April 14, 2017

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

Regarding:	Notice of Exempt Modification – Antenna Swap
Property Address:	260 Beckley Road, Berlin CT 06037 (a/k/a Kensington CT)
AT&T Site:	CT1014

Dear Ms. Bachman:

AT&T currently maintains a wireless telecommunications facility on an existing 151.5 monopole at the above-referenced address, latitude 41.631722, longitude -72.729900. Said monopole is owned by American Tower Corporation. The existing equipment shelter is 22' by 25', totaling 550 square feet.

AT&T desires to modify its existing telecommunications facility by swapping (6) antennas; adding (3) RRUs; swapping (3) RRUs, adding (1) DC/fiber squid with the associated lines, and adding (6) triplexers. The centerline height of said antennas is and will remain at 152 feet. Antennas are mounted utilizing a platform with handrails.

Please accept this application as notification pursuant to R.C.S.A. §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. §16-50j-72 (b)(2). In accordance with R.C.S.A. §16-50j-73, a copy of this letter is being sent to the Town Manager of Berlin, Jack Healy, as well as to Maureen Giusti, the Zoning Enforcement Officer. A copy of this letter is also being sent to the land owner Elaine and John Matulis and to the tower owner American Tower Corporation.

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

1. The planned modification will not result in an increase in the height of the existing structure. The antennas to be swapped will be installed at the existing height of 152 feet on the 151.5 foot monopole.

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

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

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

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

6. The self-support tower and its foundation can support AT&T's proposed modifications (please see attached structural analysis completed by American Tower dated March 27, 2017). Please see attached correspondence from American Tower regarding modifications pending on this tower.

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

Sincerely,

Sarah Snell

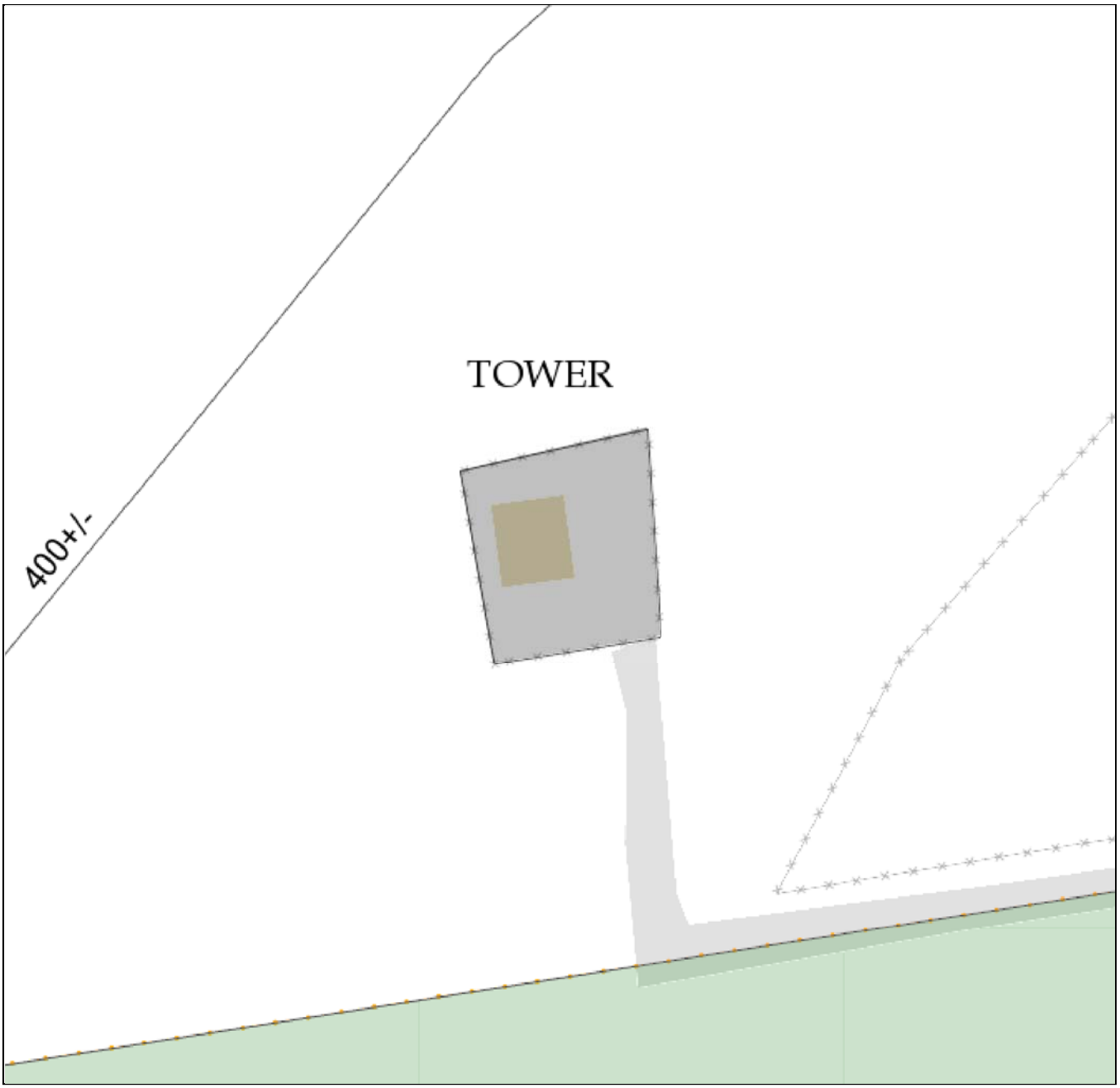
Sarah Snell
Site Acquisition Specialist

cc: Jack Healy, Town Manager (municipality)
Maureen Giusti, the Zoning Enforcement Officer
Elaine & John Matulis (land owners)
American Tower Corporation (tower owner)

Town of Berlin

Geographic Information System (GIS)

Date Printed: 4/14/2017



MAP DISCLAIMER - NOTICE OF LIABILITY

This map is for assessment purposes only. It is not for legal description or conveyances. All information is subject to verification by any user. The Town of Berlin and its mapping contractors assume no legal responsibility for the information contained herein.

Approximate Scale: 1 inch = 50 feet

0 50 Feet

N W E S

Town of Berlin, CT

Property Listing Report

Map Block Lot **11-3-132-7-3877** Account **1040691**

Property Information

Property Location	260 BECKLEY RD
Owner	MATULIS ELAINE E & JOHN C JR
Co-Owner	
Mailing Address	260 BECKLEY RD BERLIN CT 06037
Land Use	4330 Rad/TV Twr
Land Class	I
Zoning Code	R-43
Census Tract	

Neighborhood	2030
Acreage	0.01
Utilities	
Lot Setting/Desc	
Additional Info	

Photo

No Photo Available

Sketch

Primary Construction Details

Year Built		Bedrooms		Exterior Walls	
Stories		Full Bathrooms		Interior Walls	
Building Style		Half Bathrooms		Heating Type	
Building Use		Bath Style		Heating Fuel	
Building Condition		Kitchen Style		AC Type	
Floors		Roof Style		Gross Bldg Area	
Total Rooms		Roof Cover		Total Living Area	

Report Created On **4/14/2017**

Town of Berlin, CT

Property Listing Report | Map Block Lot **11-3-132-7-3877** | Account **1040691**

Valuation Summary

(Assessed value = 70% of Appraised Value)

Item	Appraised	Assessed
Buildings		
Extras		
Improvements		
Outbuildings		
Land		
Total		

