EMPIRE telecom

January 10, 2019

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

Regarding:	Notice of Exempt Modification – Antenna Modification
Property Address:	440 Hayden Station Rd., Windsor, CT 06095
AT&T Site:	AT&T Mobility ("AT&T", Site # CT5140)

Dear Ms. Bachman:

AT&T currently maintains a wireless telecommunications facility on an existing 95-foot monopole at the above-referenced address, latitude 41°-53'-52.05084", longitude -72°-38'-41.99604". Said monopole is owned by Crown Castle.

AT&T desires to modify its existing telecommunications facility by adding three (3) antennas, adding three (3) remote-radio heads ("RRHs"), adding one (1) Surge Suppressor and replacing equipment inside equipment shelter at base of tower. The centerline height of the existing antennas is and will remain at 94 feet.

Please accept this application as notification pursuant to R.C.S.A. §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. §16-50j-72 (b)(2). In accordance with R.C.S.A. §16-50j-73, a copy of this letter is being sent to The Honorable Donald Trinks, Mayor, Town of Windsor, Peter Souza, Town Manager, Town of Windsor, Robert Ruzzo, Building Official and Zoning Enforcement Officer, Town of Windsor, Crown Castle, LLC, as Tower Owner, Eric Barz, AICP, Town Planner, Town of Windsor and Cb Baggs LLP, Landowner.

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

1. The planned modification will not result in an increase in the height of the existing structure. The added antennas and accessory equipment along with equipment to be swapped will be installed at the existing height of 94 feet on the 95-foot monopole.

2. The proposed modifications will not involve any changes to ground-mounted equipment, and therefore will not require an extension of the site boundary.

3. The proposed modification will not increase the noise level at the facility by six decibels or more, or to levels that exceed state and local criteria.

Nora Oliver ⎜ Empire Telecom USA, LLC ⎜ 16 Esquire Road, Billerica, MA 01862 ⎜ 978-808-2111 ⎜ noliver@empiretelecomm.com

4. The operation of the modified facility will not increase radio frequency (RF) emissions at the facility to a level at or above Federal Communications Commission (FCC) safety standard. An RF emissions calculation (enclosed) for AT&T's modified facility is herein provided.

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 AT&T's proposed modifications (please see enclosed structural analysis completed by FDH Velocitel, dated February 16, 2018).

For the foregoing reasons, AT&T respectfully requests that the proposed remote-radio head installation be allowed within the exempt modifications under R.C.S.A. §16-50j-72 (b)(2).

Sincerely,

Nora Oliver

Nora Oliver
Site Acquisition Manager

Enclosures: Exhibit 1 – Field Card and GIS Map
Exhibit 2 – Construction Drawings
Exhibit 3 – Structural Analysis
Exhibit 4 – RF Emissions Analysis Report Evaluation

cc: The Honorable Donald Trinks, Mayor, Town of Windsor
Peter Souza, Town Manager, Town of Windsor
Robert Ruzzo, Building Official and Zoning Enforcement Officer, Town of Windsor
Crown Castle, LLC, as Tower Owner
Eric Barz, AICP, Town Planner, Town of Windsor

Property Cards

Address Search : 6739 Submit Clear Search

Your search returned multiple addresses

Additional addresses:

440 HAYDEN STATION RD

440 Hayden Station Rd

Property Owner:
Cb Baggs Llp

Property Co-Owner

Mailing Address:
440 Hayden Station Rd
Windsor, CT
06095

File Code
6739

Map:
49

Block:
471

Lot:
109

Census Tract:
4735.02

Property Type:
Ind Whses

Land Area (Acres):
3.71

Zone:
I

Click to Enlarge

Construction Details

Year Built:
1982

Building Style:
Warehouse

Stories:
1

Living Area:
0 Sq/Ft

Building ID
4624

Grade
Average

Exterior Wall
Pre-Finish Metl

Total Rooms:

Bedrooms:

Bathrooms:

Half Baths:

Heating Type
Hot Air-No Duc

Heating Fuel
Gas

AC Type
Central

Valuation

Assessed Land Value:
$246,050

Assessed Building Value:
$786,380

Total Assessed Value:
$1,032,430

Appraised Land Value:
$351,500

Appraised Building Value:
$1,123,400

Total Appraised Value:
$1,474,900

Last Sale

Last Sale Date:
Friday, October 6th, 2000

Last Sale Price:
$1,500,000

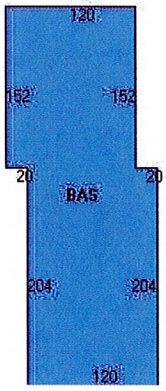
Qualified Sale:
Q

Book/Page:
1243/ 531

Prior Owners

Sale Date	Owner Name	Sale Price	Book / Page
2000/10/6	ADFM ASSOCIATES LLC	666483	1243/ 522
1994/4/15	COAST DISTRIBUTION SYSTEM INC	0	998/ 108
1989/8/31	COAST DISTRIBUTION SYS	0	758/ 213

Parcel Sketch



Sub Area Detail

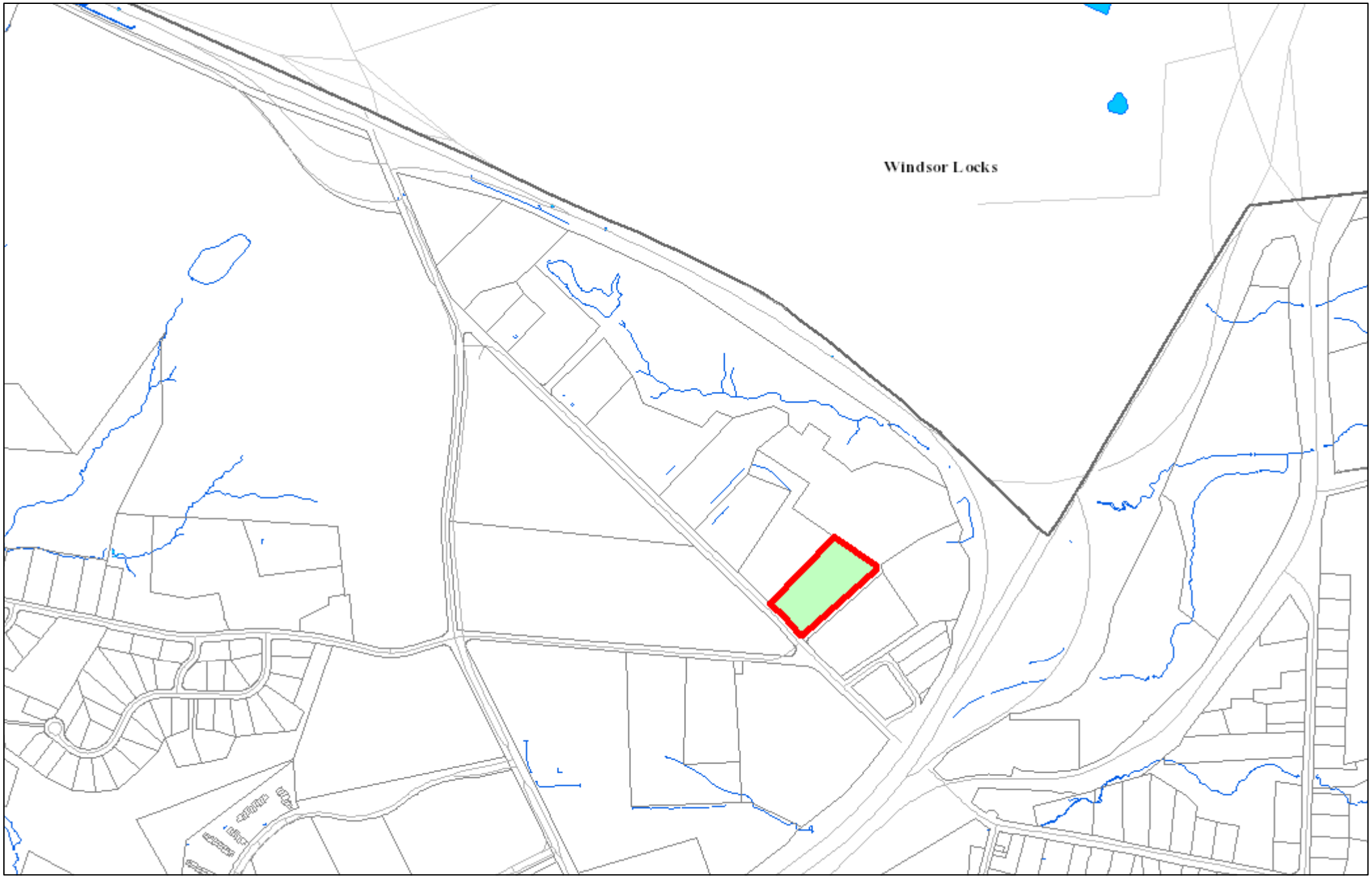
Code	Gross Area (Sq Ft)	Living Area (Sq Ft)
BAS	42720	42720

Outbuildings & Extra Features

Code	Description	Appraised Value	Assessed Value
PAV1	PAVING-ASPHALT	$20800.00	$14560.00
LDL1	LOAD LEVELERS	$17000.00	$11900.00
SPR1	SPRINKLERS-WET	$70900.00	$49630.00
VLT2	VAULT-GOOD	$60800.00	$42560.00

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 (Unifinished)	**UBM** Basement (Unfinished)
UCB Cabana (Encl)(Unfinished)	**UDS** Porch (Scrn)(Dedt)(Unifinished)	**UDU** Utility (Det)(Unifinished)
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	



Hartford County, Connecticut

Horizontal Datum is Connecticut State Plane Feet, NAD83

1 inch = 987 feet

0 410 820 1,640 Feet

Property Boundaries not legally binding for title or zoning purposes.

The Town of Windsor makes no warranty as to th accuracy, reliability, or completeness of the information and is not responsible for any error or omissions for results obtained from the use of the information.

WIRELESS COMMUNICATIONS FACILITY
CT5140 - LTE 3C WCS
WINDSOR BREAKNECK
CROWN CASTLE BU NO.: 876326
440 HAYDEN STATION RD
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: 500 ENTERPRISE DRIVE, ROCKY HILL, CONNECTICUT

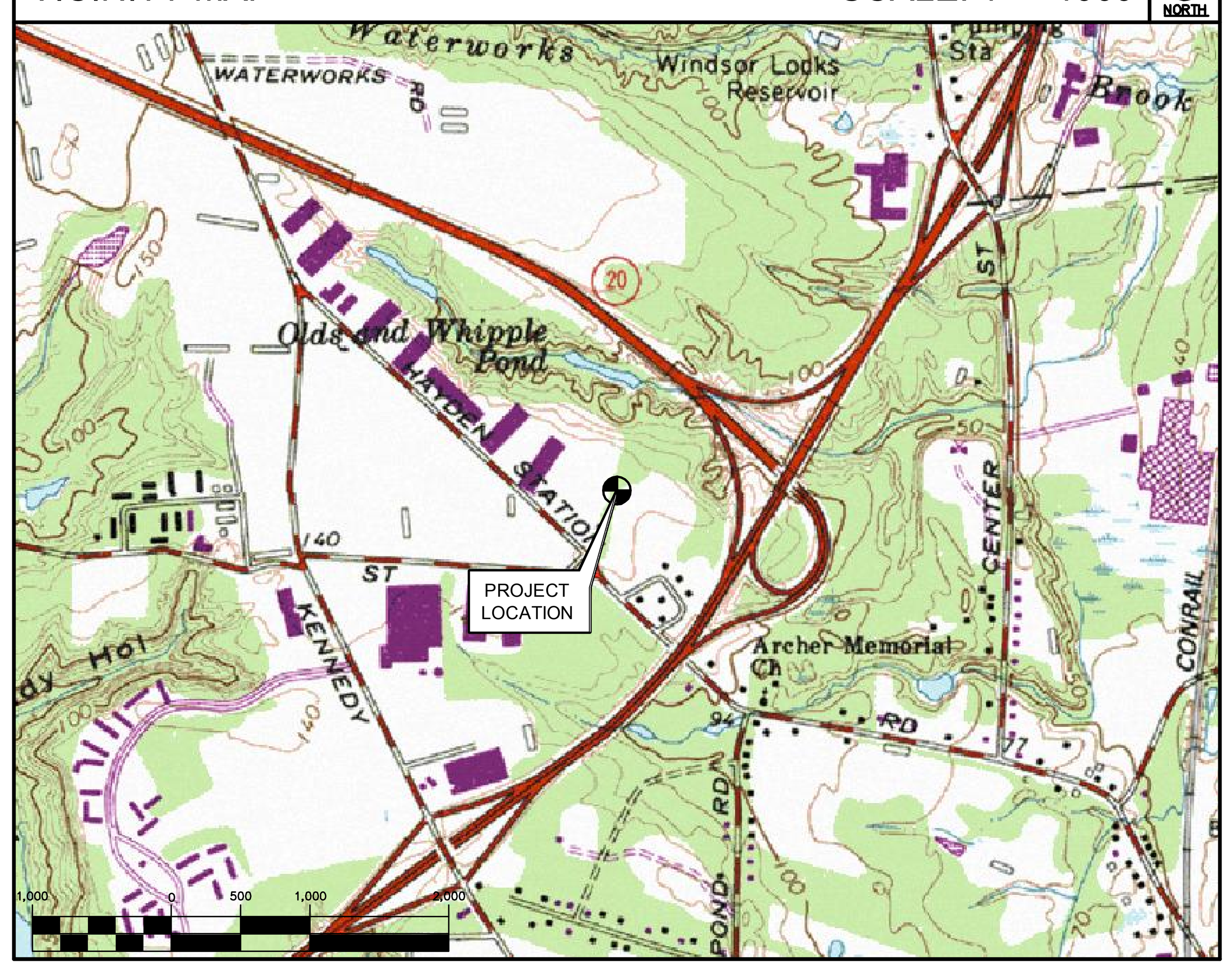
TO: 440 HAYDEN STATION RD, WINDSOR, CONNECTICUT

1.	HEAD NORTHEAST ON ENTERPRISE DR TOWARD CAPITAL BLVD	0.3 MI
2.	TURN LEFT ONTO CAPITAL BLVD	0.2 MI
3.	USE LEFT LANE TO TURN LEFT ONTO STATE HWY 411	0.2 MI
4.	TURN LEFT TO MERGE ONTO I–91 N	0.4 MI
5.	MERGE ONTO I–91 N	17.9 MI
6.	TAKE EXIT 39–41 FOR KENNEDY RD TOWARD CENTER ST	0.2 MI
7.	CONTINUE ONTO ARCHER RD	0.4 MI
8.	TURN LEFT ONTO HAYDEN STATION RD AND DESTINATION WILL BE ON THE RIGHT	0.3 MI

VICINITY MAP

SCALE: 1" = 1000'

NORTH



PROJECT SUMMARY

THE PROPOSED SCOPE OF WORK CONSISTS OF A MODIFICATION TO THE EXISTING UNMANNED TELECOMMUNICATIONS FACILITY INCLUDING THE FOLLOWING:

1. AT ANTENNA SECTOR LOCATIONS:
   - 1.1. INSTALL (3) NEW ANTENNAS AT POS.4, (1) PER SECTOR
   - 1.2. INSTALL (3) NEW RRUS–32 BEHIND PROPOSED POSITION 4 ANTENNAS
   - 1.3. INSTALL (1) SURGE ARRESTOR
   - 1.4. REMOVE AND REPLACE (3) EXISTING T–ARMS FOR A NEW TRI–PLATFORM MOUNT TO ACCOMMODATE REQUIRED ANTENNA SEPARATIONS AND ADDITIONAL ANTENNAS
2. WORK INSIDE AT&T EQUIPMENT SHELTER:
   - 2.1. REMOVE AND REPLACE EXISTING DUL DUS AND UPGRADE FOR A PROPOSED 5216 UNIT WITHIN EXISTING LTE EQUIPMENT RACK

PROJECT INFORMATION

AT&T SITE NUMBER:	CT5140
AT&T SITE NAME:	WINDSOR BREAKNECK
CROWN CASTLE BU NO.:	876326
SITE ADDRESS:	440 HAYDEN STATION RD WINDSOR, CT 06095
LESSEE/APPLICANT:	AT&T MOBILITY 500 ENTERPRISE DRIVE, SUITE 3A ROCKY HILL, CT 06067
AT&T FA LOCATION CODE:	10071329
AT&T PACE ID NUMBER:	PACE JOB 1 – MRCTB026627
ENGINEER:	CENTEK ENGINEERING, INC. 63–2 NORTH BRANFORD RD. BRANFORD, CT 06405
PROJECT COORDINATES:	LATITUDE: 41°–53'–52.05084" N LONGITUDE: 72°–38'–41.99604" W GROUND ELEVATION: ±144' AMSL GROUND ELEVATION REFERENCED FROM GOOGLE EARTH. COORDINATES REFERENCED FROM RFDS DOCUMENTS.

SHEET INDEX

SHT. NO.	DESCRIPTION	REV.
T–1	TITLE SHEET	0
N–1	NOTES, SPECIFICATIONS AND ANTENNA SCHEDULE	0
C–1	PLANS AND ELEVATION	0
C–2	LTE 3C WCS ANTENNA LAYOUT PLANS	0
C–3	DETAILS	0
E–1	LTE SCHEMATIC DIAGRAM AND NOTES	0
E–2	LTE WIRING DIAGRAM	0
E–3	TYPICAL ELECTRICAL DETAILS	0

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	06/14/18	DMD	CAG	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

EMPIRE telecom

CENTEK engineering
Centered on Solutions
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

AT&T MOBILITY

WIRELESS COMMUNICATIONS FACILITY
WINDSOR BREAKNECK
CT5140 - LTE 3C WCS
440 HAYDEN STATION RD
WINDSOR, CT 06095

DATE: 02/28/18
SCALE: AS NOTED
JOB NO. 18000.06

TITLE SHEET

T–1

Sheet No. 1 of 8

NOTES AND SPECIFICATIONS

DESIGN BASIS:

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

1. DESIGN CRITERIA:

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

GENERAL NOTES:

1. ALL CONSTRUCTION SHALL BE IN COMPLIANCE WITH THE GOVERNING BUILDING CODE.
2. 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.
3. 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.
4. DIMENSIONS AND DETAILS SHALL BE CHECKED AGAINST EXISTING FIELD CONDITIONS.
5. THE CONTRACTOR SHALL VERIFY AND COORDINATE THE SIZE AND LOCATION OF ALL OPENINGS, SLEEVES AND ANCHOR BOLTS AS REQUIRED BY ALL TRADES.
6. ALL DIMENSIONS, ELEVATIONS, AND OTHER REFERENCES TO EXISTING STRUCTURES, SURFACE, AND SUBSURFACE CONDITIONS ARE APPROXIMATE. NO GUARANTEE IS MADE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THE CONTRACTOR SHALL VERIFY AND COORDINATE ALL DIMENSIONS, ELEVATIONS, ANGLES WITH EXISTING CONDITIONS AND WITH ARCHITECTURAL AND SITE DRAWINGS BEFORE PROCEEDING WITH ANY WORK.
7. 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.
8. 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.
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 SITE OPERATIONS, COORDINATE WORK WITH NORTHEAST UTILITIES
10. 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.
11. 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.
12. 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.
13. NO DRILLING WELDING OR TAPING ON CL&P OWNED EQUIPMENT.
14. REFER TO DRAWING T1 FOR ADDITIONAL NOTES AND REQUIREMENTS.

STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL IS DESIGNED BY ALLOWABLE STRESS DESIGN (ASD)

   A. STRUCTURAL STEEL (W SHAPES)---ASTM A992 (FY = 50 KSI)
   B. STRUCTURAL STEEL (OTHER SHAPES)---ASTM A36 (FY = 36 KSI)
   C. STRUCTURAL HSS (RECTANGULAR SHAPES)---ASTM A500 GRADE B, (FY = 46 KSI)
   D. STRUCTURAL HSS (ROUND SHAPES)---ASTM A500 GRADE B, (FY = 42 KSI)
   E. PIPE---ASTM A53 (FY = 35 KSI)
   F. CONNECTION BOLTS---ASTM A325–N
   G. U–BOLTS---ASTM A36
   H. ANCHOR RODS---ASTM F 1554
   I. WELDING ELECTRODE---ASTM E 70XX

2. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE ENGINEER FOR REVIEW. SHOP DRAWINGS SHALL INCLUDE THE FOLLOWING: SECTION PROFILES, SIZES, CONNECTION ATTACHMENTS, REINFORCING, ANCHORAGE, SIZE AND TYPE OF FASTENERS AND ACCESSORIES. INCLUDE ERECTION DRAWINGS, ELEVATIONS AND DETAILS.
3. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AISC MANUAL OF STEEL CONSTRUCTION.
4. PROVIDE ALL PLATES, CLIP ANGLES, CLOSURE PIECES, STRAP ANCHORS, MISCELLANEOUS PIECES AND HOLES REQUIRED TO COMPLETE THE STRUCTURE.
5. FIT AND SHOP ASSEMBLE FABRICATIONS IN THE LARGEST PRACTICAL SECTIONS FOR DELIVERY TO SITE.
6. INSTALL FABRICATIONS PLUMB AND LEVEL, ACCURATELY FITTED, AND FREE FROM DISTORTIONS OR DEFECTS.
7. AFTER ERECTION OF STRUCTURES, TOUCHUP ALL WELDS, ABRASIONS AND NON–GALVANIZED SURFACES WITH A 95% ORGANIC ZINC RICH PAINT IN ACCORDANCE WITH ASTM 780.
8. ALL STEEL MATERIAL (EXPOSED TO WEATHER) SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT DIPPED GALVANIZED) COATINGS" ON IRONS AND STEEL PRODUCTS.
9. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT–DIP) ON IRON AND STEEL HARDWARE".
10. 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.
11. CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES.
12. 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.
13. LOCK WASHER ARE NOT PERMITTED FOR A325 STEEL ASSEMBLIES.
14. SHOP CONNECTIONS SHALL BE WELDED OR HIGH STRENGTH BOLTED.
15. MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.
16. FABRICATE BEAMS WITH MILL CAMBER UP.
17. 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.
18. COMMENCEMENT OF STRUCTURAL STEEL WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.
19. INSPECTION AND TESTING OF ALL WELDING AND HIGH STRENGTH BOLTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY.
20. 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:

1. ANTENNA PANELS:
   A. SHERWIN WILLIAMS POLANE–B
   B. COLOR TO BE MATCHED WITH EXISTING TOWER STRUCTURE.
2. COAXIAL CABLES:
   A. ONE COAT OF DTM BONDING PRIMER (2–5 MILS. DRY FINISH)
   B. TWO COATS OF DTM ACRYLIC PRIMER/FINISH (2.5–5 MILS. DRY FINISH)
   C. COLOR TO BE FIELD MATCHED WITH EXISTING STRUCTURE.

EXAMINATION AND PREPARATION:

1. 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.
2. 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.
3. TEST SHOP APPLIED PRIMER FOR COMPATIBILITY WITH SUBSEQUENT COVER MATERIALS.
4. PERFORM PREPARATION AND CLEANING PROCEDURE IN STRICT ACCORDANCE WITH COATING MANUFACTURER'S INSTRUCTIONS FOR EACH SUBSTRATE CONDITION.
5. CORRECT DEFECTS AND CLEAN SURFACES WHICH AFFECT WORK OF THIS SECTION. REMOVE EXISTING COATINGS THAT EXHIBIT LOOSE SURFACE DEFECTS.
6. IMPERVIOUS SURFACE: REMOVE MILDEW BY SCRUBBING WITH SOLUTION OF TRI–SODIUM PHOSPHATE AND BLEACH. RINSE WITH CLEAN WATER AND ALLOW SURFACE TO DRY.
7. 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.
8. 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.
9. 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.
10. 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).
11. COAXIAL CABLES: REMOVE ALL OIL, DUST, GREASE. DIRT, AND OTHER FOREIGN MATERIAL TO ENSURE ADEQUATE ADHESION.

CLEANING:

1. COLLECT WASTE MATERIAL, WHICH MAY CONSTITUTE A FIRE HAZARD, PLACE IN CLOSED METAL CONTAINERS AND REMOVE DAILY FROM SITE.

