0.9 Dead+1.6 Wind 0 deg - No Ice	27.81	0.27	-27.97	-2827.90	-30.52	1.28
1.2 Dead+1.6 Wind 30 deg - No Ice	37.08	14.04	-24.34	-2486.06	-1434.19	1.55
0.9 Dead+1.6 Wind 30 deg - No Ice	27.81	14.04	-24.34	-2461.93	-1420.02	1.55
1.2 Dead+1.6 Wind 60 deg - No Ice	37.08	24.03	-14.22	-1453.36	-2451.17	0.86
0.9 Dead+1.6 Wind 60 deg - No Ice	27.81	24.03	-14.22	-1439.29	-2427.11	0.86
1.2 Dead+1.6 Wind 90 deg - No Ice	37.08	27.67	-0.29	-31.06	-2820.87	-0.14

<p style="text-align: center;">tnxTower</p> <p>Jacobs Engineering Group, Inc. 5449 Bells Ferry Rd Acworth, GA 30102 Phone: 770-701-2500 FAX: 770-701-2501</p>	Job	147.5'-MP-WINDSOR PINE LANE	Page	11 of 16
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Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Ice						
0.9 Dead+1.6 Wind 90 deg - No Ice	27.81	27.67	-0.29	-30.82	-2793.21	-0.13
Ice						
1.2 Dead+1.6 Wind 120 deg - No Ice	37.08	23.82	13.90	1419.67	-2428.01	-0.30
0.9 Dead+1.6 Wind 120 deg - No Ice	27.81	23.82	13.90	1405.81	-2404.16	-0.30
1.2 Dead+1.6 Wind 150 deg - No Ice	37.08	13.61	24.29	2481.82	-1386.48	-0.59
0.9 Dead+1.6 Wind 150 deg - No Ice	27.81	13.61	24.29	2457.63	-1372.75	-0.58
1.2 Dead+1.6 Wind 180 deg - No Ice	37.08	-0.24	28.09	2871.15	25.67	-1.26
0.9 Dead+1.6 Wind 180 deg - No Ice	27.81	-0.24	28.09	2843.19	25.66	-1.25
1.2 Dead+1.6 Wind 210 deg - No Ice	37.08	-13.99	24.48	2502.96	1428.20	-1.55
0.9 Dead+1.6 Wind 210 deg - No Ice	27.81	-13.99	24.48	2478.58	1414.55	-1.55
1.2 Dead+1.6 Wind 240 deg - No Ice	37.08	-23.99	14.31	1465.32	2444.97	-0.98
0.9 Dead+1.6 Wind 240 deg - No Ice	27.81	-23.99	14.31	1451.03	2421.43	-0.98
1.2 Dead+1.6 Wind 270 deg - No Ice	37.08	-27.64	0.18	21.17	2815.32	0.18
0.9 Dead+1.6 Wind 270 deg - No Ice	27.81	-27.64	0.18	20.92	2788.20	0.18
1.2 Dead+1.6 Wind 300 deg - No Ice	37.08	-23.81	-13.82	-1408.53	2424.86	0.40
0.9 Dead+1.6 Wind 300 deg - No Ice	27.81	-23.81	-13.82	-1394.88	2401.51	0.40
1.2 Dead+1.6 Wind 330 deg - No Ice	37.08	-13.65	-24.11	-2460.66	1388.73	0.55
0.9 Dead+1.6 Wind 330 deg - No Ice	27.81	-13.65	-24.11	-2436.78	1375.46	0.54
1.2 Dead+1.0 Ice+1.0 Temp	69.95	0.00	-0.00	-0.56	-1.43	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	69.95	0.06	-9.28	-974.87	-8.45	1.02
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	69.95	4.64	-8.06	-847.34	-488.09	0.89
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	69.95	7.97	-4.69	-493.55	-836.72	0.40
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	69.95	9.18	-0.06	-7.70	-963.63	-0.21
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	69.95	7.92	4.62	484.63	-831.30	-0.59
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	69.95	4.54	8.05	845.10	-477.08	-0.85
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	69.95	-0.05	9.30	977.29	4.55	-1.01
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	69.95	-4.63	8.09	850.15	484.04	-0.89
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	69.95	-7.96	4.71	495.18	832.68	-0.44
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	69.95	-9.18	0.04	4.38	959.69	0.21
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	69.95	-7.92	-4.60	-483.16	827.80	0.61
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	69.95	-4.55	-8.01	-841.42	474.76	0.85
Dead+Wind 0 deg - Service	30.90	0.06	-5.98	-607.65	-7.19	0.28