Outbuilding and Extra Items

Type	Description

Sub Areas

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
Total Area		0

Sales History

Owner of Record	Book/ Page	Sale Date	Sale Price
MATULIS ELAINE E & JOHN C JR			

Report Created On **4/14/2017**

WIRELESS COMMUNICATIONS FACILITY

CT1014 - PCS 1900 RETROFIT
AMERICAN TOWER CO. SITE NO.: 302483
BERLIN NE
260 BECKLEY ROAD
BERLIN, CT 06037

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, CONNECTICUT

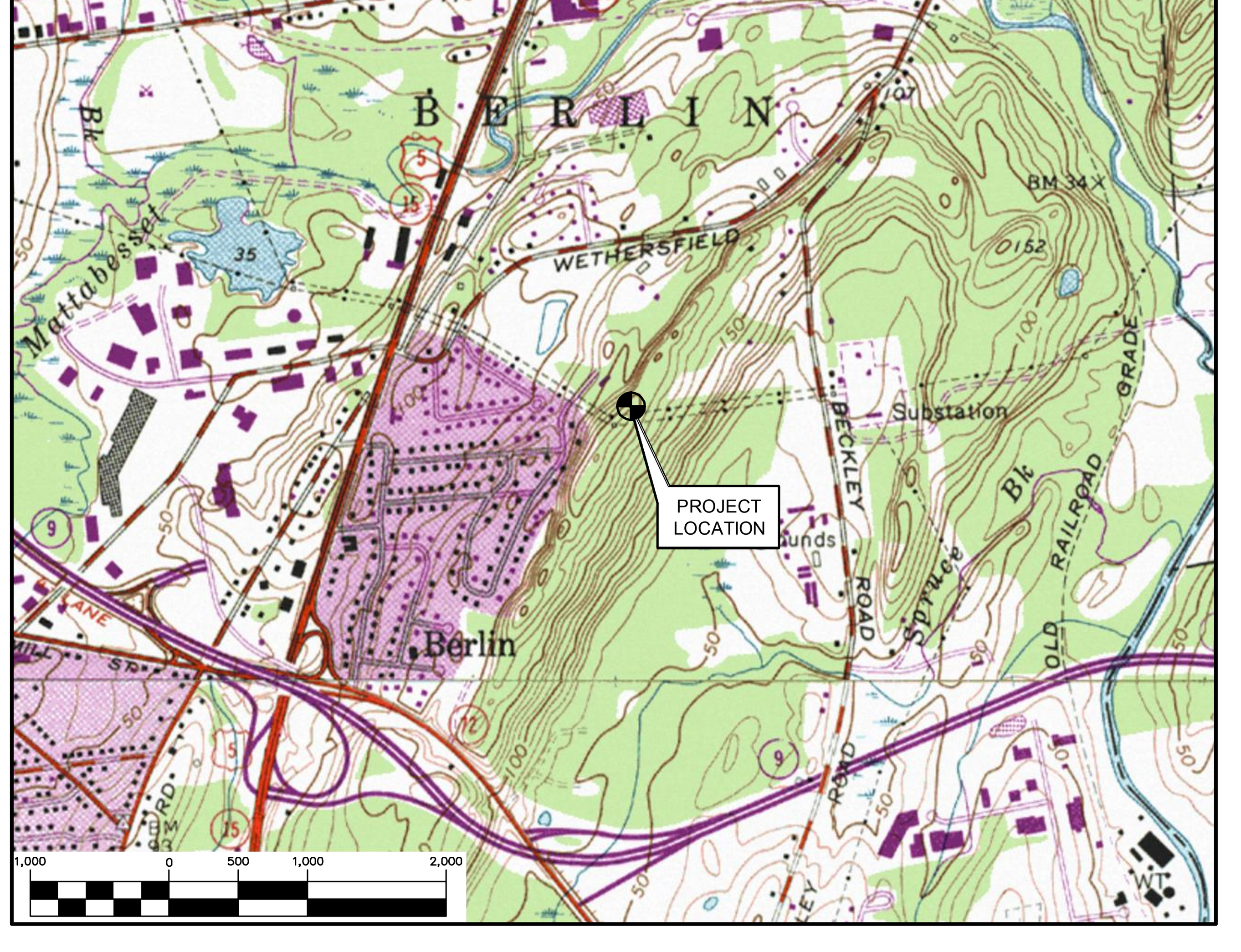
TO: 260 BECKLEY ROAD
BERLIN, CONNECTICUT

1.	TURN LEFT ONTO CAPITOL BLVD	0.3 mi
2.	TURN LEFT ONTO WEST STREET	0.3 mi
3.	TAKE RAMP LEFT FOR I-91 S TOWARD NEW HAVEN	1.6 mi
4.	MERGE ONTO CT-9 EXIT 22N TOWARD NEW BRITAIN	2.2 mi
5.	TAKE CT-372 EXIT 21 TOWARD EAST BERLIN/US-5/CT-15N	0.2 mi
6.	KEEP LEFT TO TAKE RAMP TOWARD EAST BERLIN	0.03 mi
7.	TURN LEFT ONTO MILL ST/CT-372	0.5 mi
8.	TURN LEFT ONTO BECKLEY ROAD	1.2 mi
	YOUR DESTINATION WILL BE ON THE LEFT	

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 (3) ANTENNA FOR PROPOSED (3) (12)ANTENNA, (1) PER SECTOR.
   B. REMOVE & REPLACE (3) EXISTING RRUS-11 1900 MHzWITH (3) NEW RRUS-32 B2 MOUNTED BEHIND ANTENNA ON EXISTING TOWER.
   C. REMOVE AND REPLACED EXISTING DIPLEXERS FOR NEW TRIPLEXERS, (2) PER SECTOR POSITION 2.

PROJECT INFORMATION

AT&T SITE NUMBER:	CT1014
AT&T SITE NAME:	BERLIN NE
SITE ADDRESS:	AMERICAN TOWER CO. SITE NO.: 302483 260 BECKLEY ROAD BERLIN, CT 06037
PROPERTY OWNER:	AMERICAN TOWER CORP. 116 HUNTINGTON AVE., 11TH FLOOR BOSTON, MA 02116
LESSEE/APPLICANT:	AT&T MOBILITY 500 ENTERPRISE DRIVE, SUITE 3A ROCKY HILL, CT 06067
CONTACT PERSON:	LAUREN GROPPI EMPIRE TELECOM, LLC (978) 430-2534
ENGINEER:	CENTEK ENGINEERING, INC. 63-2 NORTH BRANFORD RD. BRANFORD, CT. 06405
PROJECT COORDINATES:	LATITUDE: 41°-37'-54.02" N LONGITUDE: 72°-43'-47.54" W GROUND ELEVATION: ±187' AMSL

SHEET INDEX

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	06/14/16	KAW	CAG	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

STATE OF CONNECTICUT · LICENSED PROFESSIONAL ENGINEER · 27517

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

BERLIN NE

CT1014

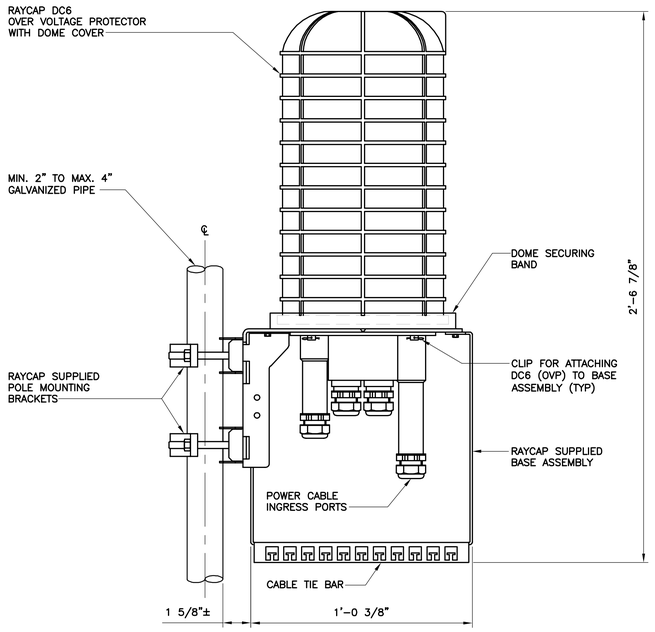
260 BECKLEY ROAD
BERLIN, CT 06037

DATE:	05/12/16
SCALE:	AS NOTED
JOB NO.	16002.10

TITLE SHEET

T-1

Sheet No. 1 of 5



ELEVATION

NOTES:

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

1 / N-1 **RAYCAP DC6 MOUNTING DETAIL**
SCALE: 3" = 1'-0"

NOTES AND SPECIFICATIONS

DESIGN BASIS

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

1. DESIGN CRITERIA:
   - WIND LOAD: PER EIA/TIA 222 F-96 (ANTENNA MOUNTS): 80 MPH (FASTEST MILE), EQUIVALENT TO 100 MPH (3 SECOND GUST).
   - BUILDING CLASSIFICATION: II (BASED ON IBC TABLE 1604.5)
   - BASIC WIND SPEED (OTHER STRUCTURE): 100 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 BUILDINGS 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	06/14/16	KAW	CAG	CONSTRUCTION DRAWINGS - 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

BERLIN NE

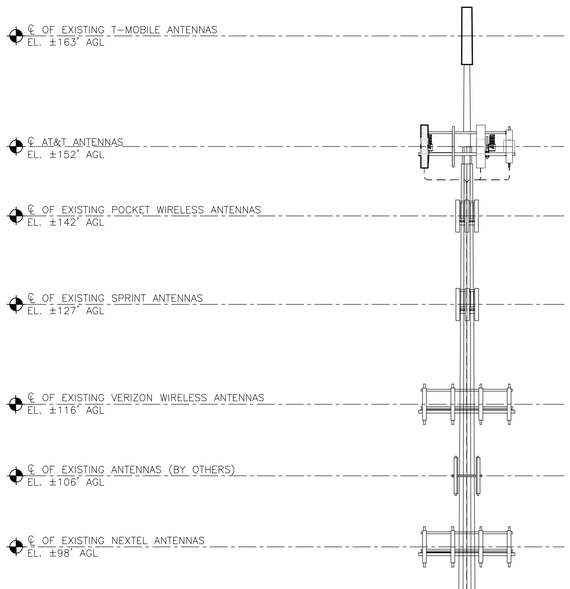
CT1014

260 BECKLEY ROAD
BERLIN, CT 06037

DATE: 05/12/16
SCALE: AS NOTED
JOB NO. 16002.10

NOTES AND SPECIFICATIONS

N-1

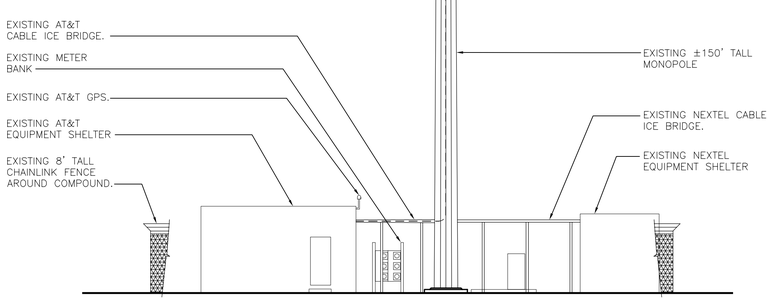


TOWER STRUCTURAL NOTES:

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

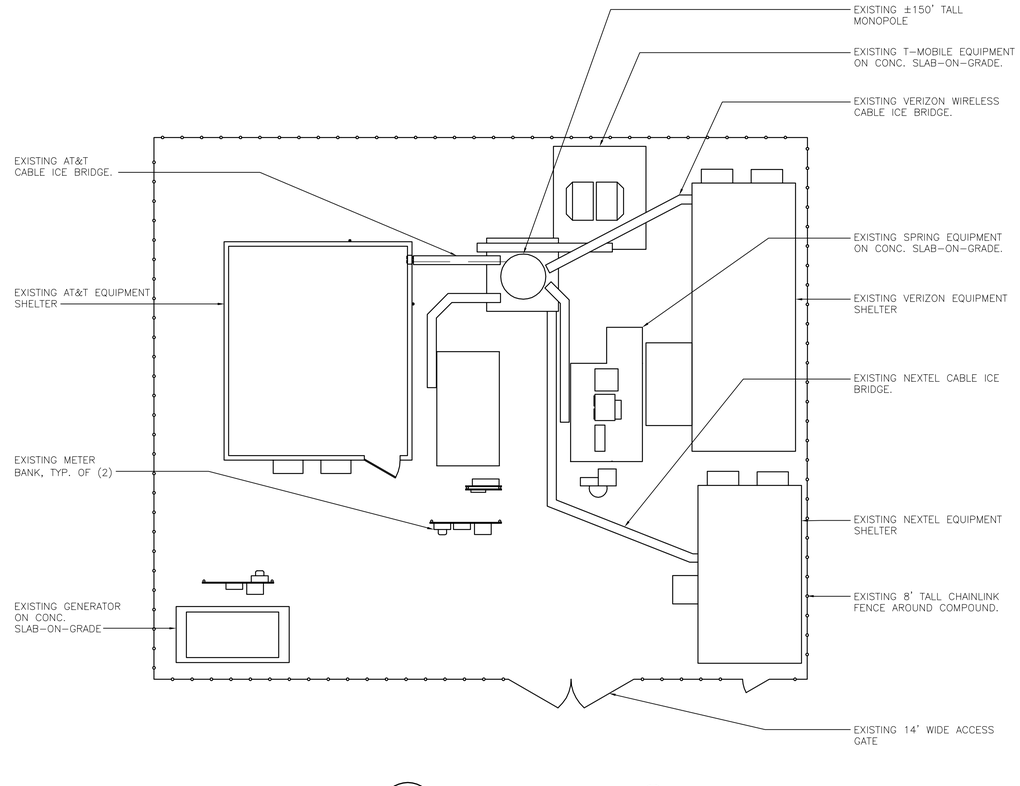
NOTES:

1. OTHER CARRIER EQUIPMENT NOT SHOWN FOR CLARITY.
2. AGL = ABOVE GRADE LEVEL

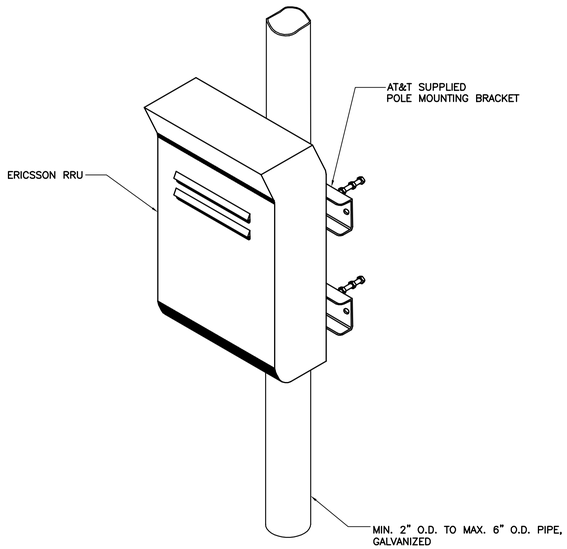


GRAPHIC SCALE
10 0 5 10 20 40
(IN FEET)
1 inch = 10 ft.

4 C-1 **EAST ELEVATION**
SCALE: 1" = 10'-0"



1 C-1 **COMPOUND PLAN**
SCALE: 1" = 10'-0"
APPROX. NORTH

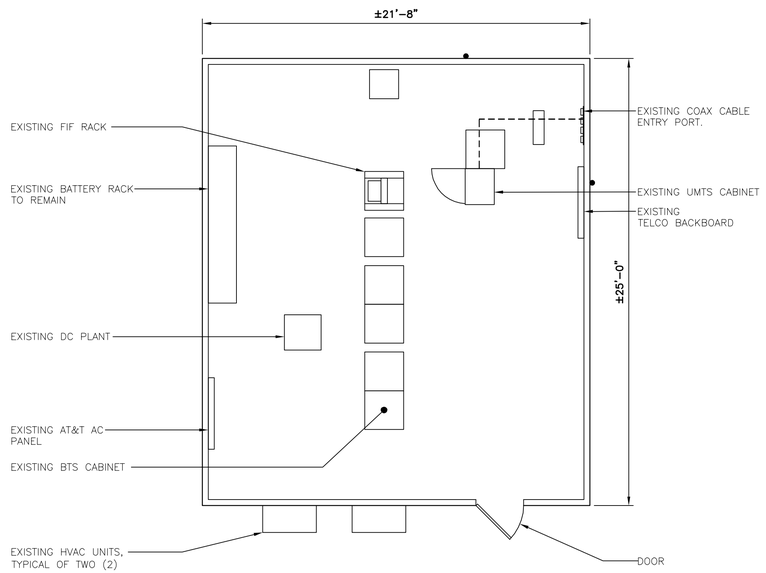


ISOMETRIC VIEW

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 RRU MOUNTING DETAILS**
SCALE: NTS



2 C-1 **EQUIPMENT BUILDING FLOOR PLAN**
SCALE: 1/4" = 1'-0"
APPROX. NORTH

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	06/14/16	KAW	CAG	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

STATE OF CONNECTICUT · 21512 · REGISTERED PROFESSIONAL ENGINEER

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

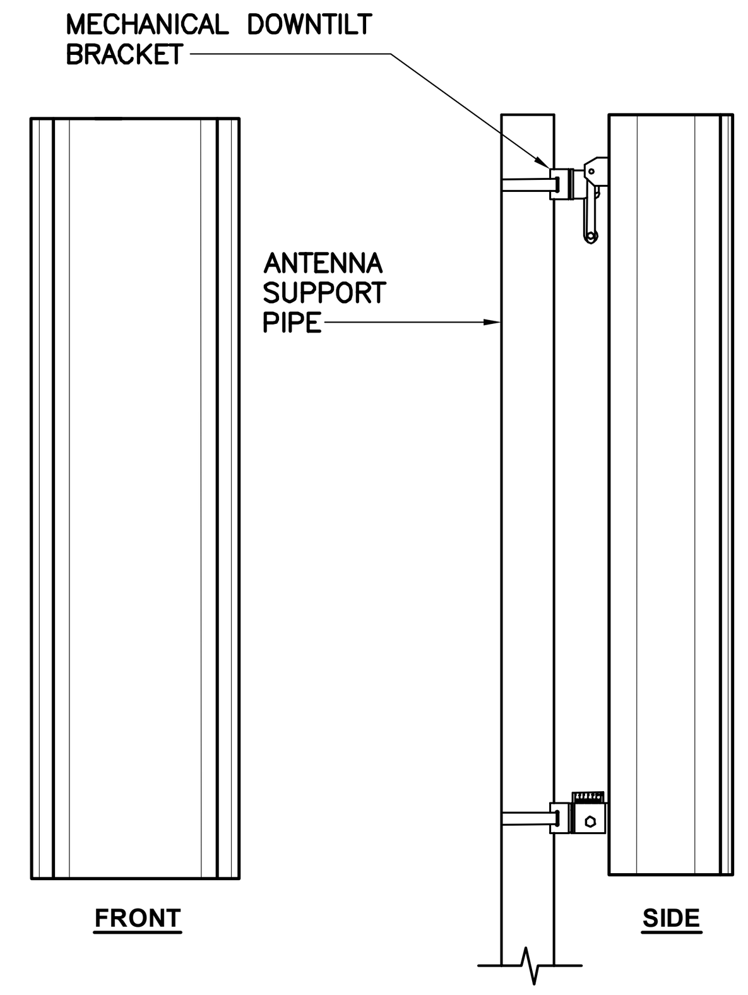
AT&T MOBILITY
WIRELESS COMMUNICATIONS FACILITY
BERLIN NE
CT1014
260 BECKLEY ROAD
BERLIN, CT 06037