APPLICATION:

1. APPLY PRODUCTS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
2. DO NOT APPLY FINISHES TO SURFACES THAT ARE NOT DRY.
3. APPLY EACH COAT TO UNIFORM FINISH.
4. APPLY EACH COAT OF PAINT SLIGHTLY DARKER THAN PRECEDING COAT UNLESS OTHERWISE APPROVED.
5. SAND METAL LIGHTLY BETWEEN COATS TO ACHIEVE REQUIRED FINISH.
6. VACUUM CLEAN SURFACES FREE OF LOOSE PARTICLES. USE TACK CLOTH JUST PRIOR TO APPLYING NEXT COAT.
7. ALLOW APPLIED COAT TO DRY BEFORE NEXT COAT IS APPLIED.

COMPLETED WORK:

1. SAMPLES: PREPARE 24" X 24" SAMPLE AREA FOR REVIEW.
2. MATCH APPROVED SAMPLES FOR COLOR, TEXTURE AND COVERAGE. REMOVE REFINISH OR REPAIR WORK NOT IN COMPLIANCE WITH SPECIFIED REQUIREMENTS.

PROPOSED ANTENNA AND APPURTENANCE SCHEDULE

SECTOR	EXISTING/PROPOSED	BAND	ANTENNA	SIZE (INCHES) (L x W x D)	ANTENNA ℄ HEIGHT	AZIMUTH	(E/P) TMA/DIPLEXER/TRIPLEXER (QTY)	(E/P) RRU (QTY)	FEEDER	(E/P) RAYCAP (QTY)
A1	EXISTING	UMTS 850/1900	KATHREIN 800–10121	54.5 x 10.3 x 5.9	94'	10°	(E) PWAVE TMA: LGP 21401 (DB–850 BYPASS) (2), (E) KATHREIN DIPLEX: 782–10250 (2)		1 5/8"ø COAX (QTY OF 2)	(E) RAYCAP DC6–48–60–18–8F (1)
A2	EXISTING	LTE 700/1900	CCI HPA–65R–BUU–H8	92.4 x 14.8 x 7.4	94'	10°		(E) RRUS–11 (1)	FIBER AND DC POWER	
A3										(P) RAYCAP DC6–48–60–0–8F (1)
A4	PROPOSED	LTE WCS	CCI TPA–65R–LCUUUU–H8	96.0 x 14.4 x 8.6	94'	10°		(E) RRUS–32 B2 (1), (P) RRUS–32 (1)	FIBER AND DC POWER	
B1	EXISTING	UMTS 850/1900	KATHREIN 800–10121	54.5 x 10.3 x 5.9	94'	125°	(E) PWAVE TMA: LGP 21401 (DB–850 BYPASS) (2), (E) KATHREIN DIPLEX: 782–10250 (2)		1 5/8"ø COAX (QTY OF 2)	
B2	EXISTING	LTE 700/1900	CCI HPA–65R–BUU–H8	92.4 x 14.8 x 7.4	94'	125°		(E) RRUS–11 (1)	FIBER AND DC POWER	
B3										
B4	PROPOSED	LTE WCS	CCI TPA–65R–LCUUUU–H8	96.0 x 14.4 x 8.6	94'	125°		(E) RRUS–32 B2 (1), (P) RRUS–32 (1)	FIBER AND DC POWER	
C1	EXISTING	UMTS 850/1900	KATHREIN 800–10121	54.5 x 10.3 x 5.9	94'	250°	(E) PWAVE TMA: LGP 21401 (DB–850 BYPASS) (2), (E) KATHREIN DIPLEX: 782–10250 (2)		1 5/8"ø COAX (QTY OF 2)	
C2	EXISTING	LTE 700/1900	CCI HPA–65R–BUU–H8	92.4 x 14.8 x 7.4	94'	250°		(E) RRUS–11 (1)	FIBER AND DC POWER	
C3										
C4	PROPOSED	LTE WCS	CCI TPA–65R–LCUUUU–H8	96.0 x 14.4 x 8.6	94'	250°		(E) RRUS–32 B2 (1), (P) RRUS–32 (1)	FIBER AND DC POWER	

RRU	SIZE (INCHES) (L x W x D)
RRUS–11	19.7 x 17 x 7.2
RRUS–32	27.2 x 12.1 x 7
RRUS–32 B2	27.2 x 12.1 x 7

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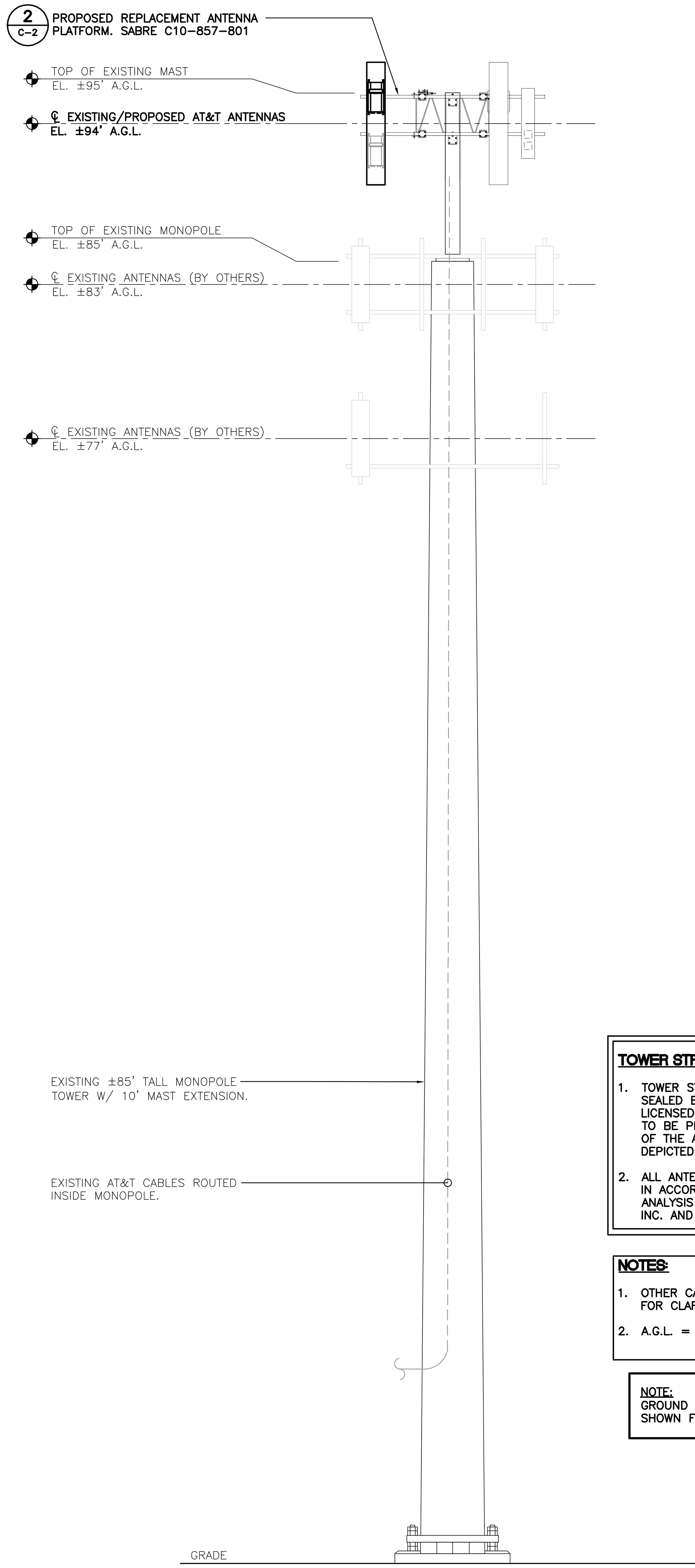
NOTES, SPECIFICATIONS & ANTENNA SCHEDULE

N-1



3 C-1 **TOWER ELEVATION - PROPOSED**
SCALE: 3/16" = 1'-0"

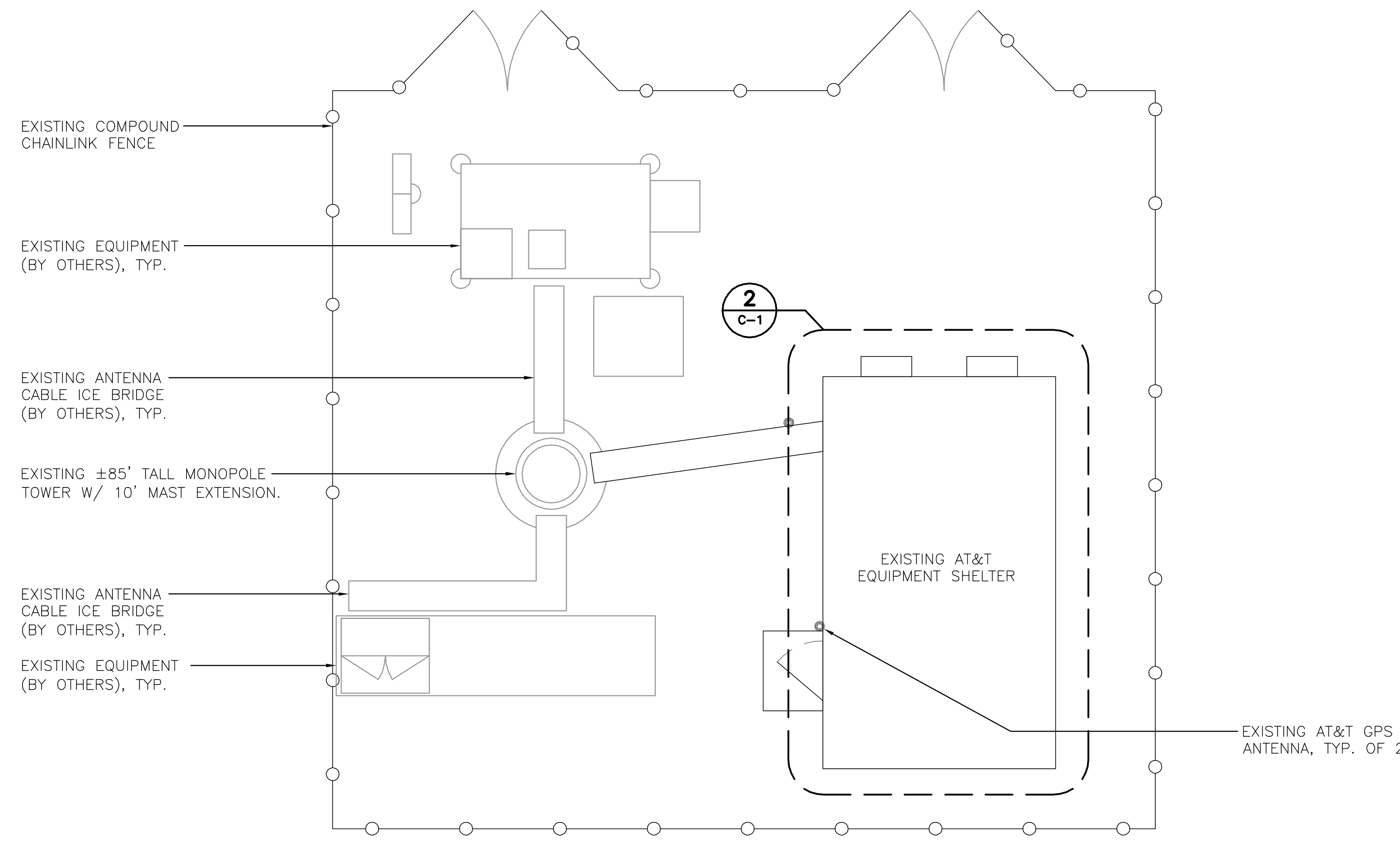
TOWER STRUCTURAL NOTES:

1. 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.
2. ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE, INC. AND FINAL AT&T RF DATA SHEET.

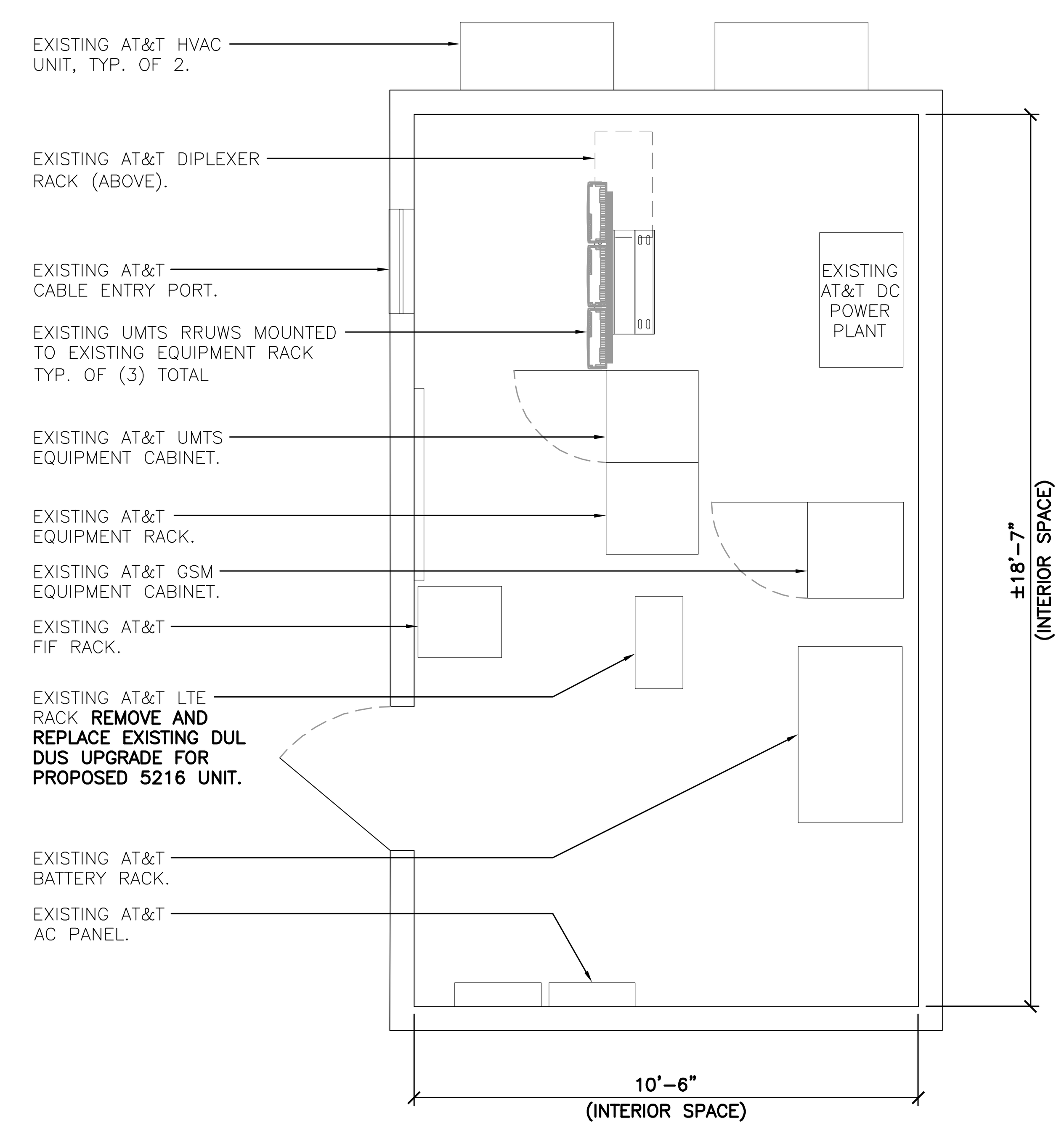
NOTES:

1. OTHER CARRIER EQUIPMENT NOT SHOWN FOR CLARITY
2. A.G.L. = ABOVE GRADE LEVEL

NOTE: GROUND EQUIPMENT NOT SHOWN FOR CLARITY.



1 C-1 **COMPOUND PLAN**
SCALE: 3/16" = 1'-0"
TRUE NORTH



2 C-1 **EQUIPMENT LAYOUT PLAN**
SCALE: 3/8" = 1'-0"
TRUE NORTH

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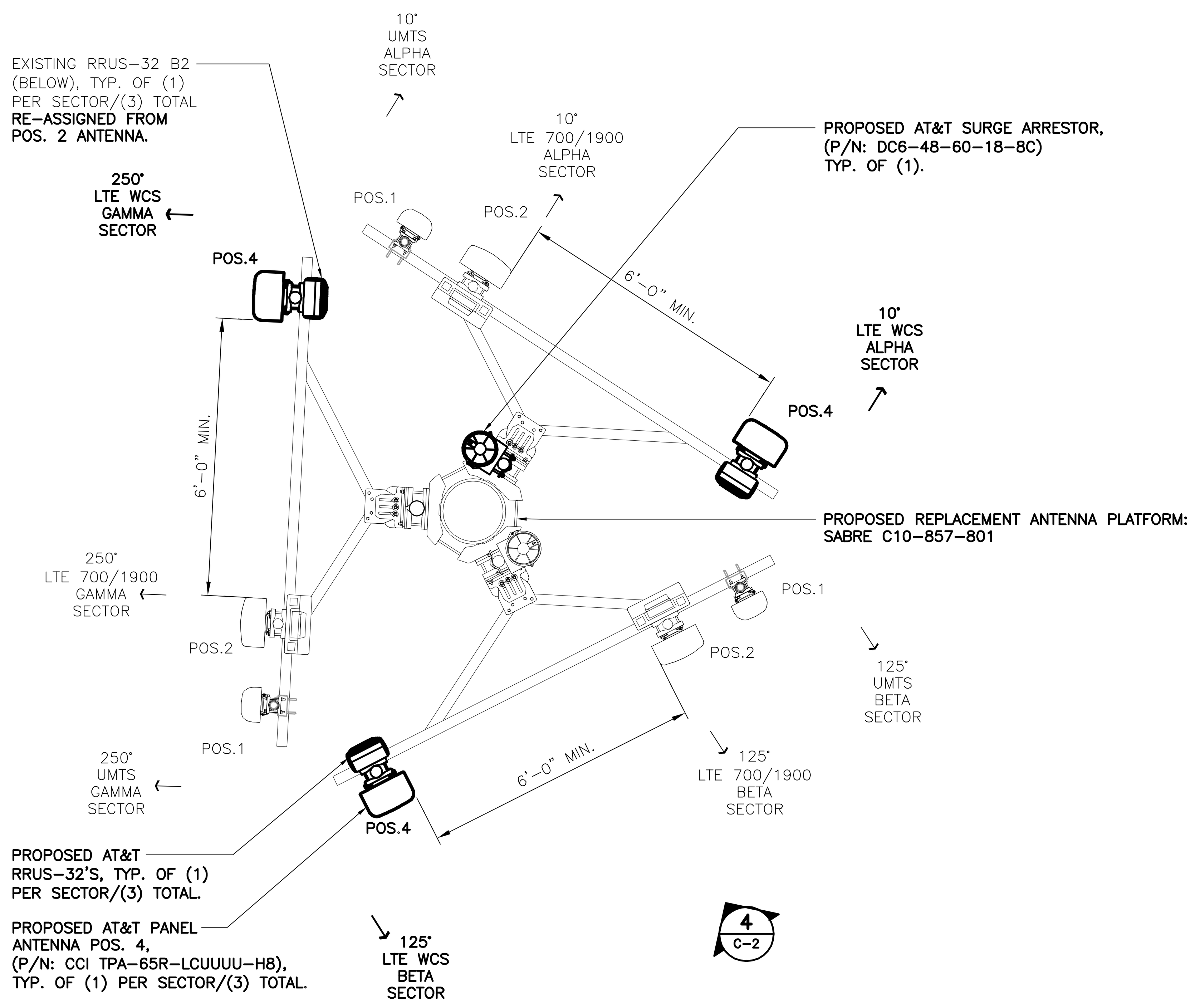
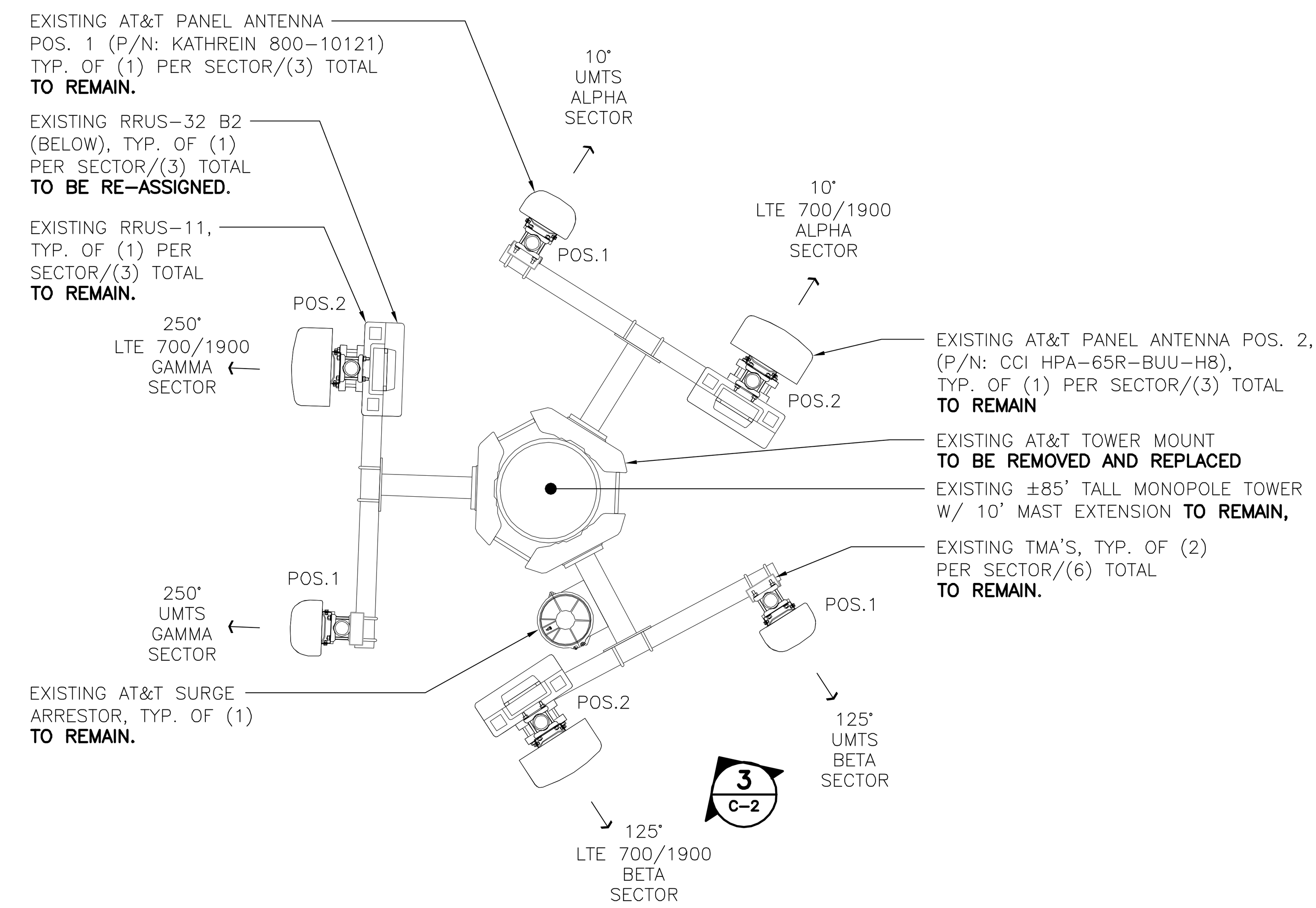
PLANS AND ELEVATION