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Load Combination	Vertical	Shear _x	Shear _z	Overturning Moment, M _x	Overturning Moment, M _z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 30 deg - Service	30.90	3.00	-5.21	-529.00	-305.82	0.43
Dead+Wind 60 deg - Service	30.90	5.14	-3.04	-309.20	-522.26	0.35
Dead+Wind 90 deg - Service	30.90	5.92	-0.06	-6.50	-600.93	0.16
Dead+Wind 120 deg - Service	30.90	5.10	2.98	302.25	-517.31	0.11
Dead+Wind 150 deg - Service	30.90	2.91	5.20	528.32	-295.66	-0.02
Dead+Wind 180 deg - Service	30.90	-0.05	6.01	611.19	4.89	-0.27
Dead+Wind 210 deg - Service	30.90	-2.99	5.24	532.84	303.40	-0.43
Dead+Wind 240 deg - Service	30.90	-5.13	3.06	311.98	519.79	-0.39
Dead+Wind 270 deg - Service	30.90	-5.91	0.04	4.62	598.59	-0.16
Dead+Wind 300 deg - Service	30.90	-5.10	-2.96	-299.65	515.48	-0.09
Dead+Wind 330 deg - Service	30.90	-2.92	-5.16	-523.58	294.98	0.02

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-30.90	0.00	0.00	30.90	0.00	0.000%
2	0.27	-37.08	-27.97	-0.27	37.08	27.97	0.000%
3	0.27	-27.81	-27.97	-0.27	27.81	27.97	0.000%
4	14.04	-37.08	-24.34	-14.04	37.08	24.34	0.000%
5	14.04	-27.81	-24.34	-14.04	27.81	24.34	0.000%
6	24.03	-37.08	-14.22	-24.03	37.08	14.22	0.000%
7	24.03	-27.81	-14.22	-24.03	27.81	14.22	0.000%
8	27.67	-37.08	-0.29	-27.67	37.08	0.29	0.000%
9	27.67	-27.81	-0.29	-27.67	27.81	0.29	0.000%
10	23.82	-37.08	13.90	-23.82	37.08	-13.90	0.000%
11	23.82	-27.81	13.90	-23.82	27.81	-13.90	0.000%
12	13.61	-37.08	24.29	-13.61	37.08	-24.29	0.000%
13	13.61	-27.81	24.29	-13.61	27.81	-24.29	0.000%
14	-0.24	-37.08	28.09	0.24	37.08	-28.09	0.000%
15	-0.24	-27.81	28.09	0.24	27.81	-28.09	0.000%
16	-13.99	-37.08	24.48	13.99	37.08	-24.48	0.000%
17	-13.99	-27.81	24.48	13.99	27.81	-24.48	0.000%
18	-23.99	-37.08	14.31	23.99	37.08	-14.31	0.000%
19	-23.99	-27.81	14.31	23.99	27.81	-14.31	0.000%
20	-27.64	-37.08	0.18	27.64	37.08	-0.18	0.000%
21	-27.64	-27.81	0.18	27.64	27.81	-0.18	0.000%
22	-23.81	-37.08	-13.82	23.81	37.08	13.82	0.000%
23	-23.81	-27.81	-13.82	23.81	27.81	13.82	0.000%
24	-13.65	-37.08	-24.11	13.65	37.08	24.11	0.000%
25	-13.65	-27.81	-24.11	13.65	27.81	24.11	0.000%
26	0.00	-69.95	0.00	-0.00	69.95	0.00	0.000%
27	0.06	-69.95	-9.28	-0.06	69.95	9.28	0.000%
28	4.64	-69.95	-8.06	-4.64	69.95	8.06	0.000%
29	7.97	-69.95	-4.69	-7.97	69.95	4.69	0.000%
30	9.18	-69.95	-0.06	-9.18	69.95	0.06	0.000%
31	7.92	-69.95	4.62	-7.92	69.95	-4.62	0.000%
32	4.54	-69.95	8.05	-4.54	69.95	-8.05	0.000%
33	-0.05	-69.95	9.30	0.05	69.95	-9.30	0.000%
34	-4.63	-69.95	8.09	4.63	69.95	-8.09	0.000%
35	-7.96	-69.95	4.71	7.96	69.95	-4.71	0.000%
36	-9.18	-69.95	0.04	9.18	69.95	-0.04	0.000%
37	-7.92	-69.95	-4.60	7.92	69.95	4.60	0.000%
38	-4.55	-69.95	-8.01	4.55	69.95	8.01	0.000%
39	0.06	-30.90	-5.98	-0.06	30.90	5.98	0.000%
40	3.00	-30.90	-5.21	-3.00	30.90	5.21	0.000%
41	5.14	-30.90	-3.04	-5.14	30.90	3.04	0.000%