DATE: 05/12/16
SCALE: AS NOTED
JOB NO. 16002.10

PLANS, ELEVATION AND DETAILS

C-1

Sheet No. 3 of 5

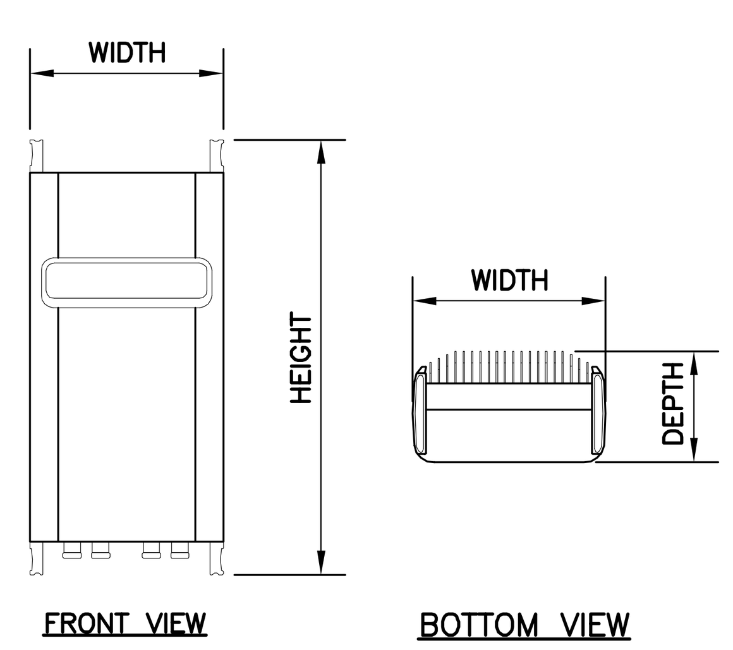


ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: QUINTEL MODEL: QS66512–2	72.0"H x 12.0"W x 9.6"D	112.0–LBS

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

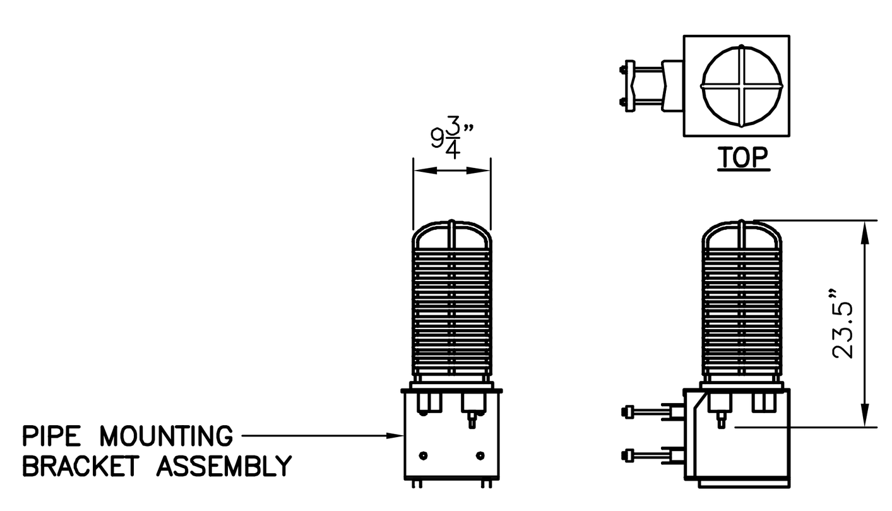


RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RRUS 32	27.17"H x 12.05"W x 7.01"D	52.91 LBS.	ABOVE: 16" MIN. BELOW: 12" MIN. FRONT: 36" MIN.

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

6 (C–2) ERICSSON RRUS 32 DETAIL

SCALE: 1" = 1'–0"

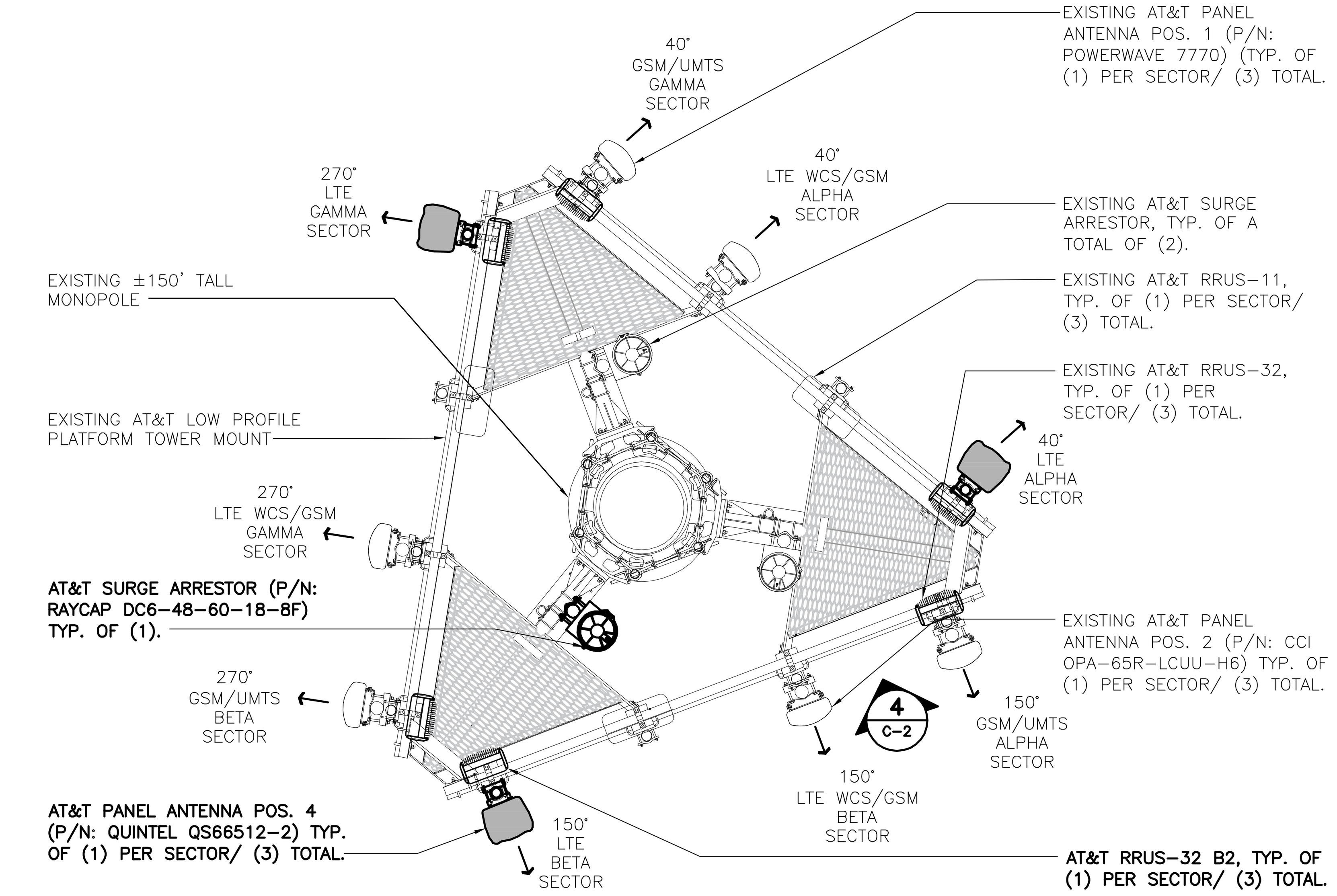


SITE TYPE	ARRESTOR MAKE/MODEL	QTY REQUIRED	ARRESTOR LOCATION	WEIGHT
	MAKE: RAYCAP (SQUID) MODEL: DC6–48–60–18–8F	(1) PER SITE	TOWER, ADJACENT TO AT&T ANTENNAS AND RRUs.	20 LBS. (WITHOUT MOUNT)

NOTES:
1. CONTRACTOR TO COORDINATE FINAL SURGE ARRESTOR MODEL SELECTION(S) WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.
2. CONTRACTOR TO INSTALL ARRESTOR IN CONFORMANCE WITH MANUFACTURERS RECOMMENDATIONS.