C-1

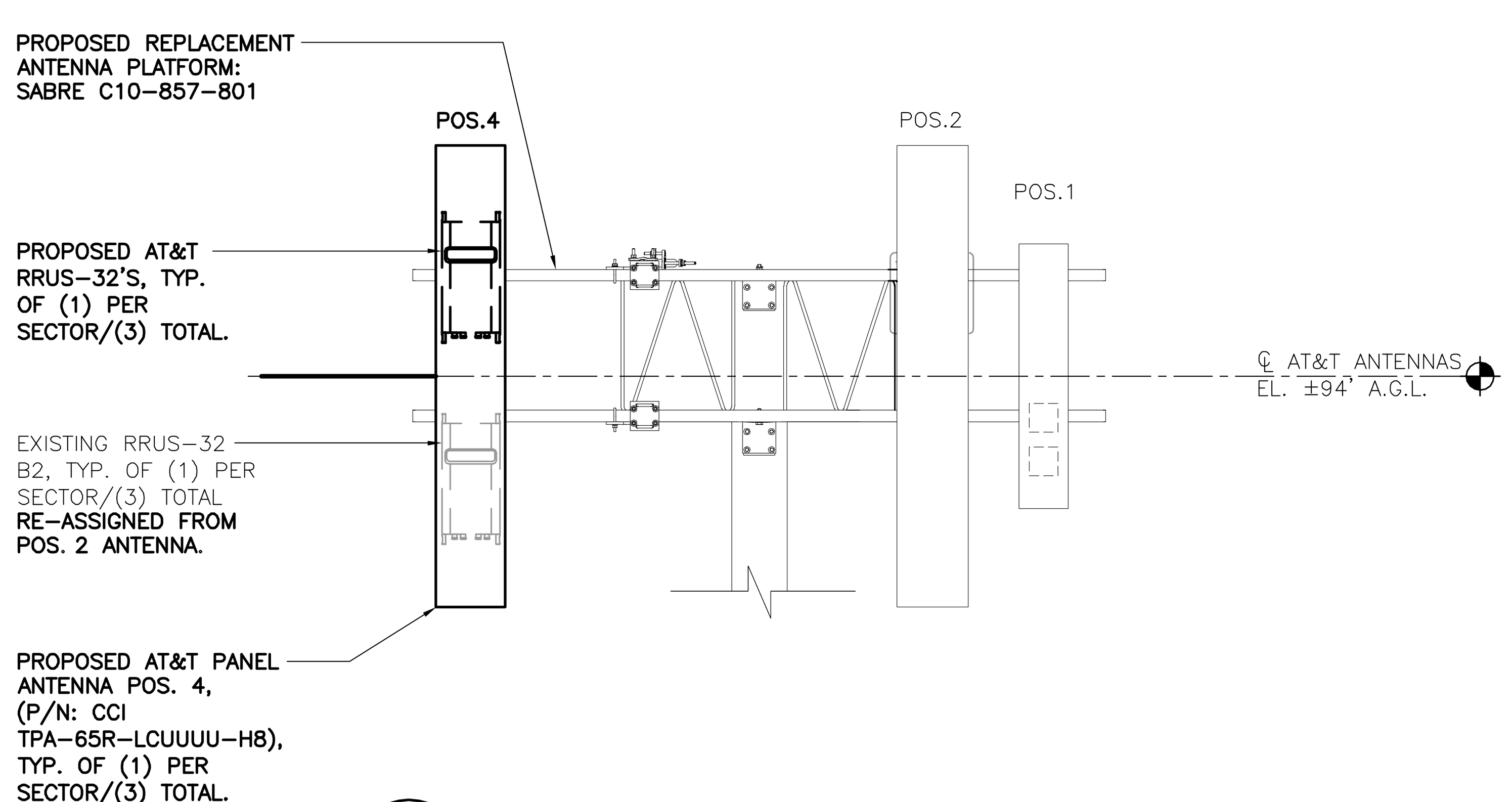
Sheet No. 3 of 8



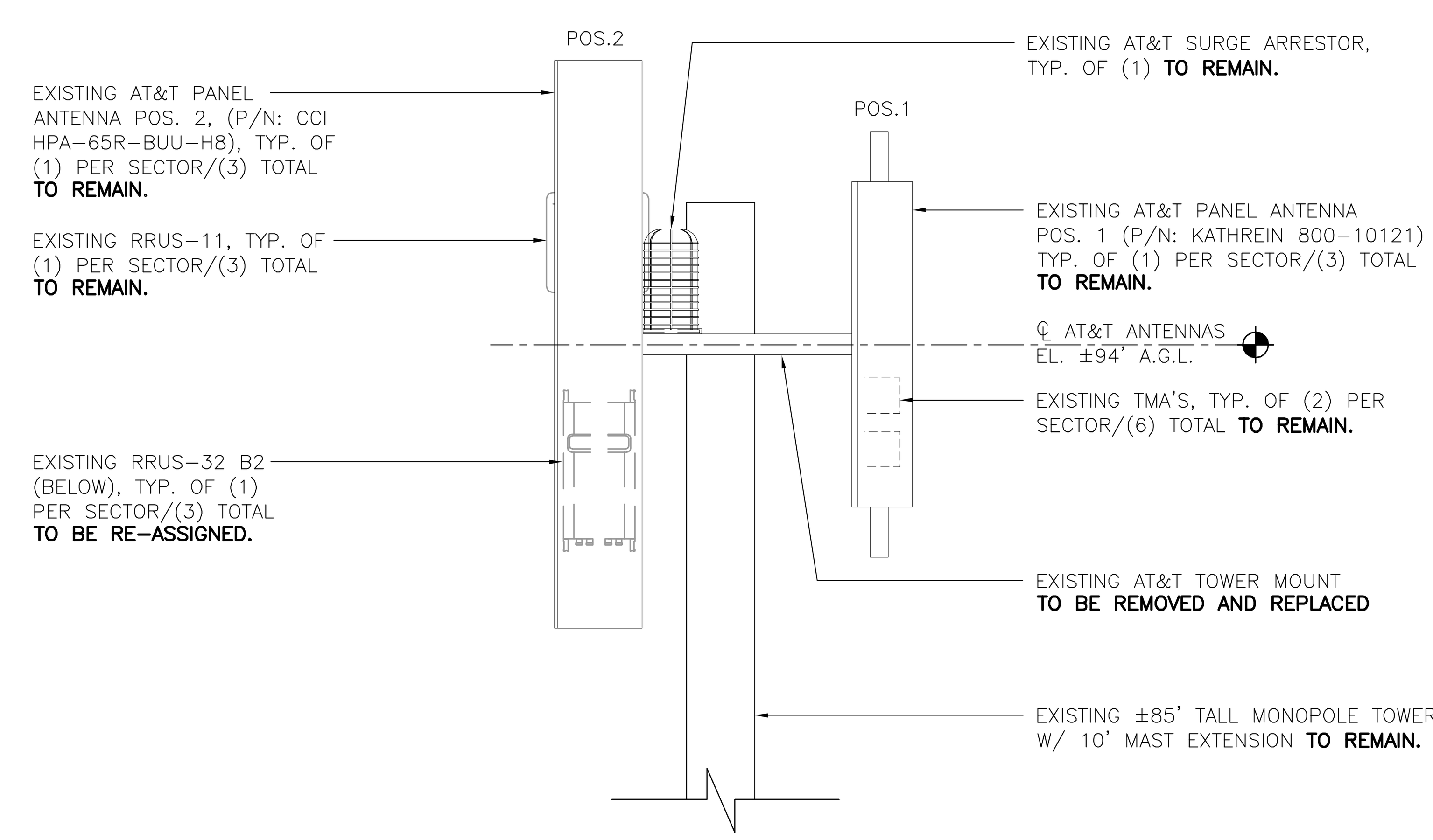
2 C-2 **PROPOSED ANTENNA PLAN** NORTH
SCALE: 3/8" = 1'-0"



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



4 C-2 **PROPOSED ANTENNA ELEVATION**
SCALE: 3/8" = 1'-0"



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

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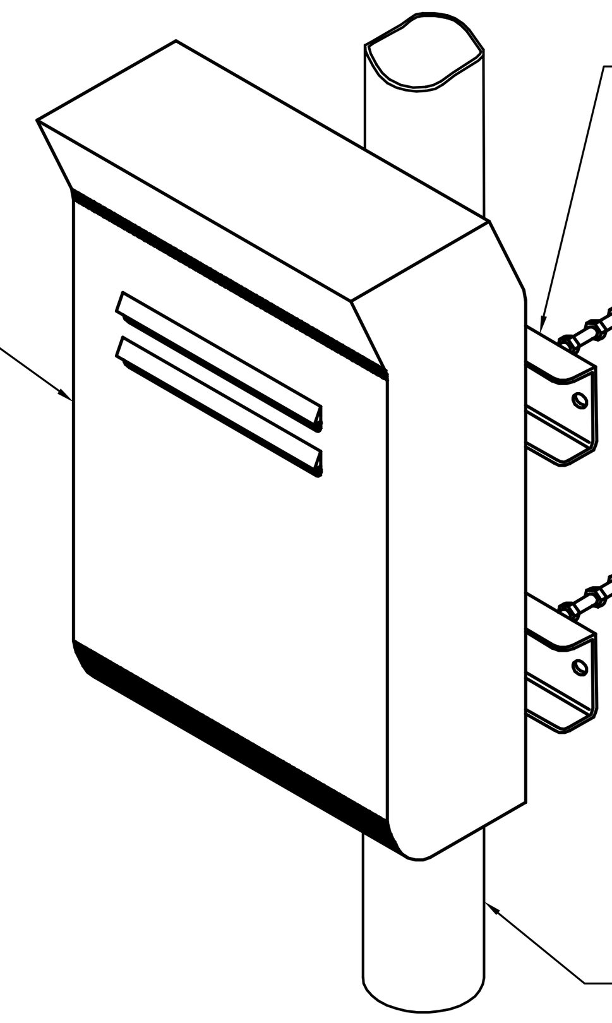
LTE 3C WCS ANTENNA LAYOUT PLANS

C-2

Sheet No. 4 of 8

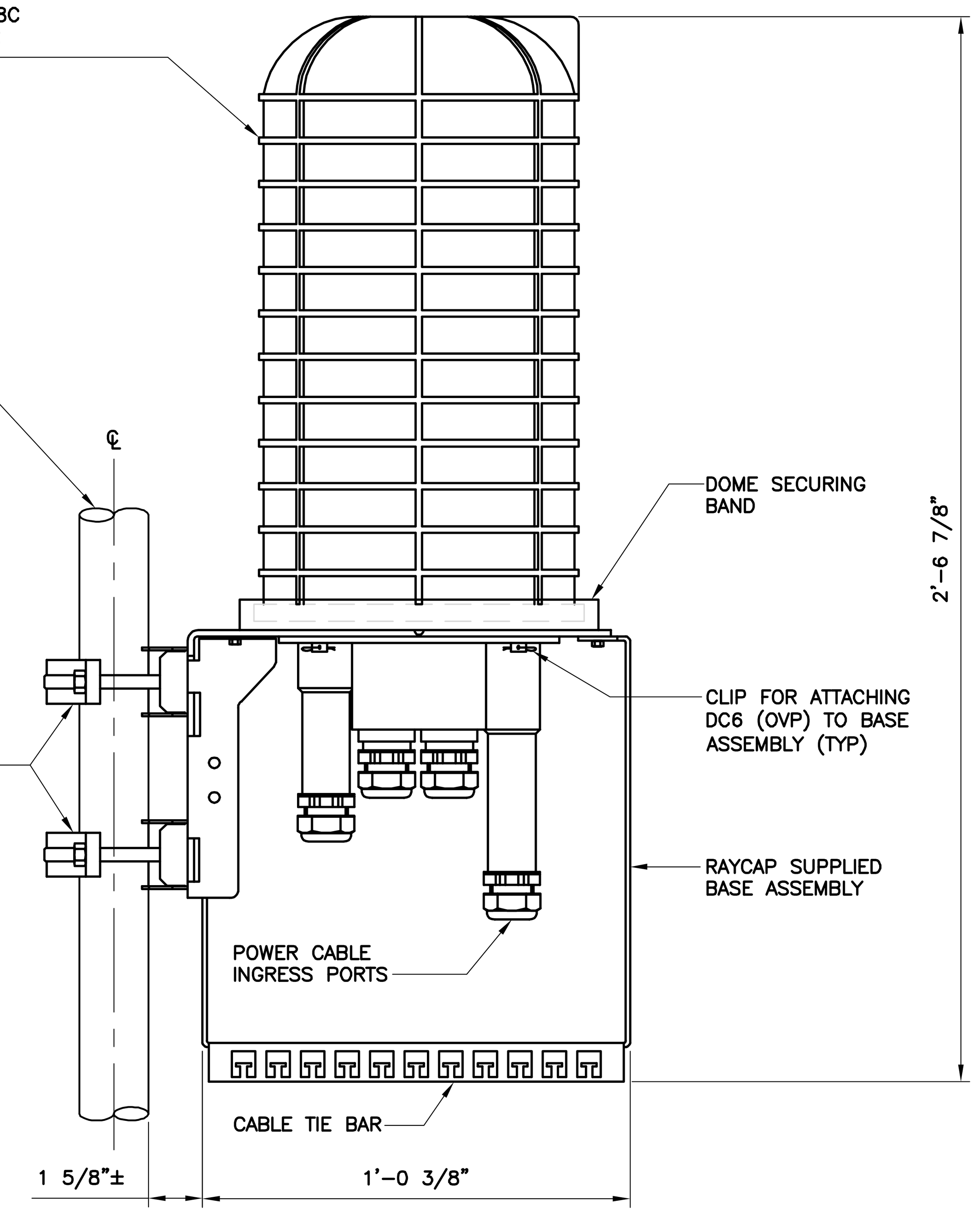


ISOMETRIC VIEW

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.

1 / C-3 TYPICAL RRUS MOUNTING DETAILS
SCALE: NTS

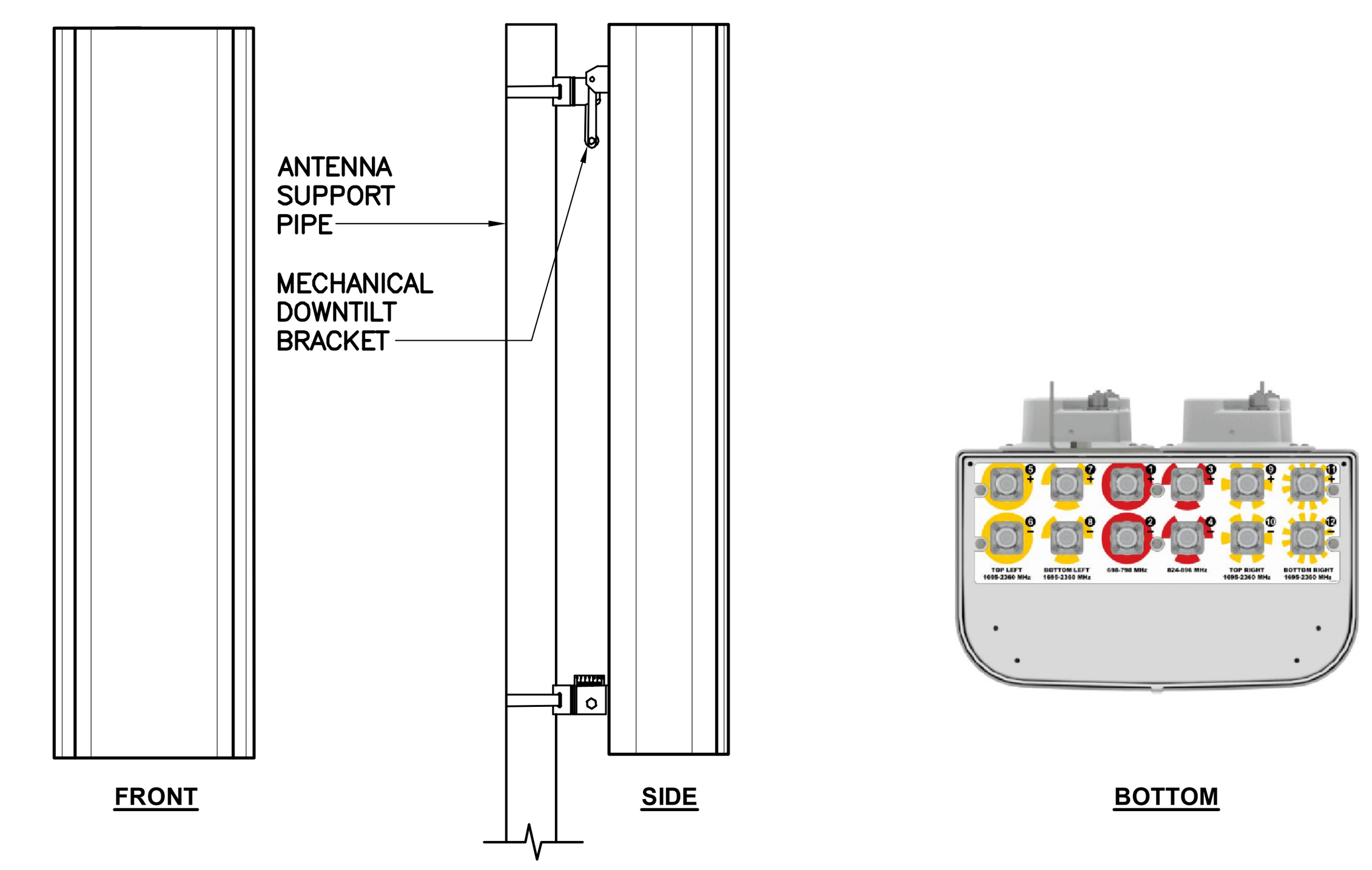


ELEVATION

NOTES:

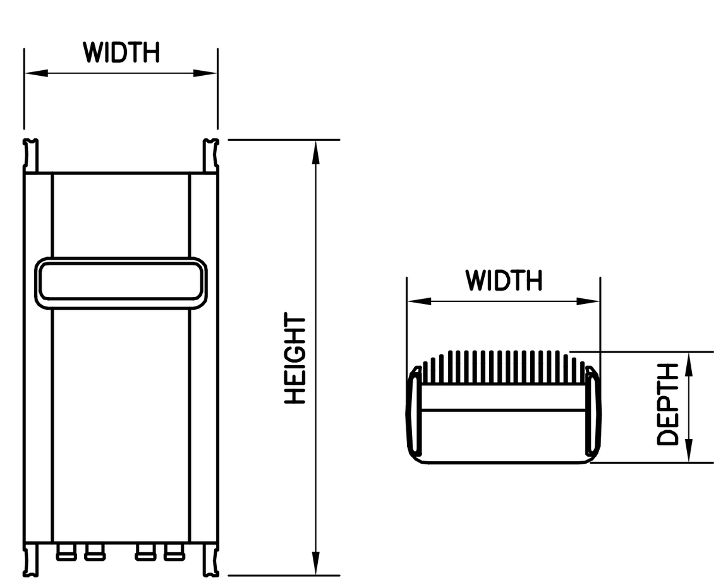
1. RAYCAP VIA AT&T SUPPLIES THE DC6 OVER VOLTAGE PROTECTOR AND PIPE MOUNTING BRACKETS. SUBCONTRACTOR SHALL SUPPLY THE PIPE.

2 / C-3 RAYCAP DC6 MOUNTING DETAIL
SCALE: 3" = 1'-0"



ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: CCI MODEL: TPA-65R-LCUUUU-H8	96"L x 14.4"W x 8.6"D	75 LBS.

3 / C-3 PROPOSED ANTENNA DETAIL
SCALE: NTS



RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RRUS-32	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.

4 / C-3 ERICSSON RRUS 32 DETAIL
SCALE: 1" = 1'-0"

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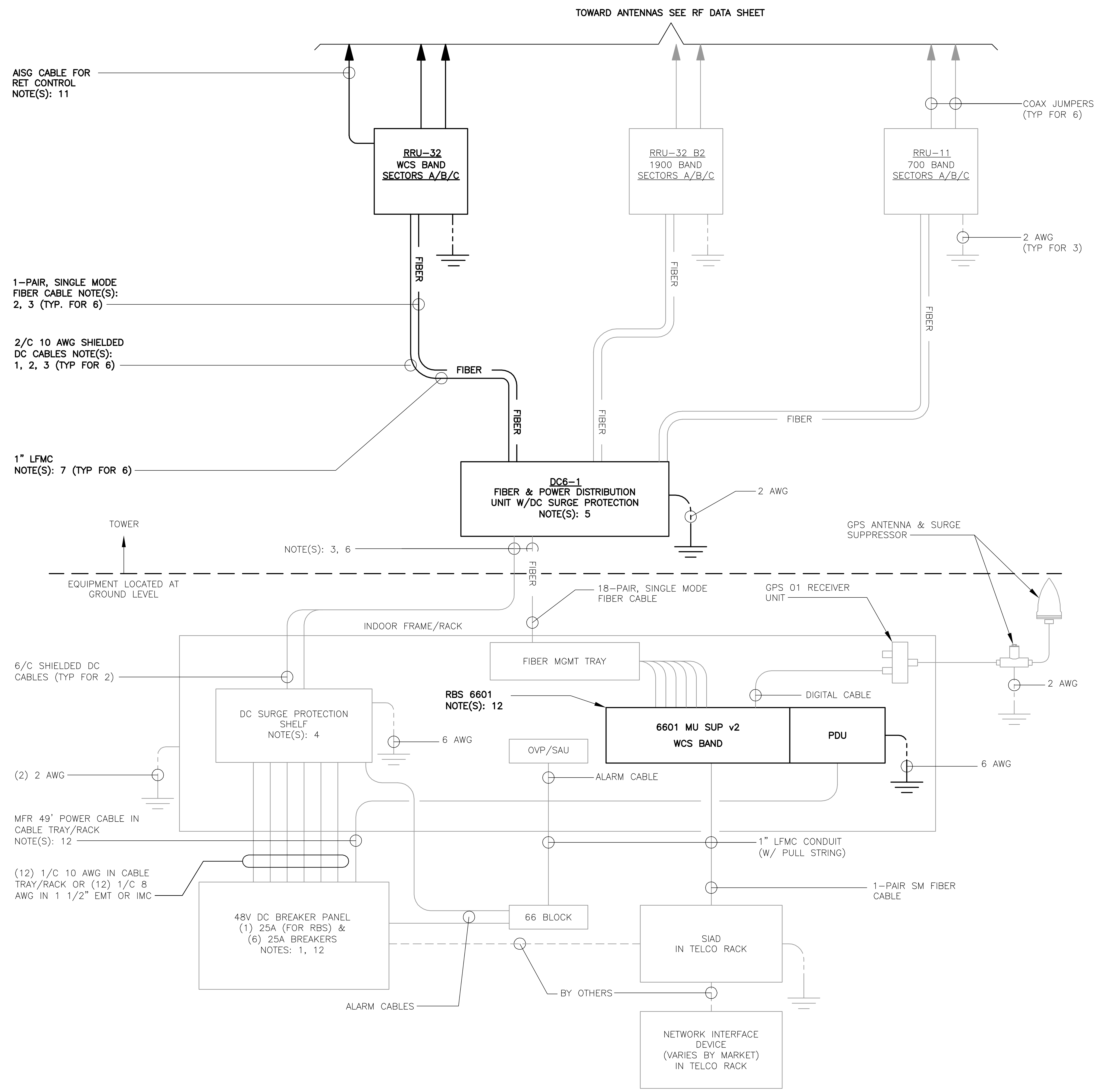
DETAILS

C-3



1 / E-1

LTE SCHEMATIC DIAGRAM

NOT TO SCALE

LTE SCHEMATIC DIAGRAM NOTES:

1. BREAKERS TO BE TAGGED AND LOCKED OUT. A 20A (MIN.) OR 30A (MAX.) BREAKER FOR RRUs MAY BE SUBSTITUTED FOR THE RECOMMENDED 25A BREAKER. SIZE 12 CONDUCTORS MAY BE USED ONLY WITH 20A BREAKERS.
2. LEAVE COILED AND PROTECTED UNTIL TERMINATED.
3. DC AND FIBER CABLE SHALL BE ROUTED WITH THE EXISTING COAX CABLE.
4. DC SURGE PROTECTION SHELF SHALL BE RAYCAP DCx–48–60–RM.
5. FIBER & DC DISTRIBUTION BOX W/DC SURGE PROTECTION SHALL BE RAYCAP DC6–48–60–18–8F.
6. SUPPORT FIBER & DC POWER CABLES WITH SNAP–IN HANGERS SPACED NO GREATER THAN 3 FEET APART ON TOWER. SUPPORT FIBER AND DC POWER CABLES INSIDE MONOPOLE WITH CABLE HOISTING GRIPS AT 250 FT MAXIMUM INTERVALS. DRESS CABLES TO PREVENT CONTACT WITH ENTRANCE AND EXIT OPENINGS.
7. CONDUIT TO BE USED ON A TOWER IF THE RRU IS MORE THAN 10' FROM THE DISTRIBUTION UNITS. MAX CABLE LENGTH IS 16 FEET.
8. SINGLE–CONDUCTOR DC POWER CABLES SHALL BE TELCOFLEX® OR KS24194™, COPPER, UL LISTED RHH NON–HALOGEN, LOW SMOKE WITH BRAIDED COVER, TYPE TC (1/0 AND LARGER). UNLESS OTHERWISE NOTED, STRANDING SHALL BE CLASS B (TYPE III) FOR CABLES SIZES 14, 12 & 10 AWG AND CLASS I (TYPE IV) FOR SIZES 8 AWG AND LARGER. CABLES SHALL BE COLOR CODED RED FOR +24V, BLUE FOR –48V AND GRAY FOR 24V AND 48V RETURN CONDUCTORS. MULTI–CONDUCTOR DC POWER CABLES SHALL BE COPPER, CLASS B STRANDING WITH FLAME RETARDANT PVC JACKET, TYPE TC, UL LISTED FOR 90°C DRY/ 75°C WET INSTALLATION.
9. GROUNDING WIRES SHALL BE COPPER, GREEN THHN/THWN UL LISTED FOR 90°C DRY/75°C WET INSTALLATION. MINIMUM SIZE IS 6 AWG UNLESS NOTED OTHERWISE.
10. FIBER OPTIC CABLES SHALL BE INSTALLED IN FLEXIBLE CONDUIT AS SCOPED BY MARKET.
11. RET CONTROL FROM THE RRU IS AN OPTIONAL METHOD OF CONNECTION. REFER TO RF DATA SHEET FOR APPLICABILITY.
12. RBS 6601 VARIANT 2 REQUIRES A 25A BREAKER AND 10 AWG (MIN.) CONDUCTORS. REPLACE EXISTING 15A OR 20A BREAKERS AND 12 AWG CONDUCTORS WHEN UPGRADING AN EXISTING RBS 6601 VARIANT 1.