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Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
42	5.92	-30.90	-0.06	-5.92	30.90	0.06	0.000%
43	5.10	-30.90	2.98	-5.10	30.90	-2.98	0.000%
44	2.91	-30.90	5.20	-2.91	30.90	-5.20	0.000%
45	-0.05	-30.90	6.01	0.05	30.90	-6.01	0.000%
46	-2.99	-30.90	5.24	2.99	30.90	-5.24	0.000%
47	-5.13	-30.90	3.06	5.13	30.90	-3.06	0.000%
48	-5.91	-30.90	0.04	5.91	30.90	-0.04	0.000%
49	-5.10	-30.90	-2.96	5.10	30.90	2.96	0.000%
50	-2.92	-30.90	-5.16	2.92	30.90	5.16	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.0000001	0.0000001
2	Yes	5	0.0000001	0.00009391
3	Yes	5	0.0000001	0.00004223
4	Yes	6	0.0000001	0.00006431
5	Yes	5	0.0000001	0.00060254
6	Yes	6	0.0000001	0.00006097
7	Yes	5	0.0000001	0.00057083
8	Yes	4	0.0000001	0.00079043
9	Yes	4	0.0000001	0.00045522
10	Yes	6	0.0000001	0.00006050
11	Yes	5	0.0000001	0.00056738
12	Yes	6	0.0000001	0.00006133
13	Yes	5	0.0000001	0.00057471
14	Yes	4	0.0000001	0.00063847
15	Yes	4	0.0000001	0.00036214
16	Yes	6	0.0000001	0.00006052
17	Yes	5	0.0000001	0.00056615
18	Yes	6	0.0000001	0.00006364
19	Yes	5	0.0000001	0.00059690
20	Yes	4	0.0000001	0.00064663
21	Yes	4	0.0000001	0.00036232
22	Yes	6	0.0000001	0.00006027
23	Yes	5	0.0000001	0.00056581
24	Yes	6	0.0000001	0.00005968
25	Yes	5	0.0000001	0.00055962
26	Yes	4	0.0000001	0.00001042
27	Yes	5	0.0000001	0.00070163
28	Yes	6	0.0000001	0.00013628
29	Yes	6	0.0000001	0.00012751
30	Yes	5	0.0000001	0.00067428
31	Yes	6	0.0000001	0.00012646
32	Yes	6	0.0000001	0.00013182
33	Yes	5	0.0000001	0.00070000
34	Yes	6	0.0000001	0.00012651
35	Yes	6	0.0000001	0.00013257
36	Yes	5	0.0000001	0.00066943
37	Yes	6	0.0000001	0.00012685
38	Yes	6	0.0000001	0.00012383
39	Yes	4	0.0000001	0.00009001
40	Yes	4	0.0000001	0.00045411
41	Yes	4	0.0000001	0.00036996
42	Yes	4	0.0000001	0.00004900