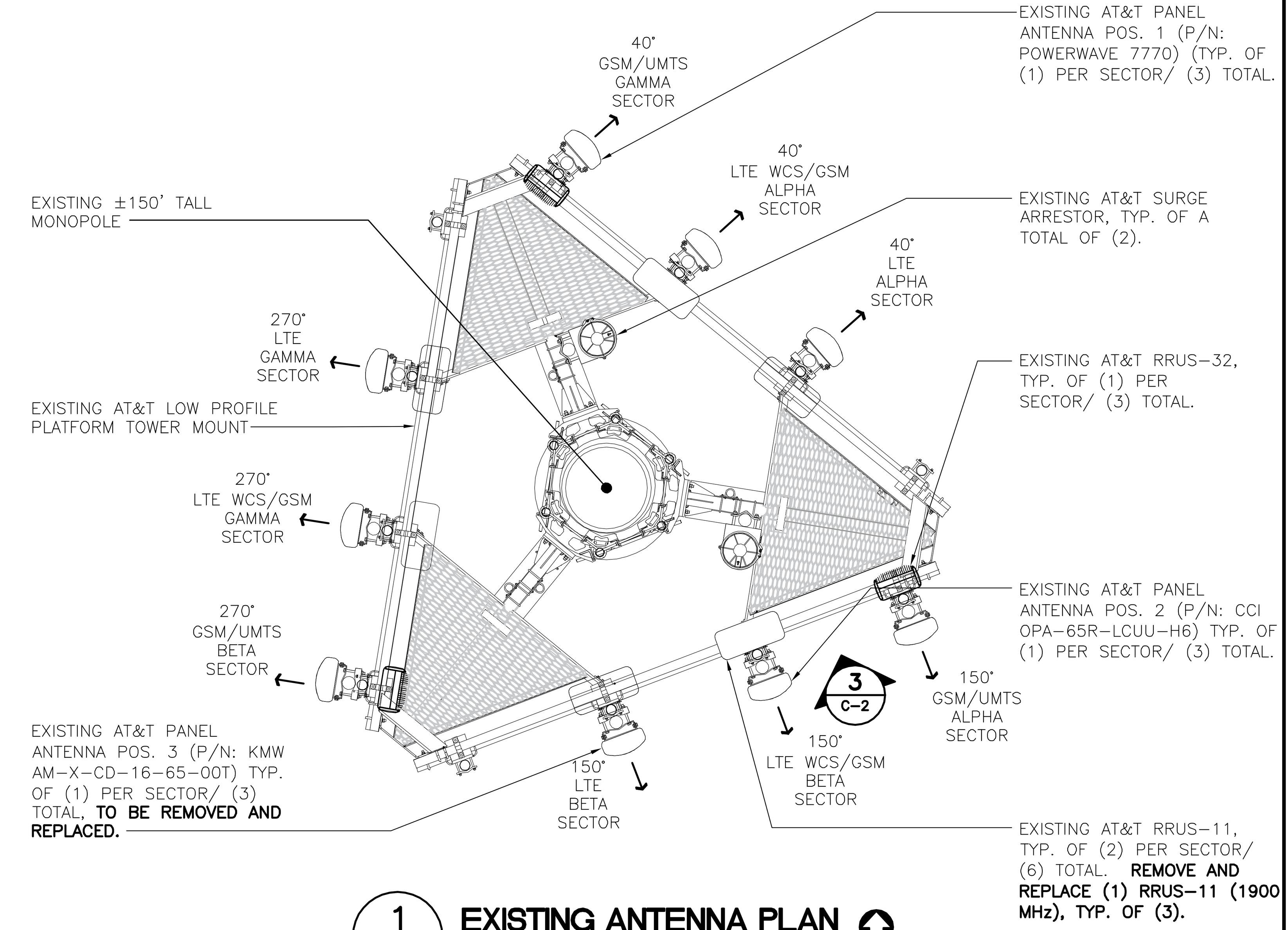
7 (C–2) SURGE ARRESTOR DETAIL

SCALE: NTS



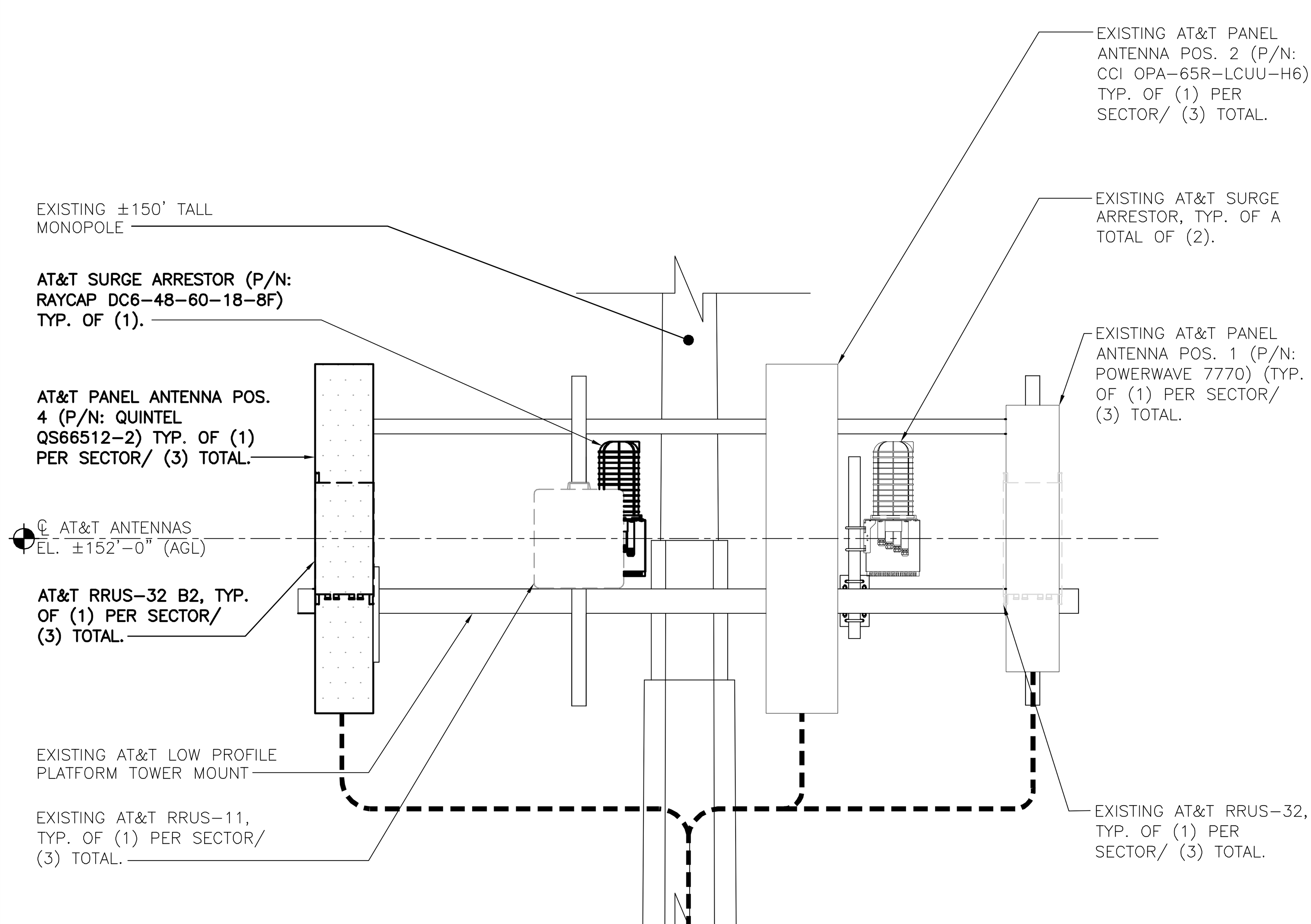
2 (C–2) PROPOSED ANTENNA PLAN

SCALE: 3/8" = 1'–0"



