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

July 21, 2016

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

RE: **Notice of Exempt Modification for AT&T/ LTE 3C Crown Site BU: 876371**
AT&T Site ID: CT2194
557 Route 82, Montville, CT 06370
Latitude: 41° 30' 20.3"/ Longitude: -72° 11' 51.1"

Dear Ms. Bachman:

AT&T currently maintains nine (9) antennas at the 147-foot level of the existing 180-foot monopole tower at 557 Route 82 in Montville, CT. The tower is owned by Crown Castle. The property is owned by the Carolyn Besade. AT&T now intends to replace three (3) antennas with three (3) new CCI 700MHz antennas. AT&T also intends to install three (3) RR12/A2 and three (3) Bias-Tees.

The Town of Montville could not confirm the original date and conditions of zoning.

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

1. The proposed modifications will not result in an increase in the height of the existing tower.

2. The proposed modifications will not require the extension of the site boundary.

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

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The existing structure and its foundation can support the proposed loading.

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

Sincerely,

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

Attachments:

Tab 1: Exhibit-1: Compound plan and elevation depicting the planned changes
Tab 2: Exhibit-2: Structural Modification Report
Tab 3: Exhibit-3: General Power Density Table Report (RF Emissions Analysis Report)

cc: The Honorable Ronald McDaniel, Mayor
Town of Montville
310 Norwich-New London Turnpike
Uncasville, CT 06382

Ms. Carolyn Besade
557 Route 52
Oakdale, CT 06370

Property Location: 557 ROUTE 82 | **MAP ID:** 058/ 015/ CEL/ / | **Bldg Name:** TOWER | **State Use:** 4340

Vision ID: 101339 | **Account #** 58015CEL | **Bldg #:** 1 of 1 | **Sec #:** 1 of 1 | **Card** 1 of 1 | **Print Date:** 04/19/2016 13:28

CURRENT OWNER	TOPO.	UTILITIES	STRT./ROAD	LOCATION
SPRINT SPECTRUM LP				
PO BOX 8430				
KANSAS CITY, MO 64114-8430				
Additional Owners:				

SUPPLEMENTAL DATA

Other ID:
Census
Dev Lot
Subdiv
Map #
Zoning Notes
GIS ID:
Callback
ASSOC PID#

CURRENT ASSESSMENT

Description	Code	Appraised Value	Assessed Value
Util OB	4-3	676,910	473,840
		Total 676,910	473,840

6086
MONTVILLE, CT

VISION

RECORD OF OWNERSHIP

RECORD OF OWNERSHIP	BK-VOL/PAGE	SALE DATE	q/u	v/i	SALE PRICE	V.C.
SPRINT SPECTRUM LP	0001/ 0001	10/01/2011	U	V		

PREVIOUS ASSESSMENTS (HISTORY)

Yr.	Code	Assessed Value	Yr.	Code	Assessed Value	Yr.	Code	Assessed Value
2015	4-3	473,840	2014	4-3	473,840	2013	4-3	473,840
Total:		473,840	*Total:*		473,840	*Total:*		473,840

EXEMPTIONS

Year	Type	Description	Amount
		Total:	

OTHER ASSESSMENTS

Code	Description	Number	Amount	Comm. Int.

This signature acknowledges a visit by a Data Collector or Assessor

ASSESSING NEIGHBORHOOD

NBHD/ SUB	NBHD Name	Street Index Name	Tracing	Batch
0001/A				

NOTES

CELL TOWER VALUE= $2000/MNTH LESS 25%

EXPENSES =$18000 CAPPED AT 11% =$163600

PER SITE X 4 SITES = $654400

APPRAISED VALUE SUMMARY

Appraised Bldg. Value (Card)	0
Appraised XF (B) Value (Bldg)	0
Appraised OB (L) Value (Bldg)	676,910
Appraised Land Value (Bldg)	0
Special Land Value	0
Total Appraised Parcel Value	676,910
Valuation Method:	C
Exemptions	0
Adjustment:	0
Net Total Appraised Parcel Value	**676,910**

BUILDING PERMIT RECORD

Permit ID	Issue Date	Type	Description	Amount	Insp. Date	% Comp.	Date Comp.	Comments
B2016-0013	01/14/2016	79	Misc	15,000		0		REPL ANTENNA PANEI
E2013-0058	03/28/2013	00	Electrical	2,800		100		RELOCATE FEED
B2013-0055	03/20/2013	79	Misc	25,000		100		3 NEW ANTENNAS
B2013-0056	03/20/2013	79	Misc	8,000		100		1 NEW CABINET
E2013-0029	02/20/2013	00	Electrical	2,800		100		RELOCATE EQUIP

VISIT/ CHANGE HISTORY

Date	Type	IS	ID	Cd.	Purpose/Result

LAND LINE VALUATION SECTION

B #	Use Code	Use Description	Zone	D	Front	Depth	Units		Unit Price	I. Factor	S.A.	Acre Disc	C. Factor	ST. Idx	Adj.	Notes- Adj	Special Pricing Spec Use	Special Pricing Spec Calc	S Adj Fact	Adj. Unit Price	Land Value
1	4340	Cell Tower					0	SF	0.00	1.0000		1.0000	1.00		0.00				.00		0

Total Card Land Units: 0.00 AC | **Parcel Total Land Area:** 0 AC | **Total Land Value:** 0

CONSTRUCTION DETAIL

Element	Cd.	Ch.	Description
Model	00		Vacant

CONSTRUCTION DETAIL (CONTINUED)

Element	Cd.	Ch.	Description

MIXED USE

Code	Description	Percentage
4340	Cell Tower	100

COST/MARKET VALUATION

Adj. Base Rate:	0.00
AYB	
Dep Code	
Remodel Rating	
Year Remodeled	
Dep %	
Functional Obslnc	
External Obslnc	
Cost Trend Factor	
Condition	
% Complete	
Overall % Cond	
Apprais Val	
Dep % Ovr	0
Dep Ovr Comment	
Misc Imp Ovr	0
Misc Imp Ovr Comment	
Cost to Cure Ovr	0
Cost to Cure Ovr Comment	

OB-OUTBUILDING & YARD ITEMS(L) / XF-BUILDING EXTRA FEATURES(B)

Code	Description	Sub	Sub Descript	L/B	Units	Unit Price	Yr	Gde	Dp Rt	Cnd	%Cnd	Apr Value
CELL	Cell Tower Site			L	4	163,600.00	Null		0		100	654,400
CELS	Cell Shed			L	120	100.00	Null	08		G	75	9,000
CELS	Cell Shed			L	160	100.00	Null	08		G	75	12,000
FN8	6' Top Rail Fen			L	288	7.00	Null	08		G	75	1,510

BUILDING SUB-AREA SUMMARY SECTION

Code	Description	Living Area	Gross Area	Eff. Area	Unit Cost	Undeprec. Value
	Ttl. Gross Liv/Lease Area:	0	0			

WIRELESS COMMUNICATIONS FACILITY
CT2194 - LTE 2C
MONTVILLE
CROWN CASTLE, INC. SITE NO.: 876371
557 ROUTE 82
MONTVILLE, CT 06370

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2003 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2005 CONNECTICUT SUPPLEMENT AND 2009 AMENDMENTS, INCLUDING THE TIA/EIA–222 REVISION "F" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2005 CONNECTICUT FIRE SAFETY CODE AND 2009 AMENDMENTS, 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, CT

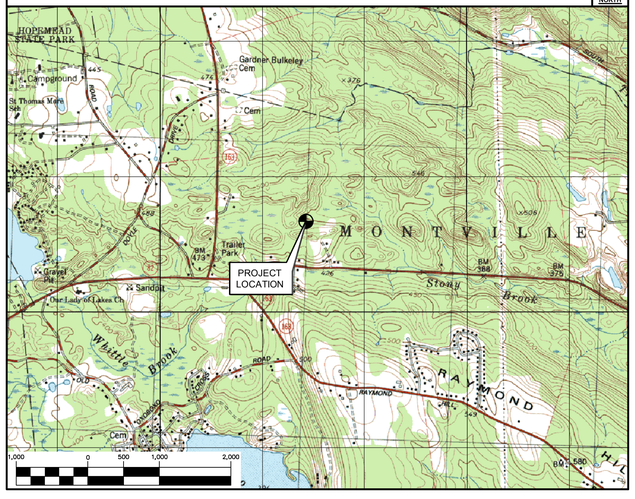
TO: 557 ROUTE 82, MONTVILLE, CT

1.	HEAD NORTHEAST ON ENTERPRISE DR TOWARD CAPITAL BLVD	0.31 MI
2.	TURN LEFT ONTO CAPITAL BLVD	0.27 MI
3.	TURN LEFT ONTO WEST ST	0.16 MI
4.	MERGE ONTO I–91N TOWARDS HARTFORD	4.44 MI
5.	TAKE EXIT 25	2.34 MI
6.	MERGE ONTO CT–2 E TOWARDS NORWICH	20.08 MI
7.	TAKE EXIT 19 ONTO CT–11S TOWARDS NEW LONDON	0.30 MI
8.	TAKE EXIT 6, TOWARD CT–85/CT–354	0.27 MI
9.	TURN LEFT ONTO LAKE HAYWARD RD	0.52 MI
10.	TURN RIIGHT ONTO PARUM RD/CT–354	6.90 MI
11.	TURN LEFT ONTO NORWICH RD/CT–82	1.43 MI
12.	ARRIVE AT 557 ROUTE 82 MONTVILLE, CT	

VICINITY MAP

SCALE: 1" = 1000'

NORTH



PROJECT SUMMARY

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

A. REMOVE AND REPLACE EXISTING POSITION 4 LTE ANTENNA FOR PROPOSED HEXPORT ANTENNA, (1) PER SECTOR/ (3) TOTAL.

B. INSTALL (3) NEW RRUS–11+A2 ON AT&T LOW PROFILE PLATFORM TOWER MOUNT.

PROJECT INFORMATION

AT&T SITE NUMBER:	CT2194
AT&T SITE NAME:	MONTVILLE
SITE ADDRESS:	CROWN CASTLE, INC. SITE NO.: 876371 557 ROUTE 82 MONTVILLE, CT 06370
LESSEE/APPLICANT:	AT&T MOBILITY 500 ENTERPRISE DRIVE, SUITE 3A ROCKY HILL, CT 06067
ENGINEER:	CENTEK ENGINEERING, INC. 63–2 NORTH BRANFORD RD. BRANFORD, CT. 06405
PROJECT COORDINATES:	LATITUDE: 41°–30'–20.220" N LONGITUDE: 72°–11'–51.047" W GROUND ELEVATION: ±413.0' 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 AND SPECIFICATIONS	0
C–1	PLANS, ELEVATION AND DETAILS	0
C–2	LTE 2C EQUIPMENT 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	06/13/16	WMW	CAG	CONSTRUCTION DOCUMENTS – ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

STATE OF CONNECTICUT · PROFESSIONAL ENGINEER · 27157

at&t

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

MONTVILLE

CT2194 - LTE 2C

557 ROUTE 82

MONTVILLE, CT 06370

DATE: 05/13/16

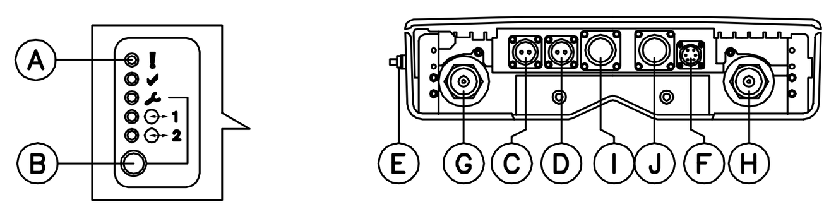
SCALE: AS NOTED

JOB NO. 16071.05

TITLE SHEET

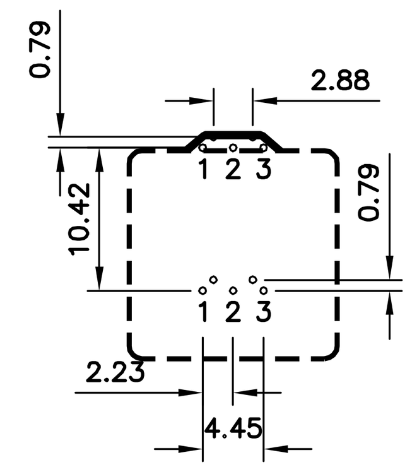
T–1

Sheet No. 1 of 7



SIDE PANEL

BOTTOM VIEW



CONNECTION INTERFACE

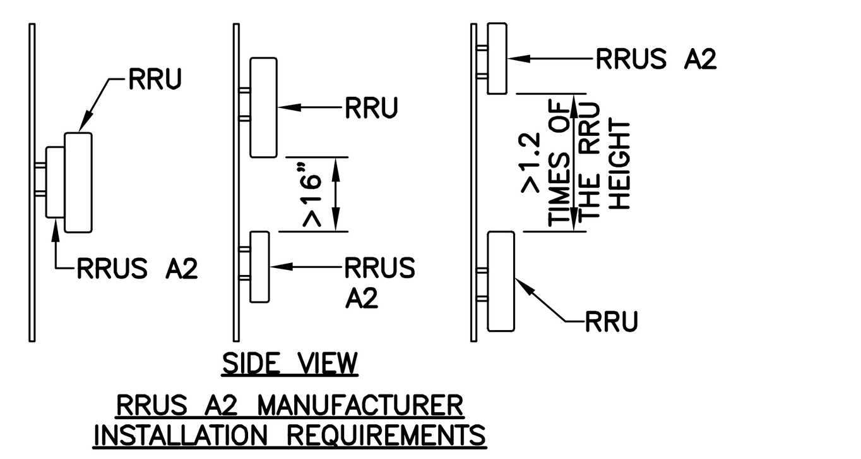
POSITION (ID)	DESCRIPTION	MARKING
A	OPTICAL INDICATORS	!, ✓, 🔧, ⊖-1, ⊖-2
B	MAINTENANCE	🔧
C	−48V DC POWER SUPPLY	POW IN
D	−48V DC POWER SUPPLY TO RRU	POW OUT
E	GROUNDING	⏚
F	RET	RET
G	ANTENNA B	Ψ← B
H	ANTENNA A	Ψ← A
I	OPTICAL CABLE 1	⊖-1
J	OPTICAL CABLE 2	⊖-2

THE NUMBER OF BOLT HOLES DEPENDS ON THE WALL MATERIAL, AS SPECIFIED BY THE SITE ENGINEER. A MINIMUM OF TWO BOLT HOLES ARE RECOMMENDED FOR EACH BRACKET.

ONE OF THE FOLLOWING SOLUTIONS FOR HOLE POSITIONS MUST BE USED:
- 1, 3
- 1, 2, 3

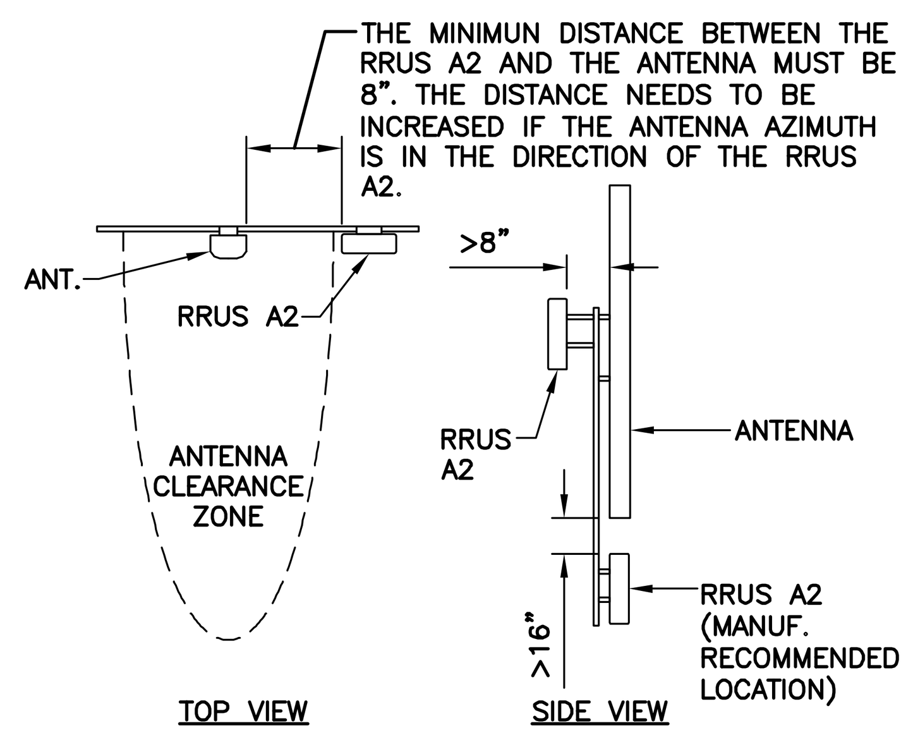
WALL MOUNTING BRACKET INSTALLATION

NOTES:
1. STACKING OF RRU's IS NOT PERMITTED.
2. NO PAINTING OF RRU OR THE SOLAR SHIELD IS ALLOWED.
3. A SINGLE RRUS A2 CAN BE INSTALLED AS A STAND ALONE UNIT OR MOUNTED TO THE BACK OF ITS ASSOCIATED RRU.



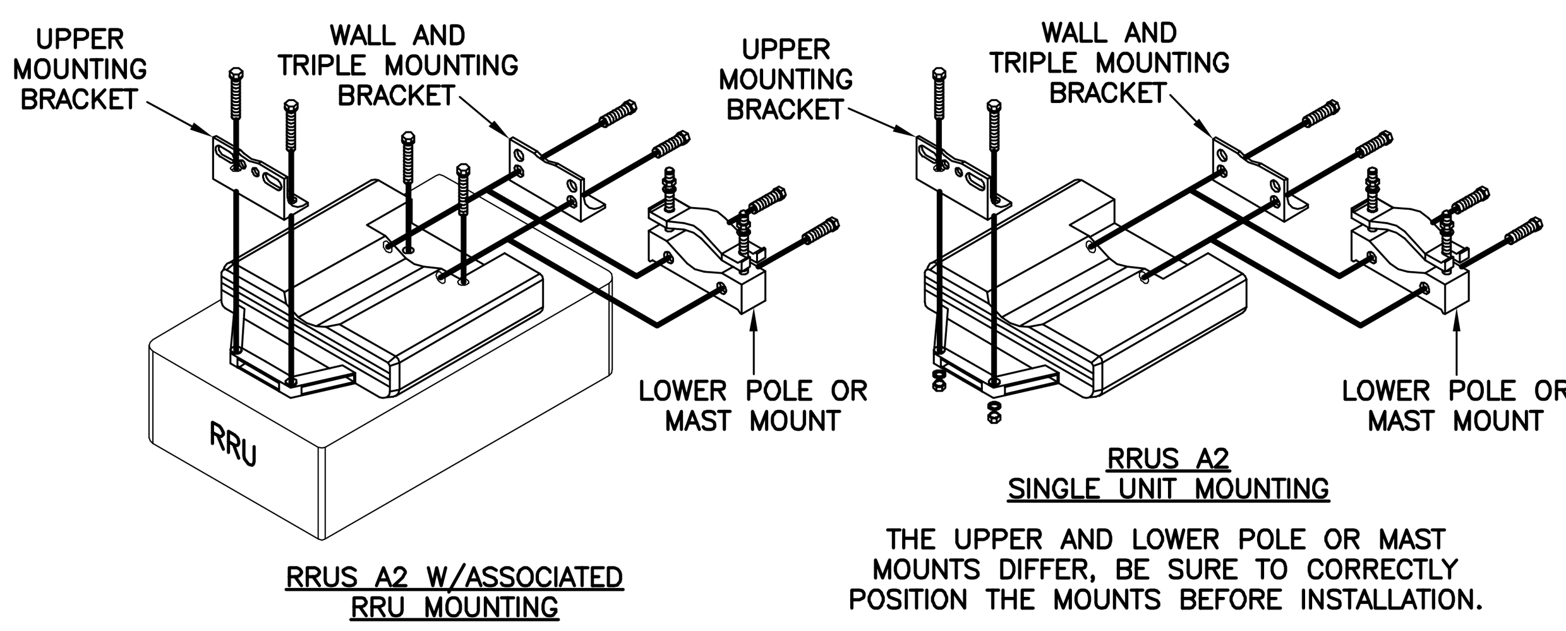
SIDE VIEW

RRUS A2 MANUFACTURER INSTALLATION REQUIREMENTS



TOP VIEW

SIDE VIEW



RRUS A2 W/ASSOCIATED RRU MOUNTING

RRUS A2 SINGLE UNIT MOUNTING

THE UPPER AND LOWER POLE OR MAST MOUNTS DIFFER, BE SURE TO CORRECTLY POSITION THE MOUNTS BEFORE INSTALLATION.