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43	Yes	4	0.00000001	0.00039063
44	Yes	4	0.00000001	0.00039021
45	Yes	4	0.00000001	0.00007303
46	Yes	4	0.00000001	0.00036186
47	Yes	4	0.00000001	0.00043835
48	Yes	4	0.00000001	0.00005653
49	Yes	4	0.00000001	0.00036656
50	Yes	4	0.00000001	0.00036995

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	147.5 - 115.417	20.06	46	1.131	0.003
L2	119.327 - 74.2967	13.50	46	1.071	0.002
L3	79.0167 - 39.2167	5.78	46	0.697	0.001
L4	44.7967 - 0	1.86	46	0.377	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
149.00	DB225-C	46	20.06	1.131	0.003	58092
140.00	HP2-102	46	18.27	1.126	0.003	38728
139.00	DB225-C	46	18.04	1.125	0.003	34172
130.00	HPA-65R-BUU-H6	46	15.93	1.111	0.002	16597
118.00	APXV18-206517S-C	46	13.20	1.063	0.002	10041
109.00	VHLP800-11	46	11.27	1.000	0.002	8317
108.00	LLPX310R w/ Mount Pipe	46	11.06	0.991	0.002	8164
107.00	VHLP2-18	46	10.86	0.983	0.002	8017
85.00	WL 14-69/S	46	6.74	0.760	0.001	5737
81.50	10' x 3" Pipe Mount	46	6.17	0.723	0.001	5492

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	147.5 - 115.417	94.34	16	5.335	0.013
L2	119.327 - 74.2967	63.48	16	5.046	0.007
L3	79.0167 - 39.2167	27.19	16	3.280	0.004
L4	44.7967 - 0	8.75	16	1.772	0.002

Critical Deflections and Radius of Curvature - Design Wind

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Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
149.00	DB225-C	16	94.34	5.335	0.013	12590
140.00	HP2-102	16	85.95	5.310	0.011	8393
139.00	DB225-C	16	84.84	5.305	0.011	7405
130.00	HPA-65R-BUU-H6	16	74.90	5.236	0.009	3595
118.00	APXV18-206517S-C	16	62.10	5.011	0.007	2171
109.00	VHLP800-11	16	53.01	4.711	0.006	1793
108.00	LLPX310R w/ Mount Pipe	16	52.03	4.671	0.006	1759
107.00	VHLP2-18	16	51.06	4.631	0.006	1727
85.00	WL 14-69/S	16	31.69	3.579	0.005	1228
81.50	10' x 3" Pipe Mount	16	29.01	3.403	0.004	1175

Compression Checks

Pole Design Data

Section No.	Elevation	Size	L	L _u	Kl/r	A	P _u	φP _n	Ratio
	ft		ft	ft		in ²	K	K	$\frac{P_u}{\phi P_n}$
L1	147.5 - 115.417 (1)	TP31.25x24x0.2188	32.08	0.00	0.0	20.9319	-8.67	1407.90	0.006
L2	115.417 - 74.2967 (2)	TP37.75x29.9289x0.2188	45.03	0.00	0.0	25.4892	-15.93	1571.94	0.010
L3	74.2967 - 39.2167 (3)	TP44.625x36.4927x0.3125	39.80	0.00	0.0	42.8216	-23.57	2877.56	0.008
L4	39.2167 - 0 (4)	TP51.25x42.8598x0.375	44.80	0.00	0.0	60.5540	-37.06	4097.19	0.009

Pole Bending Design Data

Section No.	Elevation	Size	M _{ux}	φM _{rx}	Ratio	M _{uy}	φM _{ny}	Ratio
	ft		kip-ft	kip-ft	$\frac{M_{ux}}{\phi M_{rx}}$	kip-ft	kip-ft	$\frac{M_{uy}}{\phi M_{ny}}$
L1	147.5 - 115.417 (1)	TP31.25x24x0.2188	202.99	873.33	0.232	0.00	873.33	0.000
L2	115.417 - 74.2967 (2)	TP37.75x29.9289x0.2188	917.25	1188.92	0.772	0.00	1188.92	0.000
L3	74.2967 - 39.2167 (3)	TP44.625x36.4927x0.3125	1696.83	2556.18	0.664	0.00	2556.18	0.000
L4	39.2167 - 0 (4)	TP51.25x42.8598x0.375	2881.77	4288.38	0.672	0.00	4288.38	0.000