1 (C–2) EXISTING ANTENNA PLAN

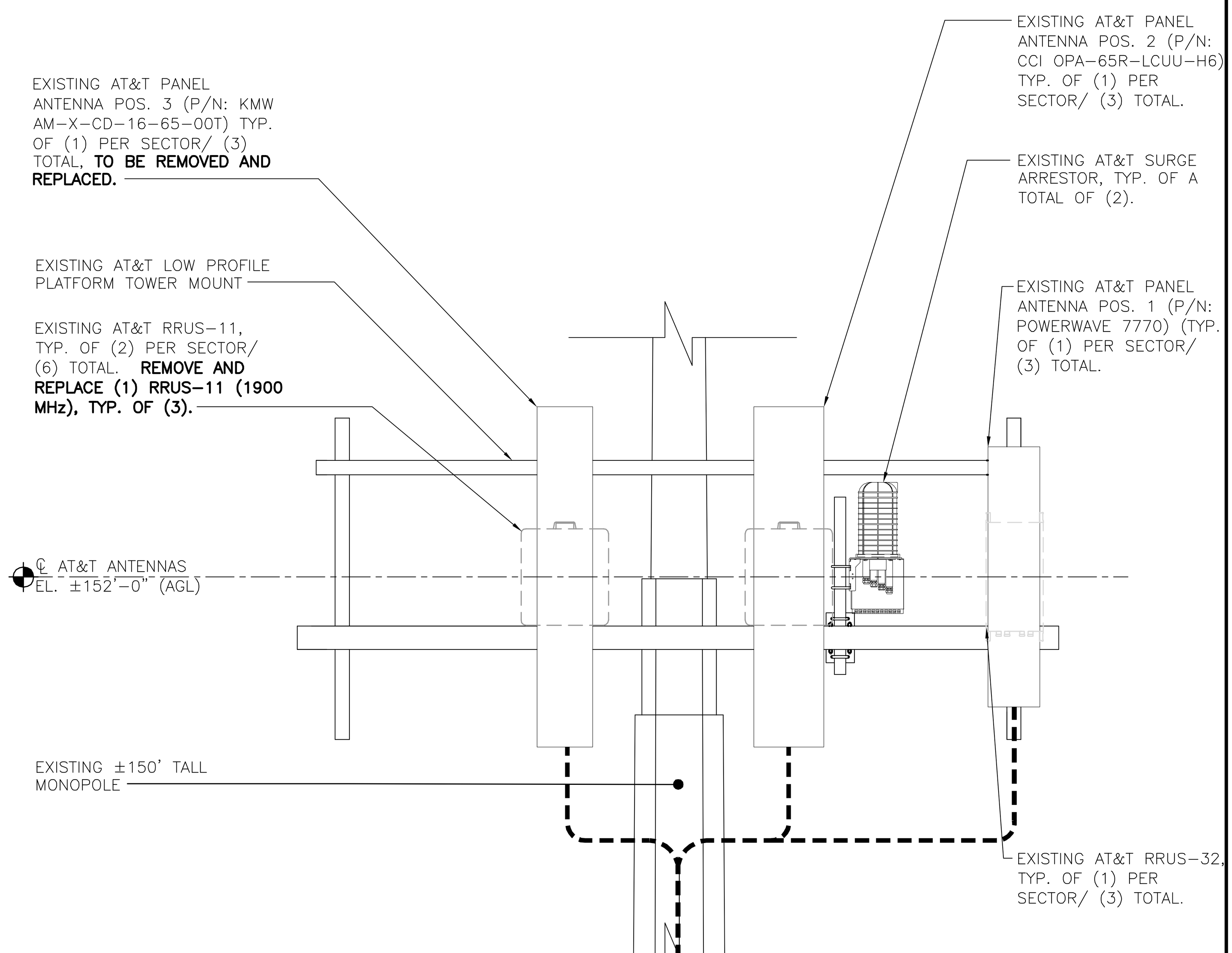
SCALE: 3/8" = 1'–0"



4 (C–2) PROPOSED ANTENNA PLAN

SCALE: 1/2" = 1'–0"

NOTE:
1. TOWER MOUNTED AMPLIFIERS (TMA), NOT SHOWN FOR CLARITY.



3 (C–2) EXISTING ANTENNA PLAN

SCALE: 1/2" = 1'–0"

NOTE:
1. TOWER MOUNTED AMPLIFIERS (TMA), NOT SHOWN FOR CLARITY.

NOTES:
1. PROVIDE MOUNTING PIPES, CROSSOVERS & ASSOCIATED HARDWARE TO COMPLETE THE PROPOSED UPGRADE.
2. REFER TO AMERICAN TOWER CORP. STRUCTURAL REPORT AND FINAL AT&T RF DATA SHEET PRIOR TO INSTALLATION OF TOWER MOUNTED LTE RELATED ANTENNAS, CABLES AND RELATED EQUIPMENT
3. COORDINATE ANTENNA CENTERLINE ELEVATION, RRU/SURGE ARRESTOR MOUNTING ELEVATION, ATTACHMENT HARDWARE WITH AMERICAN TOWER, CO.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	06/14/16	KAW	CAG	CONSTRUCTION DRAWINGS – 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

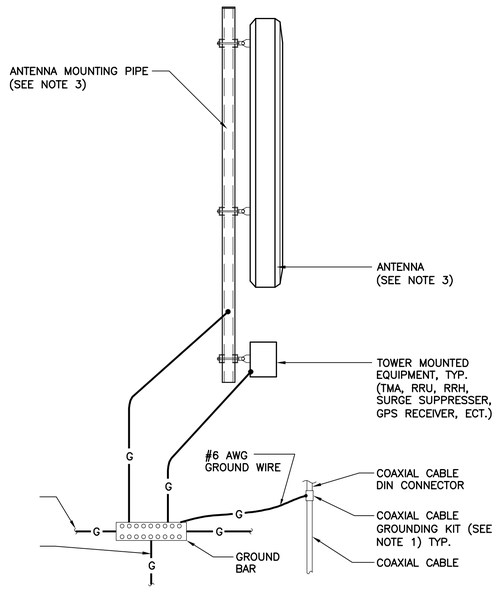
AT&T MOBILITY
WIRELESS COMMUNICATIONS FACILITY
BERLIN NE
CT1014
260 BECKLEY ROAD
BERLIN, CT 06037

DATE:	05/12/16
SCALE:	AS NOTED
JOB NO.	16002.10

LTE BWE EQUIPMENT DETAILS AND ELEVATIONS

C–2

Sheet No. 4 of 5

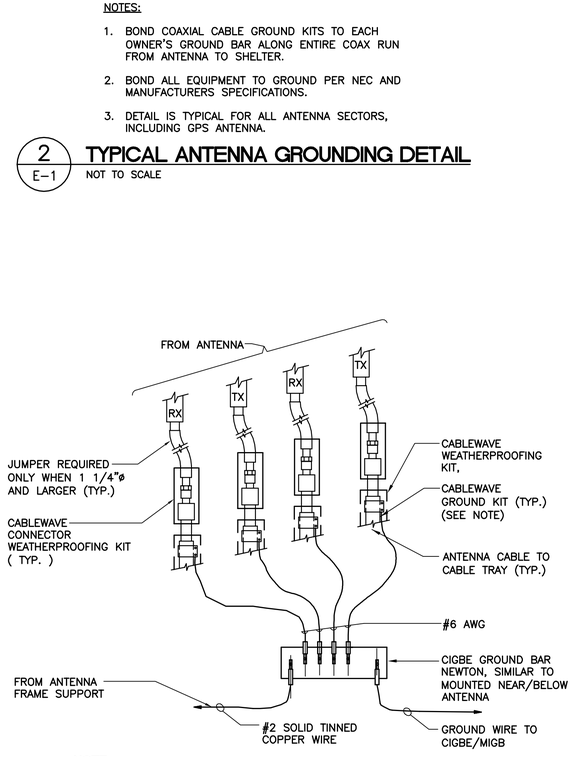


NOTES:

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.

2 / E-1 TYPICAL ANTENNA GROUNDING DETAIL

NOT TO SCALE

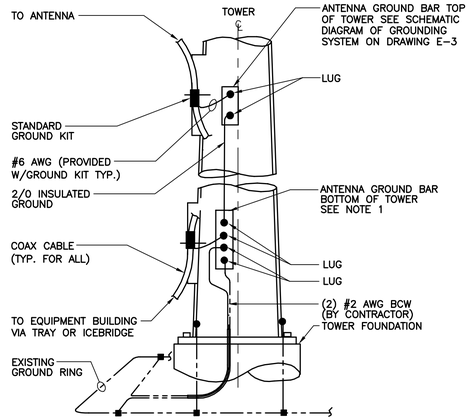


NOTE:

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

5 / E-1 CONNECTION OF GROUND WIRES TO GROUND BAR

NOT TO SCALE

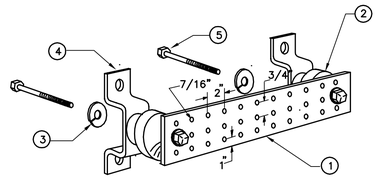


NOTES:

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.

1 / E-1 ANTENNA CABLE GROUNDING - MONOPOLE

NOT TO SCALE

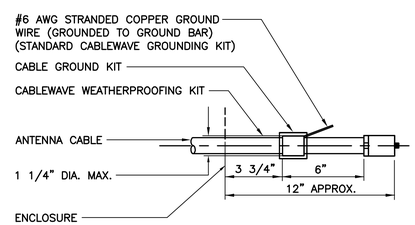


LEGEND

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

3 / E-1 GROUND BAR DETAIL

NOT TO SCALE



NOTE:

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

4 / E-1 ANTENNA CABLE GROUNDING DETAIL

NOT TO SCALE

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.

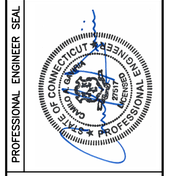
B. TESTING SHALL BE PERFORMED IN THE PRESENCE AND TO THE SATISFACTION OF OWNERS CONSTRUCTION REPRESENTATIVE. TESTING DATA SHALL BE INITIALED AND DATED BY THE CONSTRUCTION AND INCLUDED WITH THE WRITTEN REPORT/ANALYSIS.