1 / N−1 **ERICSSON RRU A2 DETAILS**
NOT TO SCALE

NOTES AND SPECIFICATIONS

DESIGN BASIS:

GOVERNING CODE: 2003 INTERNATIONAL BUILDING (IBC) AS MODIFIED BY THE 2005 CT STATE BUILDING CODE AND 2009 AMENDMENTS.

1. DESIGN CRITERIA:
   - WIND LOAD: PER EIA/TIA 222 F−96 (ANTENNA MOUNTS): 95 MPH (FASTEST MILE), EQUIVALENT TO 115 MPH (3 SECOND GUST)
   - BUILDING CLASSIFICATION: II (BASED ON IBC TABLE 1604.5)
   - BASIC WIND SPEED (OTHER STRUCTURE): 95 MPH (3 SECOND GUST) (EXPOSURE B/IMPORTANCE FACTOR 1.0 BASED ON ASCE 7−02) PER 2003 INTERNATIONAL BUILDING CODE (IBC) AS MODIFIED BY THE 2005 CONNECTICUT SUPPLEMENT AND 2009 AMMENDMENT.
   - SEISMIC LOAD (DOES NOT CONTROL): PER ASCE 7−02 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 REPAINT WORK NOT IN COMPLIANCE WITH SPECIFIED REQUIREMENTS.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	06/13/16	WMW	CAG	CONSTRUCTION DOCUMENTS − 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

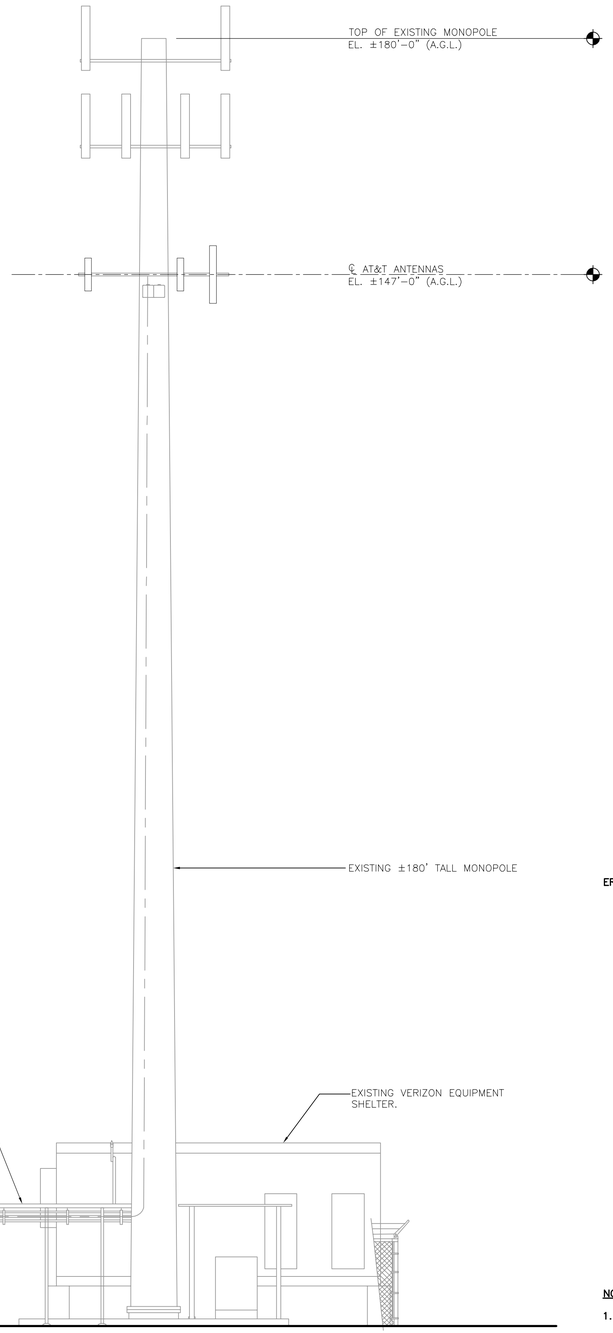
AT&T MOBILITY
WIRELESS COMMUNICATIONS FACILITY
MONTVILLE
CT2194 - LTE 2C
557 ROUTE 82
MONTVILLE, CT 06370

DATE: 05/13/16
SCALE: AS NOTED
JOB NO. 16071.05

NOTES AND SPECIFICATIONS

N−1

Sheet No. 2 of 7



TOWER STRUCTURAL NOTES:

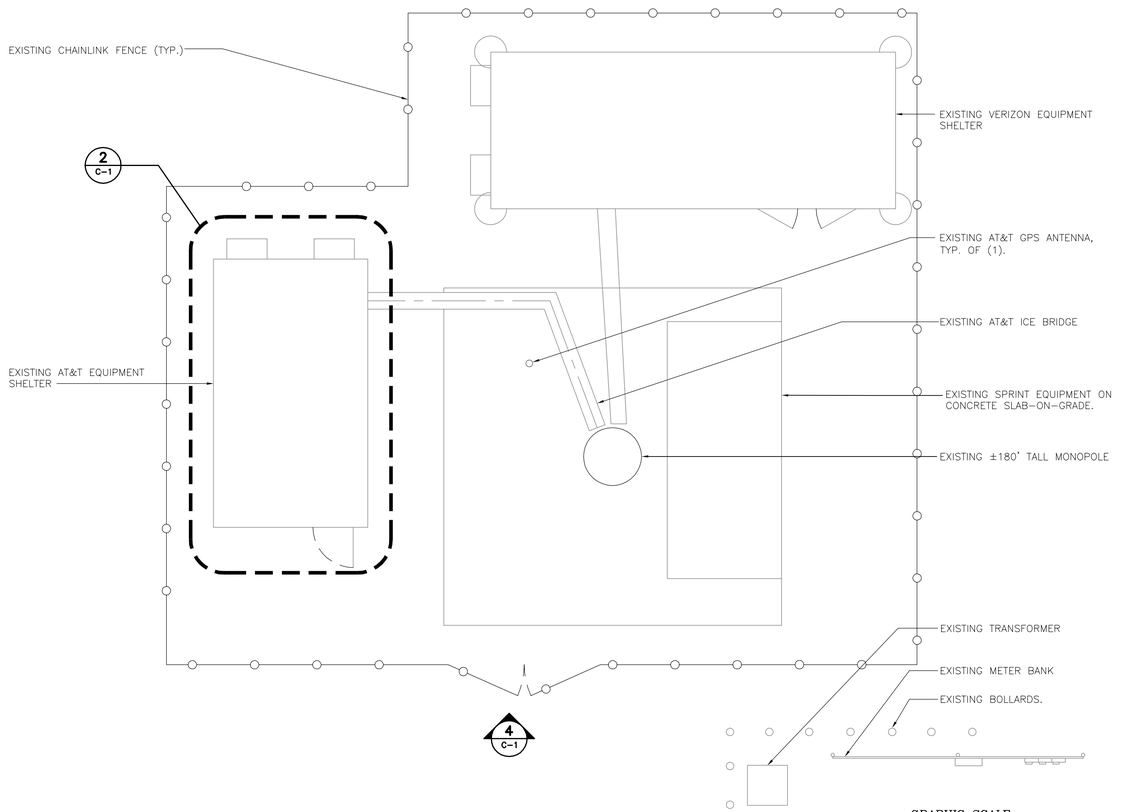
1. REFER TO STRUCTURAL ANALYSIS REPORT PREPARED BY CROWN CASTLE, INC., PROJ. NO. XXXXX.XX, DATED XXXXXX XX, XXXX FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
2. ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE, INC. AND FINAL AT&T RF DATA SHEET.

NOTES:

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

4 / C-1 **NORTHWEST ELEVATION**
SCALE: 1" = 10'

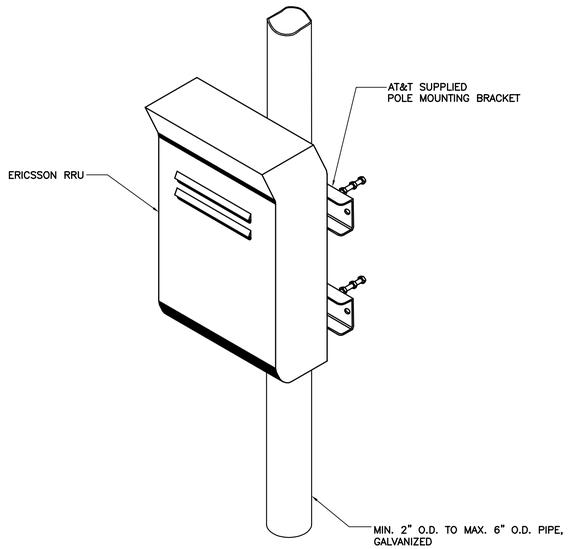
GRAPHIC SCALE
10 0 5 10 20 40
(IN FEET)
1 inch = 10 ft.



1 / C-1 **COMPOUND PLAN**
SCALE: 1/8" = 1'-0"

NORTH

GRAPHIC SCALE
8 0 4 8 16 32
(IN FEET)
1 inch = 8 ft.

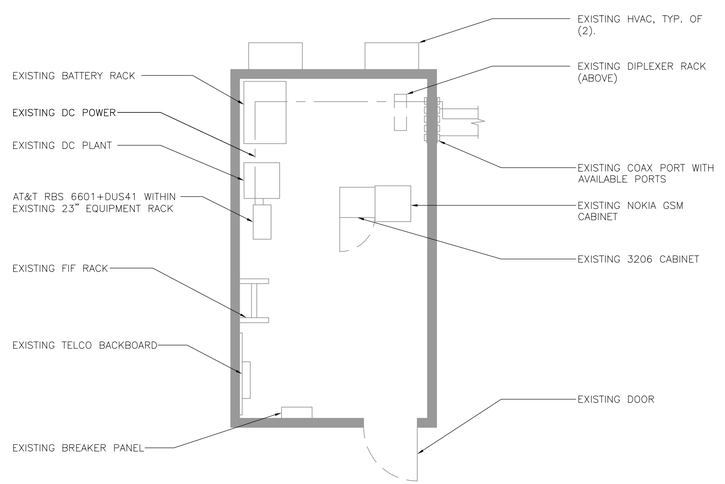


ISOMETRIC VIEW

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.
3. NO PAINTING OF THE RRU OR SOLAR SHIELD IS ALLOWED.

3 / C-1 **TYPICAL RRUS MOUNTING DETAILS**
SCALE: 1 1/2" = 1'-0"



2 / C-1 **EQUIPMENT LAYOUT PLAN**
SCALE: 1/4" = 1'-0"

NORTH

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	06/13/16	WMW	CAG	CONSTRUCTION DOCUMENTS – ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

at&t

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

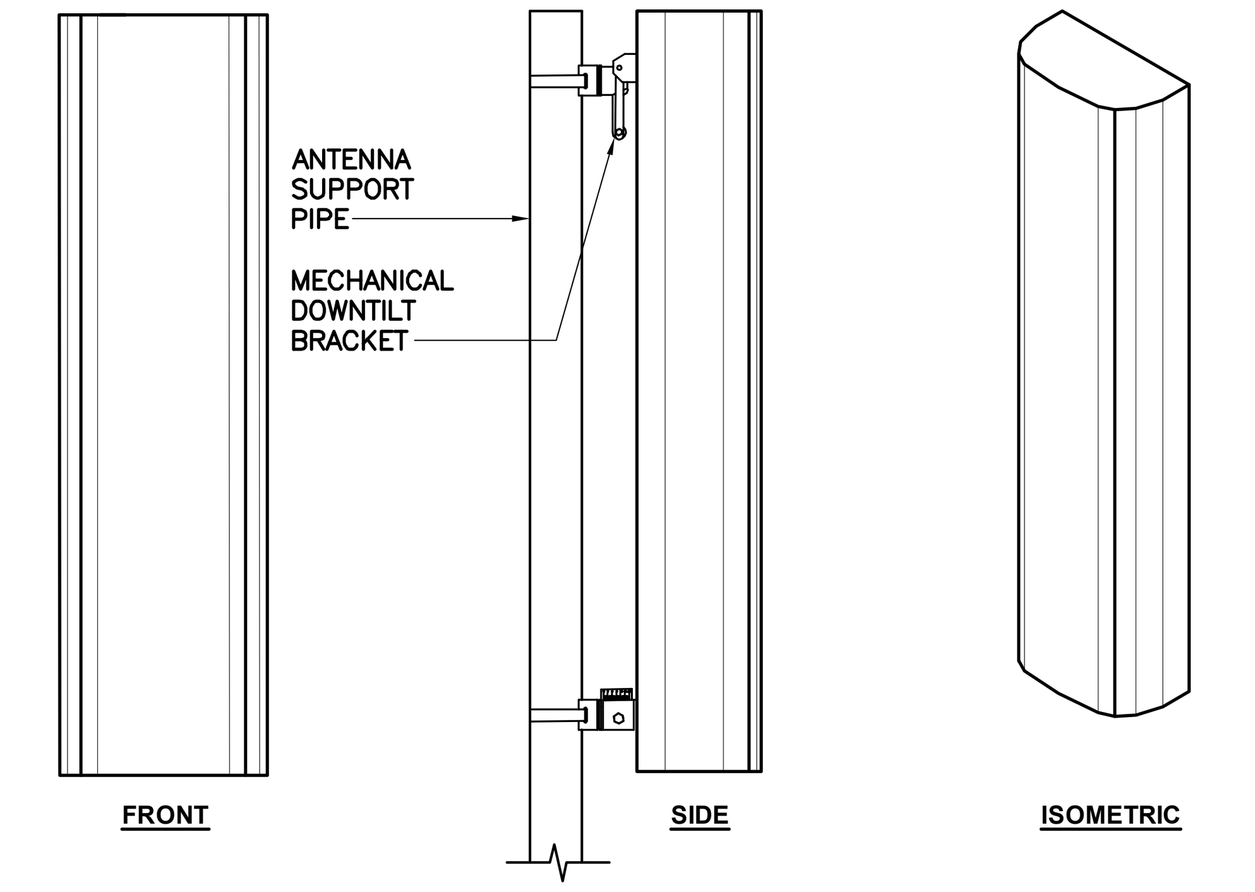
WIRELESS COMMUNICATIONS FACILITY
MONTVILLE
CT2194 - LTE 2C
557 ROUTE 82
MONTVILLE, CT 06370

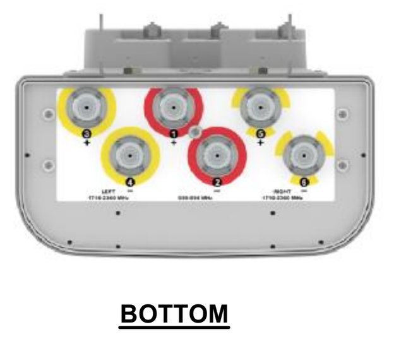
DATE: 05/13/16
SCALE: AS NOTED
JOB NO. 16071.05

PLANS, ELEVATION AND DETAILS

C-1

Sheet No. 3 of 7





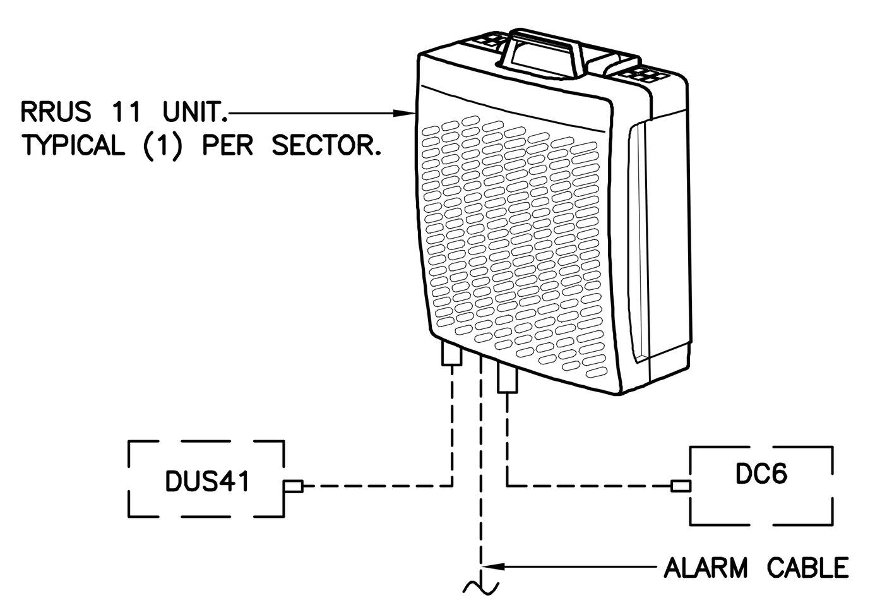
ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: CCI MODEL: HPA-65R-BUU-H8	92.4"H x 14.8"W x 7.4"D	68-LBS

5 (C-2) PROPOSED ANTENNA DETAIL

SCALE: NTS

NOTES:

1. INSTALL ANTENNA TO EXISTING PIPE MAST USING MANUFACTURERS SUPPLIED BRACKETS AND MOUNTING HARDWARE
2. SET MECHANICAL DOWNTILT TO VALUE SPECIFIED IN LATEST RFDS



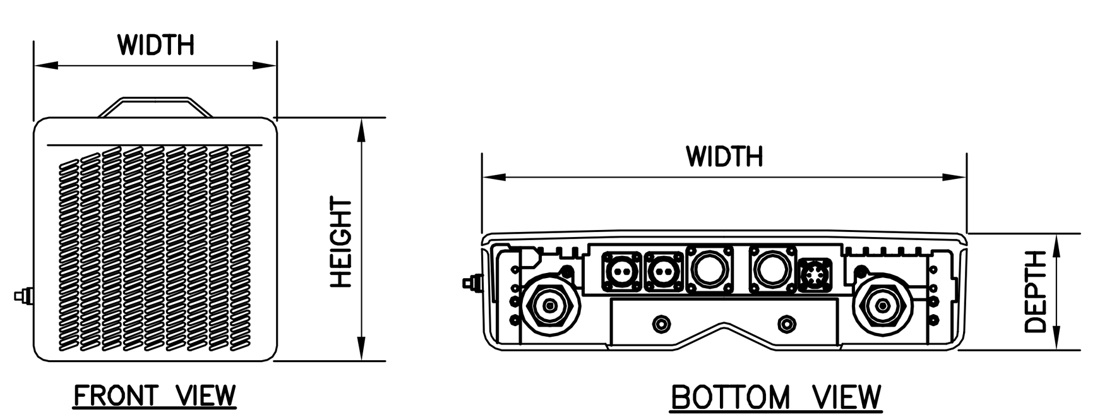
RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RRUS 11	17.8"L x 17.3"W x 7.2"D	50 LBS.	ABOVE: 16" MIN. BELOW: 12" MIN. FRONT: 36" MIN.