Pole Shear Design Data

Section No.	Elevation	Size	Actual V _u	φV _n	Ratio	Actual T _u	φT _n	Ratio
	ft		K	K	$\frac{V_u}{\phi V_n}$	kip-ft	kip-ft	$\frac{T_u}{\phi T_n}$
L1	147.5 - 115.417 (1)	TP31.25x24x0.2188	13.25	703.95	0.019	0.81	1748.80	0.000

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Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L2	115.417 - 74.2967 (2)	TP37.75x29.9289x0.2188	21.06	785.97	0.027	1.82	2380.73	0.001
L3	74.2967 - 39.2167 (3)	TP44.625x36.4927x0.3125	24.45	1438.78	0.017	1.70	5118.60	0.000
L4	39.2167 - 0 (4)	TP51.25x42.8598x0.375	28.22	2048.59	0.014	1.56	8587.25	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	147.5 - 115.417 (1)	0.006	0.232	0.000	0.019	0.000	0.239	1.000	4.8.2 ✓
L2	115.417 - 74.2967 (2)	0.010	0.772	0.000	0.027	0.001	0.782	1.000	4.8.2 ✓
L3	74.2967 - 39.2167 (3)	0.008	0.664	0.000	0.017	0.000	0.672	1.000	4.8.2 ✓
L4	39.2167 - 0 (4)	0.009	0.672	0.000	0.014	0.000	0.681	1.000	4.8.2 ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail	
L1	147.5 - 115.417	Pole	TP31.25x24x0.2188	1	-8.67	1407.90	23.9	Pass	
L2	115.417 - 74.2967	Pole	TP37.75x29.9289x0.2188	2	-15.93	1571.94	78.2	Pass	
L3	74.2967 - 39.2167	Pole	TP44.625x36.4927x0.3125	3	-23.57	2877.56	67.2	Pass	
L4	39.2167 - 0	Pole	TP51.25x42.8598x0.375	4	-37.06	4097.19	68.1	Pass	
							Summary		
							Pole (L2)	78.2	Pass
							RATING =	78.2	Pass

Square, Stiffened / Unstiffened Base Plate, Any Rod Material - Rev. F / G

- Assumptions:**
- 1) Rod groups at corners. Total # rods divisible by 4. Maximum total # of rods = 48 (12 per Corner).
 - 2) Rod Spacing = Straight Center-to-Center distance between any (2) adjacent rods (same corner)
 - 3) Clear space between bottom of leveling nut and top of concrete **not** exceeding $(1) \times (\text{Rod Diameter})$

Site Data

BU#:	841793
Site Name:	WINDSOR PINE LANE
App #:	367947 Rev.02

Anchor Rod Data

Eta Factor, η	0.5	TIA G (Fig. 4-4)
Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Yield, F_y :	75	ksi
Strength, F_u :	100	ksi
Bolt Circle:	58	in
Anchor Spacing:	6	in

Plate Data

W=Side:	57	in
Thick:	2.75	in
Grade:	36	ksi
Clip Distance:	11	in

Stiffener Data (Welding at both sides)

Configuration:	Unstiffened	
Weld Type:		**
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data

Diam:	51.25	in
Thick:	0.375	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round

Base Reactions

TIA Revision:	G	
Factored Moment, M_u :	2882	ft-kips
Factored Axial, P_u :	37	kips
Factored Shear, V_u :	28	kips

Anchor Rod Results

TIA G --> Max Rod $(C_u + V_u/\eta)$:	154.9 Kips
Axial Design Strength, $\Phi * F_u * A_{net}$:	260.0 Kips
Anchor Rod Stress Ratio:	59.6% Pass

Base Plate Results

Base Plate Stress:	27.8 ksi
PL Design Bending Strength, $\Phi * F_y$:	32.4 ksi
Base Plate Stress Ratio:	85.7% Pass