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	06/14/16	KAW	CAG	CONSTRUCTION DRAWINGS - 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

BERLIN NE

CT1014

260 BECKLEY ROAD
BERLIN, CT 06037

DATE:	05/12/16
SCALE:	AS NOTED
JOB NO.	16002.10

TYPICAL ELECTRICAL DETAILS & NOTES

E-1

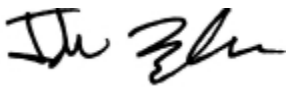
Sheet No. 5 of 5

AMERICAN TOWER®
CORPORATION

Structural Analysis Report

Structure	:	**151.5 ft Monopole (De-stacked from 174.5')**
ATC Site Name	:	**Brln - Berlin, CT**
ATC Site Number	:	**302483**
Engineering Number	:	**OAA694673_C3_02**
Proposed Carriers	:	**AT&T Mobility**
Carrier Site Name	:	**Berlin**
Carrier Site Number	:	**CT1014**
Site Location	:	**260 Beckley Road** **Kensington, CT 06037-2419** **41.631722,-72.729900**
County	:	**Hartford**
Date	:	**March 27, 2017**
Max Usage	:	**99%**
Result	:	**Pass***

Prepared By:
John D. Bigham, E.I.
Structural Engineer II



COA: D94317

AMERICAN TOWER®
CORPORATION

Table of Contents

Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 151.5 ft monopole to reflect the changes proposed by AT&T Mobility.

Supporting Documents

Tower Drawings	ITT Meyer Type "B", dated July 21, 2001 Mapping by Smith Cullum Acq. #CT-0019, dated July 21, 2001 Mapping by ATC Report #0682, dated January 7, 2016
Foundation Drawing	SpectraSite Project #CT-0019, dated May 29, 2003
Geotechnical Report	Daniel G. Loucks Project #CT-0019, dated December 21, 2001
Modifications	Scientel Project #Berlin-CT0019, dated July 30, 2002 ATC Project #11912109, dated November 9, 2016*

*** The changes outlined by ATC Project # 11912109 must be completed in order for this analysis to be valid.**

Analysis

The tower was analyzed using tnxTower version 7.0.7.0 analysis software. This program considers an elastic three-dimensional model and second-order effects per ANSI/TIA-222.

Basic Wind Speed:	97 mph (3-Second Gust,Vasd) / 125 mph (3-second Gust, Vult)
Basic Wind Speed w/ Ice:	50 mph (3-Second Gust) w/ 1" radial ice concurrent
Code:	ANSI/TIA-222-G / 2012 IBC / 2016 Connecticut State Building Code
Structure Class:	II
Exposure Category:	B
Topographic Category:	1
Crest Height:	0 ft
Spectral Response:	Ss = 0.182, S_1 = 0.063
Site Class:	D - Stiff Soil

Conclusion

Based on the analysis results, the structure meets the requirements per the applicable codes listed above. The tower and foundation can support the equipment as described in this report. If the pending modifications cited in the Supporting Documents table are not completed prior to AT&T's installation, the results of this analysis are no longer valid, and AT&T Mobility should contact American Tower's Site Manager for further direction on how to proceed.

If you have any questions or require additional information, please contact American Tower via email at Engineering@americantower.com. Please include the American Tower site name, site number, and engineering number in the subject line for any questions.

Existing and Reserved Equipment

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
151.5	152.0	3	Ericsson RRUS 11 (Band 12) (55 lb)	Platform w/ Handrails	(12) 1 1/4" Coax (4) 0.78" 8 AWG 6 (2) 0.39" Fiber Trunk (1) 3" conduit	AT&T Mobility
		3	Ericsson RRUS 32			
		3	Powerwave 7770.00			
		3	CCI OPA-65R-LCUU-H6			
	149.0	6	Powerwave LGP21401			
		2	Raycap DC6-48-60-18-8F			
142.0	142.0	3	Ericsson KRY 112 144/1	T-Arm	(6) 1 5/8" Coax	T-Mobile
		3	Ericsson RRUS 11 B12			
		3	Ericsson AIR 21, 1.3 M, B2A B4P			
		3	Ericsson AIR 21 B4A/B12P-B5P 6FT			
123.0	123.0	3	Alcatel-Lucent 800MHz 2X50W RRH w/ Filter	Flush	(4) 1 1/4" Hybriflex	Sprint Nextel
		6	Alcatel-Lucent 4x40W RRH			
		3	Alcatel-Lucent TD-RRH8x20			
		3	RFS APXVTM14-C-I20			
		2	RFS APXVSPP18-C-A20			
		1	RFS APXV9ERR18-C-A20			
114.0	114.0	3	Alcatel-Lucent RRH2X60-AWS	Low Profile Platform	(18) 1 5/8" Coax (2) 1 5/8" Fiber	Verizon
		3	Alcatel-Lucent RRH2X60-1900			
		3	Alcatel-Lucent RRH2x60 700			
		2	RFS DB-T1-6Z-8AB-0Z			
		6	Commscope SBNHH-1D65B			
		3	Commscope LNX-6514DS-A1M			
		6	Antel LPA-80063-6CF-EDIN-X			

Equipment to be Removed

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
151.5	152.0	3	KMW AM-X-CD-16-65-00T-RET	-	-	AT&T Mobility
		3	Ericsson RRUS 11 (Band 12) (55 lb)			

Proposed Equipment

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
151.5	152.0	3	Powerwave 7020.00 Dual Band RET	Platform w/ Handrails	-	AT&T Mobility
		6	CCI TPX-070821			
		3	Ericsson RRUS 32 B2			
		3	Quintel QS66512-2			

[1]Mount elevation is defined as height above bottom of steel structure to the bottom of mount, RAD elevation is defined as center of antenna above ground level (AGL).

Structure Usages*

Structural Component	Controlling Usage	Pass/Fail
Anchor Bolts	74%	Pass
Shaft	67%	Pass
Base Plate	22%	Pass

Foundations*

Reaction Component	Analysis Reactions	% Of Usage
Moment (Kips-Ft)	3,577.0	91%
Axial (Kips)	46.0	99%
Shear (Kips)	33.0	50%
Anchor Moment (Kips-Ft)	2,890.0	91%

The structure base reactions resulting from this analysis were found to be acceptable through analysis based on geotechnical and foundation information, therefore no modification or reinforcement of the foundation will be required.

Deflection and Sway*

Antenna Elevation (ft)	Antenna	Carrier	Deflection (in)	Sway (Rotation) (°)
152.0	Powerwave 7020.00 Dual Band RET	AT&T Mobility	20.812	1.146
	CCI TPX-070821			
	Ericsson RRUS 32 B2			
	Quintel QS66512-2			

***Deflection, Twist and Sway was evaluated considering a design wind speed of 60 mph (3-Second Gust) per ANSI/TIA-222-G**

AMERICAN TOWER®
CORPORATION

Standard Conditions

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

-- Information supplied by the client regarding the structure itself, antenna, mounts and feed line loading on the structure and its components, or other relevant information.

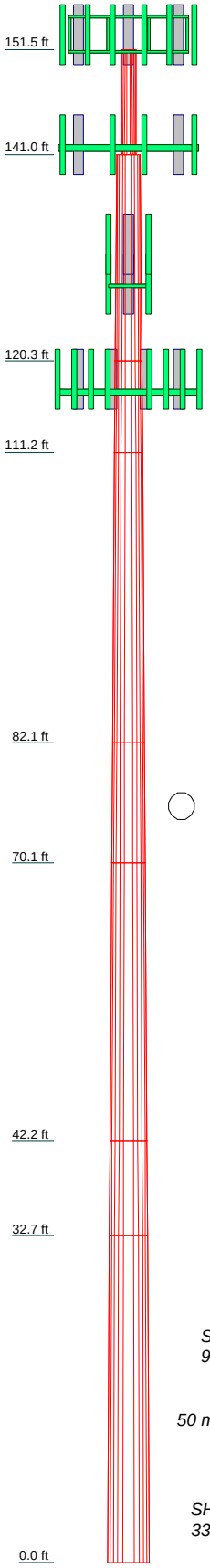
-- Information from drawings in the possession of American Tower Corporation, or generated by field inspections or measurements of the structure.

It is the responsibility of the client to ensure that the information provided to A.T. Engineering Service, PLLC and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and that their capacity has not significantly changed from the "as new" condition.

Unless explicitly agreed by both the client and American Tower Corporation, all services will be performed in accordance with the current revision of ANSI/TIA -222. The design basic wind speed will be determined based on the minimum basic wind speed as prescribed in ANSI/TIA-222. Although every effort is taken to ensure that the loading considered is adequate to meet the requirements of all applicable regulatory entities, we can provide no assurance to meet any other local and state codes or requirements. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement.