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 ALL OF THE 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.

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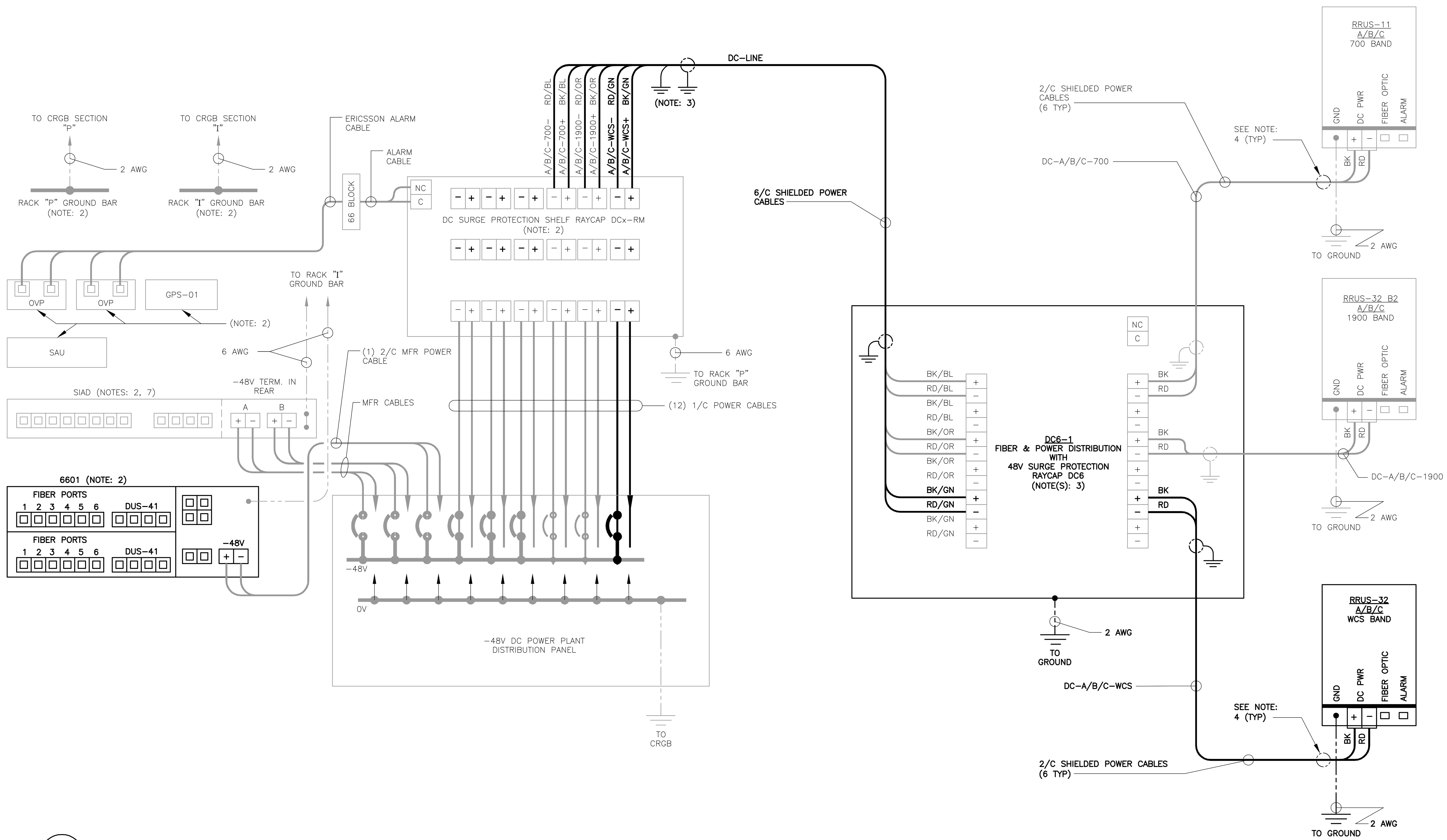
CT5140 - LTE 3C WCS
440 HAYDEN STATION RD
WINDSOR, CT 06095

DATE: 02/28/18
SCALE: AS NOTED
JOB NO. 18000.06

LTE SCHEMATIC DIAGRAM AND NOTES

E-1



1 LTE WIRING DIAGRAM
E-2

NOT TO SCALE

LTE WIRING DIAGRAM NOTES:

1. LABEL THE DC POWER CABLES AT BOTH ENDS OF EVERY WIRE AND IN ANY PULL BOX IF USED. LABEL SHALL BE DURABLE, SELF ADHESIVE, WRAPPED LONGITUDINALLY ALONG THE CABLE AND STATE THE SECTOR, FREQUENCY BAND AND POLARITY; I.E. "A–1900+". CABLE AND WIRE LABELS SHOWN ARE REPRESENTATIVE AND MAY BE MODIFIED AS DIRECTED BY AT&T.
2. INSTALL ON BASEBAND EQUIPMENT RACK.
3. THE BARE GROUND WIRE OF EACH MULTI–CONDUCTOR CABLE SHALL BE CONNECTED TO THE "P" GROUND BAR ON THE RACK. WHEN A SHIELDED CABLE IS USED, THE DRAIN WIRE ALSO SHALL BE CONNECTED TO THE "P" GROUND BAR.
4. CABLE GROUND WIRE AND SHIELD DRAIN WIRE TO BE LEFT UN–TERMINATED AT RRU AND DC POWER PLANT.
5. SEE LTE SCHEMATIC DIAGRAM DETAIL 1/E–1 FOR BREAKER RATING.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	06/14/18	DMD	CAG	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION

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Centered on Solutions
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63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

AT&T MOBILITY
WIRELESS COMMUNICATIONS FACILITY
WINDSOR BREAKNECK
CT5140 - LTE 3C WCS
440 HAYDEN STATION RD
WINDSOR, CT 06095

DATE: 02/28/18
SCALE: AS NOTED
JOB NO. 18000.06

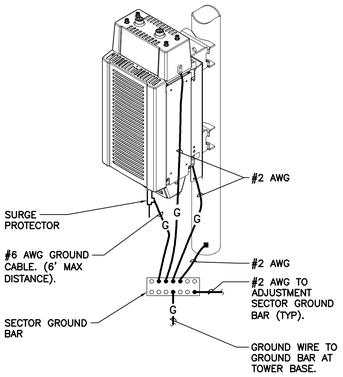
LTE WIRING DIAGRAM

E-2

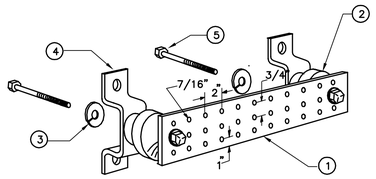
Sheet No. 7 of 8

EACH RRH CABINET SHALL BE GROUNDED IN THE FOLLOWING MANNER:

1. AT TOP OF THE CABINET
2. AT RIGHT SIDE OF THE CABINET.



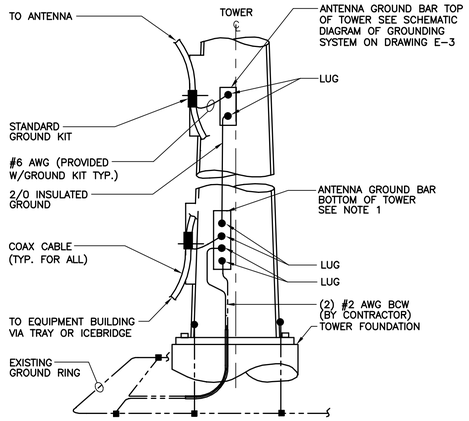
4 E-3 **RRU POLE MOUNT GROUNDING**
NOT TO SCALE



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. 3. 5/8" LOCK WASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8.
4. WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. 4. CAT NO. A-6056.
5. STAINLESS STEEL SECURITY SCREWS.

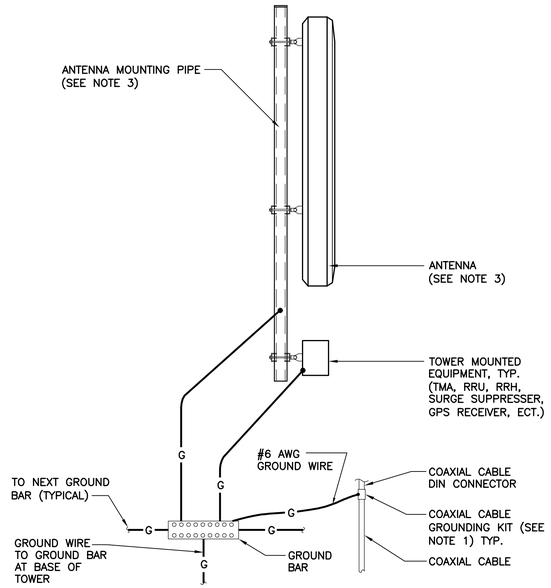
3 E-3 **GROUND BAR DETAIL**
NOT TO SCALE



NOTES:

1. NUMBER OF GROUND BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, LOCATION AND CONNECTION ORIENTATION. PROVIDE AS REQUIRED.
2. A SEPARATE GROUND BAR TO BE USED FOR GPS ANTENNA IF REQUIRED.

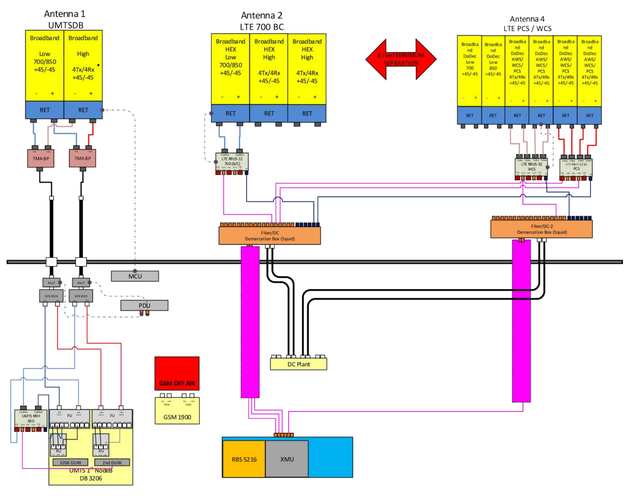
2 E-3 **ANTENNA CABLE GROUNDING - TOWER**
NOT TO SCALE



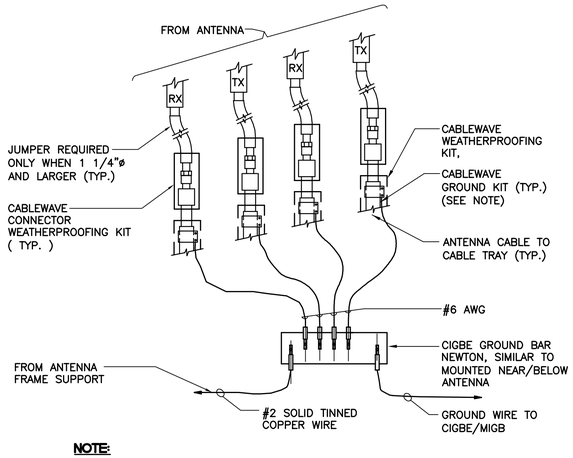
NOTES:

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 E-3 **TYPICAL ANTENNA GROUNDING DETAIL**
NOT TO SCALE



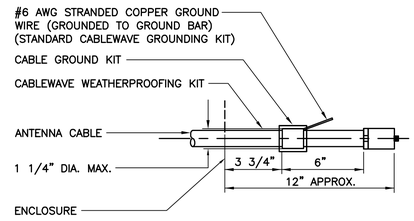
7 E-3 **RF PLUMBING DIAGRAM**
NOT TO SCALE



NOTE:

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

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



NOTE:

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

5 E-3 **ANTENNA CABLE GROUNDING DETAIL**
NOT TO SCALE

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	06/14/18	DMD	CAG	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

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WINDSOR BREAKNECK
CT5140 - LTE 3C WCS
440 HAYDEN STATION RD
WINDSOR, CT 06095

DATE:	02/28/18
SCALE:	AS NOTED
JOB NO.	18000.06

TYPICAL ELECTRICAL DETAILS

E-3

Sheet No. 8 of 8

Date: **February 16, 2018**

Marianne Dunst
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277

Velocitel, Inc. d.b.a. FDH Velocitel
6521 Meridien Drive, Suite 107
Raleigh, North Carolina 27616
(919) 755-1012

Subject: Structural Analysis Report

Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CT5140
	Carrier Site Name:	10071329
Crown Castle Designation:	**Crown Castle BU Number:**	876326
	Crown Castle Site Name:	HAYDEN STATION
	Crown Castle JDE Job Number:	480523
	Crown Castle Work Order Number:	1522662
	Crown Castle Application Number:	422595 Rev. 1
Engineering Firm Designation:	**FDH Velocitel Project Number:**	18PDVZ1400
Site Data:	**440 Hayden Station Road, WINDSOR, Hartford County, CT** **Latitude *41° 53' 52.2"*, Longitude *-72° 38' 38.7"*** **96 Foot - Monopole Tower**	

Dear Marianne Dunst,

FDH Velocitel 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 1140982, in accordance with application 422595, revision 1.

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 topographic category 1 and Risk Category II were used in this analysis.

We at *FDH Velocitel* 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:

Jack B. Deeken, EI
Project Engineer I

Reviewed by:

Dennis D. Abel, PE
Director of New Product Development
CT PE License No. 23247

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 96 ft Monopole tower designed by ROHN in January of 1997. The tower was originally designed for a wind speed of 80 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA-222-G Structural Standard for Antenna Supporting Structures and Antennas 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
92.0	92.0	3	cci antennas	TPA-65R-LCUUUU-H8	1 2	3/8 3/4	-
		3	ericsson	RRUS 32			
		1	raycap	DC6-48-60-18-8F			
		1	-	Sector Mount [SM 502-3]			

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
92.0	92.0	3	cci antennas	HPA-65R-BUU-H8	1 1 2 6	2" Conduit 3/8 3/4 1-5/8	1
		3	ericsson	RRUS 32 B2			
		3	ericsson	RRUS-11			
		3	kathrein	800 10121			
		6	kathrein	860 10025			
		6	powerwave technologies	LGP21401			
		1	raycap	DC6-48-60-18-8F			
		1	-	T-Arm Mount [TA 702-3]	-	-	2
83.0	86.0	1	andrew	VHLP2-180	2 6 4 1 3	2" Conduit 5/16 1/2 5/8 1-1/4	1
		2	dragonwave	A-ANT-11G-4-C			
	83.0	3	alcatel lucent	TD-RRH8x20-25			
		3	dragonwave	Horizon DUO			
		3	rfs celwave	APXVSPP18-C-A20			
		3	rfs celwave	APXVTM14-C-120			
		3	samsung telecommunications	WIMAX DAP HEAD			
		1	-	Platform Mount [LP 502-1]			
	82.0	3	kathrein	840 10045			
79.0	80.0	3	alcatel lucent	800MHz 2X50W RRH W/FILTER			
	79.0	1	-	Side Arm Mount [SO 104-3]			
	77.0	3	alcatel lucent	PCS 1900MHz 4x45W-65MHz			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
75.0	75.0	3	andrew	LNX-6515DS-A1M	12 1	7/8 1-5/8	1
		3	ericsson	ERICSSON AIR 21 B2A B4P			
		3	ericsson	ERICSSON AIR 21 B4A B2P			
		3	ericsson	KRY 112 144/1			
		3	ericsson	RRUS 11 B12			
		1	-	Platform Mount [LP 303-1]			
57.0	57.0	1	gps	GPS_A	1	1/2	1
		1	-	4.5' x 2" horizontal mount pipe			

Notes:
1) Existing Equipment
2) Reserved Equipment
3) Equipment To Be Removed; Not considered

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)
85	85	12	swedcom	ALP9212	12	1 5/8
75	75	12	swedcom	ALP9212	12	1 5/8
60	60	12	swedcom	ALP9212	12	1 5/8

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Clough, Harbor, & Associates LLP	1530918	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Rohn, Inc.	1640630	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Rohn, Inc.	1639483	CCISITES
4-TOWER STRUCTURAL ANALYSIS REPORTS	URS	1771083	CCISITES

3.1) Analysis Method

tnxTower (version 7.0.5.1), 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.
4) Tower extension geometry was taken from the previous analysis
5) Base and flange plate design methodology of the manufacturer has been reviewed and found to be an acceptable means of designing to resist the full capacity of the bolts and shaft.

This analysis may be affected if any assumptions are not valid or have been made in error. FDH Velocitel 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	96 - 85	Pole	P12x.5	1	-5.11	606.13	26.0	Pass
L2	85 - 65	Pole	P42x3/8	2	-15.81	1668.87	21.1	Pass
L3	65 - 32.5	Pole	P48x3/8	3	-24.33	1847.49	46.5	Pass
L4	32.5 - 0	Pole	P48x1/2	4	-35.35	2649.06	59.5	Pass
							Summary	
						Pole (L4)	59.5	Pass
						Rating =	59.5	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	70.8	Pass
1	Base Plate	0	60.7	Pass
1	Base Foundation Structural	0	41.7	Pass
1	Base Foundation Soil Interaction	0	31.8	Pass
1	Flange Plate	32.5	32.3	Pass
1	Flange Bolts	32.5	41.2	Pass
1	Flange Plate	65	21.9	Pass
1	Flange Bolts	65	13.9	Pass
1	Flange Plate	85	25.3	Pass
1	Flange Bolts	85	3.6	Pass

Structure Rating (max from all components) =	**70.8%**

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

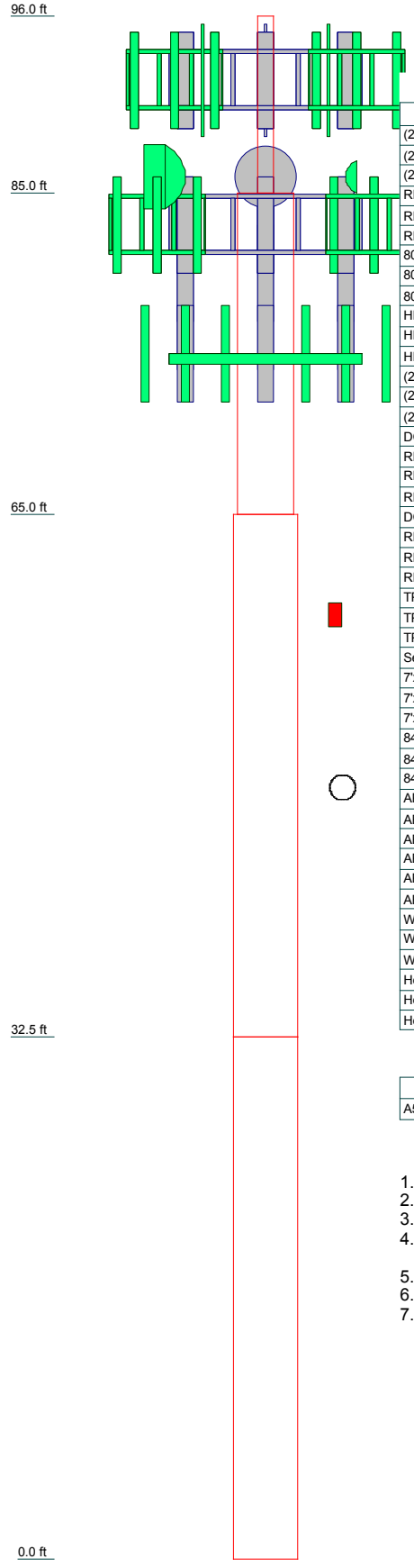
4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the proposed load configuration. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT

Section	Size	Length (ft)	Grade	Weight (K)
1	P12x.5	11.00	A53-B-35	0.7
2	P42x3/8	20.00	A53-B-42	3.3
3	P48x3/8	32.50		6.2
4	P48x1/2	32.50		8.3
				18.5



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(2) 860 10025	92	TD-RRH8x20-25	83
(2) 860 10025	92	TD-RRH8x20-25	83
(2) 860 10025	92	TD-RRH8x20-25	83
RRUS 32 B2	92	(2) 4' x 2" Pipe Mount	83
RRUS 32 B2	92	(2) 4' x 2" Pipe Mount	83
RRUS 32 B2	92	(2) 4' x 2" Pipe Mount	83
800 10121 w/ Mount Pipe	92	Platform Mount [LP 502-1]	83
800 10121 w/ Mount Pipe	92	A-ANT-11G-4-C	83
800 10121 w/ Mount Pipe	92	VHLP2-180	83
HPA-65R-BUU-H8 w/ Mount Pipe	92	A-ANT-11G-4-C	83
HPA-65R-BUU-H8 w/ Mount Pipe	92	PCS 1900MHz 4x45W-65MHz	79
HPA-65R-BUU-H8 w/ Mount Pipe	92	PCS 1900MHz 4x45W-65MHz	79
(2) LGP21401	92	PCS 1900MHz 4x45W-65MHz	79
(2) LGP21401	92	4' x 2" Pipe Mount	79
(2) LGP21401	92	4' x 2" Pipe Mount	79
DC6-48-60-18-8F	92	4' x 2" Pipe Mount	79
RRUS-11	92	Side Arm Mount [SO 104-3]	79
RRUS-11	92	800MHz 2X50W RRH W/FILTER	79
RRUS-11	92	800MHz 2X50W RRH W/FILTER	79
DC6-48-60-18-8F	92	800MHz 2X50W RRH W/FILTER	79
RRUS 32	92	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	75
RRUS 32	92	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	75
RRUS 32	92	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	75
TPA-65R-LCUUUU-H8 w/ Mount Pipe	92	KRY 112 144/1	75
TPA-65R-LCUUUU-H8 w/ Mount Pipe	92	KRY 112 144/1	75
TPA-65R-LCUUUU-H8 w/ Mount Pipe	92	KRY 112 144/1	75
Sector Mount [SM 502-3]	92	LNX-6515DS-A1M w/ Mount Pipe	75
7'x2 1/2" Pipe Mount	92	LNX-6515DS-A1M w/ Mount Pipe	75
7'x2 1/2" Pipe Mount	92	LNX-6515DS-A1M w/ Mount Pipe	75
7'x2 1/2" Pipe Mount	92	RRUS 11 B12	75
840 10045 w/ Mount Pipe	83	RRUS 11 B12	75
840 10045 w/ Mount Pipe	83	RRUS 11 B12	75
840 10045 w/ Mount Pipe	83	Platform Mount [LP 303-1]	75
APXVSPP18-C-A20 w/ Mount Pipe	83	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	75
APXVSPP18-C-A20 w/ Mount Pipe	83	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	75
APXVSPP18-C-A20 w/ Mount Pipe	83	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	75
APXVTM14-C-120 w/ Mount Pipe	83	4.5' x 2" horizontal mount pipe	57
APXVTM14-C-120 w/ Mount Pipe	83	GPS_A	57
APXVTM14-C-120 w/ Mount Pipe	83		
WIMAX DAP HEAD	83		
WIMAX DAP HEAD	83		
WIMAX DAP HEAD	83		
Horizon DUO	83		
Horizon DUO	83		
Horizon DUO	83		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-35	35 ksi	63 ksi	A53-B-42	42 ksi	63 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