Flexural Check

Yield Line (in):	29.36
Max PL Length:	29.36

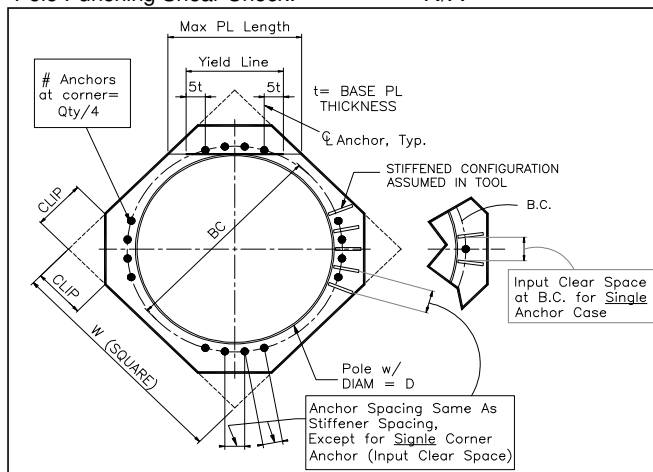
N/A - Unstiffened

Stiffener Results

Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, $f_b/F_b + (f_v/F_v)^2$:	N/A
Plate Tension+Shear, $f_t/F_t + (f_v/F_v)^2$:	N/A
Plate Comp. (AISC Bracket):	N/A

Pole Results

Pole Punching Shear Check:	N/A
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** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

BU:	841793
Site Name:	WINDSOR PINE LANE
App Number:	367947 Rev.02
Work Order:	1337819



Monopole Drilled Pier

Input

Criteria

TIA Revision:	G
ACI 318 Revision:	2008
Seismic Category:	B

Forces

Compression	37 kips
Shear	28 kips
Moment	2882 k-ft
Swelling Force	0 kips

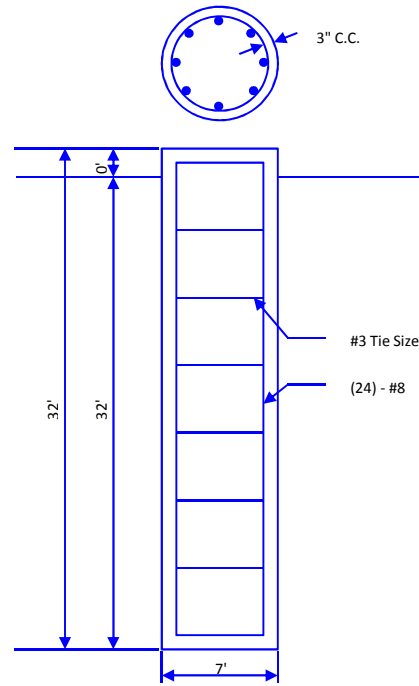
Foundation Dimensions

Pier Diameter:	7 ft
Ext. above grade:	0 ft
Depth below grade:	32 ft

Material Properties

Number of Rebar:	24 *Steel is unknown
Rebar Size:	8 0.33% code minimum was assumed
Tie Size	3
Rebar tensile strength:	60 ksi
Concrete Strength:	3000 psi
Ultimate Concrete Strain	0.003 in/in
Clear Cover to Ties:	3 in

Soil Profile: 1



Layer	Thickness (ft)	From (ft)	To (ft)	Unit Weight (pcf)	Cohesion (psf)	Friction Angle (deg)	Ultimate Uplift Friction (ksf)	Ultimate Comp. Skin Friction (ksf)	Ultimate Bearing Capacity (ksf)	SPT 'N' Counts
1	3.33	0	3.33	120	0	0			0	
2	3.67	3.33	7	120	0	30			0	
3	25	7	32	50	500	0			3	

Analysis Results

Soil Lateral Capacity

Depth to Zero Shear:	4.97 ft
Max Moment, Mu:	3004.79 k-ft
Soil Safety Factor:	1.84
Safety Factor Req'd:	1.33
RATING:	72.2%

Soil Axial Capacity

Skin Friction (k):	217.10 kips
End Bearing (k):	86.59 kips
Comp. Capacity (k), φCn:	303.69 kips
Comp. (k), Cu:	37.00 kips
RATING:	12.2%