NOTES:

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

6 (C-2) ERICSSON RRUS 11 DETAIL

SCALE: 1" = 1'-0"



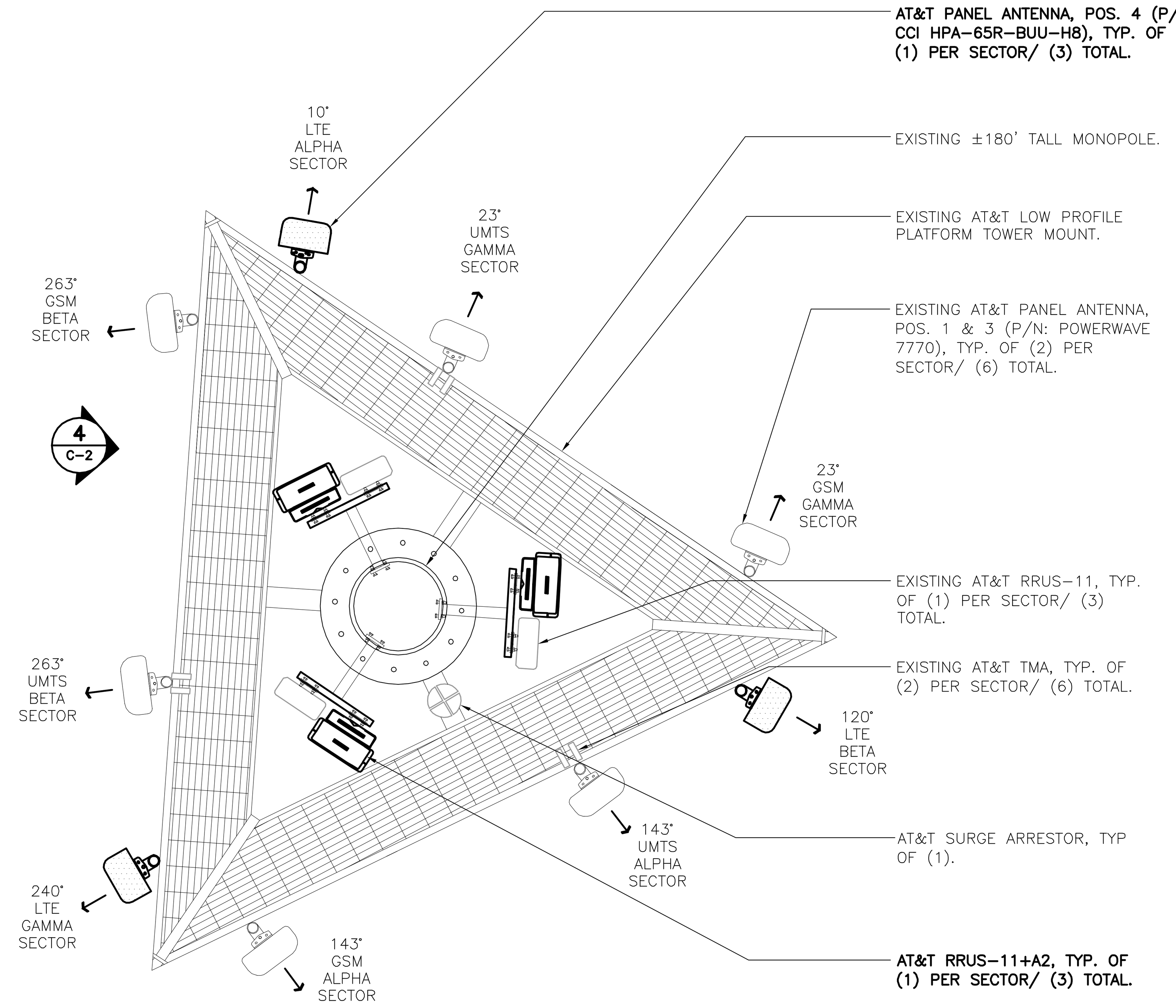
RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RRUS A2	16.42"L x 15.19"W x 3.35"D	22.05 LBS.	ABOVE: 16" MIN. BELOW: 12" MIN. FRONT: 36" MIN.

NOTES:

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

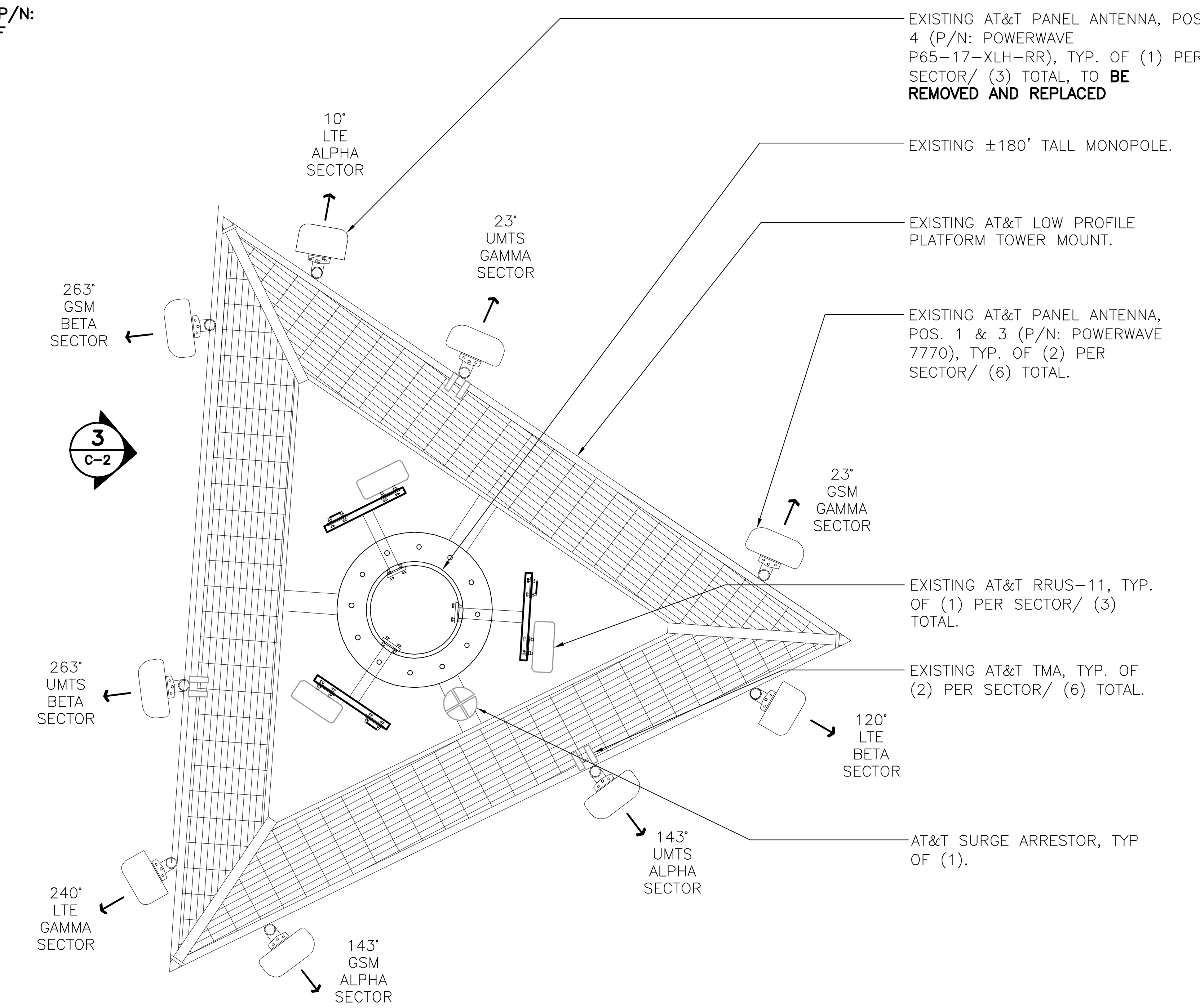
7 (C-2) ERICSSON RRUS A2 DETAIL

SCALE: 1" = 1'-0"



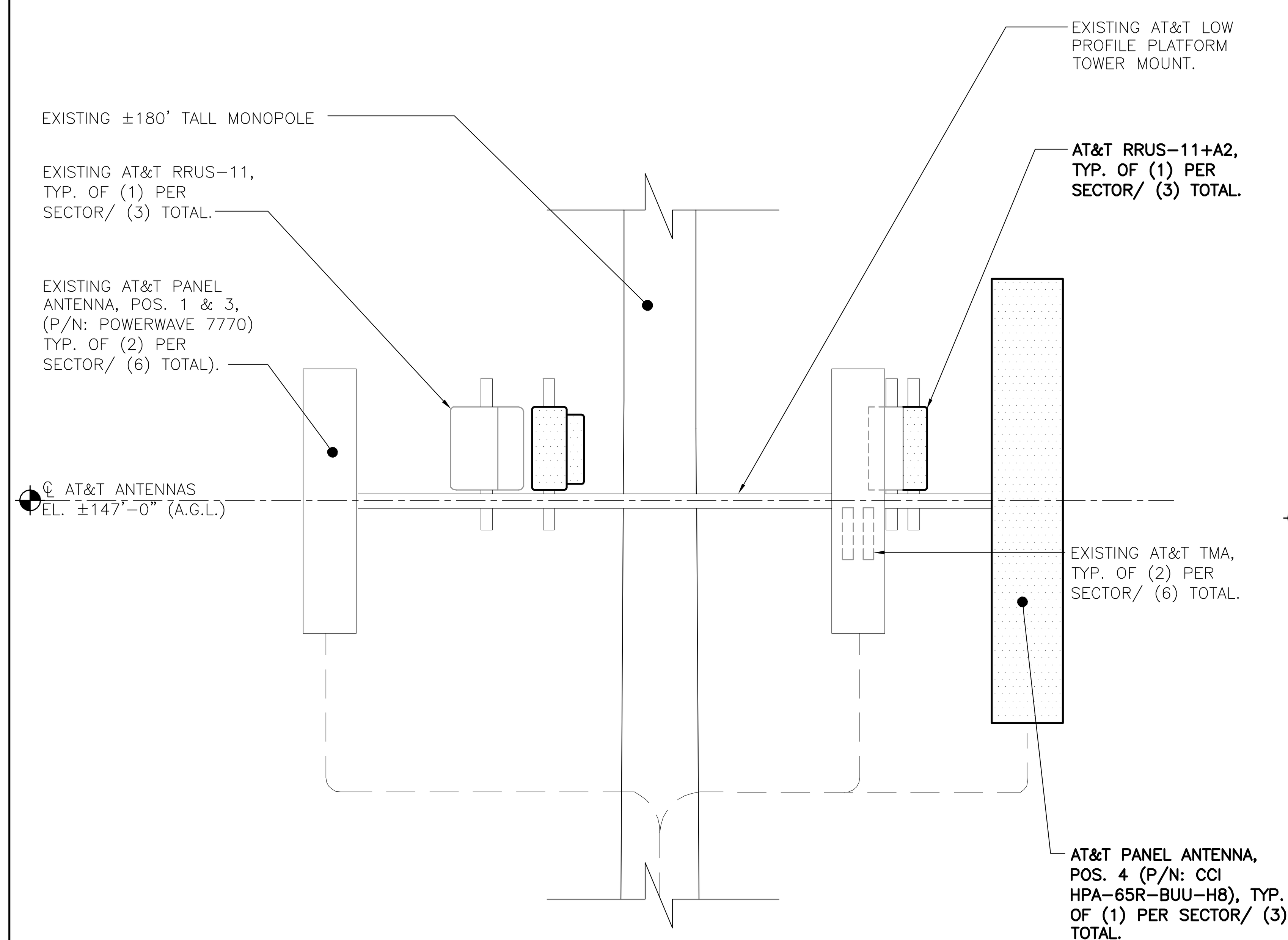
2 (C-2) PROPOSED ANTENNA PLAN

SCALE: 3/8" = 1'-0"



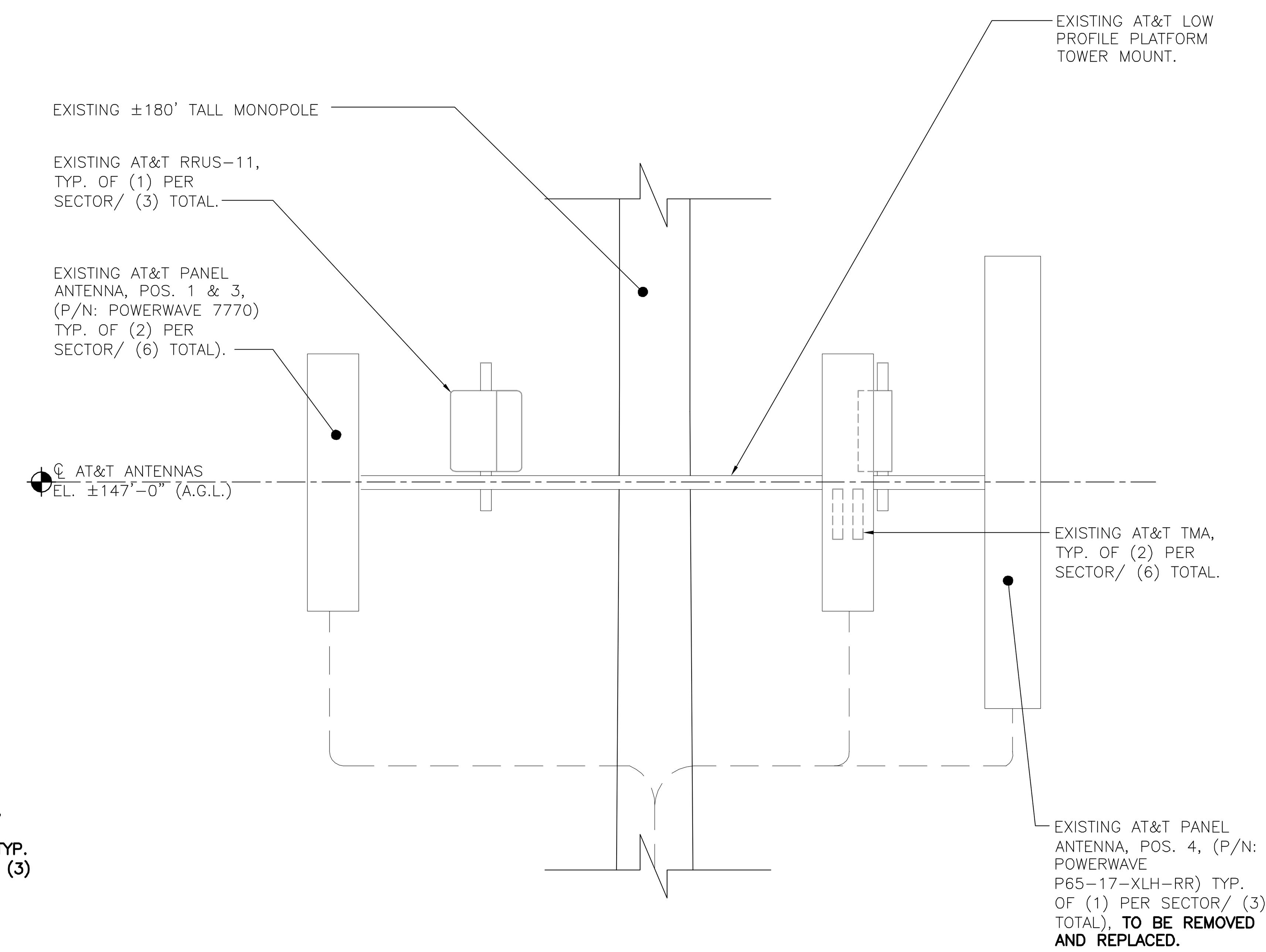
1 (C-2) EXISTING ANTENNA PLAN

SCALE: 3/8" = 1'-0"



4 (C-2) PROPOSED ANTENNA PLAN

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

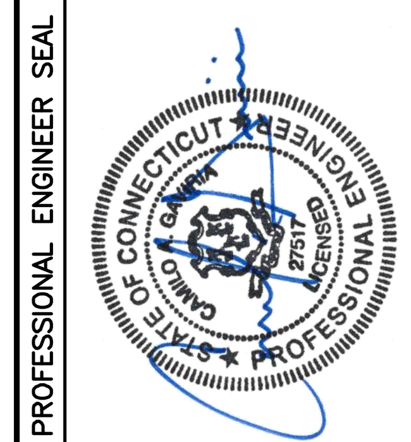


3 (C-2) EXISTING ANTENNA PLAN

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

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	06/13/16	WMW	CAG	CONSTRUCTION DOCUMENTS – ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL



at&t

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

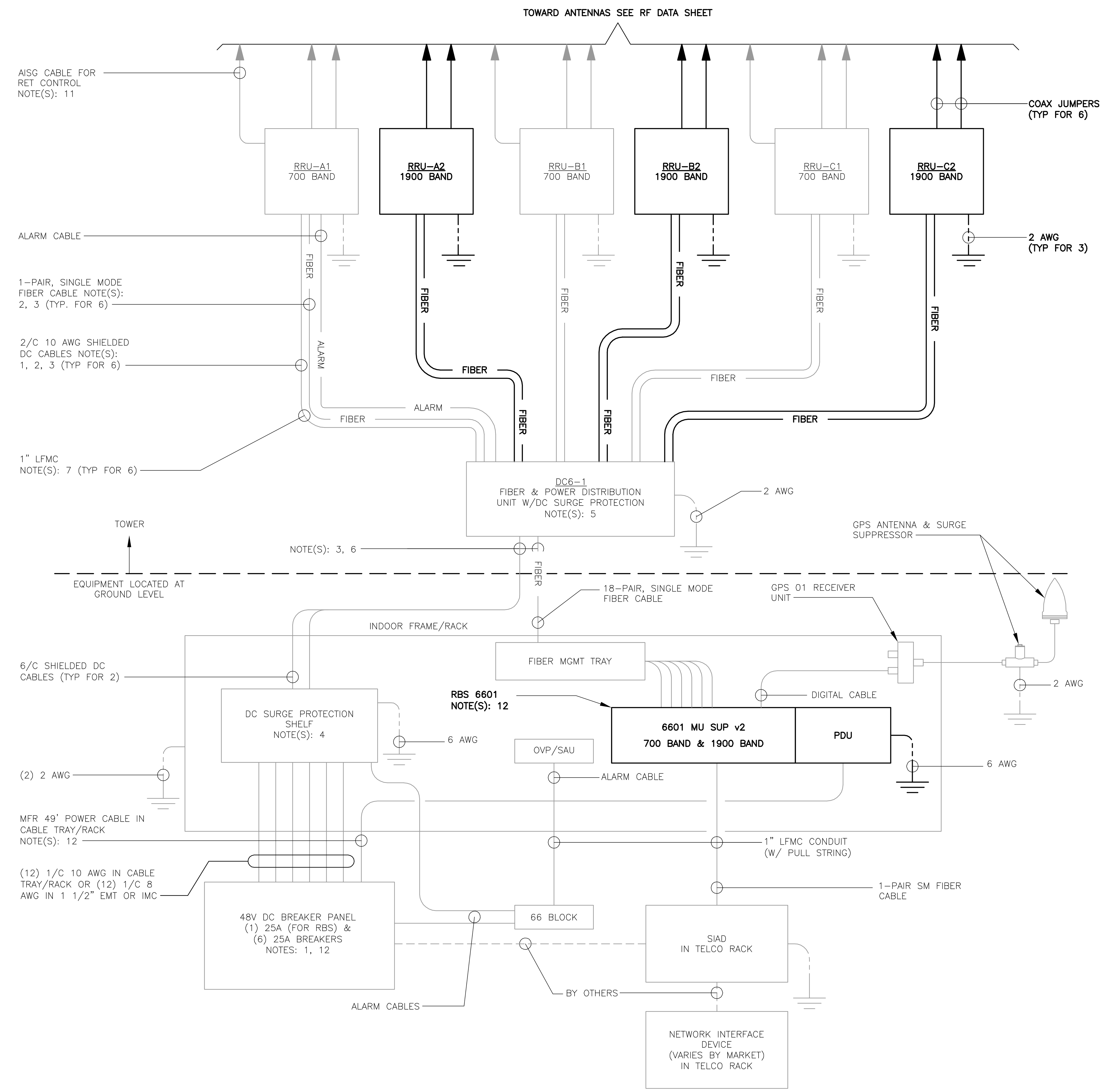
AT&T MOBILITY
WIRELESS COMMUNICATIONS FACILITY
MONTVILLE
CT2194 - LTE 2C
557 ROUTE 82
MONTVILLE, CT 06370