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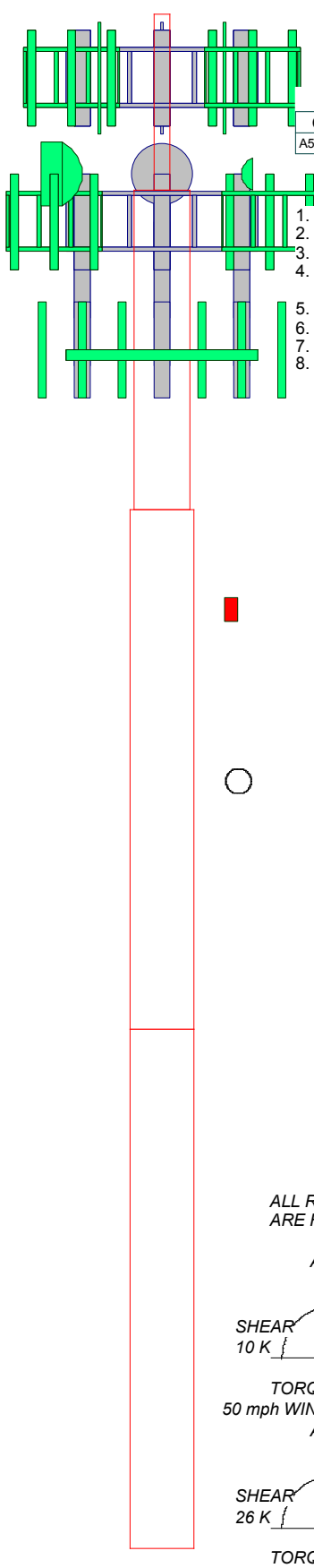
6521 Meridien Drive, Suite 107
Raleigh, North Carolina 27616
Phone: (919) 755-1012
FAX: 9197551031
Tower Analysis

Job: BU# 876326 - Hayden Station			
Project: 18PDVZ1400			
Client: Crown Castle	Drawn by: Jack B. Deeken, EI		App'd:
Code: TIA-222-G	Date: 02/16/18		Scale: NTS
Path:			Dwg No. E-1

Section	Size	Length (ft)	Grade	Weight (K)
1	P12x.5	11.00	A53-B-35	0.7
2	P42x3/8	20.00	A53-B-42	3.3
3	P48x3/8	32.50		6.2
4	P48x1/2	32.50		8.3
				18.5



MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-35	35 ksi	63 ksi	A53-B-42	42 ksi	63 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: 59.5%

ALL REACTIONS ARE FACTORED

AXIAL 72 K

SHEAR 10 K *MOMENT 645 kip-ft*

TORQUE 0 kip-ft
50 mph WIND - 1.0000 in ICE

AXIAL 35 K

SHEAR 26 K *MOMENT 1845 kip-ft*

TORQUE 2 kip-ft
REACTIONS - 97 mph WIND

FDH Velocitel
6521 Meridien Drive, Suite 107
Raleigh, North Carolina 27616
Phone: (919) 755-1012
FAX: 9197551031

Tower Analysis

Job: ***BU# 876326 - Hayden Station***			
Project: ***18PDVZ1400***			
Client: Crown Castle	Drawn by: Jack B. Deeken, EI		App'd:
Code: TIA-222-G	Date: 02/16/18		Scale: NTS
Path:			Dwg No. E-1

Tower Input Data

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

4) Tower is located in Hartford County, Connecticut.
5) ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
6) Basic wind speed of 97 mph.
7) Structure Class II.
8) Exposure Category C.
9) Topographic Category 1.
10) Crest Height 0.00 ft.
11) Nominal ice thickness of 1.0000 in.
12) Ice thickness is considered to increase with height.
13) Ice density of 56 pcf.
14) A wind speed of 50 mph is used in combination with ice.
15) Temperature drop of 50 °F.
16) Deflections calculated using a wind speed of 60 mph.
17) A non-linear (P-delta) analysis was used.
18) Pressures are calculated at each section.
19) Stress ratio used in pole design is 1.
20) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs	Distribute Leg Loads As Uniform	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Horizontals	Assume Legs Pinned	Calculate Redundant Bracing Forces
Consider Moments - Diagonals	√ Assume Rigid Index Plate	Ignore Redundant Members in FEA
Use Moment Magnification	√ Use Clear Spans For Wind Area	SR Leg Bolts Resist Compression
√ Use Code Stress Ratios	Use Clear Spans For KL/r	All Leg Panels Have Same Allowable
√ Use Code Safety Factors - Guys	Retension Guys To Initial Tension	Offset Girt At Foundation
Escalate Ice	√ Bypass Mast Stability Checks	√ Consider Feed Line Torque
Always Use Max Kz	√ Use Azimuth Dish Coefficients	Include Angle Block Shear Check
Use Special Wind Profile	√ Project Wind Area of Appurt.	Use TIA-222-G Bracing Resist. Exemption
Include Bolts In Member Capacity	Autocalc Torque Arm Areas	Use TIA-222-G Tension Splice Exemption
Leg Bolts Are At Top Of Section	Add IBC .6D+W Combination	Poles
Secondary Horizontal Braces Leg	√ Sort Capacity Reports By Component	√ Include Shear-Torsion Interaction
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Always Use Sub-Critical Flow
SR Members Have Cut Ends	Treat Feed Line Bundles As Cylinder	Use Top Mounted Sockets
SR Members Are Concentric		

Pole Section Geometry

Section	*Elevation* *ft*	*Section Length* *ft*	*Pole Size*	*Pole Grade*	*Socket Length* *ft*
L1	96.00-85.00	11.00	P12x.5	A53-B-35 (35 ksi)	
L2	85.00-65.00	20.00	P42x3/8	A53-B-42 (42 ksi)	
L3	65.00-32.50	32.50	P48x3/8	A53-B-42 (42 ksi)	
L4	32.50-0.00	32.50	P48x1/2	A53-B-42 (42 ksi)	

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 96.00-85.00				1	1	1			
L2 85.00-65.00				1	1	1			
L3 65.00-32.50				1	1	1			
L4 32.50-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
FSJ4-50B(1/2")	A	Surface Ar (CaAa)	83.00 - 0.00	3	3	-0.180 -0.150	0.5200		0.14
HB058-M12-XXXF(5/8")	A	Surface Ar (CaAa)	83.00 - 0.00	1	1	-0.210 -0.210	0.8400		0.24
HB114-1-08U4-M5J(1-1/4")	A	Surface Ar (CaAa)	83.00 - 0.00	3	3	-0.230 -0.200	1.5400		1.08
2" Rigid Conduit ****	A	Surface Ar (CaAa)	83.00 - 2.00	2	2	-0.130 -0.100	2.0000		2.80
AVA5-50(7/8)	B	Surface Ar (CaAa)	75.00 - 2.00	6	6	0.080 0.200	1.1020		0.30
AVA7-50(1-5/8)	B	Surface Ar (CaAa)	75.00 - 2.00	1	1	0.200 0.210	2.0100		0.70

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
LDF7-50A(1-5/8")	A	No	Inside Pole	92.00 - 8.00	6	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
FB-L98B-002-75000(3/8")	A	No	Inside Pole	92.00 - 8.00	1	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
FB-L98B-002-75000(3/8")	A	No	Inside Pole	92.00 - 8.00	1	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
WR-VG86ST-BRD(3/4)	A	No	Inside Pole	92.00 - 8.00	2	No Ice	0.00	0.58
						1/2" Ice	0.00	0.58
						1" Ice	0.00	0.58
WR-VG86ST-BRD(3/4)	A	No	Inside Pole	92.00 - 8.00	2	No Ice	0.00	0.58
						1/2" Ice	0.00	0.58
						1" Ice	0.00	0.58
2" Rigid Conduit *	A	No	Inside Pole	92.00 - 0.00	1	No Ice	0.00	2.80
						1/2" Ice	0.00	2.80
						1" Ice	0.00	2.80
ATCB-B01-001(5/16")	A	No	Inside Pole	83.00 - 0.00	6	No Ice	0.00	0.07
						1/2" Ice	0.00	0.07
						1" Ice	0.00	0.07
LDF4-50A(1/2")	A	No	Inside Pole	83.00 - 0.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
AVA5-50(7/8)	B	No	Inside Pole	75.00 - 2.00	6	No Ice	0.00	0.30

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
						1/2" Ice	0.00	0.30
						1" Ice	0.00	0.30

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	96.00-85.00	A	0.000	0.000	0.000	0.000	0.07
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L2	85.00-65.00	A	0.000	0.000	19.836	0.000	0.39
		B	0.000	0.000	8.622	0.000	0.04
		C	0.000	0.000	0.000	0.000	0.00
L3	65.00-32.50	A	0.000	0.000	35.815	0.000	0.66
		B	0.000	0.000	28.022	0.000	0.14
		C	0.000	0.000	0.000	0.000	0.00
L4	32.50-0.00	A	0.000	0.000	35.015	0.000	0.59
		B	0.000	0.000	26.297	0.000	0.13
		C	0.000	0.000	0.000	0.000	0.00

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	96.00-85.00	A	2.212	0.000	0.000	0.000	0.000	0.07
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L2	85.00-65.00	A	2.171	0.000	0.000	61.543	0.000	1.23
		B		0.000	0.000	20.045	0.000	0.34
		C		0.000	0.000	0.000	0.000	0.00
L3	65.00-32.50	A	2.081	0.000	0.000	108.331	0.000	2.10
		B		0.000	0.000	63.826	0.000	1.05
		C		0.000	0.000	0.000	0.000	0.00
L4	32.50-0.00	A	1.868	0.000	0.000	99.823	0.000	1.80
		B		0.000	0.000	56.975	0.000	0.87
		C		0.000	0.000	0.000	0.000	0.00

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	96.00-85.00	0.0000	0.0000	0.0000	0.0000
L2	85.00-65.00	-0.6061	-0.2744	-1.0837	-0.3640
L3	65.00-32.50	-0.2369	-0.3648	-0.6603	-0.4527
L4	32.50-0.00	-0.2705	-0.3513	-0.6822	-0.4376

Shielding Factor Ka

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

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L2	11	FSJ4-50B(1/2")	65.00 - 83.00	1.0000	1.0000
L2	13	HB058-M12-XXXF(5/8")	65.00 - 83.00	1.0000	1.0000
L2	14	HB114-1-08U4-M5J(1-1/4")	65.00 - 83.00	1.0000	1.0000
L2	15	2" Rigid Conduit	65.00 - 83.00	1.0000	1.0000
L2	17	AVA5-50(7/8)	65.00 - 75.00	1.0000	1.0000
L2	19	AVA7-50(1-5/8)	65.00 - 75.00	1.0000	1.0000
L3	11	FSJ4-50B(1/2")	32.50 - 65.00	1.0000	1.0000
L3	13	HB058-M12-XXXF(5/8")	32.50 - 65.00	1.0000	1.0000
L3	14	HB114-1-08U4-M5J(1-1/4")	32.50 - 65.00	1.0000	1.0000
L3	15	2" Rigid Conduit	32.50 - 65.00	1.0000	1.0000
L3	17	AVA5-50(7/8)	32.50 - 65.00	1.0000	1.0000
L3	19	AVA7-50(1-5/8)	32.50 - 65.00	1.0000	1.0000
L4	11	FSJ4-50B(1/2")	0.00 - 32.50	1.0000	1.0000
L4	13	HB058-M12-XXXF(5/8")	0.00 - 32.50	1.0000	1.0000
L4	14	HB114-1-08U4-M5J(1-1/4")	0.00 - 32.50	1.0000	1.0000
L4	15	2" Rigid Conduit	2.00 - 32.50	1.0000	1.0000
L4	17	AVA5-50(7/8)	2.00 - 32.50	1.0000	1.0000
L4	19	AVA7-50(1-5/8)	2.00 - 32.50	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
92FT									
(2) 860 10025	A	From Leg	4.00 0.00 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice	0.14 0.20 0.26	0.12 0.17 0.23	0.00 0.00 0.01
(2) 860 10025	B	From Leg	4.00 0.00 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice	0.14 0.20 0.26	0.12 0.17 0.23	0.00 0.00 0.01
(2) 860 10025	C	From Leg	4.00 0.00 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice	0.14 0.20 0.26	0.12 0.17 0.23	0.00 0.00 0.01
RRUS 32 B2	A	From Leg	4.00 0.00 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice	2.76 2.98 3.22	1.69 1.88 2.07	0.05 0.07 0.10
RRUS 32 B2	B	From Leg	4.00 0.00 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice	2.76 2.98 3.22	1.69 1.88 2.07	0.05 0.07 0.10

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
RRUS 32 B2	C	From Leg	4.00 0.00 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice	2.76 2.98 3.22	1.69 1.88 2.07	0.05 0.07 0.10
800 10121 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice	5.39 5.81 6.23	4.60 5.35 6.05	0.07 0.11 0.17
800 10121 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice	5.39 5.81 6.23	4.60 5.35 6.05	0.07 0.11 0.17
800 10121 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice	5.39 5.81 6.23	4.60 5.35 6.05	0.07 0.11 0.17
HPA-65R-BUU-H8 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice	12.98 13.56 14.15	9.18 10.48 11.49	0.10 0.19 0.29
HPA-65R-BUU-H8 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice	12.98 13.56 14.15	9.18 10.48 11.49	0.10 0.19 0.29
HPA-65R-BUU-H8 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice	12.98 13.56 14.15	9.18 10.48 11.49	0.10 0.19 0.29
(2) LGP21401	A	From Leg	4.00 0.00 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice	1.10 1.24 1.38	0.35 0.44 0.54	0.01 0.02 0.03
(2) LGP21401	B	From Leg	4.00 0.00 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice	1.10 1.24 1.38	0.35 0.44 0.54	0.01 0.02 0.03
(2) LGP21401	C	From Leg	4.00 0.00 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice	1.10 1.24 1.38	0.35 0.44 0.54	0.01 0.02 0.03
DC6-48-60-18-8F	A	From Leg	4.00 0.00 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice	1.21 1.89 2.11	1.21 1.89 2.11	0.03 0.05 0.08
RRUS-11	B	From Leg	4.00 0.00 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice	2.52 2.72 2.92	1.07 1.21 1.36	0.06 0.07 0.10
RRUS-11	C	From Leg	4.00 0.00 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice	2.52 2.72 2.92	1.07 1.21 1.36	0.06 0.07 0.10
RRUS-11	A	From Leg	4.00 0.00 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice	2.52 2.72 2.92	1.07 1.21 1.36	0.06 0.07 0.10
DC6-48-60-18-8F	A	From Leg	4.00 0.00 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice	1.21 1.89 2.11	1.21 1.89 2.11	0.03 0.05 0.08
RRUS 32	A	From Leg	4.00 0.00 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice	2.86 3.08 3.32	1.78 1.97 2.17	0.06 0.08 0.10
RRUS 32	B	From Leg	4.00	0.0000	92.00	No Ice	2.86	1.78	0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2"	3.08	1.97	0.08
			0.00			Ice	3.32	2.17	0.10
						1" Ice			
RRUS 32	C	From Leg	4.00	0.0000	92.00	No Ice	2.86	1.78	0.06
			0.00			1/2"	3.08	1.97	0.08
			0.00			Ice	3.32	2.17	0.10
						1" Ice			
TPA-65R-LCUUUU-H8 w/ Mount Pipe	A	From Leg	4.00	0.0000	92.00	No Ice	13.59	11.41	0.13
			0.00			1/2"	14.29	12.94	0.24
			0.00			Ice	14.98	14.29	0.36
						1" Ice			
TPA-65R-LCUUUU-H8 w/ Mount Pipe	B	From Leg	4.00	0.0000	92.00	No Ice	13.59	11.41	0.13
			0.00			1/2"	14.29	12.94	0.24
			0.00			Ice	14.98	14.29	0.36
						1" Ice			
TPA-65R-LCUUUU-H8 w/ Mount Pipe	C	From Leg	4.00	0.0000	92.00	No Ice	13.59	11.41	0.13
			0.00			1/2"	14.29	12.94	0.24
			0.00			Ice	14.98	14.29	0.36
						1" Ice			
Sector Mount [SM 502-3]	C	None		0.0000	92.00	No Ice	33.02	33.02	1.67
						1/2"	47.36	47.36	2.22
						Ice	61.70	61.70	2.77
						1" Ice			
7'x2 1/2" Pipe Mount	A	From Leg	4.00	0.0000	92.00	No Ice	2.01	2.01	0.04
			0.00			1/2"	2.59	2.59	0.06
			0.00			Ice	3.02	3.02	0.07
						1" Ice			
7'x2 1/2" Pipe Mount	B	From Leg	4.00	0.0000	92.00	No Ice	2.01	2.01	0.04
			0.00			1/2"	2.59	2.59	0.06
			0.00			Ice	3.02	3.02	0.07
						1" Ice			
7'x2 1/2" Pipe Mount	C	From Leg	4.00	0.0000	92.00	No Ice	2.01	2.01	0.04
			0.00			1/2"	2.59	2.59	0.06
			0.00			Ice	3.02	3.02	0.07
						1" Ice			
83FT									
840 10045 w/ Mount Pipe	A	From Leg	4.00	0.0000	83.00	No Ice	3.58	3.58	0.06
			0.00			1/2"	5.31	5.31	0.11
			-1.00			Ice	6.02	6.02	0.17
						1" Ice			
840 10045 w/ Mount Pipe	B	From Leg	4.00	0.0000	83.00	No Ice	3.58	3.58	0.06
			0.00			1/2"	5.31	5.31	0.11
			-1.00			Ice	6.02	6.02	0.17
						1" Ice			
840 10045 w/ Mount Pipe	C	From Leg	4.00	0.0000	83.00	No Ice	3.58	3.58	0.06
			0.00			1/2"	5.31	5.31	0.11
			-1.00			Ice	6.02	6.02	0.17
						1" Ice			
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.00	0.0000	83.00	No Ice	8.26	7.47	0.09
			0.00			1/2"	8.82	8.66	0.16
			0.00			Ice	9.35	9.56	0.24
						1" Ice			
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.00	0.0000	83.00	No Ice	8.26	7.47	0.09
			0.00			1/2"	8.82	8.66	0.16
			0.00			Ice	9.35	9.56	0.24
						1" Ice			
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.00	0.0000	83.00	No Ice	8.26	7.47	0.09
			0.00			1/2"	8.82	8.66	0.16
			0.00			Ice	9.35	9.56	0.24
						1" Ice			
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.00	0.0000	83.00	No Ice	6.58	4.96	0.08
			0.00			1/2"	7.03	5.75	0.13
			0.00			Ice	7.47	6.47	0.19
						1" Ice			
APXVTM14-C-120 w/	B	From Leg	4.00	0.0000	83.00	No Ice	6.58	4.96	0.08

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Mount Pipe			0.00			1/2" Ice	7.03	5.75	0.13
			0.00			1" Ice	7.47	6.47	0.19
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice	6.58 7.03 7.47	4.96 5.75 6.47	0.08 0.13 0.19
WIMAX DAP HEAD	A	From Leg	4.00 0.00 0.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice	1.55 1.70 1.87	0.68 0.80 0.92	0.03 0.04 0.06
WIMAX DAP HEAD	B	From Leg	4.00 0.00 0.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice	1.55 1.70 1.87	0.68 0.80 0.92	0.03 0.04 0.06
WIMAX DAP HEAD	C	From Leg	4.00 0.00 0.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice	1.55 1.70 1.87	0.68 0.80 0.92	0.03 0.04 0.06
Horizon DUO	A	From Leg	4.00 0.00 0.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice	0.47 0.56 0.65	0.29 0.37 0.44	0.01 0.01 0.02
Horizon DUO	B	From Leg	4.00 0.00 0.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice	0.47 0.56 0.65	0.29 0.37 0.44	0.01 0.01 0.02
Horizon DUO	C	From Leg	4.00 0.00 0.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice	0.47 0.56 0.65	0.29 0.37 0.44	0.01 0.01 0.02
TD-RRH8x20-25	A	From Leg	4.00 0.00 0.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice	3.70 3.95 4.20	1.29 1.46 1.64	0.07 0.09 0.12
TD-RRH8x20-25	B	From Leg	4.00 0.00 0.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice	3.70 3.95 4.20	1.29 1.46 1.64	0.07 0.09 0.12
TD-RRH8x20-25	C	From Leg	4.00 0.00 0.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice	3.70 3.95 4.20	1.29 1.46 1.64	0.07 0.09 0.12
(2) 4' x 2" Pipe Mount	A	From Leg	4.00 0.00 0.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice	0.79 1.03 1.28	0.79 1.03 1.28	0.03 0.04 0.04
(2) 4' x 2" Pipe Mount	B	From Leg	4.00 0.00 0.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice	0.79 1.03 1.28	0.79 1.03 1.28	0.03 0.04 0.04
(2) 4' x 2" Pipe Mount	C	From Leg	4.00 0.00 0.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice	0.79 1.03 1.28	0.79 1.03 1.28	0.03 0.04 0.04
Platform Mount [LP 502-1]	C	None		0.0000	83.00	No Ice 1/2" Ice 1" Ice	32.35 45.67 58.99	32.35 45.67 58.99	0.93 1.19 1.46
79FT 800MHz 2X50W RRH W/FILTER	A	From Leg	1.00 0.00 1.00	0.0000	79.00	No Ice 1/2" Ice 1" Ice	2.06 2.24 2.43	1.93 2.11 2.29	0.06 0.09 0.11
800MHz 2X50W RRH	B	From Leg	1.00	0.0000	79.00	No Ice	2.06	1.93	0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
W/FILTER			0.00			1/2" Ice	2.24	2.11	0.09
			1.00			1" Ice	2.43	2.29	0.11
800MHz 2X50W RRH W/FILTER	C	From Leg	1.00 0.00 1.00	0.0000	79.00	No Ice 1/2" Ice 1" Ice	2.06 2.24 2.43	1.93 2.11 2.29	0.06 0.09 0.11
PCS 1900MHz 4x45W-65MHz	A	From Leg	1.00 0.00 -2.00	0.0000	79.00	No Ice 1/2" Ice 1" Ice	2.32 2.53 2.74	2.24 2.44 2.65	0.06 0.08 0.11
PCS 1900MHz 4x45W-65MHz	B	From Leg	1.00 0.00 -2.00	0.0000	79.00	No Ice 1/2" Ice 1" Ice	2.32 2.53 2.74	2.24 2.44 2.65	0.06 0.08 0.11
PCS 1900MHz 4x45W-65MHz	C	From Leg	1.00 0.00 -2.00	0.0000	79.00	No Ice 1/2" Ice 1" Ice	2.32 2.53 2.74	2.24 2.44 2.65	0.06 0.08 0.11
4' x 2" Pipe Mount	A	From Leg	1.00 0.00 0.00	0.0000	79.00	No Ice 1/2" Ice 1" Ice	0.79 1.03 1.28	0.79 1.03 1.28	0.03 0.04 0.04
4' x 2" Pipe Mount	B	From Leg	1.00 0.00 0.00	0.0000	79.00	No Ice 1/2" Ice 1" Ice	0.79 1.03 1.28	0.79 1.03 1.28	0.03 0.04 0.04
4' x 2" Pipe Mount	C	From Leg	1.00 0.00 0.00	0.0000	79.00	No Ice 1/2" Ice 1" Ice	0.79 1.03 1.28	0.79 1.03 1.28	0.03 0.04 0.04
Side Arm Mount [SO 104-3]	C	None		0.0000	79.00	No Ice 1/2" Ice 1" Ice	3.30 4.13 4.96	3.30 4.13 4.96	0.29 0.32 0.35
75FT									
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	75.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	75.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	75.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	75.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	75.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	75.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
KRY 112 144/1	A	From Leg	4.00 0.00 0.00	0.0000	75.00	No Ice 1/2" Ice 1" Ice	0.35 0.43 0.51	0.16 0.22 0.28	0.01 0.01 0.02
KRY 112 144/1	B	From Leg	4.00	0.0000	75.00	No Ice	0.35	0.16	0.01