Concrete/Steel Check

Mu (from soil analysis)	3004.79 k-ft
φMn	3204.68 k-ft
RATING:	93.8%

rho provided	0.34
rho required	0.33 OK

Rebar Spacing	8.98
Spacing required	16.00 OK

Dev. Length required	26.78
Dev. Length provided	43.82 OK

Overall Foundation Rating: 93.8%



Radio Frequency Emissions Analysis Report

AT&T Existing Facility

Site ID: CT1137

Windsor Pine Lane
50 Pine Lane
Windsor, CT 06095

December 12, 2016

Centerline Communications Project Number: 950006-002

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	8.81 %



December 12, 2016

AT&T Mobility – New England
Attn: John Benedetto, RF Manager
550 Cochituate Road
Suite 550 – 13&14
Framingham, MA 06040

Emissions Analysis for Site: **CT1137 – Windsor Pine Lane**

Centerline Communications, LLC (“Centerline”) was directed to analyze the proposed AT&T facility located at **50 Pine Lane, Windsor, CT**, for the purpose of determining whether the emissions from the Proposed AT&T Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The number of $\mu\text{W}/\text{cm}^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The general population exposure limits for the 700 and 850 MHz Bands are approximately $467 \mu\text{W}/\text{cm}^2$ and $567 \mu\text{W}/\text{cm}^2$ respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 2300 MHz (WCS) bands is $1000 \mu\text{W}/\text{cm}^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.



Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.



CALCULATIONS

Calculations were performed for the proposed AT&T Wireless antenna facility located at **50 Pine Lane, Windsor, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since AT&T is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. All power values expressed and analyzed are maximum power levels expected to be used on all radios.

All emissions values for additional carriers were taken from the Connecticut Siting Council (CSC) active MPE database. Values in this database are provided by the individual carriers themselves

For each sector the following channel counts, frequency bands and power levels were utilized as shown in *Table 1*:

Technology	Frequency Band	Channel Count	Transmit Power per Channel (W)
UMTS	850 MHz	2	30
UMTS	1900 MHz (PCS)	2	30
LTE	700 MHz	2	60
LTE	1900 MHz (PCS)	2	60
GSM	850 MHz	2	30
GSM	1900 MHz (PCS)	2	30
LTE	2300 MHz (WCS)	2	60

Table 1: Channel Data Table



The following antennas listed in *Table 2* were used in the modeling for transmission in the 700 MHz, 850 MHz, 1900 MHz (PCS) and 2300 MHz (WCS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	Powerwave P65-17-XLH-RR	130
A	2	CCI HPA-65R-BUU-H6	130
A	3	Quintel QS66512-2	130
B	1	KMW AM-X-CD-16-65-00T-RET	130
B	2	CCI HPA-65R-BUU-H8	130
B	3	CCI TPA-65R-LCUUUU-H8	130
C	1	KMW AM-X-CD-16-65-00T-RET	130
C	2	CCI HPA-65R-BUU-H6	130
C	3	Quintel QS66512-2	130

Table 2: Antenna Data

All calculations were done with respect to uncontrolled / general public threshold limits.



RESULTS

Per the calculations completed for the proposed AT&T configurations *Table 3* shows resulting emissions power levels and percentages of the FCC’s allowable general population limit.