DATE: 05/13/16
SCALE: AS NOTED
JOB NO. 16071.05

LTE 2C EQUIPMENT DETAILS

C-2

Sheet No. 4 of 7



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 OF ALL INSPECTIONS AS MAY BE REQUIRED BY THE LOCAL AUTHORITY.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH THE SITE AND/OR BUILDING OWNER FOR NEW AND/OR DEMOLITION WORK INVOLVED.
15. THE CONTRACTOR SHALL GUARANTEE ALL NEW WORK FOR A PERIOD OF ONE YEAR FROM THE ACCEPTANCE DATE BY THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING WARRANTIES FROM ALL EQUIPMENT MANUFACTURERS FOR SUBMISSION TO THE OWNER.
16. DRAWINGS INDICATE GENERAL ARRANGEMENT OF WORK INCLUDED IN CONTRACT. CONTRACTOR SHALL WITHOUT EXTRA CHARGE, MAKE MODIFICATIONS TO THE LAYOUT OF THE WORK TO PREVENT CONFLICT WITH WORK OF OTHER TRADES AND FOR THE PROPER INSTALLATION OF WORK. CHECK ALL DRAWINGS AND VISIT JOB SITE TO VERIFY SPACE AND TYPE OF EXISTING CONDITIONS IN WHICH WORK WILL BE DONE, PRIOR TO SUBMITTAL OF BID.
17. ALL NON-CURRENT CARRYING PARTS OF THE ELECTRICAL AND TELEPHONE CONDUIT SYSTEMS SHALL BE MECHANICALLY AND ELECTRICALLY CONNECTED TO PROVIDE AN INDEPENDENT RETURN PATH TO THE EQUIPMENT GROUNDING SOURCES.
18. GROUNDING SYSTEM WILL BE IN ACCORDANCE WITH THE LATEST ACCEPTABLE EDITION OF THE NATIONAL ELECTRICAL CODE AND REQUIREMENTS PER LOCAL INSPECTOR HAVING JURISDICTION.
19. EACH EQUIPMENT GROUND CONDUCTOR SHALL BE SIZED IN ACCORDANCE WITH THE N.E.C. ARTICLE 250-122. (MIN. #12 AWG).
20. CONTRACTOR SHALL PROVIDE A CELLULAR GROUNDING SYSTEM WITH THE MAXIMUM AC RESISTANCE TO GROUND OF 5 OHM BETWEEN ANY POINT ON THE GROUNDING SYSTEM AS MEASURED BY 3-POINT GROUNDING TEST. (REFER TO SECTION 16960).

TESTS BY INDEPENDENT ELECTRICAL TESTING FIRM

A. CONTRACTOR SHALL RETAIN THE SERVICES OF A LOCAL INDEPENDENT ELECTRICAL TESTING FIRM (WITH MINIMUM 5 YEARS COMMERCIAL EXPERIENCE IN THE ELECTRICAL TESTING INDUSTRY) AS SPECIFIED BY OWNER TO PERFORM:

TEST 1: RESISTANCE TO GROUND TEST ON THE CELLULAR GROUNDING SYSTEM.

THE TESTING FIRM SHALL INCLUDE THE FOLLOWING INFORMATION WITH THE REPORT:

1. TESTING PROCEDURE INCLUDING THE MAKE AND MODEL OF TEST EQUIPMENT.
2. CERTIFICATION OF TESTING EQUIPMENT CALIBRATION WITHIN SIX (6) MONTHS OF DATE OF TESTING. INCLUDE CERTIFICATION LAB ADDRESS AND TELEPHONE NUMBER.
3. GRAPHICAL DESCRIPTION OF TESTING METHOD ACTUALLY IMPLEMENTED.

B. TESTING SHALL BE PERFORMED IN THE PRESENCE AND TO THE SATISFACTION OF OWNERS CONSTRUCTION REPRESENTATIVE. TESTING DATA SHALL BE INITIALED AND DATED BY THE CONSTRUCTION AND INCLUDED WITH THE WRITTEN REPORT/ANALYSIS.

C. THE CONTRACTOR SHALL FORWARD SIX (6) COPIES OF THE INDEPENDENT ELECTRICAL TESTING FIRM REPORT/ANALYSIS TO ENGINEER A MINIMUM OF TEN (10) WORKING DAYS PRIOR TO THE JOB TURNOVER.

D. CONTRACTOR TO PROVIDE A MINIMUM OF ONE (1) WEEK NOTICE TO OWNER AND ENGINEER FOR ALL TESTS REQUIRING WITNESSING.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	06/13/16	WWW	CAG	CONSTRUCTION DOCUMENTS - ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

at&t

EMPIRE telecom

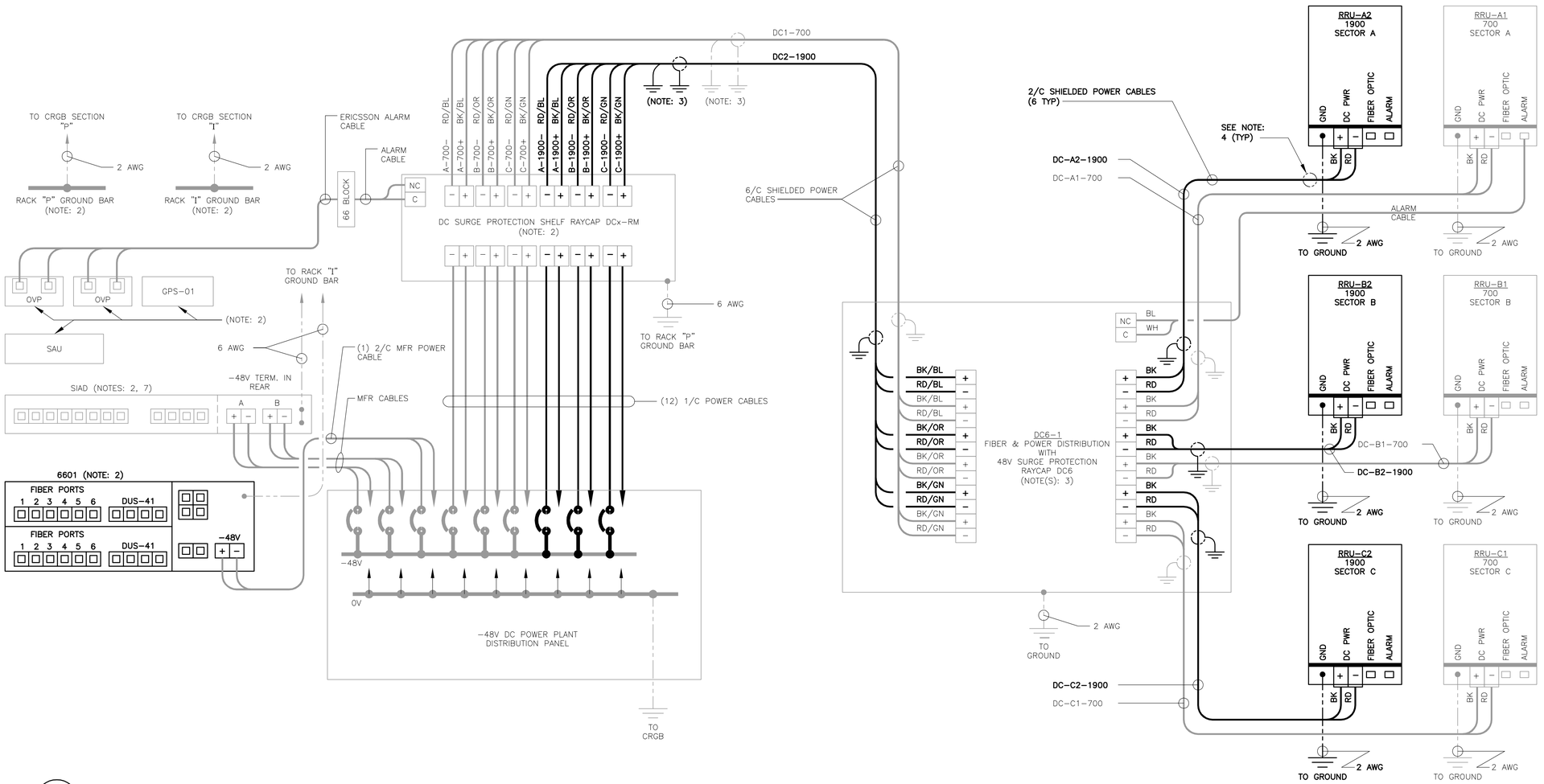
CENTEK engineering
Centered on Solutions™
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

AT&T MOBILITY
WIRELESS COMMUNICATIONS FACILITY
MONTVILLE
CT2194 - LTE 2C
557 ROUTE 82
MONTVILLE, CT 06370

DATE: 05/13/16
SCALE: AS NOTED
JOB NO. 16071.05

LTE SCHEMATIC DIAGRAM AND NOTES

E-1



1 / E-2 LTE WIRING DIAGRAM

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	06/13/16	WMW	CAG	CONSTRUCTION DOCUMENTS - ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

at&t

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

MONTVILLE

CT2194 - LTE 2C

557 ROUTE 82

MONTVILLE, CT 06370

DATE: 05/13/16

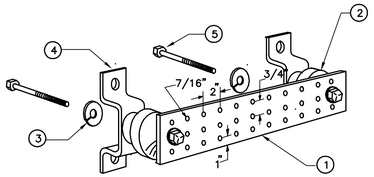
SCALE: AS NOTED

JOB NO. 16071.05

LTE WIRING DIAGRAM

E-2

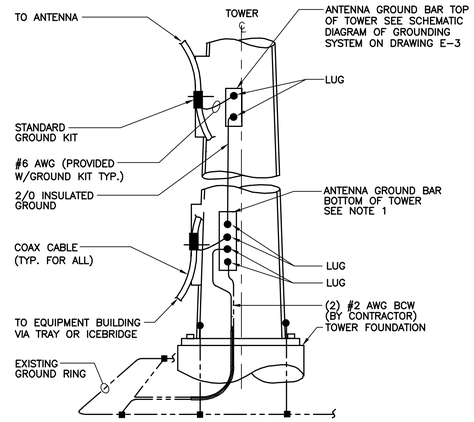
Sheet No. 6 of 7



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.

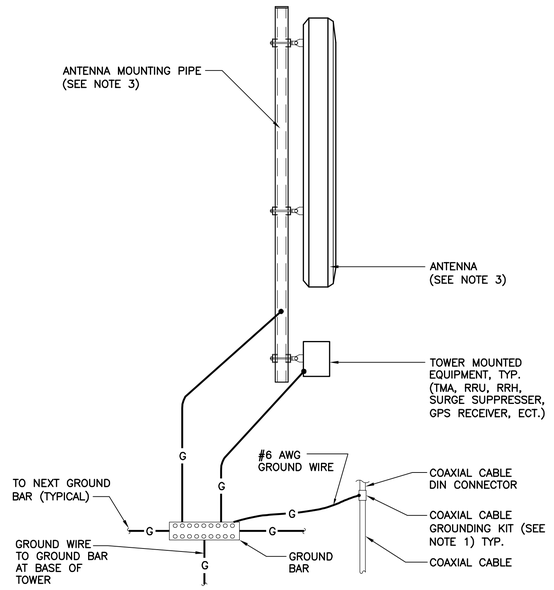
3 GROUND BAR DETAIL
E-3 NOT TO SCALE



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.

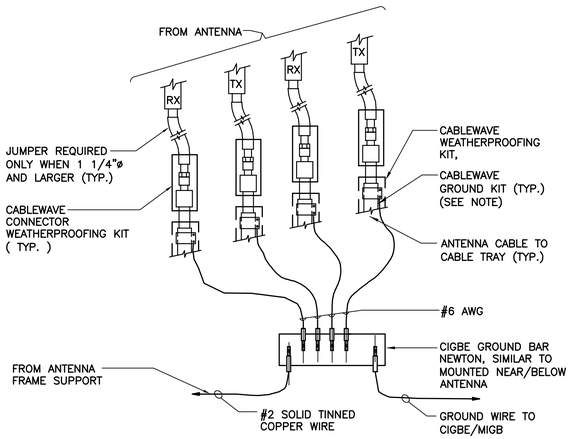
2 ANTENNA CABLE GROUNDING - TOWER
E-3 NOT TO SCALE



NOTES:

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

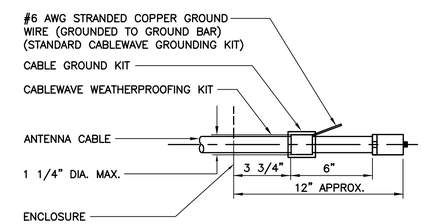
1 TYPICAL ANTENNA GROUNDING DETAIL
E-3 NOT TO SCALE



NOTE:

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

5 CONNECTION OF GROUND WIRES TO GROUND BAR
E-3 NOT TO SCALE



NOTE:

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

4 ANTENNA CABLE GROUNDING DETAIL
E-3 NOT TO SCALE

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	06/13/16	WMW	CAG	CONSTRUCTION DOCUMENTS - ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

at&t

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

MONTVILLE

CT2194 - LTE 2C

557 ROUTE 82

MONTVILLE, CT 06370

DATE: 05/13/16

SCALE: AS NOTED

JOB NO. 16071.05

TYPICAL ELECTRICAL DETAILS

E-3

Sheet No. 7 of 7

PJF PAUL J. FORD & COMPANY

Date: **June 20, 2016**

Sean Dempsey
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
704.405.6565

Paul J Ford and Company
250 E. Broad Street, Suite 600
Columbus, OH 43215
614.221.6679
rferrante@pjfweb.com

Subject: **Structural Analysis Report**

Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CTL02194
	Carrier Site Name:	Montville Rt 82
Crown Castle Designation:	**Crown Castle BU Number:**	876371
	Crown Castle Site Name:	WALDEN / CAROLYN BESADE
	Crown Castle JDE Job Number:	378652
	Crown Castle Work Order Number:	1240942
	Crown Castle Application Number:	344716 Rev. 2
Engineering Firm Designation:	**Paul J Ford and Company Project Number:**	37516-2062.001.7805
Site Data:	**557 Rte. 82, Oakdale, New London County, CT** **Latitude *41° 30' 20.3"*, Longitude *-72° 11' 51.1"*** **180 Foot - Monopole Tower**	

Dear Sean Dempsey,

Paul J Ford and Company 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 915491, in accordance with application 344716, revision 2.

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

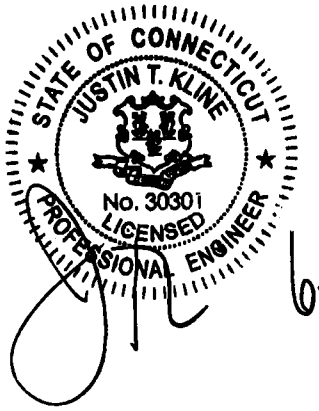
LC7: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

The analysis has been performed in accordance with the TIA/EIA-222-F standard and the 2005 CT State Building Code based upon a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

We at *Paul J Ford and Company* 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:

Ryan Ferrante, E.I.
Structural Designer



6-20-16

Date: **June 20, 2016**

Sean Dempsey
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
704.405.6565

Paul J Ford and Company
250 E. Broad Street, Suite 600
Columbus, OH 43215
614.221.6679
rferrante@pjfweb.com

Subject: **Structural Analysis Report**

Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CTL02194
	Carrier Site Name:	Montville Rt 82
Crown Castle Designation:	**Crown Castle BU Number:**	876371
	Crown Castle Site Name:	WALDEN / CAROLYN BESADE
	Crown Castle JDE Job Number:	378652
	Crown Castle Work Order Number:	1240942
	Crown Castle Application Number:	344716 Rev. 2
Engineering Firm Designation:	**Paul J Ford and Company Project Number:**	37516-2062.001.7805
Site Data:	**557 Rte. 82, Oakdale, New London County, CT**	
	Latitude *41° 30' 20.3"*, Longitude *-72° 11' 51.1"*	
	180 Foot - Monopole Tower	

Dear Sean Dempsey,

Paul J Ford and Company 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 915491, in accordance with application 344716, revision 2.

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

LC7: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

The analysis has been performed in accordance with the TIA/EIA-222-F standard and the 2005 CT State Building Code based upon a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

We at *Paul J Ford and Company* 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:

Ryan Ferrante, E.I.
Structural Designer

TABLE OF CONTENTS

1) INTRODUCTION

2) ANALYSIS CRITERIA
Table 1 - Proposed Antenna and Cable Information
Table 2 - Existing and Reserved Antenna and Cable Information

3) ANALYSIS PROCEDURE
Table 3 - Documents Provided
3.1) Analysis Method
3.2) Assumptions

4) ANALYSIS RESULTS
Table 4 - Section Capacity (Summary)
Table 5 – Tower Components vs. Capacity
4.1) Recommendations

5) APPENDIX A
tnxTower Output

6) APPENDIX B
Base Level Drawing

7) APPENDIX C
Additional Calculations

1) INTRODUCTION

This tower is a 180 ft Monopole tower designed by ENGINEERED ENDEAVORS, INC. in November of 1999. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The analysis has been performed in accordance with the TIA/EIA-222-F standard and the 2005 CT State Building Code based upon a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

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
148.0	148.0	3	ericsson	RRUS-11	-	-	-
147.0	147.0	3	cci antennas	HPA-65R-BUU-H8 w/ Mount Pipe	-	-	-
		3	ericsson	RRUS11 A2			
		3	powerwave technologies	1001940			

Table 2 - Existing and Reserved 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
180.0	180.0	6	decibel	DB980H90E-M w/ Mount Pipe	6	1-5/8	1
		1	tower mounts	Platform Mount [LP 601-1]			
167.0	167.0	3	alcatel lucent	RRH2X60-PCS	2	1-5/8	2
		3	alcatel lucent	RRH2x60-700			
		3	alcatel lucent	RRH2x60-AWS			
		2	rfs celwave	DB-T1-6Z-8AB-0Z			
		6	commscope	HBXX-6516DS-A2M w/ Mount Pipe			
		3	commscope	LNX-6514DS-A1M w/ Mount Pipe			
		1	gps	GPS_A	12 1	1-5/8 1/2	1
		4	antel	LPA-80063/6CF w/ Mount Pipe			
		2	antel	LPA-80080-6CF-EDIN w/ Mount Pipe			
		6	rfs celwave	FD9R6004/2C-3L			
		1	tower mounts	Platform Mount [LP 601-1]			
148.0	148.0	3	ericsson	TME-RRUS-11	-	-	1
		1	tower mounts	Pipe Mount [PM 601-3]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
147.0	147.0	3	powerwave technologies	P65-17-XLH-RR w/ Mount Pipe	-	-	3
		6	powerwave technologies	7770.00 w/ Mount Pipe	12 1 2	1-5/8 3/8 7/16	1
		6	powerwave technologies	LGP21401			
		6	powerwave technologies	LGP21901			
		1	raycap	DC6-48-60-18-8F			
		1	tower mounts	Platform Mount [LP 601-1]			
75.0	76.0	1	gps	GPS_A	1	1/2	1
	75.0	1	tower mounts	Side Arm Mount [SO 701-1]			

Notes:
1) Existing Equipment
2) Reserved Equipment
3) Equipment to be Removed

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
GEOTECHNICAL REPORTS	Dr. Clarence Welti, 10/29/99	2053524	CCISITES
POST-MODIFICATION INSPECTION	Vertical Structures, 2009-004-024, 6/12/09	2447495	CCISITES
POST-MODIFICATION INSPECTION	TEP, 131001.876371, 5/28/13	3868204	CCISITES
TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	EEI, 6063, 11/23/99	1615419	CCISITES
TOWER MANUFACTURER DRAWINGS	EEI, 6063, 11/22/99	1615393	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) Monopole was reinforced in conformance with the referenced modification drawings.