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* ft ft ft	*Azimuth Adjustment* °	*Placement* ft		C_AA_A *Front* ft^2	C_AA_A *Side* ft^2	*Weight* K
			0.00			1/2" Ice	0.43	0.22	0.01
			0.00			1" Ice	0.51	0.28	0.02
KRY 112 144/1	C	From Leg	4.00	0.0000	75.00	No Ice	0.35	0.16	0.01
			0.00			1/2" Ice	0.43	0.22	0.01
			0.00			1" Ice	0.51	0.28	0.02
LNX-6515DS-A1M w/ Mount Pipe	A	From Leg	4.00	0.0000	75.00	No Ice	11.78	10.85	0.12
			0.00			1/2" Ice	12.50	12.32	0.22
			0.00			1" Ice	13.18	13.46	0.33
LNX-6515DS-A1M w/ Mount Pipe	B	From Leg	4.00	0.0000	75.00	No Ice	11.78	10.85	0.12
			0.00			1/2" Ice	12.50	12.32	0.22
			0.00			1" Ice	13.18	13.46	0.33
LNX-6515DS-A1M w/ Mount Pipe	C	From Leg	4.00	0.0000	75.00	No Ice	11.78	10.85	0.12
			0.00			1/2" Ice	12.50	12.32	0.22
			0.00			1" Ice	13.18	13.46	0.33
RRUS 11 B12	A	From Leg	4.00	0.0000	75.00	No Ice	2.83	1.18	0.05
			0.00			1/2" Ice	3.04	1.33	0.07
			0.00			1" Ice	3.26	1.48	0.10
RRUS 11 B12	B	From Leg	4.00	0.0000	75.00	No Ice	2.83	1.18	0.05
			0.00			1/2" Ice	3.04	1.33	0.07
			0.00			1" Ice	3.26	1.48	0.10
RRUS 11 B12	C	From Leg	4.00	0.0000	75.00	No Ice	2.83	1.18	0.05
			0.00			1/2" Ice	3.04	1.33	0.07
			0.00			1" Ice	3.26	1.48	0.10
Platform Mount [LP 303-1]	C	None		0.0000	75.00	No Ice	14.66	14.66	1.25
						1/2" Ice	18.87	18.87	1.48
						1" Ice	23.08	23.08	1.71
57FT GPS_A	B	From Leg	3.00	0.0000	57.00	No Ice	0.26	0.26	0.00
			0.00			1/2" Ice	0.32	0.32	0.00
			1.00			1" Ice	0.39	0.39	0.01
4.5' x 2" horizontal mount pipe	B	From Leg	0.00	0.0000	57.00	No Ice	0.90	0.90	0.03
			0.00			1/2" Ice	1.21	1.21	0.04
			0.00			1" Ice	1.49	1.49	0.05
******									

Dishes

Description	*Face or Leg*	*Dish Type*	*Offset Type*	*Offsets: Horz Lateral Vert* ft	*Azimuth Adjustment* °	*3 dB Beam Width* °	*Elevation* ft	*Outside Diameter* ft		*Aperture Area* ft^2	*Weight* K
A-ANT-11G-4-C	A	Paraboloid w/Shroud (HP)	From Leg	4.00	-5.0000		83.00	3.92	No Ice	14.08	0.12
				0.00					1/2" Ice	14.63	0.20
				3.00					1" Ice	15.19	0.27
VHLP2-180	B	Paraboloid w/o Radome	From Leg	4.00	-35.0000		83.00	2.00	No Ice	3.14	0.03
				0.00					1/2" Ice	3.41	0.04
				3.00					1" Ice	3.68	0.06

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
A-ANT-11G-4-C	C	Paraboloid w/Shroud (HP)	From Leg	4.00 0.00 3.00	25.0000		83.00	3.92	No Ice 1/2" Ice 1" Ice	14.08 14.63 15.19	0.12 0.20 0.27
***											

Load Combinations

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	96 - 85	Pole	Max Tension	14	0.00	-0.00	-0.00
			Max. Compression	26	-14.97	1.47	2.32
			Max. Mx	20	-5.11	49.18	0.63
			Max. My	2	-5.11	0.38	49.14
			Max. Vy	8	8.30	-48.42	0.59
			Max. Vx	14	8.22	0.54	-48.19
			Max. Torque	24			1.80
L2	85 - 65	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-40.30	2.80	2.79
			Max. Mx	8	-15.81	-359.65	1.18
			Max. My	14	-15.81	3.50	-359.12
			Max. Vy	8	19.16	-359.65	1.18
			Max. Vx	14	19.18	3.50	-359.12
			Max. Torque	24			1.80
L3	65 - 32.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-55.30	4.11	3.63
			Max. Mx	8	-24.34	-1039.82	2.16
			Max. My	14	-24.33	8.29	-1047.35
			Max. Vy	8	22.61	-1039.82	2.16
			Max. Vx	14	23.05	8.29	-1047.35
			Max. Torque	24			1.80
L4	32.5 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-71.71	5.57	4.48
			Max. Mx	8	-35.35	-1817.37	3.16
			Max. My	14	-35.35	13.10	-1844.67
			Max. Vy	8	25.16	-1817.37	3.16
			Max. Vx	14	25.90	13.10	-1844.67
			Max. Torque	24			1.73

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	71.71	-0.00	-0.00
	Max. H_x	21	26.52	25.06	0.07
	Max. H_z	3	26.52	-0.02	25.69
	Max. M_x	2	1829.74	-0.02	25.69
	Max. M_z	8	1817.37	-25.14	0.02
	Max. Torsion	24	1.73	12.71	21.50
	Min. Vert	15	26.52	0.13	-25.89
	Min. H_x	9	26.52	-25.14	0.02
	Min. H_z	15	26.52	0.13	-25.89
	Min. M_x	14	-1844.67	0.13	-25.89
	Min. M_z	20	-1814.06	25.06	0.07
	Min. Torsion	12	-1.06	-12.72	-21.66

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	29.47	-0.00	-0.00	-0.83	1.46	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	35.36	0.02	-25.69	-1829.74	0.02	-1.31
0.9 Dead+1.6 Wind 0 deg - No Ice	26.52	0.02	-25.69	-1824.33	-0.43	-1.31
1.2 Dead+1.6 Wind 30 deg - No Ice	35.36	12.68	-21.55	-1557.21	-916.87	0.27
0.9 Dead+1.6 Wind 30 deg -	26.52	12.68	-21.55	-1552.53	-914.71	0.28

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
No Ice						
1.2 Dead+1.6 Wind 60 deg - No Ice	35.36	21.77	-12.59	-911.91	-1573.61	-0.19
0.9 Dead+1.6 Wind 60 deg - No Ice	26.52	21.77	-12.59	-909.07	-1569.58	-0.18
1.2 Dead+1.6 Wind 90 deg - No Ice	35.36	25.14	-0.02	-3.16	-1817.37	-0.40
0.9 Dead+1.6 Wind 90 deg - No Ice	26.52	25.14	-0.02	-2.90	-1812.66	-0.39
1.2 Dead+1.6 Wind 120 deg - No Ice	35.36	21.75	12.69	918.83	-1571.86	0.50
0.9 Dead+1.6 Wind 120 deg - No Ice	26.52	21.75	12.69	916.47	-1567.83	0.51
1.2 Dead+1.6 Wind 150 deg - No Ice	35.36	12.72	21.66	1564.33	-920.99	1.06
0.9 Dead+1.6 Wind 150 deg - No Ice	26.52	12.72	21.66	1560.14	-918.81	1.06
1.2 Dead+1.6 Wind 180 deg - No Ice	35.36	-0.13	25.89	1844.67	13.10	1.01
0.9 Dead+1.6 Wind 180 deg - No Ice	26.52	-0.13	25.89	1839.71	12.62	1.00
1.2 Dead+1.6 Wind 210 deg - No Ice	35.36	-12.73	21.71	1568.39	924.75	0.01
0.9 Dead+1.6 Wind 210 deg - No Ice	26.52	-12.73	21.71	1564.19	921.68	0.00
1.2 Dead+1.6 Wind 240 deg - No Ice	35.36	-21.66	12.62	912.35	1566.91	0.14
0.9 Dead+1.6 Wind 240 deg - No Ice	26.52	-21.66	12.62	910.01	1562.02	0.13
1.2 Dead+1.6 Wind 270 deg - No Ice	35.36	-25.06	-0.07	-6.94	1814.06	0.51
0.9 Dead+1.6 Wind 270 deg - No Ice	26.52	-25.06	-0.07	-6.66	1808.48	0.51
1.2 Dead+1.6 Wind 300 deg - No Ice	35.36	-21.73	-12.43	-897.87	1573.49	-0.64
0.9 Dead+1.6 Wind 300 deg - No Ice	26.52	-21.73	-12.43	-895.07	1568.58	-0.64
1.2 Dead+1.6 Wind 330 deg - No Ice	35.36	-12.71	-21.50	-1552.91	923.80	-1.73
0.9 Dead+1.6 Wind 330 deg - No Ice	26.52	-12.71	-21.50	-1548.25	920.73	-1.73
1.2 Dead+1.0 Ice+1.0 Temp	71.71	0.00	0.00	-4.48	5.57	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	71.71	0.00	-9.47	-645.08	5.28	-0.23
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	71.71	4.03	-6.91	-500.72	-284.78	0.04
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	71.71	6.95	-4.02	-293.56	-494.34	-0.08
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	71.71	8.03	-0.00	-5.04	-571.75	-0.14
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	71.71	6.95	4.03	286.10	-493.95	0.02
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	71.71	4.04	6.93	493.28	-285.63	0.15
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	71.71	-0.03	9.51	639.24	8.12	0.17
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	71.71	-4.05	6.93	494.04	297.62	0.00
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	71.71	-6.93	4.02	284.69	504.08	0.07
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	71.71	-8.01	-0.01	-5.71	582.06	0.15
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	71.71	-6.95	-3.98	-290.52	505.39	-0.07
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	71.71	-4.05	-6.89	-499.74	297.39	-0.30
Dead+Wind 0 deg - Service	29.47	0.00	-5.50	-391.38	1.10	-0.28
Dead+Wind 30 deg - Service	29.47	2.71	-4.61	-333.17	-194.71	0.06
Dead+Wind 60 deg - Service	29.47	4.66	-2.69	-195.36	-334.96	-0.04

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 90 deg - Service	29.47	5.38	-0.01	-1.30	-387.02	-0.08
Dead+Wind 120 deg - Service	29.47	4.65	2.71	195.60	-334.58	0.11
Dead+Wind 150 deg - Service	29.47	2.72	4.63	333.45	-195.59	0.23
Dead+Wind 180 deg - Service	29.47	-0.03	5.54	393.33	3.89	0.22
Dead+Wind 210 deg - Service	29.47	-2.72	4.64	334.32	198.58	0.00
Dead+Wind 240 deg - Service	29.47	-4.63	2.70	194.22	335.72	0.03
Dead+Wind 270 deg - Service	29.47	-5.36	-0.01	-2.10	388.50	0.11
Dead+Wind 300 deg - Service	29.47	-4.65	-2.66	-192.37	337.12	-0.14
Dead+Wind 330 deg - Service	29.47	-2.72	-4.60	-332.25	198.38	-0.37

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-29.47	0.00	0.00	29.47	0.00	0.000%
2	0.02	-35.36	-25.69	-0.02	35.36	25.69	0.001%
3	0.02	-26.52	-25.69	-0.02	26.52	25.69	0.001%
4	12.68	-35.36	-21.55	-12.68	35.36	21.55	0.000%
5	12.68	-26.52	-21.55	-12.68	26.52	21.55	0.000%
6	21.77	-35.36	-12.59	-21.77	35.36	12.59	0.000%
7	21.77	-26.52	-12.59	-21.77	26.52	12.59	0.000%
8	25.14	-35.36	-0.02	-25.14	35.36	0.02	0.001%
9	25.14	-26.52	-0.02	-25.14	26.52	0.02	0.001%
10	21.75	-35.36	12.69	-21.75	35.36	-12.69	0.000%
11	21.75	-26.52	12.69	-21.75	26.52	-12.69	0.000%
12	12.72	-35.36	21.66	-12.72	35.36	-21.66	0.000%
13	12.72	-26.52	21.66	-12.72	26.52	-21.66	0.000%
14	-0.13	-35.36	25.89	0.13	35.36	-25.89	0.001%
15	-0.13	-26.52	25.89	0.13	26.52	-25.89	0.001%
16	-12.73	-35.36	21.71	12.73	35.36	-21.71	0.000%
17	-12.73	-26.52	21.71	12.73	26.52	-21.71	0.000%
18	-21.66	-35.36	12.62	21.66	35.36	-12.62	0.000%
19	-21.66	-26.52	12.62	21.66	26.52	-12.62	0.000%
20	-25.07	-35.36	-0.07	25.06	35.36	0.07	0.001%
21	-25.07	-26.52	-0.07	25.06	26.52	0.07	0.001%
22	-21.73	-35.36	-12.43	21.73	35.36	12.43	0.000%
23	-21.73	-26.52	-12.43	21.73	26.52	12.43	0.000%
24	-12.71	-35.36	-21.50	12.71	35.36	21.50	0.000%
25	-12.71	-26.52	-21.50	12.71	26.52	21.50	0.000%
26	0.00	-71.71	0.00	-0.00	71.71	-0.00	0.000%
27	0.00	-71.71	-9.47	-0.00	71.71	9.47	0.000%
28	4.03	-71.71	-6.91	-4.03	71.71	6.91	0.000%
29	6.95	-71.71	-4.02	-6.95	71.71	4.02	0.000%
30	8.03	-71.71	-0.00	-8.03	71.71	0.00	0.000%
31	6.95	-71.71	4.03	-6.95	71.71	-4.03	0.000%
32	4.04	-71.71	6.93	-4.04	71.71	-6.93	0.000%
33	-0.03	-71.71	9.51	0.03	71.71	-9.51	0.000%
34	-4.05	-71.71	6.93	4.05	71.71	-6.93	0.000%
35	-6.93	-71.71	4.02	6.93	71.71	-4.02	0.000%
36	-8.01	-71.71	-0.01	8.01	71.71	0.01	0.000%
37	-6.95	-71.71	-3.98	6.95	71.71	3.98	0.000%
38	-4.05	-71.71	-6.89	4.05	71.71	6.89	0.000%
39	0.00	-29.47	-5.50	-0.00	29.47	5.50	0.001%
40	2.71	-29.47	-4.61	-2.71	29.47	4.61	0.001%
41	4.66	-29.47	-2.69	-4.66	29.47	2.69	0.001%
42	5.38	-29.47	-0.01	-5.38	29.47	0.01	0.001%
43	4.65	-29.47	2.72	-4.65	29.47	-2.71	0.001%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
44	2.72	-29.47	4.63	-2.72	29.47	-4.63	0.001%
45	-0.03	-29.47	5.54	0.03	29.47	-5.54	0.001%
46	-2.72	-29.47	4.64	2.72	29.47	-4.64	0.001%
47	-4.63	-29.47	2.70	4.63	29.47	-2.70	0.001%
48	-5.36	-29.47	-0.01	5.36	29.47	0.01	0.001%
49	-4.65	-29.47	-2.66	4.65	29.47	2.66	0.001%
50	-2.72	-29.47	-4.60	2.72	29.47	4.60	0.001%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	9	0.00000001	0.00010416
3	Yes	9	0.00000001	0.00008850
4	Yes	10	0.00000001	0.00009792
5	Yes	10	0.00000001	0.00008032
6	Yes	10	0.00000001	0.00009875
7	Yes	10	0.00000001	0.00008086
8	Yes	9	0.00000001	0.00004794
9	Yes	9	0.00000001	0.00004236
10	Yes	10	0.00000001	0.00010204
11	Yes	10	0.00000001	0.00008373
12	Yes	10	0.00000001	0.00008915
13	Yes	10	0.00000001	0.00007289
14	Yes	9	0.00000001	0.00009011
15	Yes	9	0.00000001	0.00007670
16	Yes	10	0.00000001	0.00009824
17	Yes	10	0.00000001	0.00008036
18	Yes	10	0.00000001	0.00009466
19	Yes	10	0.00000001	0.00007750
20	Yes	9	0.00000001	0.00005531
21	Yes	9	0.00000001	0.00004827
22	Yes	10	0.00000001	0.00008978
23	Yes	10	0.00000001	0.00007331
24	Yes	10	0.00000001	0.00011478
25	Yes	10	0.00000001	0.00009443
26	Yes	6	0.00000001	0.00001167
27	Yes	10	0.00000001	0.00012848
28	Yes	10	0.00000001	0.00012193
29	Yes	10	0.00000001	0.00012168
30	Yes	10	0.00000001	0.00011631
31	Yes	10	0.00000001	0.00012006
32	Yes	10	0.00000001	0.00011980
33	Yes	10	0.00000001	0.00012643
34	Yes	10	0.00000001	0.00012197
35	Yes	10	0.00000001	0.00012236
36	Yes	10	0.00000001	0.00011906
37	Yes	10	0.00000001	0.00012391
38	Yes	10	0.00000001	0.00012389
39	Yes	8	0.00000001	0.00005353
40	Yes	8	0.00000001	0.00004749
41	Yes	8	0.00000001	0.00004763
42	Yes	8	0.00000001	0.00005043
43	Yes	8	0.00000001	0.00004850
44	Yes	8	0.00000001	0.00004683
45	Yes	8	0.00000001	0.00005254
46	Yes	8	0.00000001	0.00004723
47	Yes	8	0.00000001	0.00004686
48	Yes	8	0.00000001	0.00005090
49	Yes	8	0.00000001	0.00004666
50	Yes	8	0.00000001	0.00005540

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	96 - 85	3.342	45	0.2705	0.0009
L2	85 - 65	2.737	45	0.2413	0.0005
L3	65 - 32.5	1.758	45	0.2204	0.0003
L4	32.5 - 0	0.501	45	0.1347	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
92.00	(2) 860 10025	45	3.119	0.2584	0.0008	46088
86.00	A-ANT-11G-4-C	45	2.791	0.2432	0.0008	24501
83.00	840 10045 w/ Mount Pipe	45	2.632	0.2381	0.0007	23122
79.00	800MHz 2X50W RRH W/FILTER	45	2.428	0.2331	0.0007	26616
75.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	45	2.230	0.2294	0.0006	32458
57.00	GPS_A	45	1.397	0.2073	0.0004	31238

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	96 - 85	15.696	14	1.2631	0.0044
L2	85 - 65	12.849	14	1.1338	0.0022
L3	65 - 32.5	8.248	14	1.0346	0.0014
L4	32.5 - 0	2.350	14	0.6319	0.0006

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
92.00	(2) 860 10025	14	14.644	1.2108	0.0039	10211
86.00	A-ANT-11G-4-C	14	13.100	1.1429	0.0036	5426
83.00	840 10045 w/ Mount Pipe	14	12.355	1.1179	0.0034	5114
79.00	800MHz 2X50W RRH W/FILTER	14	11.394	1.0938	0.0032	5867
75.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	14	10.466	1.0766	0.0029	7119
57.00	GPS_A	14	6.554	0.9733	0.0019	6699

Compression Checks

Pole Design Data

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
L1	96 - 95	P12x.5	11.00	0.00	0.0	19.2423	-0.13	606.13	0.000 [1]
	95 - 94					19.2423	-0.17	606.13	0.000
	94 - 93					19.2423	-0.26	606.13	0.000
	93 - 92					19.2423	-0.34	606.13	0.001
	92 - 91					19.2423	-4.28	606.13	0.007
	91 - 90					19.2423	-4.37	606.13	0.007
	90 - 89					19.2423	-4.46	606.13	0.007
	89 - 88					19.2423	-4.54	606.13	0.007
	88 - 87					19.2423	-4.63	606.13	0.008
	87 - 86					19.2423	-4.72	606.13	0.008
	86 - 85					19.2423	-5.11	606.13	0.008
L2	85 - 84	P42x3/8	20.00	0.00	0.0	49.0383	-5.33	1668.87	0.003
	84 - 83					49.0383	-5.56	1668.87	0.003
	83 - 82					49.0383	-8.24	1668.87	0.005
	82 - 81					49.0383	-8.46	1668.87	0.005
	81 - 80					49.0383	-8.69	1668.87	0.005
	80 - 79					49.0383	-8.91	1668.87	0.005
	79 - 78					49.0383	-10.01	1668.87	0.006
	78 - 77					49.0383	-10.23	1668.87	0.006
	77 - 76					49.0383	-10.45	1668.87	0.006
	76 - 75					49.0383	-10.68	1668.87	0.006
	75 - 74					49.0383	-13.77	1668.87	0.008
	74 - 73					49.0383	-14.00	1668.87	0.008
	73 - 72					49.0383	-14.22	1668.87	0.009
	72 - 71					49.0383	-14.45	1668.87	0.009
	71 - 70					49.0383	-14.68	1668.87	0.009
	70 - 69					49.0383	-14.90	1668.87	0.009
	69 - 68					49.0383	-15.13	1668.87	0.009
	68 - 67					49.0383	-15.36	1668.87	0.009
	67 - 66					49.0383	-15.58	1668.87	0.009
	66 - 65					49.0383	-15.81	1668.87	0.009
L3	65 - 63.375	P48x3/8	32.50	0.00	0.0	56.1069	-16.23	1847.49	0.009
	63.375 - 61.75					56.1069	-16.65	1847.49	0.009
	61.75 - 60.125					56.1069	-17.07	1847.49	0.009
	60.125 - 58.5					56.106	-17.49	1847.49	0.009

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
	58.5 - 56.875					56.1069	-17.95	1847.49	0.010
	56.875 - 55.25					56.1069	-18.37	1847.49	0.010
	55.25 - 53.625					56.1069	-18.80	1847.49	0.010
	53.625 - 52					56.1069	-19.22	1847.49	0.010
	52 - 50.375					56.1069	-19.64	1847.49	0.011
	50.375 - 48.75					56.1069	-20.06	1847.49	0.011
	48.75 - 47.125					56.1069	-20.49	1847.49	0.011
	47.125 - 45.5					56.1069	-20.91	1847.49	0.011
	45.5 - 43.875					56.1069	-21.34	1847.49	0.012
	43.875 - 42.25					56.1069	-21.76	1847.49	0.012
	42.25 - 40.625					56.1069	-22.19	1847.49	0.012
	40.625 - 39					56.1069	-22.62	1847.49	0.012
	39 - 37.375					56.1069	-23.05	1847.49	0.012
	37.375 - 35.75					56.1069	-23.48	1847.49	0.013
	35.75 - 34.125					56.1069	-23.91	1847.49	0.013
	34.125 - 32.5					56.1069	-24.33	1847.49	0.013
L4	32.5 - 30.875	P48x1/2	32.50	0.00	0.0	74.6128	-24.88	2649.06	0.009
	30.875 - 29.25					74.6128	-25.43	2649.06	0.010
	29.25 - 27.625					74.6128	-25.97	2649.06	0.010
	27.625 - 26					74.6128	-26.52	2649.06	0.010
	26 - 24.375					74.6128	-27.07	2649.06	0.010
	24.375 - 22.75					74.6128	-27.62	2649.06	0.010
	22.75 - 21.125					74.6128	-28.17	2649.06	0.011
	21.125 - 19.5					74.6128	-28.72	2649.06	0.011
	19.5 - 17.875					74.6128	-29.27	2649.06	0.011
	17.875 - 16.25					74.6128	-29.82	2649.06	0.011
	16.25 - 14.625					74.6128	-30.37	2649.06	0.011
	14.625 - 13					74.6128	-30.92	2649.06	0.012
	13 - 11.375					74.6128	-31.47	2649.06	0.012
	11.375 - 9.75					74.6128	-32.02	2649.06	0.012
	9.75 - 8.125					74.6128	-32.58	2649.06	0.012
	8.125 - 6.5					74.6128	-33.13	2649.06	0.013
	6.5 - 4.875					74.6128	-33.68	2649.06	0.013
	4.875 - 3.25					74.6128	-34.24	2649.06	0.013