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP(W)	MPE %
Antenna A1	Powerwave P65-17-XLH-RR	850 MHz / 1900 MHz (PCS)	15.1 / 15.1	4	120	3,883.12	1.25
Antenna A2	CCI HPA-65R-BUU-H6	700 MHz / 1900 MHz (PCS)	11.95 / 14.75	4	240	5,462.56	1.78
Antenna A3	Quintel QS66512-2	850 MHz / 1900 MHz (PCS) / 2300 MHz (WCS)	11.35 / 13.85	6	240	5,940.62	1.54
Sector A Composite MPE%							4.57
Antenna B1	KMW AM-X-CD-16-65-00T-RET	850 MHz / 1900 MHz (PCS)	13.85 / 15.25	4	120	3,465.76	1.07
Antenna B2	CCI HPA-65R-BUU-H8	700 MHz / 1900 MHz (PCS)	13.15 / 14.95	4	240	6,229.75	2.12
Antenna B3	CCI TPA-65R-LCUUUU-H8	850 MHz / 1900 MHz (PCS) / 2300 MHz (WCS)	13.45 / 13.75 / 14.45	6	240	6,094.03	1.66
Sector B Composite MPE%							4.85
Antenna C1	KMW AM-X-CD-16-65-00T-RET	850 MHz / 1900 MHz (PCS)	13.85 / 15.25	4	120	3,465.76	1.07
Antenna C2	CCI HPA-65R-BUU-H6	700 MHz / 1900 MHz (PCS)	11.95 / 14.75	4	240	5,462.56	1.78
Antenna C3	Quintel QS66512-2	850 MHz / 1900 MHz (PCS) / 2300 MHz (WCS)	11.35 / 13.85	6	240	5,940.62	1.54
Sector C Composite MPE%							4.38

Table 3: AT&T Emissions Levels



The Following table (*table 4*) shows all additional carriers on site and their MPE% as recorded in the CSC active MPE database for this facility along with the newly calculated maximum AT&T MPE contributions per this report. FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. For this site, the sector with the largest calculated MPE% is **Sector B**. *Table 5* below shows a summary for each AT&T Sector as well as the composite MPE value for the site.

Site Composite MPE%	
Carrier	MPE%
AT&T – Max Sector Value	4.85 %
EYE Tower	0.00 %
Town of Windsor	0.27 %
MetroPCS	0.94 %
Clearwire	0.17 %
Nextel	1.65 %
Police UHF	0.26 %
Police Back up repeater	0.10 %
Hartford County Fire	0.08 %
State Police	0.36 %
NPSAC	0.01 %
RAFS	0.12 %
Site Total MPE %:	8.81 %

Table 4: All Carrier MPE Contributions

AT&T Sector A Total:	4.57 %
AT&T Sector B Total:	4.85 %
AT&T Sector C Total:	4.38 %
Site Total:	8.81 %

Table 5: Site MPE Summary



Per FCC OET 65, carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. *Table 6* below details a breakdown by frequency band and technology for the MPE power values for the maximum calculated AT&T sector(s). For this site, the sector with the largest calculated MPE% is **Sector B**.

AT&T _ Frequency Band / Technology (Sector B)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu\text{W}/\text{cm}^2$)	Frequency (MHz)	Allowable MPE ($\mu\text{W}/\text{cm}^2$)	Calculated % MPE
AT&T 850 MHz UMTS	2	727.98	130	3.40	850 MHz	567	0.60%
AT&T 1900 MHz (PCS) UMTS	2	1,004.90	130	4.70	1900 MHz (PCS)	1000	0.47%
AT&T 700 MHz LTE	2	1,239.23	130	5.79	700 MHz	467	1.24%
AT&T 1900 MHz (PCS) LTE	2	1,875.65	130	8.77	1900 MHz (PCS)	1000	0.88%
AT&T 850 MHz GSM	2	663.93	130	3.10	850 MHz	567	0.55%
AT&T 1900 MHz (PCS) GSM	2	711.41	130	3.33	1900 MHz (PCS)	1000	0.33%
AT&T 2300 MHz (WCS) LTE	2	1,671.67	130	7.82	2300 MHz (WCS)	1000	0.78%
						Total:	4.85%

Table 6: AT&T Maximum Sector MPE Power Values



Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general public exposure to RF Emissions.

The anticipated maximum composite contributions from the AT&T facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general public exposure to RF Emissions are shown here:

AT&T Sector	Power Density Value (%)
Sector A:	4.57 %
Sector B:	4.85 %
Sector C:	4.38 %
AT&T Maximum Total (per sector):	4.85 %
Site Total:	8.81 %
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **8.81 %** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.

A handwritten signature in black ink, appearing to read 'Scott Heffernan', is written over a light blue horizontal line.

Scott Heffernan
RF Engineering Director
Centerline Communications, LLC
95 Ryan Drive, Suite 1
Raynham, MA 02767