This analysis may be affected if any assumptions are not valid or have been made in error. Paul J Ford and Company should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	180 - 133	Pole	TP27.99x18x0.25	1	-7.64	1109.25	87.1	Pass
L2	133 - 131	Pole	TP27.8996x26.6398x0.3125	2	-8.68	1422.52	82.8	Pass
L3	131 - 104.5	Pole	TP33.4638x27.8996x0.4395	3	-13.57	2263.25	84.2	Pass
L4	104.5 - 87.42	Pole	TP37.05x33.4638x0.4591	4	-16.12	2689.87	81.2	Pass
L5	87.42 - 69	Pole	TP40.2846x35.0462x0.5053	5	-22.90	3316.77	82.3	Pass
L6	69 - 42.88	Pole	TP45.76x40.2846x0.5153	6	-28.45	3735.60	83.1	Pass
L7	42.88 - 34.5	Pole	TP46.767x43.4193x0.5712	7	-31.93	4173.16	78.9	Pass
L8	34.5 - 0	Pole	TP54x46.767x0.5342	8	-40.85	4426.25	84.2	Pass
							Summary	
						Pole (L1)	87.1	Pass
						Rating =	87.1	Pass

Table 5 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	80.6	Pass
1	Base Plate	0	64.0	Pass
1	Base Foundation Structural Steel	0	18.0	Pass
1	Base Foundation Soil Interaction	0	66.8	Pass

Structure Rating (max from all components) =	87.1%

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

4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT

Tower Input Data

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

1) Tower is located in New London County, Connecticut.
2) Basic wind speed of 85 mph.
3) Nominal ice thickness of 0.7500 in.
4) Ice thickness is considered to increase with height.
5) Ice density of 56.00 pcf.
6) A wind speed of 38 mph is used in combination with ice.
7) Deflections calculated using a wind speed of 50 mph.
8) A non-linear (P-delta) analysis was used.
9) Pressures are calculated at each section.
10) Stress ratio used in pole design is 1.333.
11) 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				

Tapered Pole Section Geometry

Section	*Elevation*	*Section Length*	*Splice Length*	*Number of*	*Top Diameter*	*Bottom Diameter*	*Wall Thickness*	*Bend Radius*	*Pole Grade*
	ft	*ft*	*ft*	*Sides*	*in*	*in*	*in*	*in*	
L1	180.00-133.00	47.00	4.00	18	18.0000	27.9900	0.2500	1.0000	A572-65 (65 ksi)
L2	133.00-131.00	6.00	0.00	18	26.6398	27.8996	0.3125	1.2500	A572-65 (65 ksi)
L3	131.00-104.50	26.50	0.00	18	27.8996	33.4637	0.4395	1.7579	Reinf 61.43 ksi (61 ksi)
L4	104.50-87.42	17.08	5.17	18	33.4637	37.0500	0.4591	1.8365	Reinf 65.00 ksi (65 ksi)
L5	87.42-69.00	23.59	0.00	18	35.0462	40.2846	0.5053	2.0212	Reinf 65.00 ksi (65 ksi)
L6	69.00-42.88	26.12	6.25	18	40.2846	45.7600	0.5153	2.0612	Reinf 65.00 ksi (65 ksi)
L7	42.88-34.50	14.63	0.00	18	43.4193	46.7670	0.5712	2.2847	Reinf 65.00 ksi (65 ksi)
L8	34.50-0.00	34.50		18	46.7670	54.0000	0.5342	2.1370	Reinf 65.00 ksi (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	18.2777	14.0846	560.6340	6.3012	9.1440	61.3117	1122.0058	7.0437	2.7280	10.912
	28.4218	22.0117	2139.9506	9.8477	14.2189	150.5002	4282.7170	11.0079	4.4862	17.945
L2	27.9036	26.1134	2286.7186	9.3462	13.5330	168.9734	4576.4462	13.0592	4.1386	13.244
	28.3300	27.3630	2630.9525	9.7934	14.1730	185.6313	5265.3670	13.6841	4.3603	13.953
L3	28.3300	38.3035	3649.0671	9.7483	14.1730	257.4661	7302.9357	19.1554	4.1369	9.413
	33.9800	46.0648	6347.0757	11.7236	16.9996	373.3665	12702.5031	23.0368	5.1162	11.642
L4	33.9800	48.0969	6619.1810	11.7166	16.9996	389.3731	13247.0716	24.0530	5.0816	11.068
	37.6216	53.3231	9019.8279	12.9898	18.8214	479.2326	18051.5243	26.6666	5.7127	12.443
L5	36.7526	55.3986	8350.3193	12.2620	17.8035	469.0276	16711.6261	27.7045	5.2788	10.447
	40.9060	63.8001	12754.7622	14.1216	20.4646	623.2610	25526.3074	31.9061	6.2007	12.271
L6	40.9060	65.0439	12996.8849	14.1181	20.4646	635.0923	26010.8714	32.5281	6.1832	11.999
	46.4659	73.9991	19138.1306	16.0619	23.2461	823.2842	38301.4436	37.0066	7.1468	13.87
L7	45.5413	77.6804	18018.1997	15.2111	22.0570	816.8932	36060.1082	38.8476	6.6365	11.619
	47.4885	83.7496	22580.0910	16.3995	23.7576	950.4349	45189.8935	41.8828	7.2257	12.651
L8	47.4885	78.3959	21170.4709	16.4126	23.7576	891.1016	42368.7984	39.2054	7.2907	13.647
	54.8330	90.6607	32742.2114	18.9803	27.4320	1193.5773	65527.5058	45.3390	8.5637	16.03

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
VXL7-50(1-5/8")	C	No	Inside Pole	180.00 - 0.00	6	No Ice	0.00	0.75
						1/2" Ice	0.00	0.75
						1" Ice	0.00	0.75
						2" Ice	0.00	0.75
						4" Ice	0.00	0.75
***								
HB158-1-08U8-S8J18(1-5/8)	C	No	Inside Pole	167.00 - 0.00	2	No Ice	0.00	1.30
						1/2" Ice	0.00	1.30
						1" Ice	0.00	1.30
						2" Ice	0.00	1.30
						4" Ice	0.00	1.30
LDF4-50A(1/2")	C	No	Inside Pole	167.00 - 0.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
						2" Ice	0.00	0.15
						4" Ice	0.00	0.15
LDF7-50A(1-5/8")	C	No	Inside Pole	167.00 - 0.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
***								
LCF158-50A(1-5/8")	C	No	Inside Pole	147.00 - 0.00	12	No Ice	0.00	0.80
						1/2" Ice	0.00	0.80
						1" Ice	0.00	0.80
						2" Ice	0.00	0.80
						4" Ice	0.00	0.80
FB-L98B-002-75000(3/8")	C	No	Inside Pole	147.00 - 0.00	1	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
						2" Ice	0.00	0.06
						4" Ice	0.00	0.06
WR-VG122ST-BRDA(7/16)	C	No	Inside Pole	147.00 - 0.00	2	No Ice	0.00	0.14
						1/2" Ice	0.00	0.14
						1" Ice	0.00	0.14
						2" Ice	0.00	0.14
						4" Ice	0.00	0.14
***								
LCF12-50J(1/2)	C	No	Inside Pole	75.00 - 0.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
						2" Ice	0.00	0.15
						4" Ice	0.00	0.15

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
***								
1" Flat Reinforcement	C	No	CaAa (Out Of Face)	132.75 - 1.75	1	No Ice	0.17	0.00
						1/2" Ice	0.28	0.00
						1" Ice	0.39	0.00
						2" Ice	0.61	0.00
						4" Ice	1.06	0.00

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	180.00-133.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.78
L2	133.00-131.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.292	0.05
L3	131.00-104.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	4.417	0.72
L4	104.50-87.42	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.847	0.46
L5	87.42-69.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	3.070	0.50
L6	69.00-42.88	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	4.353	0.71
L7	42.88-34.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.397	0.23
L8	34.50-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	5.458	0.94

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	180.00-133.00	A	0.903	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.78
L2	133.00-131.00	A	0.886	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.643	0.05
L3	131.00-104.50	A	0.873	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	9.559	0.72
L4	104.50-87.42	A	0.852	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	6.082	0.46
L5	87.42-69.00	A	0.832	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	6.559	0.50
L6	69.00-42.88	A	0.799	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	8.988	0.71
L7	42.88-34.50	A	0.764	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	2.884	0.23
L8	34.50-0.00	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	10.917	0.94

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L1	180.00-133.00	0.0000	0.0000	0.0000	0.0000
L2	133.00-131.00	-0.1784	0.1030	-0.3470	0.2003
L3	131.00-104.50	-0.2033	0.1174	-0.3912	0.2258
L4	104.50-87.42	-0.2049	0.1183	-0.3955	0.2283
L5	87.42-69.00	-0.2057	0.1188	-0.4000	0.2310
L6	69.00-42.88	-0.2069	0.1194	-0.3945	0.2278
L7	42.88-34.50	-0.2075	0.1198	-0.3974	0.2294
L8	34.50-0.00	-0.1973	0.1139	-0.3706	0.2140

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
(2) DB980H90E-M w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.00	180.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.04 4.50 4.95 5.87 8.05	3.62 4.48 5.22 6.74 10.00	0.03 0.07 0.11 0.22 0.55
(2) DB980H90E-M w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.00	180.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.04 4.50 4.95 5.87 8.05	3.62 4.48 5.22 6.74 10.00	0.03 0.07 0.11 0.22 0.55
(2) DB980H90E-M w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.00	180.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.04 4.50 4.95 5.87 8.05	3.62 4.48 5.22 6.74 10.00	0.03 0.07 0.11 0.22 0.55
6' x 2" Mount Pipe	A	From Leg	4.00 0.00 0.00	0.00	180.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.92 2.29 3.06 4.70	1.43 1.92 2.29 3.06 4.70	0.02 0.03 0.05 0.09 0.23
6' x 2" Mount Pipe	B	From Leg	4.00 0.00 0.00	0.00	180.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.92 2.29 3.06 4.70	1.43 1.92 2.29 3.06 4.70	0.02 0.03 0.05 0.09 0.23
6' x 2" Mount Pipe	C	From Leg	4.00 0.00 0.00	0.00	180.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.92 2.29 3.06 4.70	1.43 1.92 2.29 3.06 4.70	0.02 0.03 0.05 0.09 0.23
Platform Mount [LP 601-1]	C	None		0.00	180.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	28.47 33.59 38.71 48.95 69.43	28.47 33.59 38.71 48.95 69.43	1.12 1.51 1.91 2.69 4.26
***									
(2) HBXX-6516DS-A2M w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.00	167.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.18 6.65 7.14 8.13 10.26	4.53 5.20 5.90 7.37 10.56	0.05 0.10 0.15 0.29 0.67
(2) HBXX-6516DS-A2M w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.00	167.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.18 6.65 7.14 8.13 10.26	4.53 5.20 5.90 7.37 10.56	0.05 0.10 0.15 0.29 0.67

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
(2) HBXX-6516DS-A2M w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.00	167.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.18 6.65 7.14 8.13 10.26	4.53 5.20 5.90 7.37 10.56	0.05 0.10 0.15 0.29 0.67
LNX-6514DS-A1M w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.00	167.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.65 9.31 9.93 11.20 13.87	7.08 8.27 9.18 11.02 15.06	0.06 0.13 0.21 0.39 0.90
LNX-6514DS-A1M w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.00	167.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.65 9.31 9.93 11.20 13.87	7.08 8.27 9.18 11.02 15.06	0.06 0.13 0.21 0.39 0.90
LNX-6514DS-A1M w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.00	167.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.65 9.31 9.93 11.20 13.87	7.08 8.27 9.18 11.02 15.06	0.06 0.13 0.21 0.39 0.90
RRH2x60-700	A	From Leg	4.00 0.00 0.00	0.00	167.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.96 4.27 4.60 5.27 6.72	1.82 2.08 2.36 2.96 4.25	0.06 0.08 0.11 0.17 0.35
RRH2x60-700	B	From Leg	4.00 0.00 0.00	0.00	167.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.96 4.27 4.60 5.27 6.72	1.82 2.08 2.36 2.96 4.25	0.06 0.08 0.11 0.17 0.35
RRH2x60-700	C	From Leg	4.00 0.00 0.00	0.00	167.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.96 4.27 4.60 5.27 6.72	1.82 2.08 2.36 2.96 4.25	0.06 0.08 0.11 0.17 0.35
RRH2X60-PCS	A	From Leg	4.00 0.00 0.00	0.00	167.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.57 2.79 3.02 3.52 4.61	2.01 2.22 2.43 2.89 3.92	0.06 0.08 0.10 0.16 0.31
RRH2X60-PCS	B	From Leg	4.00 0.00 0.00	0.00	167.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.57 2.79 3.02 3.52 4.61	2.01 2.22 2.43 2.89 3.92	0.06 0.08 0.10 0.16 0.31
RRH2X60-PCS	C	From Leg	4.00 0.00 0.00	0.00	167.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.57 2.79 3.02 3.52 4.61	2.01 2.22 2.43 2.89 3.92	0.06 0.08 0.10 0.16 0.31
RRH2x60-AWS	A	From Leg	4.00 0.00 0.00	0.00	167.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.19 2.40 2.61 3.07 4.09	1.43 1.61 1.80 2.21 3.13	0.04 0.06 0.08 0.13 0.26
RRH2x60-AWS	B	From Leg	4.00 0.00 0.00	0.00	167.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.19 2.40 2.61 3.07 4.09	1.43 1.61 1.80 2.21 3.13	0.04 0.06 0.08 0.13 0.26
RRH2x60-AWS	C	From Leg	4.00 0.00 0.00	0.00	167.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.19 2.40 2.61 3.07 4.09	1.43 1.61 1.80 2.21 3.13	0.04 0.06 0.08 0.13 0.26

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
DB-T1-6Z-8AB-0Z	A	From Leg	4.00 0.00 0.00	0.00	167.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.60 5.92 6.24 6.91 8.37	2.33 2.56 2.79 3.28 4.37	0.04 0.08 0.12 0.21 0.45
DB-T1-6Z-8AB-0Z	C	From Leg	4.00 0.00 0.00	0.00	167.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.60 5.92 6.24 6.91 8.37	2.33 2.56 2.79 3.28 4.37	0.04 0.08 0.12 0.21 0.45
(2) LPA-80080-6CF-EDIN w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.00	167.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.56 5.10 5.61 6.65 8.83	10.74 12.00 12.98 14.99 19.23	0.05 0.11 0.19 0.36 0.86
(2) LPA-80063/6CF w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.00	167.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	10.58 11.24 11.87 13.16 15.87	10.67 11.93 12.91 14.92 19.16	0.05 0.14 0.25 0.48 1.09
(2) LPA-80063/6CF w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.00	167.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	10.58 11.24 11.87 13.16 15.87	10.67 11.93 12.91 14.92 19.16	0.05 0.14 0.25 0.48 1.09
(2) FD9R6004/2C-3L	A	From Leg	4.00 0.00 0.00	0.00	167.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.37 0.45 0.54 0.75 1.28	0.08 0.14 0.20 0.34 0.74	0.00 0.01 0.01 0.02 0.06
(2) FD9R6004/2C-3L	B	From Leg	4.00 0.00 0.00	0.00	167.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.37 0.45 0.54 0.75 1.28	0.08 0.14 0.20 0.34 0.74	0.00 0.01 0.01 0.02 0.06
(2) FD9R6004/2C-3L	C	From Leg	4.00 0.00 0.00	0.00	167.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.37 0.45 0.54 0.75 1.28	0.08 0.14 0.20 0.34 0.74	0.00 0.01 0.01 0.02 0.06
GPS_A	A	From Leg	4.00 0.00 0.00	0.00	167.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.30 0.37 0.46 0.65 1.15	0.30 0.37 0.46 0.65 1.15	0.00 0.00 0.01 0.02 0.08
Platform Mount [LP 601-1]	C	None		0.00	167.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	28.47 33.59 38.71 48.95 69.43	28.47 33.59 38.71 48.95 69.43	1.12 1.51 1.91 2.69 4.26
***									
TME-RRUS-11	A	From Leg	1.00 0.00 0.00	0.00	148.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.25 3.49 3.74 4.27 5.43	1.37 1.55 1.74 2.14 3.04	0.05 0.07 0.09 0.15 0.31
TME-RRUS-11	B	From Leg	1.00 0.00 0.00	0.00	148.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.25 3.49 3.74 4.27 5.43	1.37 1.55 1.74 2.14 3.04	0.05 0.07 0.09 0.15 0.31
TME-RRUS-11	C	From Leg	1.00 0.00 0.00	0.00	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.25 3.49 3.74 4.27	1.37 1.55 1.74 2.14	0.05 0.07 0.09 0.15