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
	3.25 - 1.625					74.6128	-34.79	2649.06	0.013
	1.625 - 0					74.6128	-35.35	2649.06	0.013

[1] P_u / ϕP_n controls

Pole Bending Design Data

Section No.	Elevation	Size	M_{ux}	ϕM_{nx}	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy}	ϕM_{ny}	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	ft		kip-ft	kip-ft		kip-ft	kip-ft	
L1	96 - 95	P12x.5	0.01	197.07	0.000	0.00	197.07	0.000
	95 - 94		0.07	197.07	0.000	0.00	197.07	0.000
	94 - 93		0.15	197.07	0.001	0.00	197.07	0.000
	93 - 92		0.27	197.07	0.001	0.00	197.07	0.000
	92 - 91		7.23	197.07	0.037	0.00	197.07	0.000
	91 - 90		13.89	197.07	0.071	0.00	197.07	0.000
	90 - 89		20.59	197.07	0.104	0.00	197.07	0.000
	89 - 88		27.32	197.07	0.139	0.00	197.07	0.000
	88 - 87		34.09	197.07	0.173	0.00	197.07	0.000
	87 - 86		40.88	197.07	0.207	0.00	197.07	0.000
	86 - 85		49.38	197.07	0.251	0.00	197.07	0.000
L2	85 - 84	P42x3/8	57.64	1796.56	0.032	0.00	1796.56	0.000
	84 - 83		66.00	1796.56	0.037	0.00	1796.56	0.000
	83 - 82		78.37	1796.56	0.044	0.00	1796.56	0.000
	82 - 81		91.25	1796.56	0.051	0.00	1796.56	0.000
	81 - 80		104.25	1796.56	0.058	0.00	1796.56	0.000
	80 - 79		117.34	1796.56	0.065	0.00	1796.56	0.000
	79 - 78		131.04	1796.56	0.073	0.00	1796.56	0.000
	78 - 77		145.22	1796.56	0.081	0.00	1796.56	0.000
	77 - 76		159.52	1796.56	0.089	0.00	1796.56	0.000
	76 - 75		173.91	1796.56	0.097	0.00	1796.56	0.000
	75 - 74		192.12	1796.56	0.107	0.00	1796.56	0.000
	74 - 73		210.42	1796.56	0.117	0.00	1796.56	0.000
	73 - 72		228.83	1796.56	0.127	0.00	1796.56	0.000
	72 - 71		247.34	1796.56	0.138	0.00	1796.56	0.000
	71 - 70		265.96	1796.56	0.148	0.00	1796.56	0.000
	70 - 69		284.68	1796.56	0.158	0.00	1796.56	0.000
	69 - 68		303.50	1796.56	0.169	0.00	1796.56	0.000
	68 - 67		322.43	1796.56	0.179	0.00	1796.56	0.000
	67 - 66		341.45	1796.56	0.190	0.00	1796.56	0.000
	66 - 65		360.58	1796.56	0.201	0.00	1796.56	0.000
L3	65 - 63.375	P48x3/8	391.90	2321.11	0.169	0.00	2321.11	0.000
	63.375 - 61.75		423.51	2321.11	0.182	0.00	2321.11	0.000
	61.75 - 60.125		455.42	2321.11	0.196	0.00	2321.11	0.000
	60.125 - 58.5		487.62	2321.11	0.210	0.00	2321.11	0.000
	58.5 - 56.875		520.13	2321.11	0.224	0.00	2321.11	0.000
	56.875 - 55.25		552.99	2321.11	0.238	0.00	2321.11	0.000
	55.25 - 53.625		586.14	2321.11	0.253	0.00	2321.11	0.000
	53.625 - 52		619.57	2321.11	0.267	0.00	2321.11	0.000
	52 - 50.375		653.27	2321.11	0.281	0.00	2321.11	0.000
	50.375 - 48.75		687.59	2321.11	0.296	0.00	2321.11	0.000
	48.75 - 47.125		722.22	2321.11	0.311	0.00	2321.11	0.000
	47.125 - 45.5		757.16	2321.11	0.326	0.00	2321.11	0.000
	45.5 - 43.875		792.40	2321.11	0.341	0.00	2321.11	0.000
	43.875 - 42.25		827.94	2321.11	0.357	0.00	2321.11	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	42.25 - 40.625		863.79	2321.11	0.372	0.00	2321.11	0.000
	40.625 - 39		899.92	2321.11	0.388	0.00	2321.11	0.000
	39 - 37.375		936.36	2321.11	0.403	0.00	2321.11	0.000
	37.375 - 35.75		973.08	2321.11	0.419	0.00	2321.11	0.000
	35.75 - 34.125		1010.09	2321.11	0.435	0.00	2321.11	0.000
	34.125 - 32.5		1047.38	2321.11	0.451	0.00	2321.11	0.000
L4	32.5 - 30.875	P48x1/2	1084.96	3173.47	0.342	0.00	3173.47	0.000
	30.875 - 29.25		1122.78	3173.47	0.354	0.00	3173.47	0.000
	29.25 - 27.625		1160.88	3173.47	0.366	0.00	3173.47	0.000
	27.625 - 26		1199.22	3173.47	0.378	0.00	3173.47	0.000
	26 - 24.375		1237.82	3173.47	0.390	0.00	3173.47	0.000
	24.375 - 22.75		1276.67	3173.47	0.402	0.00	3173.47	0.000
	22.75 - 21.125		1315.76	3173.47	0.415	0.00	3173.47	0.000
	21.125 - 19.5		1355.10	3173.47	0.427	0.00	3173.47	0.000
	19.5 - 17.875		1394.68	3173.47	0.439	0.00	3173.47	0.000
	17.875 - 16.25		1434.48	3173.47	0.452	0.00	3173.47	0.000
	16.25 - 14.625		1474.53	3173.47	0.465	0.00	3173.47	0.000
	14.625 - 13		1514.79	3173.47	0.477	0.00	3173.47	0.000
	13 - 11.375		1555.29	3173.47	0.490	0.00	3173.47	0.000
	11.375 - 9.75		1596.01	3173.47	0.503	0.00	3173.47	0.000
	9.75 - 8.125		1636.93	3173.47	0.516	0.00	3173.47	0.000
	8.125 - 6.5		1678.08	3173.47	0.529	0.00	3173.47	0.000
	6.5 - 4.875		1719.43	3173.47	0.542	0.00	3173.47	0.000
	4.875 - 3.25		1761.00	3173.47	0.555	0.00	3173.47	0.000
	3.25 - 1.625		1802.76	3173.47	0.568	0.00	3173.47	0.000
	1.625 - 0		1844.72	3173.47	0.581	0.00	3173.47	0.000

Pole Shear Design Data

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 $\frac{T_u}{\phi T_n}$
L1	96 - 95	P12x.5	0.02	303.07	0.000	0.00	297.74	0.000
	95 - 94		0.07	303.07	0.000	0.00	297.74	0.000
	94 - 93		0.10	303.07	0.000	0.00	297.74	0.000
	93 - 92		0.13	303.07	0.000	0.00	297.74	0.000
	92 - 91		6.65	303.07	0.022	0.00	297.74	0.000
	91 - 90		6.68	303.07	0.022	0.00	297.74	0.000
	90 - 89		6.72	303.07	0.022	0.00	297.74	0.000
	89 - 88		6.75	303.07	0.022	0.00	297.74	0.000
	88 - 87		6.78	303.07	0.022	0.00	297.74	0.000
	87 - 86		6.81	303.07	0.022	0.00	297.74	0.000
	86 - 85		8.14	303.07	0.027	1.80	297.74	0.006
L2	85 - 84	P42x3/8	8.30	834.44	0.010	0.64	2868.84	0.000
	84 - 83		8.40	834.44	0.010	0.64	2868.84	0.000
	83 - 82		12.82	834.44	0.015	0.64	2868.84	0.000
	82 - 81		12.93	834.44	0.015	0.64	2868.84	0.000
	81 - 80		13.03	834.44	0.016	0.64	2868.84	0.000
	80 - 79		13.13	834.44	0.016	0.64	2868.84	0.000
	79 - 78		14.04	834.44	0.017	0.58	2868.84	0.000
	78 - 77		14.24	834.44	0.017	0.13	2868.84	0.000
	77 - 76		14.34	834.44	0.017	0.13	2868.84	0.000
	76 - 75		14.45	834.44	0.017	0.13	2868.84	0.000
	75 - 74		18.25	834.44	0.022	0.13	2868.84	0.000
	74 - 73		18.36	834.44	0.022	0.13	2868.84	0.000
	73 - 72		18.46	834.44	0.022	0.13	2868.84	0.000

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 $\frac{T_u}{\phi T_n}$
	72 - 71		18.56	834.44	0.022	0.13	2868.84	0.000
	71 - 70		18.67	834.44	0.022	0.13	2868.84	0.000
	70 - 69		18.77	834.44	0.022	0.13	2868.84	0.000
	69 - 68		18.87	834.44	0.023	0.13	2868.84	0.000
	68 - 67		18.97	834.44	0.023	0.13	2868.84	0.000
	67 - 66		19.08	834.44	0.023	0.13	2868.84	0.000
	66 - 65		19.18	834.44	0.023	0.13	2868.84	0.000
L3	65 - 63.375	P48x3/8	19.36	923.75	0.021	0.13	3637.70	0.000
	63.375 - 61.75		19.54	923.75	0.021	0.13	3637.70	0.000
	61.75 - 60.125		19.73	923.75	0.021	0.13	3637.70	0.000
	60.125 - 58.5		19.91	923.75	0.022	0.13	3637.70	0.000
	58.5 - 56.875		20.13	923.75	0.022	0.13	3637.70	0.000
	56.875 - 55.25		20.31	923.75	0.022	0.01	3637.70	0.000
	55.25 - 53.625		20.49	923.75	0.022	0.01	3637.70	0.000
	53.625 - 52		20.66	923.75	0.022	0.01	3637.70	0.000
	52 - 50.375		21.03	923.75	0.023	1.01	3637.70	0.000
	50.375 - 48.75		21.23	923.75	0.023	1.01	3637.70	0.000
	48.75 - 47.125		21.42	923.75	0.023	1.01	3637.70	0.000
	47.125 - 45.5		21.60	923.75	0.023	1.01	3637.70	0.000
	45.5 - 43.875		21.79	923.75	0.024	1.01	3637.70	0.000
	43.875 - 42.25		21.98	923.75	0.024	1.01	3637.70	0.000
	42.25 - 40.625		22.16	923.75	0.024	1.01	3637.70	0.000
	40.625 - 39		22.34	923.75	0.024	1.01	3637.70	0.000
	39 - 37.375		22.52	923.75	0.024	1.01	3637.70	0.000
	37.375 - 35.75		22.70	923.75	0.025	1.01	3637.70	0.000
	35.75 - 34.125		22.88	923.75	0.025	1.01	3637.70	0.000
	34.125 - 32.5		23.05	923.75	0.025	1.01	3637.70	0.000
L4	32.5 - 30.875	P48x1/2	23.21	1324.53	0.018	1.01	5188.89	0.000
	30.875 - 29.25		23.37	1324.53	0.018	1.01	5188.89	0.000
	29.25 - 27.625		23.53	1324.53	0.018	1.01	5188.89	0.000
	27.625 - 26		23.69	1324.53	0.018	1.01	5188.89	0.000
	26 - 24.375		23.84	1324.53	0.018	1.01	5188.89	0.000
	24.375 - 22.75		23.99	1324.53	0.018	1.01	5188.89	0.000
	22.75 - 21.125		24.15	1324.53	0.018	1.01	5188.89	0.000
	21.125 - 19.5		24.29	1324.53	0.018	1.01	5188.89	0.000
	19.5 - 17.875		24.44	1324.53	0.018	1.01	5188.89	0.000
	17.875 - 16.25		24.58	1324.53	0.019	1.01	5188.89	0.000
	16.25 - 14.625		24.73	1324.53	0.019	1.01	5188.89	0.000
	14.625 - 13		24.87	1324.53	0.019	1.01	5188.89	0.000
	13 - 11.375		25.00	1324.53	0.019	1.01	5188.89	0.000
	11.375 - 9.75		25.14	1324.53	0.019	1.01	5188.89	0.000
	9.75 - 8.125		25.27	1324.53	0.019	1.01	5188.89	0.000
	8.125 - 6.5		25.40	1324.53	0.019	1.01	5188.89	0.000
	6.5 - 4.875		25.53	1324.53	0.019	1.01	5188.89	0.000
	4.875 - 3.25		25.65	1324.53	0.019	1.01	5188.89	0.000
	3.25 - 1.625		25.78	1324.53	0.019	1.01	5188.89	0.000
	1.625 - 0		25.90	1324.53	0.020	1.01	5188.89	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	96 - 95	0.000	0.000	0.000	0.000	0.000	0.000 [1]	1.000	4.8.2
	95 - 94	0.000	0.000	0.000	0.000	0.000	0.001	1.000	4.8.2
	94 - 93	0.000	0.001	0.000	0.000	0.000	0.001	1.000	4.8.2
	93 - 92	0.001	0.001	0.000	0.000	0.000	0.002	1.000	4.8.2
	92 - 91	0.007	0.037	0.000	0.022	0.000	0.044	1.000	4.8.2
	91 - 90	0.007	0.071	0.000	0.022	0.000	0.078	1.000	4.8.2
	90 - 89	0.007	0.104	0.000	0.022	0.000	0.112	1.000	4.8.2
	89 - 88	0.007	0.139	0.000	0.022	0.000	0.147	1.000	4.8.2
	88 - 87	0.008	0.173	0.000	0.022	0.000	0.181	1.000	4.8.2
	87 - 86	0.008	0.207	0.000	0.022	0.000	0.216	1.000	4.8.2
	86 - 85	0.008	0.251	0.000	0.027	0.006	0.260	1.000	4.8.2
L2	85 - 84	0.003	0.032	0.000	0.010	0.000	0.035	1.000	4.8.2
	84 - 83	0.003	0.037	0.000	0.010	0.000	0.040	1.000	4.8.2
	83 - 82	0.005	0.044	0.000	0.015	0.000	0.049	1.000	4.8.2
	82 - 81	0.005	0.051	0.000	0.015	0.000	0.056	1.000	4.8.2
	81 - 80	0.005	0.058	0.000	0.016	0.000	0.063	1.000	4.8.2
	80 - 79	0.005	0.065	0.000	0.016	0.000	0.071	1.000	4.8.2
	79 - 78	0.006	0.073	0.000	0.017	0.000	0.079	1.000	4.8.2
	78 - 77	0.006	0.081	0.000	0.017	0.000	0.087	1.000	4.8.2
	77 - 76	0.006	0.089	0.000	0.017	0.000	0.095	1.000	4.8.2
	76 - 75	0.006	0.097	0.000	0.017	0.000	0.104	1.000	4.8.2
	75 - 74	0.008	0.107	0.000	0.022	0.000	0.116	1.000	4.8.2
	74 - 73	0.008	0.117	0.000	0.022	0.000	0.126	1.000	4.8.2
	73 - 72	0.009	0.127	0.000	0.022	0.000	0.136	1.000	4.8.2
	72 - 71	0.009	0.138	0.000	0.022	0.000	0.147	1.000	4.8.2
	71 - 70	0.009	0.148	0.000	0.022	0.000	0.157	1.000	4.8.2
	70 - 69	0.009	0.158	0.000	0.022	0.000	0.168	1.000	4.8.2
	69 - 68	0.009	0.169	0.000	0.023	0.000	0.179	1.000	4.8.2
	68 - 67	0.009	0.179	0.000	0.023	0.000	0.189	1.000	4.8.2
	67 - 66	0.009	0.190	0.000	0.023	0.000	0.200	1.000	4.8.2
	66 - 65	0.009	0.201	0.000	0.023	0.000	0.211	1.000	4.8.2
L3	65 - 63.375	0.009	0.169	0.000	0.021	0.000	0.178	1.000	4.8.2
	63.375 - 61.75	0.009	0.182	0.000	0.021	0.000	0.192	1.000	4.8.2
	61.75 - 60.125	0.009	0.196	0.000	0.021	0.000	0.206	1.000	4.8.2
	60.125 - 58.5	0.009	0.210	0.000	0.022	0.000	0.220	1.000	4.8.2
	58.5 - 56.875	0.010	0.224	0.000	0.022	0.000	0.234	1.000	4.8.2
	56.875 - 55.25	0.010	0.238	0.000	0.022	0.000	0.249	1.000	4.8.2
	55.25 - 53.625	0.010	0.253	0.000	0.022	0.000	0.263	1.000	4.8.2
	53.625 - 52	0.010	0.267	0.000	0.022	0.000	0.278	1.000	4.8.2
	52 - 50.375	0.011	0.281	0.000	0.023	0.000	0.293	1.000	4.8.2
	50.375 - 48.75	0.011	0.296	0.000	0.023	0.000	0.308	1.000	4.8.2
	48.75 - 47.125	0.011	0.311	0.000	0.023	0.000	0.323	1.000	4.8.2
	47.125 - 45.5	0.011	0.326	0.000	0.023	0.000	0.338	1.000	4.8.2
	45.5 - 43.875	0.012	0.341	0.000	0.024	0.000	0.354	1.000	4.8.2
	43.875 - 42.25	0.012	0.357	0.000	0.024	0.000	0.369	1.000	4.8.2
	42.25 - 40.625	0.012	0.372	0.000	0.024	0.000	0.385	1.000	4.8.2
	40.625 - 39	0.012	0.388	0.000	0.024	0.000	0.401	1.000	4.8.2
	39 - 37.375	0.012	0.403	0.000	0.024	0.000	0.416	1.000	4.8.2
	37.375 - 35.75	0.013	0.419	0.000	0.025	0.000	0.433	1.000	4.8.2
	35.75 - 34.125	0.013	0.435	0.000	0.025	0.000	0.449	1.000	4.8.2
	34.125 - 32.5	0.013	0.451	0.000	0.025	0.000	0.465	1.000	4.8.2
L4	32.5 - 30.875	0.009	0.342	0.000	0.018	0.000	0.352	1.000	4.8.2
	30.875 - 29.25	0.010	0.354	0.000	0.018	0.000	0.364	1.000	4.8.2
	29.25 - 27.625	0.010	0.366	0.000	0.018	0.000	0.376	1.000	4.8.2

Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	27.625 - 26	0.010	0.378	0.000	0.018	0.000	0.388	1.000	4.8.2
	26 - 24.375	0.010	0.390	0.000	0.018	0.000	0.401	1.000	4.8.2
	24.375 - 22.75	0.010	0.402	0.000	0.018	0.000	0.413	1.000	4.8.2
	22.75 - 21.125	0.011	0.415	0.000	0.018	0.000	0.426	1.000	4.8.2
	21.125 - 19.5	0.011	0.427	0.000	0.018	0.000	0.438	1.000	4.8.2
	19.5 - 17.875	0.011	0.439	0.000	0.018	0.000	0.451	1.000	4.8.2
	17.875 - 16.25	0.011	0.452	0.000	0.019	0.000	0.464	1.000	4.8.2
	16.25 - 14.625	0.011	0.465	0.000	0.019	0.000	0.476	1.000	4.8.2
	14.625 - 13	0.012	0.477	0.000	0.019	0.000	0.489	1.000	4.8.2
	13 - 11.375	0.012	0.490	0.000	0.019	0.000	0.502	1.000	4.8.2
	11.375 - 9.75	0.012	0.503	0.000	0.019	0.000	0.515	1.000	4.8.2
	9.75 - 8.125	0.012	0.516	0.000	0.019	0.000	0.528	1.000	4.8.2
	8.125 - 6.5	0.013	0.529	0.000	0.019	0.000	0.542	1.000	4.8.2
	6.5 - 4.875	0.013	0.542	0.000	0.019	0.000	0.555	1.000	4.8.2
	4.875 - 3.25	0.013	0.555	0.000	0.019	0.000	0.568	1.000	4.8.2
	3.25 - 1.625	0.013	0.568	0.000	0.019	0.000	0.582	1.000	4.8.2
	1.625 - 0	0.013	0.581	0.000	0.020	0.000	0.595	1.000	4.8.2

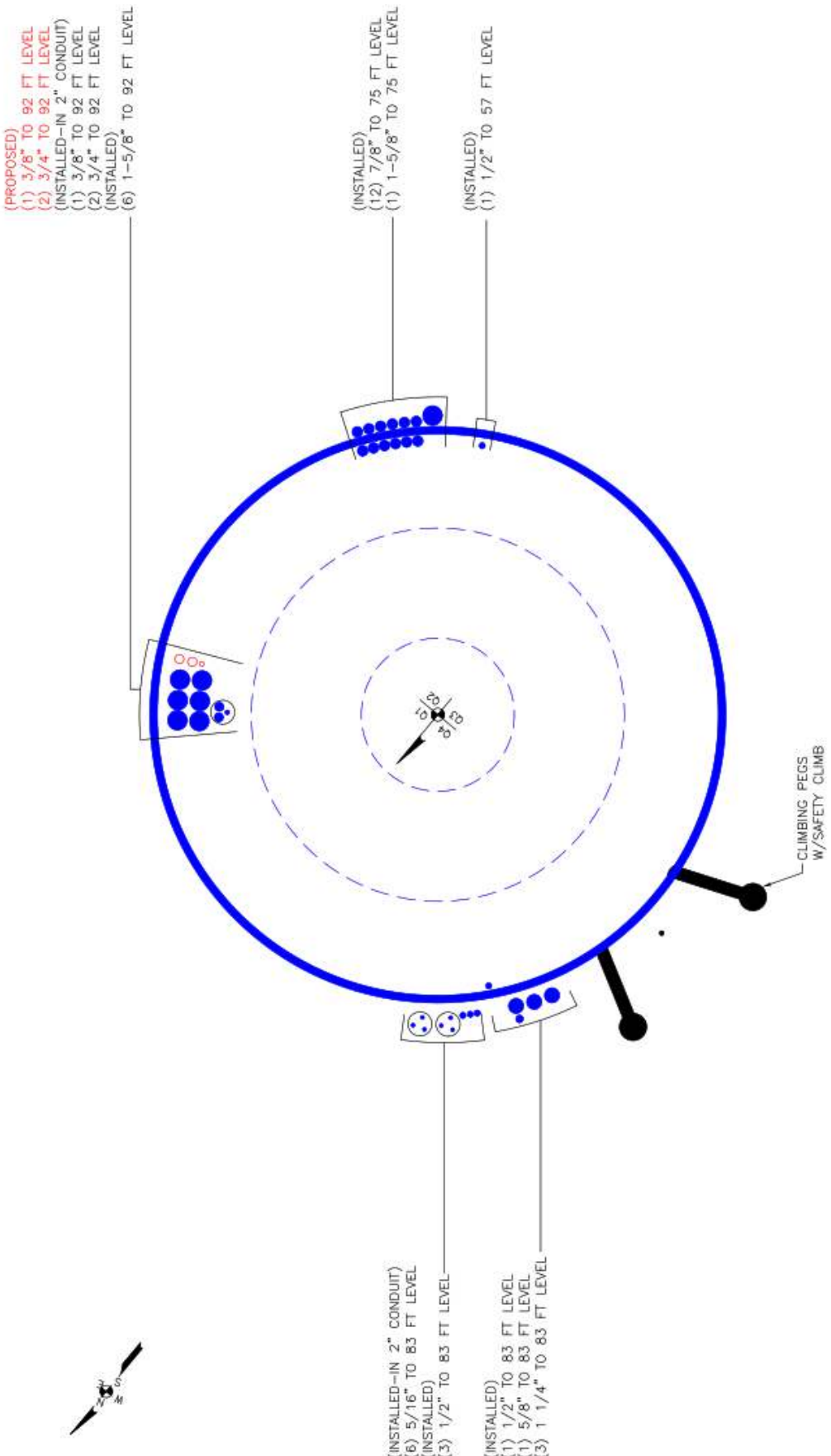
[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	96 - 85	Pole	P12x.5	1	-5.11	606.13	26.0	Pass
L2	85 - 65	Pole	P42x3/8	2	-15.81	1668.87	21.1	Pass
L3	65 - 32.5	Pole	P48x3/8	3	-24.33	1847.49	46.5	Pass
L4	32.5 - 0	Pole	P48x1/2	4	-35.35	2649.06	59.5	Pass
						Summary		
						Pole (L4)	59.5	Pass
						RATING =	**59.5**	**Pass**