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
						4" Ice	5.43	3.04	0.31
RRUS-11	A	From Leg	1.00	0.00	148.00	No Ice	3.26	1.38	0.05
			0.00			1/2" Ice	3.50	1.56	0.07
			0.00			1" Ice	3.75	1.74	0.09
						2" Ice	4.28	2.15	0.15
						4" Ice	5.44	3.05	0.31
RRUS-11	B	From Leg	1.00	0.00	148.00	No Ice	3.26	1.38	0.05
			0.00			1/2" Ice	3.50	1.56	0.07
			0.00			1" Ice	3.75	1.74	0.09
						2" Ice	4.28	2.15	0.15
						4" Ice	5.44	3.05	0.31
RRUS-11	C	From Leg	1.00	0.00	148.00	No Ice	3.26	1.38	0.05
			0.00			1/2" Ice	3.50	1.56	0.07
			0.00			1" Ice	3.75	1.74	0.09
						2" Ice	4.28	2.15	0.15
						4" Ice	5.44	3.05	0.31
Pipe Mount [PM 601-3]	C	None		0.00	148.00	No Ice	4.39	4.39	0.20
						1/2" Ice	5.48	5.48	0.24
						1" Ice	6.57	6.57	0.28
						2" Ice	8.75	8.75	0.36
						4" Ice	13.11	13.11	0.53
***									
(2) 7770.00 w/ Mount Pipe	A	From Leg	4.00	0.00	147.00	No Ice	6.22	4.82	0.09
			0.00			1/2" Ice	6.71	5.51	0.14
			0.00			1" Ice	7.22	6.21	0.21
						2" Ice	8.26	7.67	0.36
						4" Ice	10.48	11.06	0.76
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.00	0.00	147.00	No Ice	6.22	4.82	0.09
			0.00			1/2" Ice	6.71	5.51	0.14
			0.00			1" Ice	7.22	6.21	0.21
						2" Ice	8.26	7.67	0.36
						4" Ice	10.48	11.06	0.76
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.00	0.00	147.00	No Ice	6.22	4.82	0.09
			0.00			1/2" Ice	6.71	5.51	0.14
			0.00			1" Ice	7.22	6.21	0.21
						2" Ice	8.26	7.67	0.36
						4" Ice	10.48	11.06	0.76
(2) LGP21401	A	From Leg	4.00	0.00	147.00	No Ice	1.29	0.36	0.01
			0.00			1/2" Ice	1.45	0.48	0.02
			0.00			1" Ice	1.61	0.60	0.03
						2" Ice	1.97	0.87	0.05
						4" Ice	2.79	1.52	0.14
(2) LGP21401	B	From Leg	4.00	0.00	147.00	No Ice	1.29	0.36	0.01
			0.00			1/2" Ice	1.45	0.48	0.02
			0.00			1" Ice	1.61	0.60	0.03
						2" Ice	1.97	0.87	0.05
						4" Ice	2.79	1.52	0.14
(2) LGP21401	C	From Leg	4.00	0.00	147.00	No Ice	1.29	0.36	0.01
			0.00			1/2" Ice	1.45	0.48	0.02
			0.00			1" Ice	1.61	0.60	0.03
						2" Ice	1.97	0.87	0.05
						4" Ice	2.79	1.52	0.14
(2) LGP21901	A	From Leg	4.00	0.00	147.00	No Ice	0.27	0.18	0.01
			0.00			1/2" Ice	0.34	0.25	0.01
			0.00			1" Ice	0.43	0.32	0.01
						2" Ice	0.62	0.49	0.02
						4" Ice	1.10	0.94	0.07
(2) LGP21901	B	From Leg	4.00	0.00	147.00	No Ice	0.27	0.18	0.01
			0.00			1/2" Ice	0.34	0.25	0.01
			0.00			1" Ice	0.43	0.32	0.01
						2" Ice	0.62	0.49	0.02
						4" Ice	1.10	0.94	0.07
(2) LGP21901	C	From Leg	4.00	0.00	147.00	No Ice	0.27	0.18	0.01
			0.00			1/2" Ice	0.34	0.25	0.01
			0.00			1" Ice	0.43	0.32	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
						2" Ice	0.62	0.49	0.02
						4" Ice	1.10	0.94	0.07
DC6-48-60-18-8F	A	From Leg	4.00	0.00	147.00	No Ice	1.47	1.47	0.02
			0.00			1/2" Ice	1.67	1.67	0.04
			0.00			1" Ice	1.88	1.88	0.06
						2" Ice	2.33	2.33	0.11
						4" Ice	3.38	3.38	0.24
HPA-65R-BUU-H8 w/ Mount Pipe	A	From Leg	4.00	0.00	147.00	No Ice	13.53	9.58	0.10
			0.00			1/2" Ice	14.34	11.05	0.20
			0.00			1" Ice	15.14	12.50	0.30
						2" Ice	16.71	14.75	0.55
						4" Ice	19.95	19.46	1.22
HPA-65R-BUU-H8 w/ Mount Pipe	B	From Leg	4.00	0.00	147.00	No Ice	13.53	9.58	0.10
			0.00			1/2" Ice	14.34	11.05	0.20
			0.00			1" Ice	15.14	12.50	0.30
						2" Ice	16.71	14.75	0.55
						4" Ice	19.95	19.46	1.22
HPA-65R-BUU-H8 w/ Mount Pipe	C	From Leg	4.00	0.00	147.00	No Ice	13.53	9.58	0.10
			0.00			1/2" Ice	14.34	11.05	0.20
			0.00			1" Ice	15.14	12.50	0.30
						2" Ice	16.71	14.75	0.55
						4" Ice	19.95	19.46	1.22
RRUS11 A2	A	From Leg	4.00	0.00	147.00	No Ice	3.26	2.01	0.07
			0.00			1/2" Ice	3.50	2.21	0.10
			0.00			1" Ice	3.75	2.42	0.13
						2" Ice	4.28	2.86	0.19
						4" Ice	5.44	3.85	0.37
RRUS11 A2	B	From Leg	4.00	0.00	147.00	No Ice	3.26	2.01	0.07
			0.00			1/2" Ice	3.50	2.21	0.10
			0.00			1" Ice	3.75	2.42	0.13
						2" Ice	4.28	2.86	0.19
						4" Ice	5.44	3.85	0.37
RRUS11 A2	C	From Leg	4.00	0.00	147.00	No Ice	3.26	2.01	0.07
			0.00			1/2" Ice	3.50	2.21	0.10
			0.00			1" Ice	3.75	2.42	0.13
						2" Ice	4.28	2.86	0.19
						4" Ice	5.44	3.85	0.37
1001940	A	From Leg	4.00	0.00	147.00	No Ice	0.21	0.09	0.00
			0.00			1/2" Ice	0.27	0.15	0.00
			0.00			1" Ice	0.34	0.21	0.01
						2" Ice	0.52	0.36	0.01
						4" Ice	0.97	0.75	0.05
1001940	B	From Leg	4.00	0.00	147.00	No Ice	0.21	0.09	0.00
			0.00			1/2" Ice	0.27	0.15	0.00
			0.00			1" Ice	0.34	0.21	0.01
						2" Ice	0.52	0.36	0.01
						4" Ice	0.97	0.75	0.05
1001940	C	From Leg	4.00	0.00	147.00	No Ice	0.21	0.09	0.00
			0.00			1/2" Ice	0.27	0.15	0.00
			0.00			1" Ice	0.34	0.21	0.01
						2" Ice	0.52	0.36	0.01
						4" Ice	0.97	0.75	0.05
6' x 2" Mount Pipe	A	From Leg	4.00	0.00	147.00	No Ice	1.43	1.43	0.02
			0.00			1/2" Ice	1.92	1.92	0.03
			0.00			1" Ice	2.29	2.29	0.05
						2" Ice	3.06	3.06	0.09
						4" Ice	4.70	4.70	0.23
6' x 2" Mount Pipe	B	From Leg	4.00	0.00	147.00	No Ice	1.43	1.43	0.02
			0.00			1/2" Ice	1.92	1.92	0.03
			0.00			1" Ice	2.29	2.29	0.05
						2" Ice	3.06	3.06	0.09
						4" Ice	4.70	4.70	0.23
6' x 2" Mount Pipe	C	From Leg	4.00	0.00	147.00	No Ice	1.43	1.43	0.02
			0.00			1/2" Ice	1.92	1.92	0.03
			0.00			1" Ice	2.29	2.29	0.05

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	3.06	3.06	0.09
						4" Ice	4.70	4.70	0.23
Platform Mount [LP 601-1]	C	None		0.00	147.00	No Ice	28.47	28.47	1.12
						1/2" Ice	33.59	33.59	1.51
						1" Ice	38.71	38.71	1.91
						2" Ice	48.95	48.95	2.69
						4" Ice	69.43	69.43	4.26
***									
GPS_A	A	From Leg	3.00	0.00	75.00	No Ice	0.30	0.30	0.00
			0.00			1/2" Ice	0.37	0.37	0.00
			1.00			1" Ice	0.46	0.46	0.01
						2" Ice	0.65	0.65	0.02
						4" Ice	1.15	1.15	0.08
Side Arm Mount [SO 701-1]	A	From Leg	1.50	0.00	75.00	No Ice	0.85	1.67	0.07
			0.00			1/2" Ice	1.14	2.34	0.08
			0.00			1" Ice	1.43	3.01	0.09
						2" Ice	2.01	4.35	0.12
						4" Ice	3.17	7.03	0.18
***									

Tower Pressures - No Ice

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1 180.00-133.00	155.05	1.556	28.75	90.064	A	0.000	90.064	90.064	100.00	0.000	0.000
					B	0.000	90.064		100.00	0.000	0.000
					C	0.000	90.064		100.00	0.000	0.000
L2 133.00-131.00	132.00	1.486	27.48	4.615	A	0.000	4.615	4.615	100.00	0.000	0.000
					B	0.000	4.615		100.00	0.000	0.000
					C	0.000	4.615		100.00	0.000	0.292
L3 131.00-104.50	117.35	1.437	26.58	67.755	A	0.000	67.755	67.755	100.00	0.000	0.000
					B	0.000	67.755		100.00	0.000	0.000
					C	0.000	67.755		100.00	0.000	4.417
L4 104.50-87.42	95.82	1.356	25.08	50.182	A	0.000	50.182	50.182	100.00	0.000	0.000
					B	0.000	50.182		100.00	0.000	0.000
					C	0.000	50.182		100.00	0.000	2.847
L5 87.42-69.00	78.05	1.279	23.65	58.697	A	0.000	58.697	58.697	100.00	0.000	0.000
					B	0.000	58.697		100.00	0.000	0.000
					C	0.000	58.697		100.00	0.000	3.070
L6 69.00-42.88	55.66	1.161	21.48	93.645	A	0.000	93.645	93.645	100.00	0.000	0.000
					B	0.000	93.645		100.00	0.000	0.000
					C	0.000	93.645		100.00	0.000	4.353
L7 42.88-34.50	38.66	1.046	19.35	31.989	A	0.000	31.989	31.989	100.00	0.000	0.000
					B	0.000	31.989		100.00	0.000	0.000
					C	0.000	31.989		100.00	0.000	1.397
L8 34.50-0.00	16.84	1	18.50	144.853	A	0.000	144.853	144.853	100.00	0.000	0.000
					B	0.000	144.853		100.00	0.000	0.000
					C	0.000	144.853		100.00	0.000	5.458

Tower Pressure - With Ice

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 180.00-133.00	155.05	1.556	5.63	0.9030	97.137	A	0.000	97.137	97.137	100.00	0.000	0.000
						B	0.000	97.137		100.00	0.000	0.000
						C	0.000	97.137		100.00	0.000	0.000
L2 133.00-131.00	132.00	1.486	5.38	0.8857	4.916	A	0.000	4.916	4.916	100.00	0.000	0.000
						B	0.000	4.916		100.00	0.000	0.000
						C	0.000	4.916		100.00	0.000	0.643
L3 131.00-104.50	117.35	1.437	5.20	0.8733	71.613	A	0.000	71.613	71.613	100.00	0.000	0.000
						B	0.000	71.613		100.00	0.000	0.000
						C	0.000	71.613		100.00	0.000	9.559
L4 104.50-87.42	95.82	1.356	4.91	0.8523	52.609	A	0.000	52.609	52.609	100.00	0.000	0.000
						B	0.000	52.609		100.00	0.000	0.000
						C	0.000	52.609		100.00	0.000	6.082
L5 87.42-69.00	78.05	1.279	4.63	0.8316	61.314	A	0.000	61.314	61.314	100.00	0.000	0.000
						B	0.000	61.314		100.00	0.000	0.000
						C	0.000	61.314		100.00	0.000	6.559
L6 69.00-42.88	55.66	1.161	4.20	0.7986	97.122	A	0.000	97.122	97.122	100.00	0.000	0.000
						B	0.000	97.122		100.00	0.000	0.000
						C	0.000	97.122		100.00	0.000	8.988
L7 42.88-34.50	38.66	1.046	3.79	0.7644	33.105	A	0.000	33.105	33.105	100.00	0.000	0.000
						B	0.000	33.105		100.00	0.000	0.000
						C	0.000	33.105		100.00	0.000	2.884
L8 34.50-0.00	16.84	1	3.62	0.7500	149.165	A	0.000	149.165	149.165	100.00	0.000	0.000
						B	0.000	149.165		100.00	0.000	0.000
						C	0.000	149.165		100.00	0.000	10.917

Tower Pressure - Service

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 180.00-133.00	155.05	1.556	9.95	90.064	A	0.000	90.064	90.064	100.00	0.000	0.000
					B	0.000	90.064		100.00	0.000	0.000
					C	0.000	90.064		100.00	0.000	0.000
L2 133.00-131.00	132.00	1.486	9.51	4.615	A	0.000	4.615	4.615	100.00	0.000	0.000
					B	0.000	4.615		100.00	0.000	0.000
					C	0.000	4.615		100.00	0.000	0.292
L3 131.00-104.50	117.35	1.437	9.20	67.755	A	0.000	67.755	67.755	100.00	0.000	0.000
					B	0.000	67.755		100.00	0.000	0.000
					C	0.000	67.755		100.00	0.000	4.417
L4 104.50-87.42	95.82	1.356	8.68	50.182	A	0.000	50.182	50.182	100.00	0.000	0.000
					B	0.000	50.182		100.00	0.000	0.000
					C	0.000	50.182		100.00	0.000	2.847
L5 87.42-69.00	78.05	1.279	8.18	58.697	A	0.000	58.697	58.697	100.00	0.000	0.000
					B	0.000	58.697		100.00	0.000	0.000
					C	0.000	58.697		100.00	0.000	3.070
L6 69.00-42.88	55.66	1.161	7.43	93.645	A	0.000	93.645	93.645	100.00	0.000	0.000
					B	0.000	93.645		100.00	0.000	0.000
					C	0.000	93.645		100.00	0.000	4.353
L7 42.88-34.50	38.66	1.046	6.70	31.989	A	0.000	31.989	31.989	100.00	0.000	0.000
					B	0.000	31.989		100.00	0.000	0.000
					C	0.000	31.989		100.00	0.000	1.397
L8 34.50-0.00	16.84	1	6.40	144.853	A	0.000	144.853	144.853	100.00	0.000	0.000
					B	0.000	144.853		100.00	0.000	0.000
					C	0.000	144.853		100.00	0.000	5.458

Load Combinations

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	180 - 133	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-18.14	0.48	0.06
			Max. Mx	11	-7.64	528.70	-2.03
			Max. My	2	-7.75	-2.05	512.62
			Max. Vy	11	-21.67	528.70	-2.03
			Max. Vx	2	-21.12	-2.05	512.62
			Max. Torque	10			-0.87
L2	133 - 131	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-19.39	0.48	0.06
			Max. Mx	11	-8.68	660.14	-2.47
			Max. My	2	-8.79	-2.49	640.80
			Max. Vy	11	-22.16	660.14	-2.47
			Max. Vx	2	-21.61	-2.49	640.80
			Max. Torque	10			-0.87
L3	131 - 104.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-24.81	0.48	0.06
			Max. Mx	11	-13.57	1277.10	-4.40
			Max. My	2	-13.66	-4.43	1243.30
			Max. Vy	11	-24.46	1277.10	-4.40
			Max. Vx	2	-23.91	-4.43	1243.30
			Max. Torque	10			-0.87

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L4	104.5 - 87.42	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-27.61	0.48	0.06
			Max. Mx	11	-16.12	1574.36	-5.27
			Max. My	2	-16.20	-5.31	1534.03
			Max. Vy	11	-25.49	1574.36	-5.27
			Max. Vx	2	-24.94	-5.31	1534.03
			Max. Torque	10			-0.87
L5	87.42 - 69	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-35.20	0.48	0.37
			Max. Mx	11	-22.90	2201.92	-6.80
			Max. My	2	-22.96	-7.05	2148.64
			Max. Vy	11	-27.69	2201.92	-6.80
			Max. Vx	2	-27.11	-7.05	2148.64
			Max. Torque	10			-1.09
L6	69 - 42.88	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-41.22	0.48	0.37
			Max. Mx	11	-28.45	2767.33	-8.26
			Max. My	2	-28.49	-8.50	2702.55
			Max. Vy	11	-29.26	2767.33	-8.26
			Max. Vx	2	-28.68	-8.50	2702.55
			Max. Torque	10			-1.09
L7	42.88 - 34.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-48.10	0.48	0.37
			Max. Mx	11	-34.63	3204.87	-9.32
			Max. My	2	-34.66	-9.57	3131.66
			Max. Vy	11	-30.48	3204.87	-9.32
			Max. Vx	2	-29.91	-9.57	3131.66
			Max. Torque	10			-1.09
L8	34.5 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-60.60	0.48	0.37
			Max. Mx	11	-46.21	4294.89	-11.79
			Max. My	2	-46.21	-12.04	4202.15
			Max. Vy	11	-32.76	4294.89	-11.79
			Max. Vx	2	-32.20	-12.04	4202.15
			Max. Torque	10			-1.09

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	24	60.60	7.57	-0.01
	Max. H_x	11	46.23	32.73	-0.07
	Max. H_z	2	46.23	-0.07	32.18
	Max. M_x	2	4202.15	-0.07	32.18
	Max. M_z	5	4294.54	-32.73	0.07
	Max. Torsion	4	1.08	-28.38	16.15
	Min. Vert	1	46.23	0.00	0.00
	Min. H_x	5	46.23	-32.73	0.07
	Min. H_z	8	46.23	0.07	-32.18
	Min. M_x	8	-4201.31	0.07	-32.18
	Min. M_z	11	-4294.89	32.73	-0.07
	Min. Torsion	10	-1.09	28.38	-16.15

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	46.23	0.00	0.00	-0.41	0.17	0.00
Dead+Wind 0 deg - No Ice	46.23	0.07	-32.18	-4202.15	-12.04	-0.67
Dead+Wind 30 deg - No Ice	46.23	16.43	-27.90	-3645.18	-2157.93	-1.01
Dead+Wind 60 deg - No Ice	46.23	28.38	-16.15	-2111.65	-3725.33	-1.08
Dead+Wind 90 deg - No Ice	46.23	32.73	-0.07	-12.64	-4294.54	-0.87
Dead+Wind 120 deg - No Ice	46.23	28.31	16.03	2089.70	-3713.21	-0.42
Dead+Wind 150 deg - No Ice	46.23	16.31	27.83	3632.21	-2136.82	0.14

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 180 deg - No Ice	46.23	-0.07	32.18	4201.31	12.39	0.67
Dead+Wind 210 deg - No Ice	46.23	-16.43	27.90	3644.33	2158.28	1.02
Dead+Wind 240 deg - No Ice	46.23	-28.38	16.15	2110.81	3725.68	1.09
Dead+Wind 270 deg - No Ice	46.23	-32.73	0.07	11.79	4294.89	0.87
Dead+Wind 300 deg - No Ice	46.23	-28.31	-16.03	-2090.55	3713.57	0.41
Dead+Wind 330 deg - No Ice	46.23	-16.31	-27.83	-3633.07	2137.18	-0.15
Dead+Ice	60.60	0.00	0.00	-0.37	0.48	0.00
Dead+Wind 0 deg+Ice	60.60	0.01	-7.45	-1017.99	-2.04	-0.19
Dead+Wind 30 deg+Ice	60.60	3.80	-6.46	-882.97	-520.43	-0.27
Dead+Wind 60 deg+Ice	60.60	6.56	-3.74	-511.45	-899.23	-0.28
Dead+Wind 90 deg+Ice	60.60	7.57	-0.01	-2.99	-1036.90	-0.21
Dead+Wind 120 deg+Ice	60.60	6.55	3.71	506.17	-896.64	-0.09
Dead+Wind 150 deg+Ice	60.60	3.77	6.44	879.59	-515.95	0.06
Dead+Wind 180 deg+Ice	60.60	-0.01	7.45	1017.19	3.13	0.19
Dead+Wind 210 deg+Ice	60.60	-3.80	6.46	882.18	521.52	0.27
Dead+Wind 240 deg+Ice	60.60	-6.56	3.74	510.65	900.31	0.28
Dead+Wind 270 deg+Ice	60.60	-7.57	0.01	2.19	1037.98	0.21
Dead+Wind 300 deg+Ice	60.60	-6.55	-3.71	-506.97	897.73	0.09
Dead+Wind 330 deg+Ice	60.60	-3.77	-6.44	-880.39	517.04	-0.06
Dead+Wind 0 deg - Service	46.23	0.02	-11.13	-1457.26	-4.06	-0.24
Dead+Wind 30 deg - Service	46.23	5.68	-9.65	-1264.20	-748.12	-0.36
Dead+Wind 60 deg - Service	46.23	9.82	-5.59	-732.51	-1291.66	-0.38
Dead+Wind 90 deg - Service	46.23	11.33	-0.02	-4.67	-1489.06	-0.31
Dead+Wind 120 deg - Service	46.23	9.80	5.55	724.31	-1287.43	-0.15
Dead+Wind 150 deg - Service	46.23	5.64	9.63	1259.10	-740.78	0.05
Dead+Wind 180 deg - Service	46.23	-0.02	11.13	1456.40	4.42	0.24
Dead+Wind 210 deg - Service	46.23	-5.68	9.65	1263.34	748.48	0.36
Dead+Wind 240 deg - Service	46.23	-9.82	5.59	731.65	1292.03	0.38
Dead+Wind 270 deg - Service	46.23	-11.33	0.02	3.81	1489.42	0.30
Dead+Wind 300 deg - Service	46.23	-9.80	-5.55	-725.17	1287.79	0.15
Dead+Wind 330 deg - Service	46.23	-5.64	-9.63	-1259.97	741.14	-0.05

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	-46.23	0.00	0.00	46.23	0.00	0.000%
2	0.07	-46.23	-32.18	-0.07	46.23	32.18	0.000%
3	16.43	-46.23	-27.90	-16.43	46.23	27.90	0.000%
4	28.38	-46.23	-16.15	-28.38	46.23	16.15	0.000%
5	32.73	-46.23	-0.07	-32.73	46.23	0.07	0.000%
6	28.31	-46.23	16.03	-28.31	46.23	-16.03	0.000%
7	16.31	-46.23	27.83	-16.31	46.23	-27.83	0.000%
8	-0.07	-46.23	32.18	0.07	46.23	-32.18	0.000%
9	-16.43	-46.23	27.90	16.43	46.23	-27.90	0.000%
10	-28.38	-46.23	16.15	28.38	46.23	-16.15	0.000%
11	-32.73	-46.23	0.07	32.73	46.23	-0.07	0.000%
12	-28.31	-46.23	-16.03	28.31	46.23	16.03	0.000%
13	-16.31	-46.23	-27.83	16.31	46.23	27.83	0.000%
14	0.00	-60.60	0.00	0.00	60.60	0.00	0.000%
15	0.01	-60.60	-7.45	-0.01	60.60	7.45	0.000%
16	3.80	-60.60	-6.46	-3.80	60.60	6.46	0.000%
17	6.56	-60.60	-3.74	-6.56	60.60	3.74	0.000%
18	7.57	-60.60	-0.01	-7.57	60.60	0.01	0.000%
19	6.55	-60.60	3.71	-6.55	60.60	-3.71	0.000%
20	3.77	-60.60	6.44	-3.77	60.60	-6.44	0.000%
21	-0.01	-60.60	7.45	0.01	60.60	-7.45	0.000%
22	-3.80	-60.60	6.46	3.80	60.60	-6.46	0.000%
23	-6.56	-60.60	3.74	6.56	60.60	-3.74	0.000%
24	-7.57	-60.60	0.01	7.57	60.60	-0.01	0.000%
25	-6.55	-60.60	-3.71	6.55	60.60	3.71	0.000%
26	-3.77	-60.60	-6.44	3.77	60.60	6.44	0.000%
27	0.02	-46.23	-11.13	-0.02	46.23	11.13	0.000%
28	5.68	-46.23	-9.65	-5.68	46.23	9.65	0.000%
29	9.82	-46.23	-5.59	-9.82	46.23	5.59	0.000%
30	11.33	-46.23	-0.02	-11.33	46.23	0.02	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
31	9.80	-46.23	5.55	-9.80	46.23	-5.55	0.000%
32	5.64	-46.23	9.63	-5.64	46.23	-9.63	0.000%
33	-0.02	-46.23	11.13	0.02	46.23	-11.13	0.000%
34	-5.68	-46.23	9.65	5.68	46.23	-9.65	0.000%
35	-9.82	-46.23	5.59	9.82	46.23	-5.59	0.000%
36	-11.33	-46.23	0.02	11.33	46.23	-0.02	0.000%
37	-9.80	-46.23	-5.55	9.80	46.23	5.55	0.000%
38	-5.64	-46.23	-9.63	5.64	46.23	9.63	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00060436
3	Yes	6	0.00000001	0.00009573
4	Yes	6	0.00000001	0.00009825
5	Yes	5	0.00000001	0.00006818
6	Yes	6	0.00000001	0.00009565
7	Yes	6	0.00000001	0.00009615
8	Yes	5	0.00000001	0.00005542
9	Yes	6	0.00000001	0.00009806
10	Yes	6	0.00000001	0.00009549
11	Yes	4	0.00000001	0.00079977
12	Yes	6	0.00000001	0.00009683
13	Yes	6	0.00000001	0.00009640
14	Yes	4	0.00000001	0.00000001
15	Yes	4	0.00000001	0.00059823
16	Yes	5	0.00000001	0.00030061
17	Yes	5	0.00000001	0.00032098
18	Yes	4	0.00000001	0.00063772
19	Yes	5	0.00000001	0.00030179
20	Yes	5	0.00000001	0.00030166
21	Yes	4	0.00000001	0.00060865
22	Yes	5	0.00000001	0.00031767
23	Yes	5	0.00000001	0.00030295
24	Yes	4	0.00000001	0.00062526
25	Yes	5	0.00000001	0.00031114
26	Yes	5	0.00000001	0.00030569
27	Yes	4	0.00000001	0.00030257
28	Yes	5	0.00000001	0.00022986
29	Yes	5	0.00000001	0.00024333
30	Yes	4	0.00000001	0.00038055
31	Yes	5	0.00000001	0.00022975
32	Yes	5	0.00000001	0.00022938
33	Yes	4	0.00000001	0.00033331
34	Yes	5	0.00000001	0.00023964
35	Yes	5	0.00000001	0.00023117
36	Yes	4	0.00000001	0.00033855
37	Yes	5	0.00000001	0.00023554
38	Yes	5	0.00000001	0.00023099

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	180 - 133	52.21	36	2.75	0.00
L2	137 - 131	29.09	36	2.18	0.00
L3	131 - 104.5	26.40	36	2.08	0.00
L4	104.5 - 87.42	16.24	36	1.57	0.00
L5	92.59 - 69	12.60	36	1.34	0.00
L6	69 - 42.88	6.81	36	0.97	0.00
L7	49.13 - 34.5	3.46	36	0.65	0.00
L8	34.5 - 0	1.69	36	0.48	0.00

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180.00	(2) DB980H90E-M w/ Mount Pipe	36	52.21	2.75	0.00	19724
167.00	(2) HBXX-6516DS-A2M w/ Mount Pipe	36	44.78	2.59	0.00	7585
148.00	TME-RRUS-11	36	34.46	2.35	0.00	3080
147.00	(2) 7770.00 w/ Mount Pipe	36	33.95	2.33	0.00	2986
75.00	GPS_A	36	8.10	1.06	0.00	3229

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	180 - 133	150.03	11	7.89	0.01
L2	137 - 131	83.69	11	6.28	0.00
L3	131 - 104.5	75.97	11	5.99	0.00
L4	104.5 - 87.42	46.76	11	4.52	0.00
L5	92.59 - 69	36.31	11	3.87	0.00
L6	69 - 42.88	19.64	11	2.79	0.00
L7	49.13 - 34.5	9.97	11	1.87	0.00
L8	34.5 - 0	4.88	11	1.38	0.00

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180.00	(2) DB980H90E-M w/ Mount Pipe	11	150.03	7.89	0.01	7099
167.00	(2) HBXX-6516DS-A2M w/ Mount Pipe	11	128.71	7.46	0.01	2728
148.00	TME-RRUS-11	11	99.13	6.75	0.01	1103
147.00	(2) 7770.00 w/ Mount Pipe	11	97.67	6.71	0.01	1069
75.00	GPS_A	11	23.34	3.07	0.00	1128

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L1	180 - 133 (1)	TP27.99x18x0.25	47.00	0.00	0.0	39.00	21.3370	-7.64	832.14	0.009
L2	133 - 131 (2)	TP27.8996x26.6398x0.3125	6.00	0.00	0.0	39.00	27.3630	-8.68	1067.16	0.008
L3	131 - 104.5 (3)	TP33.4638x27.8996x0.4395	26.50	0.00	0.0	36.86	46.0648	-13.57	1697.86	0.008
L4	104.5 - 87.42 (4)	TP37.05x33.4638x0.4591	17.08	0.00	0.0	39.00	51.7412	-16.12	2017.91	0.008
L5	87.42 - 69 (5)	TP40.2846x35.0462x0.5053	23.59	0.00	0.0	39.00	63.8001	-22.90	2488.20	0.009
L6	69 - 42.88 (6)	TP45.76x40.2846x0.5153	26.12	0.00	0.0	39.00	71.8563	-28.45	2802.40	0.010
L7	42.88 - 34.5 (7)	TP46.767x43.4193x0.5712	14.63	0.00	0.0	39.00	80.2732	-31.93	3130.65	0.010
L8	34.5 - 0 (8)	TP54x46.767x0.5342	34.50	0.00	0.0	39.00	85.1415	-40.85	3320.52	0.012

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	180 - 133 (1)	TP27.99x18x0.25	528.71	44.88	39.00	1.151	0.00	0.00	39.00	0.000
L2	133 - 131 (2)	TP27.8996x26.6398x0.3125	660.15	42.67	39.00	1.094	0.00	0.00	39.00	0.000
L3	131 - 104.5 (3)	TP33.4638x27.8996x0.4395	1277.11	41.05	36.86	1.114	0.00	0.00	36.86	0.000
L4	104.5 - 87.42 (4)	TP37.05x33.4638x0.4591	1574.38	41.89	39.00	1.074	0.00	0.00	39.00	0.000

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L5	87.42 - 69 (5)	TP40.2846x35.0462x0.5053	2201.93	42.40	39.00	1.087	0.00	0.00	39.00	0.000
L6	69 - 42.88 (6)	TP45.76x40.2846x0.5153	2767.34	42.79	39.00	1.097	0.00	0.00	39.00	0.000
L7	42.88 - 34.5 (7)	TP46.767x43.4193x0.5712	2952.07	40.59	39.00	1.041	0.00	0.00	39.00	0.000
L8	34.5 - 0 (8)	TP54x46.767x0.5342	3794.71	43.29	39.00	1.110	0.00	0.00	39.00	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	180 - 133 (1)	TP27.99x18x0.25	21.67	1.02	26.00	0.078	0.72	0.03	26.00	0.001
L2	133 - 131 (2)	TP27.8996x26.6398x0.3125	22.16	0.81	26.00	0.062	0.72	0.02	26.00	0.001
L3	131 - 104.5 (3)	TP33.4638x27.8996x0.4395	24.46	0.53	24.57	0.043	0.70	0.01	24.57	0.000
L4	104.5 - 87.42 (4)	TP37.05x33.4638x0.4591	25.49	0.49	26.00	0.038	0.69	0.01	26.00	0.000
L5	87.42 - 69 (5)	TP40.2846x35.0462x0.5053	27.69	0.43	26.00	0.033	0.93	0.01	26.00	0.000
L6	69 - 42.88 (6)	TP45.76x40.2846x0.5153	29.26	0.41	26.00	0.031	0.91	0.01	26.00	0.000
L7	42.88 - 34.5 (7)	TP46.767x43.4193x0.5712	29.96	0.37	26.00	0.029	0.90	0.01	26.00	0.000
L8	34.5 - 0 (8)	TP54x46.767x0.5342	31.84	0.37	26.00	0.029	0.88	0.00	26.00	0.000

Pole Interaction Design Data

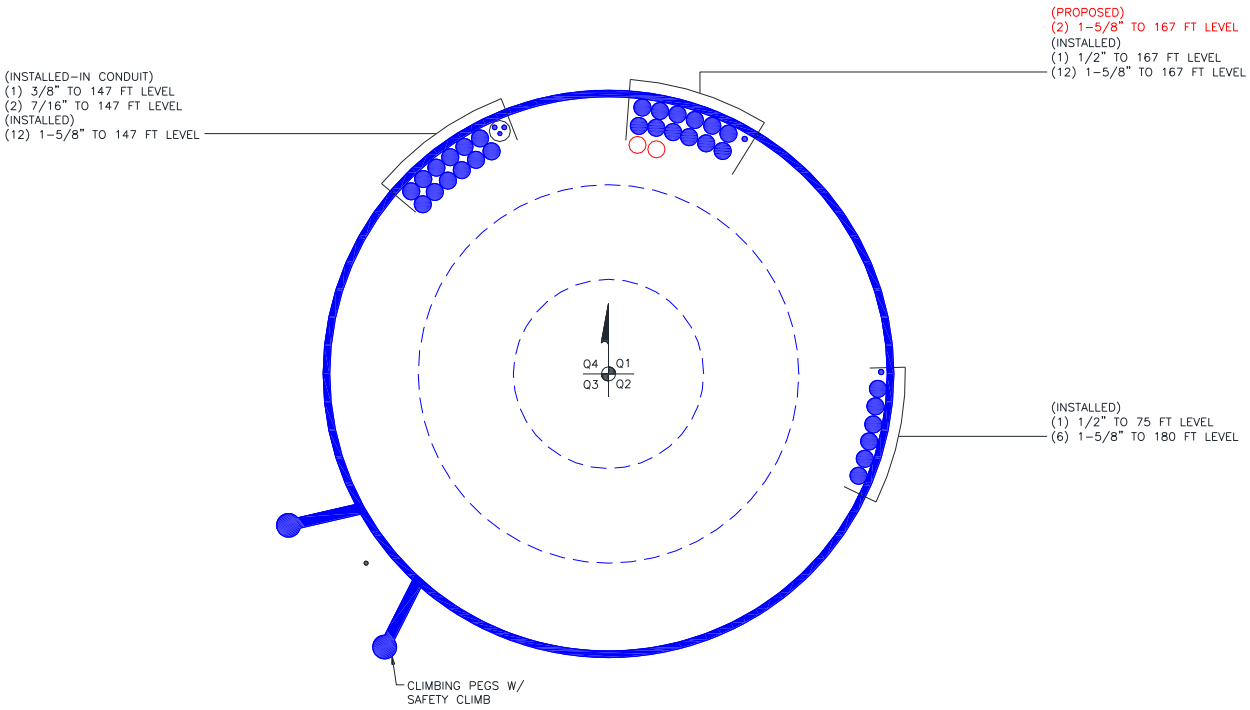
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	180 - 133 (1)	0.009	1.151	0.000	0.078	0.001	1.161 ✔	1.333	H1-3+VT ✔
L2	133 - 131 (2)	0.008	1.094	0.000	0.062	0.001	1.103 ✔	1.333	H1-3+VT ✔
L3	131 - 104.5 (3)	0.008	1.114	0.000	0.043	0.000	1.122 ✔	1.333	H1-3+VT ✔
L4	104.5 - 87.42 (4)	0.008	1.074	0.000	0.038	0.000	1.082 ✔	1.333	H1-3+VT ✔
L5	87.42 - 69 (5)	0.009	1.087	0.000	0.033	0.000	1.097 ✔	1.333	H1-3+VT ✔
L6	69 - 42.88 (6)	0.010	1.097	0.000	0.031	0.000	1.108 ✔	1.333	H1-3+VT ✔
L7	42.88 - 34.5 (7)	0.010	1.041	0.000	0.029	0.000	1.051 ✔	1.333	H1-3+VT ✔
L8	34.5 - 0 (8)	0.012	1.110	0.000	0.029	0.000	1.122 ✔	1.333	H1-3+VT ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P_{allow} K	% Capacity	Pass Fail
L1	180 - 133	Pole	TP27.99x18x0.25	1	-7.64	1109.25	87.1	Pass
L2	133 - 131	Pole	TP27.8996x26.6398x0.3125	2	-8.68	1422.52	82.8	Pass
L3	131 - 104.5	Pole	TP33.4638x27.8996x0.4395	3	-13.57	2263.25	84.2	Pass
L4	104.5 - 87.42	Pole	TP37.05x33.4638x0.4591	4	-16.12	2689.87	81.2	Pass
L5	87.42 - 69	Pole	TP40.2846x35.0462x0.5053	5	-22.90	3316.77	82.3	Pass
L6	69 - 42.88	Pole	TP45.76x40.2846x0.5153	6	-28.45	3735.60	83.1	Pass
L7	42.88 - 34.5	Pole	TP46.767x43.4193x0.5712	7	-31.93	4173.16	78.9	Pass
L8	34.5 - 0	Pole	TP54x46.767x0.5342	8	-40.85	4426.25	84.2	Pass
							Summary	
						Pole (L1)	87.1	Pass
						RATING =	**87.1**	**Pass**

APPENDIX B

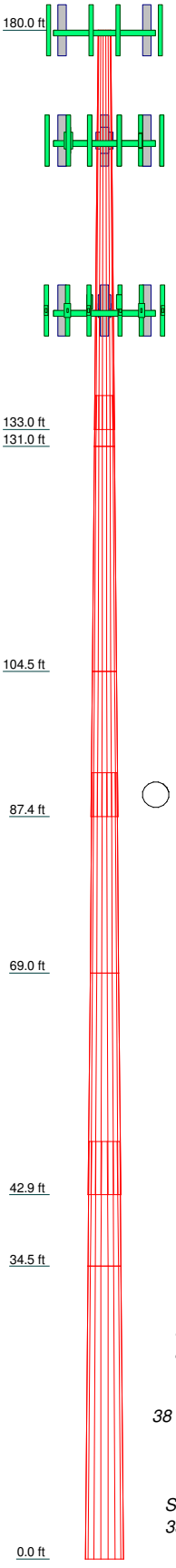
BASE LEVEL DRAWING

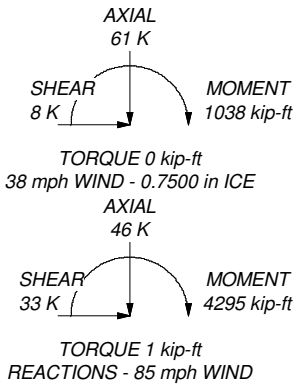

(PROPOSED)
(2) 1-5/8" TO 167 FT LEVEL
(INSTALLED)
(1) 1/2" TO 167 FT LEVEL
(12) 1-5/8" TO 167 FT LEVEL
(INSTALLED-IN CONDUIT)
(1) 3/8" TO 147 FT LEVEL
(2) 7/16" TO 147 FT LEVEL
(INSTALLED)
(12) 1-5/8" TO 147 FT LEVEL
Q4
Q1
Q3
Q2
(INSTALLED)
(1) 1/2" TO 75 FT LEVEL
(6) 1-5/8" TO 180 FT LEVEL
CLIMBING PEGS W/
SAFETY CLIMB

APPENDIX C

ADDITIONAL CALCULATIONS

Section	1	2	3	4	5	6	7	8
Length (ft)	47.00	6.00	26.50	17.08	23.59	26.12	14.63	34.50
Number of Sides	18	18	18	18	18	18	18	18
Thickness (in)	0.2500	0.3125	0.4395	0.4591	0.5053	0.5153	0.5712	0.5342
Socket Length (ft)	4.00			5.17		6.25		
Top Dia (in)	18.0000	26.6398	27.8996	33.4637	35.0462	40.2846	43.4193	46.7670
Bot Dia (in)	27.9900	27.8996	33.4637	37.0500	40.2846	45.7600	46.7670	54.0000
Grade	A572-65		Reinf 61.43 ksi			Reinf 65.00 ksi		
Weight (K)	2.9	0.5	3.8	2.9	4.8	6.2	4.0	9.9