APPENDIX B

BASE LEVEL DRAWING


(PROPOSED)
(1) 3/8" TO 92 FT LEVEL
(2) 3/4" TO 92 FT LEVEL
(INSTALLED-IN 2" CONDUIT)
(1) 3/8" TO 92 FT LEVEL
(2) 3/4" TO 92 FT LEVEL
(INSTALLED)
(6) 1-5/8" TO 92 FT LEVEL
(INSTALLED)
(12) 7/8" TO 75 FT LEVEL
(1) 1-5/8" TO 75 FT LEVEL
(INSTALLED)
(1) 1/2" TO 57 FT LEVEL
CLIMBING PEGS
W/SAFETY CLIMB
(INSTALLED-IN 2" CONDUIT)
(6) 5/16" TO 83 FT LEVEL
(INSTALLED)
(3) 1/2" TO 83 FT LEVEL
(INSTALLED)
(1) 1/2" TO 83 FT LEVEL
(1) 5/8" TO 83 FT LEVEL
(3) 1 1/4" TO 83 FT LEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Stiffened or Unstiffened, Ungrouted, Circular Base Plate - Any Rod Material

TIA Rev G Assumption: Clear space between bottom of leveling nut and top of concrete **not** exceeding (1)*(Rod Diameter)

Site Data

BU#: *876326*
Site Name: *Hayden Station*
App #: *18PDVZ1400*

Pole Manufacturer:	*Other*

Anchor Rod Data		
Qty:	20	
Diam:	1.5	in
Rod Material:	Other	
Strength (Fu):	109	ksi
Yield (Fy):	125	ksi
Bolt Circle:	53.5	in

Plate Data		
Diam:	59	in
Thick:	2	in
Grade:	36	ksi
Single-Rod B-eff:	7.54	in

Stiffener Data (Welding at both sides)		
Config:	0	*
Weld Type:		
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	48	in
Thick:	0.5	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Reactions		
Mu:	1845	ft-kips
Axial, Pu:	35	kips
Shear, Vu:	26	kips
Eta Factor, ɳ	0.5	TIA G (Fig. 4-4)

If No stiffeners, Criteria:	AISC LRFD	<-Only Applcable to Unstiffened Cases

Anchor Rod Results

		Rigid
Max Rod (Cu+ Vu/ɱ):	87.1 Kips	AISC LRFD
Allowable Axial, Φ*Fu*Anet:	123.0 Kips	φ*Tn
Anchor Rod Stress Ratio:	70.8% **Pass**	

Base Plate Results Flexural Check

		Rigid
Base Plate Stress:	19.7 ksi	AISC LRFD
Allowable Plate Stress:	32.4 ksi	φ*Fy
Base Plate Stress Ratio:	60.7% **Pass**	Y.L. Length: 23.63

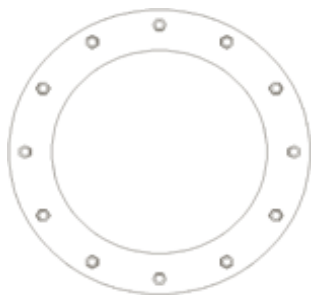
n/a

Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check:	n/a



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *876326*
Site Name: *Hayden Station*
App #: *18PDVZ1400*

Reactions		
Mu	1047.39	ft-kips
Axial, Pu:	24.33	kips
Shear, Vu:	23.05	kips
Elevation:	32.5	feet

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
76.54

Pole Manufacturer:	Other

If No stiffeners, Criteria: TIA G <-Only Applcable to Unstiffened Cases

Bolt Data			
Qty:	20		
Diameter (in.):	1.5	Bolt Fu:	105
Bolt Material:	A325	Bolt Fy:	81
N/A:	100	<-- Disregard	
N/A:	75	<-- Disregard	
Circle (in.):	53.5		

Plate Data		
Diam:	59	in
Thick, t:	2	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	7.54	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	48	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Flange Bolt Results

Bolt Tension Capacity, φ*Tn,**B1**:	111.04	kips	Rigid: φ*Tn
Adjusted φ*Tn (due to Vu=Vu/Qty), **B**:	111.02	kips	φTn[(1-(Vu/φVn)^2]^0.5
Max Bolt directly applied Tu:	45.77	Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	1.501	in	
Min PL "treq" for actual **T w/ Pry**:	0.720	in	
Min PL "t1" for actual **T w/o Pry**:	0.964	in	
T allowable w/o Prying:	111.04	kips	α'<0 case
Prying Force, q:	0.00	kips	
Total Bolt Tension=Tu+q:	45.77	kips	
Non-Prying Bolt Stress Ratio, Tu/B:	41.2%	**Pass**	

Exterior Flange Plate Results Flexural Check

Compression Side Plate Stress:	10.5	ksi	Rigid: TIA G
Allowable Plate Stress:	32.4	ksi	φ*Fy
Compression Plate Stress Ratio:	32.3%	**Pass**	Comp. Y.L. Length: 23.63
No Prying			
Tension Side Stress Ratio, (treq/t)^2:	13.0%	**Pass**	

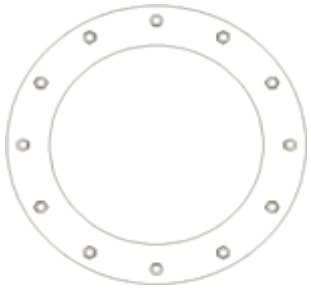
n/a

Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check: n/a



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt
** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *876326*
Site Name: *Hayden Station*
App #: *18PDVZ1400*

Reactions		
Mu	1047.39	ft-kips
Axial, Pu:	24.33	kips
Shear, Vu:	23.05	kips
Elevation:	32.5	feet

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
76.54

Pole Manufacturer:	Other

If No stiffeners, Criteria:	TIA G	<-Only Applcable to Unstiffened Cases

Bolt Data				
Qty:	20			
Diameter (in.):	1.5	Bolt Fu:	105	
Bolt Material:	A325	Bolt Fy:	81	
N/A:	100	<-- Disregard		
N/A:	75	<-- Disregard		
Circle (in.):	53.5			

Plate Data		
Diam:	59	in
Thick, t:	2	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	7.54	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	48	in
Thick:	0.5	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Flange Bolt Results

Bolt Tension Capacity, φ*Tn,**B1**:	111.04	kips	
Adjusted φ*Tn (due to Vu=Vu/Qty), **B**:	111.02	kips	
Max Bolt directly applied Tu:	45.77	Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	1.501	in	
Min PL "treq" for actual **T w/ Pry**:	0.720	in	
Min PL "t1" for actual **T w/o Pry**:	0.964	in	
T allowable w/o Prying:	111.04	kips	α'<0 case
Prying Force, q:	0.00	kips	
Total Bolt Tension=Tu+q:	45.77	kips	
Non-Prying Bolt Stress Ratio, Tu/B:	41.2%	**Pass**	

Rigid
φ*Tn
φTn[(1-(Vu/φVn)^2]^0.5

Exterior Flange Plate Results

	Flexural Check		
Compression Side Plate Stress:	10.5	ksi	
Allowable Plate Stress:	32.4	ksi	
Compression Plate Stress Ratio:	32.3%	**Pass**	
No Prying			
Tension Side Stress Ratio, (treq/t)^2:	13.0%	**Pass**	

Rigid
TIA G
φ*Fy
Comp. Y.L. Length:
23.63

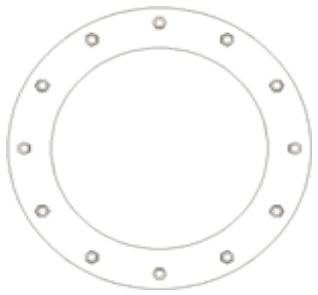
n/a

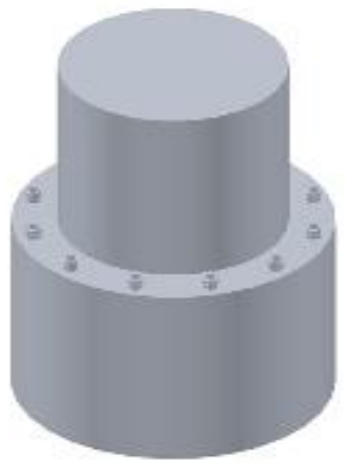
Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check: n/a





* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *876326*
Site Name: *Hayden Station*
App #: *18PDVZ1400*

Reactions		
Mu	360.58	ft-kips
Axial, Pu:	15.81	kips
Shear, Vu:	19.18	kips
Elevation:	65	feet

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
76.54

Pole Manufacturer:	Other

If No stiffeners, Criteria:	TIA G	<-Only Applcable to Unstiffened Cases

Bolt Data			
Qty:	20		
Diameter (in.):	1.5	Bolt Fu:	105
Bolt Material:	A325	Bolt Fy:	81
N/A:	100	<-- Disregard	
N/A:	75	<-- Disregard	
Circle (in.):	53.5		

Plate Data		
Diam:	59	in
Thick, t:	2	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	6.60	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	42	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Flange Bolt Results

Bolt Tension Capacity, φ*Tn,**B1**:	111.04	kips	Rigid: φ*Tn
Adjusted φ*Tn (due to Vu=Vu/Qty), **B**:	111.03	kips	φTn[(1-(Vu/φVn)^2]^0.5
Max Bolt directly applied Tu:	15.39	Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	2.538	in	
Min PL "treq" for actual **T w/ Pry**:	0.712	in	
Min PL "t1" for actual **T w/o Pry**:	0.945	in	
T allowable with Prying:	86.27	kips	0≤α'≤1 case
Prying Force, q:	0.00	kips	
Total Bolt Tension=Tu+q:	15.39	kips	
Prying Bolt Stress Ratio=(Tu+q)/(B):	13.9%	**Pass**	

Exterior Flange Plate Results Flexural Check

Compression Side Plate Stress:	7.1	ksi	Rigid: TIA G
Allowable Plate Stress:	32.4	ksi	φ*Fy
Compression Plate Stress Ratio:	21.9%	**Pass**	Comp. Y.L. Length: 33.14
No Prying			
Tension Side Stress Ratio, (treq/t)^2:	12.7%	**Pass**	

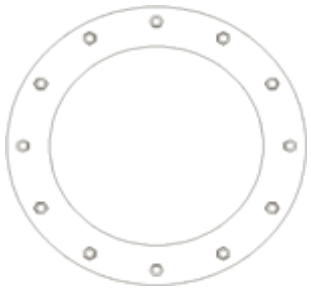
n/a

Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check: n/a



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *876326*
Site Name: *Hayden Station*
App #: *18PDVZ1400*

Reactions		
Mu	360.58	ft-kips
Axial, Pu:	15.81	kips
Shear, Vu:	19.18	kips
Elevation:	65	feet

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
76.54

Pole Manufacturer:	Other

If No stiffeners, Criteria:	TIA G	<-Only Applcable to Unstiffened Cases

Bolt Data				
Qty:	20			
Diameter (in.):	1.5	Bolt Fu:	105	
Bolt Material:	A325	Bolt Fy:	81	
N/A:	100	<-- Disregard		
N/A:	75	<-- Disregard		
Circle (in.):	53.5			

Plate Data		
Diam:	59	in
Thick, t:	2	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	7.54	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	48	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Flange Bolt Results

Bolt Tension Capacity, φ*Tn,**B1**:	111.04	kips	
Adjusted φ*Tn (due to Vu=Vu/Qty), **B**:	111.03	kips	
Max Bolt directly applied Tu:	15.39	Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	1.502	in	
Min PL "treq" for actual **T w/ Pry**:	0.417	in	
Min PL "t1" for actual **T w/o Pry**:	0.559	in	
T allowable w/o Prying:	111.04	kips	α'<0 case
Prying Force, q:	0.00	kips	
Total Bolt Tension=Tu+q:	15.39	kips	
Non-Prying Bolt Stress Ratio, Tu/B:	13.9%	**Pass**	

Rigid
φ*Tn
φTn[(1-(Vu/φVn)^2]^0.5

Exterior Flange Plate Results

	Flexural Check		
Compression Side Plate Stress:	3.7	ksi	
Allowable Plate Stress:	32.4	ksi	
Compression Plate Stress Ratio:	11.4%	**Pass**	
No Prying			
Tension Side Stress Ratio, (treq/t)^2:	4.4%	**Pass**	

Rigid
TIA G
φ*Fy
Comp. Y.L. Length:
23.63

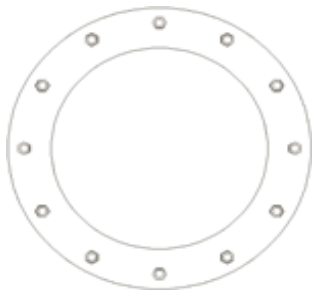
n/a

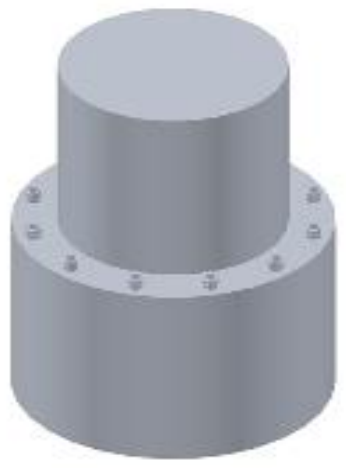
Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check: n/a





* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *876326*
Site Name: *Hayden Station*
App #: *18PDVZ1400*

Reactions		
Mu	49.38	ft-kips
Axial, Pu:	5.11	kips
Shear, Vu:	8.14	kips
Elevation:	85	feet

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
38.88

Pole Manufacturer:	Other

If No stiffeners, Criteria: TIA G <-Only Applcable to Unstiffened Cases

Bolt Data			
Qty:	20		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	100	<-- Disregard	
N/A:	75	<-- Disregard	
Circle (in.):	53		

Plate Data		
Diam:	59	in
Thick, t:	2	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	2.00	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	12.75	in
Thick:	0.5	in
Grade:	35	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Flange Bolt Results

Bolt Tension Capacity, φ*Tn,**B1**:	54.54	kips	
Adjusted φ*Tn (due to Vu=Vu/Qty), **B**:	54.54	kips	
Max Bolt directly applied Tu:	1.98	Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	6.396	in	
Min PL "treq" for actual **T w/ Pry**:	1.006	in	
Min PL "t1" for actual **T w/o Pry**:	1.219	in	
T allowable with Prying:	7.84	kips	α'>1 case
Prying Force, q:	0.00	kips	
Total Bolt Tension=Tu+q:	1.98	kips	
Prying Bolt Stress Ratio=(Tu+q)/(B):	3.6%	**Pass**	

Non-Rigid
φ*Tn
φTn[(1-(Vu/φVn)^2]^0.5

Exterior Flange Plate Results Flexural Check

Compression Side Plate Stress:	4.6	ksi
Allowable Plate Stress:	32.4	ksi
Compression Plate Stress Ratio:	14.1%	**Pass**
No Prying		
Tension Side Stress Ratio, (treq/t)^2:	25.3%	**Pass**

Non-Rigid
TIA G
φ*Fy
Comp. Y.L. Length:
51.44

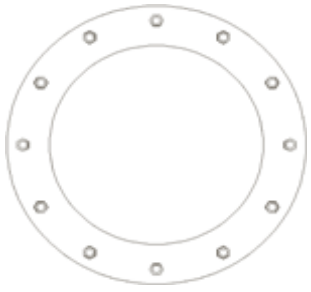
n/a

Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check: n/a



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *876326*
Site Name: *Hayden Station*
App #: *18PDVZ1400*

Reactions		
Mu	49.38	ft-kips
Axial, Pu:	5.11	kips
Shear, Vu:	8.14	kips
Elevation:	85	feet

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
38.88

Pole Manufacturer:	Other

If No stiffeners, Criteria:	TIA G	<-Only Applcable to Unstiffened Cases

Bolt Data				
Qty:	20			
Diameter (in.):	1	Bolt Fu:	120	
Bolt Material:	A325	Bolt Fy:	92	
N/A:	100	<-- Disregard		
N/A:	75	<-- Disregard		
Circle (in.):	53			

Plate Data		
Diam:	59	in
Thick, t:	1	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	6.60	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	42	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Flange Bolt Results

Bolt Tension Capacity, φ*Tn,**B1**:	54.54	kips	
Adjusted φ*Tn (due to Vu=Vu/Qty), **B**:	54.54	kips	
Max Bolt directly applied Tu:	1.98	Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	1.779	in	
Min PL "treq" for actual **T w/ Pry**:	0.250	in	
Min PL "t1" for actual **T w/o Pry**:	0.339	in	
T allowable with Prying:	31.70	kips	α'>1 case
Prying Force, q:	0.00	kips	
Total Bolt Tension=Tu+q:	1.98	kips	
Prying Bolt Stress Ratio=(Tu+q)/(B):	3.6%	**Pass**	

Non-Rigid
φ*Tn
φTn[(1-(Vu/φVn)^2]^0.5

Exterior Flange Plate Results Flexural Check

Compression Side Plate Stress:	4.6	ksi
Allowable Plate Stress:	32.4	ksi
Compression Plate Stress Ratio:	14.2%	**Pass**
No Prying		
Tension Side Stress Ratio, (treq/t)^2:	6.2%	**Pass**

Non-Rigid
TIA G
φ*Fy
Comp. Y.L. Length:
32.33

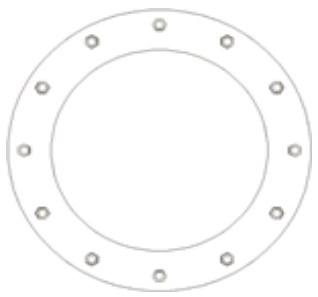
n/a

Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check: n/a



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Drilled Pier Foundation

BU # :	876326
Site Name:	HAYDEN STATION
App. Number:	422595 Rev. 1

TIA-222 Revison:	G
Tower Type:	Monopole

Applied Loads	**Comp.**	**Uplift**
Moment (kip-ft)	1844.71	
Axial Force (kips)	35.35	
Shear Force (kips)	25.9	

Material Properties		
Concrete Strength, f'c:	3	ksi
Rebar Strength, Fy:	60	ksi

Pier Design Data		
Depth	30	ft
Ext. Above Grade	0.5	ft
Pier Section 1		
From 0.5' above grade to 30' below grade		
Pier Diameter	7	ft
Rebar Quantity	24	
Rebar Size	10	
Clear Cover to Ties	3	in
Tie Size	5	

Analysis Results		
Soil Lateral Capacity	*Compression*	*Uplift*
$D_{v=0}$ (ft from TOC)	8.80	-
Soil Safety Factor	8.37	-
Max Moment (kip-ft)	2040.09	-
Rating	*15.9%*	-
Soil Vertical Capacity	*Compression*	*Uplift*
Skin Friction (kips)	774.36	-
End Bearing (kips)	0.00	-
Weight of Concrete (kips)	211.28	-
Total Capacity (kips)	774.36	-
Axial (kips)	246.63	-
Rating	*31.8%*	-
Reinforced Concrete Capacity	*Compression*	*Uplift*
Critical Depth (ft from TOC)	9.04	-
Critical Moment (kip-ft)	2039.84	-
Critical Moment Capacity	4896.79	-
Rating	*41.7%*	-

Soil Interaction Rating	**31.8%**
Structural Foundation Rating	**41.7%**

Soil Profile

Groundwater Depth	31	ft	
# of Layers	3		

Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ_{soil} (pcf)	$\gamma_{concrete}$ (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Gross Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	4	4	120	150	0	0	0.000	0.000					Cohesionless
2	4	20	16	120	150	0	32	1.387	1.387				14	Cohesionless
3	20	30	10	120	150	0	32	2.475	2.475			0	16	Cohesionless

Radio Frequency Emissions Analysis Report

AT&T Existing Facility

Site ID: CT5140
FA#: 10071329

Windsor Breakneck
440 Hayden Station Road
Windsor, CT 6095

March 14, 2018

Centerline Communications Project Number: 950006-104

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**21.65 %**

March 14, 2018

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

Emissions Analysis for Site: **CT5140 – Windsor Breakneck**

Centerline Communications, LLC ("Centerline") was directed to analyze the proposed AT&T facility located at **440 Hayden Station Road, 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 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ 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 population 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 population 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.

Population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 700 and 850 MHz Bands are approximately 467 $\mu W/cm^2$ and 567 $\mu W/cm^2$ respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 2300 MHz (WCS) bands is 1000 $\mu W/cm^2$. 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 **440 Hayden Station Road, 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	1	30
UMTS	850 MHz	1	30
LTE	700 MHz	2	40
LTE	1900 MHz (PCS)	4	40
LTE	2300 MHz (WCS)	4	30

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	Kathrein 800-10121	92
A	2	CCI HPA-65R-BUU-H8	92
A	3	CCI TPA-65R-LCUUUU-H8	92
B	1	Kathrein 800-10121	92
B	2	CCI HPA-65R-BUU-H8	92
B	3	CCI TPA-65R-LCUUUU-H8	92
C	1	Kathrein 800-10121	92
C	2	CCI HPA-65R-BUU-H8	92
C	3	CCI TPA-65R-LCUUUU-H8	92

Table 2: Antenna Data

All calculations were done with respect to uncontrolled / general population 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	Kathrein 800-10121	850 MHz / 1900 MHz (PCS)	11.45 / 14.35	2	60	1,235.72	0.76
Antenna A2	CCI HPA-65R-BUU-H8	700 MHz	13.15	2	80	1,652.30	1.72
Antenna A3	CCI TPA-65R-LCUUUU-H8	1900 MHz (PCS) / 2100 MHz (AWS)	13.75 / 14.25	8	280	6,987.07	3.40
						Sector A Composite MPE%	**5.87**
Antenna B1	Kathrein 800-10121	850 MHz / 1900 MHz (PCS)	11.45 / 14.35	2	60	1,235.72	0.76
Antenna B2	CCI HPA-65R-BUU-H8	700 MHz	13.15	2	80	1,652.30	1.72
Antenna B3	CCI TPA-65R-LCUUUU-H8	1900 MHz (PCS) / 2100 MHz (AWS)	13.75 / 14.25	8	280	6,987.07	3.40
						Sector B Composite MPE%	**5.87**
Antenna C1	Kathrein 800-10121	850 MHz / 1900 MHz (PCS)	11.45 / 14.35	2	60	1,235.72	0.76
Antenna C2	CCI HPA-65R-BUU-H8	700 MHz	13.15	2	80	1,652.30	1.72
Antenna C3	CCI TPA-65R-LCUUUU-H8	1900 MHz (PCS) / 2100 MHz (AWS)	13.75 / 14.25	8	280	6,987.07	3.40
						Sector C Composite MPE%	**5.87**

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, all three sectors have the same configuration yielding the same results on all three sectors. *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	**5.87 %**
T-Mobile	13.74 %
Clearwire	0.31 %
Sprint	1.73 %
Site Total MPE %:	**21.65 %**

Table 4: All Carrier MPE Contributions

AT&T Sector A Total:	5.87 %
AT&T Sector B Total:	5.87 %
AT&T Sector C Total:	5.87 %
Site Total:	21.65 %

Table 5: Site MPE Summary

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. *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, all three sectors have the same configuration yielding the same results on all three sectors.

AT&T _ Frequency Band / Technology Max Power Values (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
AT&T 850 MHz UMTS (Antenna 1)	1	418.91	92	2.04	850 MHz	567	0.36%
AT&T 1900 MHz (PCS) UMTS (Antenna 1)	1	816.81	92	3.97	1900 MHz (PCS)	1000	0.40%
AT&T 700 MHz LTE (Antenna 2)	2	826.15	92	8.03	700 MHz	467	1.72%
AT&T 1900 MHz (PCS) LTE (Antenna 3)	4	948.55	92	18.44	1900 MHz (PCS)	1000	1.84%
AT&T 2100 MHz (AWS) LTE (Antenna 3)	4	798.22	92	15.52	2100 MHz (AWS)	1000	1.55%
						Total:	**5.87%**

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 population 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 population exposure to RF Emissions are shown here:

AT&T Sector	Power Density Value (%)
Sector A:	5.87 %
Sector B:	5.87 %
Sector C:	5.87 %
AT&T Maximum Total (per sector):	5.87 %
Site Total:	21.65 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **21.65 %** of the allowable FCC established general population 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.

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