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(2) DB980H90E-M w/ Mount Pipe	180	TME-RRUS-11	148
(2) DB980H90E-M w/ Mount Pipe	180	TME-RRUS-11	148
(2) DB980H90E-M w/ Mount Pipe	180	TME-RRUS-11	148
6' x 2" Mount Pipe	180	RRUS-11	148
6' x 2" Mount Pipe	180	RRUS-11	148
6' x 2" Mount Pipe	180	RRUS-11	148
Platform Mount [LP 601-1]	180	Pipe Mount [PM 601-3]	148
(2) HBXX-6516DS-A2M w/ Mount Pipe	167	(2) 7770.00 w/ Mount Pipe	147
(2) HBXX-6516DS-A2M w/ Mount Pipe	167	(2) 7770.00 w/ Mount Pipe	147
(2) HBXX-6516DS-A2M w/ Mount Pipe	167	(2) 7770.00 w/ Mount Pipe	147
LNX-6514DS-A1M w/ Mount Pipe	167	(2) LGP21401	147
LNX-6514DS-A1M w/ Mount Pipe	167	(2) LGP21401	147
LNX-6514DS-A1M w/ Mount Pipe	167	(2) LGP21401	147
RRH2x60-700	167	(2) LGP21901	147
RRH2x60-700	167	(2) LGP21901	147
RRH2x60-700	167	(2) LGP21901	147
RRH2X60-PCS	167	DC6-48-60-18-8F	147
RRH2X60-PCS	167	HPA-65R-BUU-H8 w/ Mount Pipe	147
RRH2X60-PCS	167	HPA-65R-BUU-H8 w/ Mount Pipe	147
RRH2x60-AWS	167	HPA-65R-BUU-H8 w/ Mount Pipe	147
RRH2x60-AWS	167	RRUS11 A2	147
RRH2x60-AWS	167	RRUS11 A2	147
DB-T1-6Z-8AB-0Z	167	RRUS11 A2	147
DB-T1-6Z-8AB-0Z	167	1001940	147
(2) LPA-80080-6CF-EDIN w/ Mount Pipe	167	1001940	147
		1001940	147
(2) LPA-80063/6CF w/ Mount Pipe	167	6' x 2" Mount Pipe	147
(2) LPA-80063/6CF w/ Mount Pipe	167	6' x 2" Mount Pipe	147
(2) FD9R6004/2C-3L	167	6' x 2" Mount Pipe	147
(2) FD9R6004/2C-3L	167	Platform Mount [LP 601-1]	147
(2) FD9R6004/2C-3L	167	GPS_A	75
GPS_A	167	Side Arm Mount [SO 701-1]	75
Platform Mount [LP 601-1]	167		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi	Reinf 65.00 ksi	65 ksi	82 ksi
Reinf 61.43 ksi	61 ksi	77 ksi			

TOWER DESIGN NOTES

1. Tower is located in New London County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 87.1%

Paul J Ford and Company
250 E. Broad Street Suite 600
Columbus, OH 43215
Phone: 614.221.6679
FAX: 614.448.4105

Job: 180' MP; Oakdale, CT; Walden/ Carolyn Besade		
Project: PJF 37516-2062.001 (BU 876371)		
Client: Crown Castle	Drawn by: Ryan Ferrante	App'd:
Code: TIA/EIA-222-F	Date: 06/20/16	Scale: NTS
Path: T:\375_Crown_Castle\2016\37516-2062_876371_Walden - Carolyn Besade\37516-2062.001.7805_SA_124094237516-2062.001.eri		Dwg No. E-1

PAUL J. FORD & COMPANY
250 E Broad St, Ste 600 • Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com

v4.4 - Effective 7-12-13

Date: 6/20/2016
PJF Project: 37516-2062.001
Client Ref. # BU 876371
Site Name: Walden / Carolyn Besade
Description: 180' MP
Owner: Crown Castle
Engineer: RMF

Asymmetric Anchor Rod Analysis

Moment =	4295	k-ft	TIA Ref.	F	Location =	Base Plate		
Axial =	46.0	kips	ASIF =	1.3333	η =	N/A	for BP, Rev. G Sect. 4.9.9	
Shear =	33.0	kips	Max Ratio =	105.0%	Threads =	N/A	for FP, Rev. G	
Anchor Qty =	20							

**** For Post Installed Anchors: Check anchors for embedment, epoxy/grout bond, and capacity based on proof load. ****

Item	Nominal Anchor Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Anchor Circle, in	Area Override, in^2	Area, in^2	Max Net Compression, kips	Max Net Tension, kips	Load for Capacity Calc, kips	Capacity Override, kips	Capacity, kips	Capacity Ratio
1	2.250	#18J A615 Gr 75	75	100	0.0	63.00	0.00	3.98	154.41	149.81	149.81	0.00	195.00	76.8%
2	2.250	#18J A615 Gr 75	75	100	22.5	63.00	0.00	3.98	154.41	149.81	149.81	0.00	195.00	76.8%
3	2.250	#18J A615 Gr 75	75	100	45.0	63.00	0.00	3.98	154.41	149.81	149.81	0.00	195.00	76.8%
4	2.250	#18J A615 Gr 75	75	100	67.5	63.00	0.00	3.98	154.41	149.81	149.81	0.00	195.00	76.8%
5	2.250	#18J A615 Gr 75	75	100	90.0	63.00	0.00	3.98	154.41	149.81	149.81	0.00	195.00	76.8%
6	2.250	#18J A615 Gr 75	75	100	112.5	63.00	0.00	3.98	154.41	149.81	149.81	0.00	195.00	76.8%
7	2.250	#18J A615 Gr 75	75	100	135.0	63.00	0.00	3.98	154.41	149.81	149.81	0.00	195.00	76.8%
8	2.250	#18J A615 Gr 75	75	100	157.5	63.00	0.00	3.98	154.41	149.81	149.81	0.00	195.00	76.8%
9	2.250	#18J A615 Gr 75	75	100	180.0	63.00	0.00	3.98	154.41	149.81	149.81	0.00	195.00	76.8%
10	2.250	#18J A615 Gr 75	75	100	202.5	63.00	0.00	3.98	154.41	149.81	149.81	0.00	195.00	76.8%
11	2.250	#18J A615 Gr 75	75	100	225.0	63.00	0.00	3.98	154.41	149.81	149.81	0.00	195.00	76.8%
12	2.250	#18J A615 Gr 75	75	100	247.5	63.00	0.00	3.98	154.41	149.81	149.81	0.00	195.00	76.8%
13	2.250	#18J A615 Gr 75	75	100	270.0	63.00	0.00	3.98	154.41	149.81	149.81	0.00	195.00	76.8%
14	2.250	#18J A615 Gr 75	75	100	292.5	63.00	0.00	3.98	154.41	149.81	149.81	0.00	195.00	76.8%
15	2.250	#18J A615 Gr 75	75	100	315.0	63.00	0.00	3.98	154.41	149.81	149.81	0.00	195.00	76.8%
16	2.250	#18J A615 Gr 75	75	100	337.5	63.00	0.00	3.98	154.41	149.81	149.81	0.00	195.00	76.8%
17	2.250	A193 Gr B7	105	125	11.3	74.00	0.00	3.98	180.79	176.19	176.19	0.00	218.68	80.6%
18	2.250	A193 Gr B7	105	125	101.3	74.00	0.00	3.98	180.79	176.19	176.19	0.00	218.68	80.6%
19	2.250	A193 Gr B7	105	125	191.3	74.00	0.00	3.98	180.79	176.19	176.19	0.00	218.68	80.6%
20	2.250	A193 Gr B7	105	125	281.3	74.00	0.00	3.98	180.79	176.19	176.19	0.00	218.68	80.6%
								79.58						

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

TIA Rev F

Site Data

BU#:	
Site Name:	
App #:	
Pole Manufacturer:	*Other*

Reactions		
Moment:	3194.3	ft-kips
Axial:	36.8	kips
Shear:	26.4	kips

Reactions adjusted to account for additional anchors

Anchor Rod Data		
Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	63	in

Plate Data		
Diam:	69	in
Thick:	2	in
Grade:	60	ksi
Single-Rod B-eff:	10.71	in

Stiffener Data (Welding at both sides)		
Config:	1	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.75	in
Fillet V. Weld:	0.4375	in
Width:	7	in
Height:	20	in
Thick:	1	in
Notch:	0.75	in
Grade:	50	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	54	in
Thick:	0.4375	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

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

Anchor Rod Results

		Stiffened
Maximum Rod Tension:	149.8 Kips	Service, ASD
Allowable Tension:	195.0 Kips	Fty*ASIF
Anchor Rod Stress Ratio:	76.8% **Pass**	

Base Plate Results

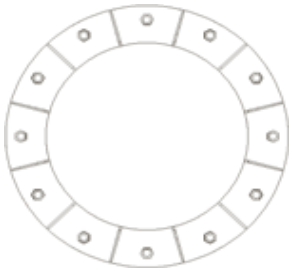
	Flexural Check	Stiffened
Base Plate Stress:	38.4 ksi	Service, ASD
Allowable Plate Stress:	60.0 ksi	0.75*Fy*ASIF
Base Plate Stress Ratio:	64.0% **Pass**	Y.L. Length: N/A, Roark

Stiffener Results

Horizontal Weld :	56.2% **Pass**
Vertical Weld:	34.5% **Pass**
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	11.1% **Pass**
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	43.2% **Pass**
Plate Comp. (AISC Bracket):	46.8% **Pass**

Pole Results

Pole Punching Shear Check:	9.6% **Pass**



* 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

PAUL J. FORD & COMPANY
STRUCTURAL ENGINEERS
250 E. BROAD ST. SUITE 1500
COLUMBUS, OH 43215

PAGE 1 OF
BY RMF DATE 6/20/16
PROJECT BU 876371
CLIENT CROWN PROJ # 37516-2062.001

REACTIONS FROM TNX (WORKING LOADS)

M = 4295 K·FT

V = 33 K

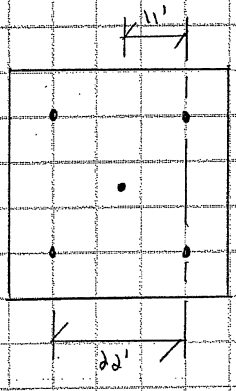
$M_{TOT} = 4295 + 33(5') = 4460$ K·FT

TENSION IN ROCK ANCHORS

1" WILLIAMS 150 KSI → $F_{ULT} = 128^K$

CONCRETE WT: $(25')(25')(5')(0.150\ K/FT^3) = 468.75^K$

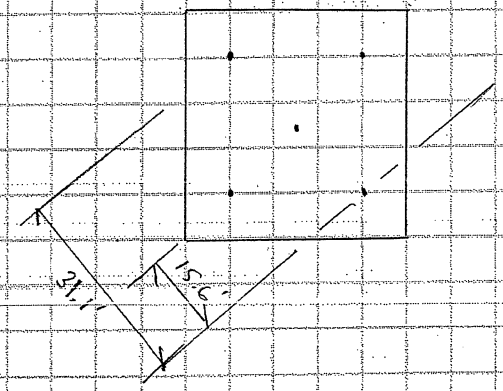
WIND INTO SIDE



$2(4460) = 2F(22') + 468.75(11')$

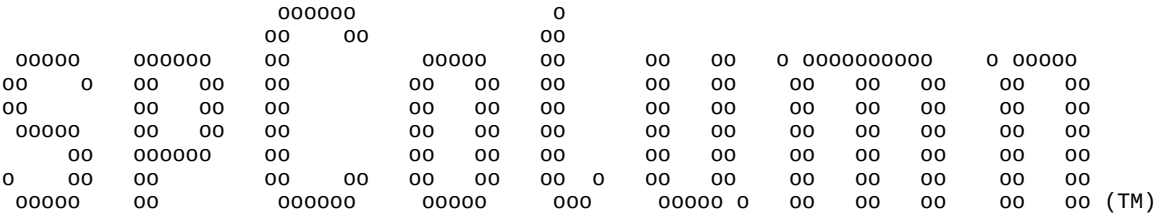
$F_{ULT} = 85.5^K < 128^K$ (66.8 %)

WIND INTO CORNER



$2(4460) = F(31.1') + 2[\frac{1}{2}F(15.6')] + 468.75(15.6')$

$F_{ULT} = 34.4^K < 128^K$ (26.9 %)



spColumn v5.00 (TM)
Computer program for the Strength Design of Reinforced Concrete Sections

General Information:
==========
File Name: T:\375_Crown_Castle\2016\37516-2062_876371_Walden - Carolyn Besade\...\37516-2062.001.col
Project:
Column: Engineer:
Code: ACI 318-08 Units: English

Run Option: Investigation Slenderness: Not considered
Run Axis: X-axis Column Type: Structural

Material Properties:
==========
Concrete: Standard Steel: Standard
f'c = 4 ksi fy = 60 ksi
Ec = 3605 ksi Es = 29000 ksi
fc = 3.4 ksi Eps_yt = 0.00206897 in/in
Eps_u = 0.003 in/in
Beta1 = 0.85

Section:
========
Rectangular: Width = 300 in Depth = 60 in

Gross section area, Ag = 18000 in^2
Ix = 5.4e+006 in^4 Iy = 1.35e+008 in^4
rx = 17.3205 in ry = 86.6025 in
Xo = 0 in Yo = 0 in

Reinforcement:
==========
Bar Set: ASTM A615

Size	Diam (in)	Area (in^2)	Size	Diam (in)	Area (in^2)	Size	Diam (in)	Area (in^2)
# 3	0.38	0.11	# 4	0.50	0.20	# 5	0.63	0.31
# 6	0.75	0.44	# 7	0.88	0.60	# 8	1.00	0.79
# 9	1.13	1.00	# 10	1.27	1.27	# 11	1.41	1.56
# 14	1.69	2.25	# 18	2.26	4.00			

Confinement: Tied; #3 ties with #10 bars, #4 with larger bars.
phi(a) = 0.8, phi(b) = 0.9, phi(c) = 0.65

Layout: Rectangular
Pattern: Sides Different (Cover to transverse reinforcement)
Total steel area: As = 63.20 in^2 at rho = 0.35% (Note: rho < 0.50%)
Minimum clear spacing = 6.49 in

	Top	Bottom	Left	Right
Bars	40 # 8	40 # 8	0 # 3	0 # 3
Cover(in)	3	3	3	3

Factored Loads and Moments with Corresponding Capacities:
==========

No.	Pu kip	Mux k-ft	PhiMnx k-ft	PhiMn/Mu	NA depth in	Dt depth in	eps_t	Phi
1	0.00	1432.13	7941.20	5.545	3.05	56.13	0.05225	0.900

*** End of output ***

EBI Consulting
environmental | engineering | due diligence

RADIO FREQUENCY EMISSIONS ANALYSIS REPORT
EVALUATION OF HUMAN EXPOSURE POTENTIAL TO NON-IONIZING EMISSIONS

AT&T Existing Facility

Site ID: CT2194

Montville
557 Route 82
Montville, CT 06370

July 8, 2016

EBI Project Number: 6216003135

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	4.48 %

21 B Street · Burlington, MA 01803 · Tel: (781) 273.2500 · Fax: (781) 273.3311

EBI Consulting
environmental | engineering | due diligence

July 8, 2016

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

Emissions Analysis for Site: **CT2194 – Montville**

EBI Consulting was directed to analyze the proposed AT&T facility located at **557 Route 82, Montville, 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 public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). 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 done for the proposed AT&T Wireless antenna facility located at **557 Route 82, Montville, 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.

For all calculations, all equipment was calculated using the following assumptions:

1) 2 UMTS channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

2) 2 UMTS channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

3) 2 LTE channels (700 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

4) 2 LTE channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

5) 2 GSM channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

6) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. 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. This is rarely the case, and if so, is never continuous.

7) For the following calculations the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

8) The antennas used in this modeling are the **Powerwave 7770 and the CCI HPA-65R-BUU-H8** for transmission in the 700 MHz, 850 MHz and 1900 MHz (PCS). 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.

9) The antenna mounting height centerlines of the proposed antennas are **147 feet** above ground level (AGL) for **Sector A**, **147 feet** above ground level (AGL) for **Sector B** and **147 feet** above ground level (AGL) for Sector C.

10) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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

AT&T Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770
Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd
Height (AGL):	**147 feet**	Height (AGL):	**147 feet**	Height (AGL):	**147 feet**
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	120 Watts	Total TX Power(W):	120 Watts	Total TX Power(W):	120 Watts
ERP (W):	2,140.89	ERP (W):	2,140.89	ERP (W):	2,140.89
Antenna A1 MPE%	**0.50 %**	Antenna B1 MPE%	**0.50 %**	Antenna C1 MPE%	**0.50 %**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	CCI HPA-65R-BUU-H8	Make / Model:	CCI HPA-65R-BUU-H8	Make / Model:	CCI HPA-65R-BUU-H8
Gain:	13.15 / 14.95 dBd	Gain:	13.15 / 14.95 dBd	Gain:	13.15 / 14.95 dBd
Height (AGL):	**147 feet**	Height (AGL):	**147 feet**	Height (AGL):	**147 feet**
Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	240 Watts	Total TX Power(W):	240 Watts	Total TX Power(W):	240 Watts
ERP (W):	6,229.75	ERP (W):	6,229.75	ERP (W):	6,229.75
Antenna A2 MPE%	**1.64 %**	Antenna B2 MPE%	**1.64 %**	Antenna C2 MPE%	**1.64 %**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770
Gain:	11.4 dBd	Gain:	11.4 dBd	Gain:	11.4 dBd
Height (AGL):	**147 feet**	Height (AGL):	**147 feet**	Height (AGL):	**147 feet**
Frequency Bands	850 MHz	Frequency Bands	850 MHz	Frequency Bands	850 MHz
Channel Count	2	Channel Count	2	Channel Count	2
Total TX Power(W):	60 Watts	Total TX Power(W):	60 Watts	Total TX Power(W):	60 Watts
ERP (W):	828.23	ERP (W):	828.23	ERP (W):	828.23
Antenna A3 MPE%	**0.26 %**	Antenna B3 MPE%	**0.26 %**	Antenna C3 MPE%	**0.26 %**

Site Composite MPE%	
Carrier	**MPE%**
AT&T – Max per sector	**2.40 %**
Verizon Wireless	1.92 %
Sprint	0.16 %
Site Total MPE %:	**4.48 %**

AT&T Sector A Total:	2.40 %
AT&T Sector B Total:	2.40 %
AT&T Sector C Total:	2.40 %
Site Total:	4.48 %

AT&T _ Max Values Per Sector	**# Channels**	**Watts ERP (Per Channel)**	**Height (feet)**	**Total Power Density (μW/cm²)**	**Frequency (MHz)**	**Allowable MPE (μW/cm²)**	**Calculated % MPE**
AT&T 850 MHz UMTS	2	414.12	147	1.50	850 MHz	567	0.26%
AT&T 1900 MHz (PCS) UMTS	2	656.33	147	2.37	1900 MHz (PCS)	1000	0.24%
AT&T 700 MHz LTE	2	1,239.23	147	4.48	700 MHz	467	0.96%
AT&T 1900 MHz (PCS) LTE	2	1,875.65	147	6.78	1900 MHz (PCS)	1000	0.68%
AT&T 850 MHz GSM	2	414.12	147	1.50	850 MHz	567	0.26%
						Total:	**2.40 %**

Summary

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

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

AT&T Sector	Power Density Value (%)
Sector A:	2.40 %
Sector B:	2.40 %
Sector C:	2.40 %
AT&T Maximum Total (per sector):	2.40 %
Site Total:	4.48 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **4.48 %** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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