All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. A.T. Engineering Service, PLLC is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

Section	Length (ft)	Number of Sides	Thickness (in)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	10.50	12	0.2400	17.1872	17.7841	A572-65	0.5
2	20.67	12	0.3059	28.7830	31.5570		2.1
3	9.14	12	0.3063	31.5570	33.0280		1.0
4	29.11	12	0.3141	33.0280	38.3470		3.5
5	12.02	12	0.3804	38.3470	39.7110		1.9
6	27.82	12	0.4014	39.7110	43.9500		5.1
7	9.53	12	0.4706	43.9500	45.0640		2.2
8	32.71	12	0.4906	45.0640	49.5520		8.2
							24.5



ALL REACTIONS ARE FACTORED

AXIAL 95 K

SHEAR 9 K

MOMENT 1040 kip-ft

TORQUE 0 kip-ft

50 mph WIND - 1.0000 in ICE

AXIAL 46 K

SHEAR 33 K

MOMENT 3577 kip-ft

TORQUE 0 kip-ft

REACTIONS - 97 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Flat Platform w/ Handrails	153	AIR 21 B4A/B12P-B5P 6ft	142
7020.00 Dual Band RET	151.5	(3) T-Arms	142
7020.00 Dual Band RET	151.5	800 MHz 2X50W RRH w/ Filter	128
7020.00 Dual Band RET	151.5	800 MHz 2X50W RRH w/ Filter	128
(2) TPX-070821	151.5	800 MHz 2X50W RRH w/ Filter	128
(2) TPX-070821	151.5	4x40W RRH	128
(2) TPX-070821	151.5	4x40W RRH	128
RRUS 11 (Band 12)	151.5	4x40W RRH	128
RRUS 11 (Band 12)	151.5	4x40W RRH	128
RRUS 11 (Band 12)	151.5	4x40W RRH	128
RRUS-32	151.5	4x40W RRH	128
RRUS-32	151.5	TD-RRH8x20	128
RRUS-32	151.5	TD-RRH8x20	128
RRUS 32 B2	151.5	TD-RRH8x20	128
RRUS 32 B2	151.5	APXVTM14-C-I20	128
RRUS 32 B2	151.5	APXVTM14-C-I20	128
7770.00	151.5	APXVTM14-C-I20	128
7770.00	151.5	APXVSPP18-C-A20	128
7770.00	151.5	APXVSPP18-C-A20	128
QS66512-2	151.5	APXV9ERR18-C-A20	128
QS66512-2	151.5	Flush Mount	128
QS66512-2	151.5	RRH2X60-AWS	117.5
OPA-65R-LCUU-H6	151.5	RRH2X60-AWS	117.5
OPA-65R-LCUU-H6	151.5	RRH2X60-AWS	117.5
OPA-65R-LCUU-H6	151.5	RRH2X60-1900	117.5
(2) LGP21401	151.5	RRH2X60-1900	117.5
(2) LGP21401	151.5	RRH2X60-1900	117.5
(2) LGP21401	151.5	RRH2x60 700	117.5
DC6-48-60-18-8F	151.5	RRH2x60 700	117.5
DC6-48-60-18-8F	151.5	RRH2x60 700	117.5
DC6-48-60-18-8F	151.5	DB-T1-6Z-8AB-0Z	117.5
KRY 112 144/1	142	DB-T1-6Z-8AB-0Z	117.5
KRY 112 144/1	142	(2) SBNHH-1D65B	117.5
KRY 112 144/1	142	(2) SBNHH-1D65B	117.5
RRUS 11 B12	142	(2) SBNHH-1D65B	117.5
RRUS 11 B12	142	LNX-6514DS-A1M	117.5
RRUS 11 B12	142	LNX-6514DS-A1M	117.5
AIR 21, 1.3 M, B2A B4P	142	LNX-6514DS-A1M	117.5
AIR 21, 1.3 M, B2A B4P	142	(2) LPA-80063-6CF-EDIN-X	117.5
AIR 21, 1.3 M, B2A B4P	142	(2) LPA-80063-6CF-EDIN-X	117.5
AIR 21 B4A/B12P-B5P 6ft	142	(2) LPA-80063-6CF-EDIN-X	117.5
AIR 21 B4A/B12P-B5P 6ft	142	Round Low Profile Platform	117.5

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. Combined pole and wrap structure.
9. Sections modeled to have equivalent inertia to pole and wrap combined.
10. TOWER RATING: 66.9%

AMERICAN TOWER CORPORATION

Tower Analysis

American Tower Corporation
3500 Regency Parkway, Suite 100
Cary, NC 27511
Phone: (919) 466-5033
FAX: (919) 466-5415

Job: ***302483 - Brln-Berlin***			
Project: ***OAA694673***			
Client: AT&T Mobility	Drawn by: John Bigham	App'd:	
Code: TIA-222-G	Date: 03/27/17	Scale: NTS	
Path: C:\Users\john.bigham\Desktop\TNX\302483 - Brln-Berlin - Equivalent.eri		Dwg No. E-1	

Tower Input Data

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

Tower is located in Hartford County, Connecticut.
ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
Basic wind speed of 97 mph.
Structure Class II.
Exposure Category B.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 1.0000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
Combined pole and wrap structure..
Sections modeled to have equivalent inertia to pole and wrap combined..
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

	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 ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	151.50-141.00	10.50	0.00	12	17.1872	17.7841	0.2400	0.9600	A572-65 (65 ksi)
L2	141.00-120.33	20.67	0.00	12	28.7830	31.5570	0.3059	2.0000	A572-65 (65 ksi)
L3	120.33-111.19	9.14	0.00	12	31.5570	33.0280	0.3063	2.0000	A572-65 (65 ksi)
L4	111.19-82.08	29.11	0.00	12	33.0280	38.3470	0.3141	2.2000	A572-65 (65 ksi)
L5	82.08-70.06	12.02	0.00	12	38.3470	39.7110	0.3804	2.4000	A572-65 (65 ksi)
L6	70.06-42.24	27.82	0.00	12	39.7110	43.9500	0.4014	2.6000	A572-65 (65 ksi)
L7	42.24-32.71	9.53	0.00	12	43.9500	45.0640	0.4706	2.8000	A572-65 (65 ksi)
L8	32.71-0.00	32.71		12	45.0640	49.5520	0.4906	3.0000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	17.7935	13.0968	480.1168	6.0671	8.9030	53.9277	972.8469	6.4458	3.9630	16.512
	18.4115	13.5581	532.6554	6.2808	9.2122	57.8209	1079.3043	6.6729	4.1229	17.179
L2	29.7984	28.0499	2903.4114	10.1948	14.9096	194.7344	5883.0987	13.8053	6.8940	22.537
	32.6702	30.7823	3837.2246	11.1879	16.3465	234.7425	7775.2574	15.1501	7.6375	24.967
L3	32.6702	30.8221	3842.0947	11.1878	16.3465	235.0404	7785.1256	15.1697	7.6364	24.931
	34.1931	32.2730	4410.5870	11.7144	17.1085	257.8009	8937.0451	15.8838	8.0306	26.218
L4	34.1931	33.0869	4519.6700	11.7116	17.1085	264.1768	9158.0767	16.2844	8.0097	25.501
	39.6997	38.4666	7102.1213	13.6158	19.8637	357.5419	14390.8231	18.9321	9.4352	30.039
L5	39.6997	46.5048	8556.3285	13.5920	19.8637	430.7510	17337.4413	22.8883	9.2575	24.336
	41.1119	48.1756	9512.0483	14.0804	20.5703	462.4166	19273.9886	23.7106	9.6231	25.297
L6	41.1119	50.8080	10021.0923	14.0728	20.5703	487.1632	20305.4499	25.0061	9.5668	23.834
	45.5004	56.2869	13625.1654	15.5904	22.7661	598.4848	27608.2791	27.7027	10.7028	26.664
L7	45.5004	65.8857	15898.0688	15.5656	22.7661	698.3220	32213.7975	32.4270	10.5174	22.349
	46.6537	67.5738	17151.6341	15.9644	23.3432	734.7608	34753.8607	33.2578	10.8159	22.983
L8	46.6537	70.4140	17856.5130	15.9573	23.3432	764.9572	36182.1365	34.6556	10.7623	21.937
	51.3000	77.5039	23811.6328	17.5640	25.6679	927.6801	48248.8237	38.1450	11.9651	24.389

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 151.50-141.00				1	1	1			
L2 141.00-120.33				1	1	1			
L3 120.33-111.19				1	1	1			
L4 111.19-82.08				1	1	1			
L5 82.08-70.06				1	1	1			
L6 70.06-42.24				1	1	1			
L7 42.24-32.71				1	1	1			
L8 32.71-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
***									
***									
1 5/8 Fiber	A	Surface Ar (CaAa)	142.00 - 5.00	1	1	0.000 0.100	1.9800		1.04
***									
1 5/8 Coax	B	Surface Ar (CaAa)	117.50 - 5.00	18	6	-0.250 0.250	1.9800		1.04
1 5/8 Fiber	B	Surface Ar (CaAa)	117.50 - 5.00	2	2	0.250 0.300	1.9800		1.04
***									
***									
4" Wrap Seams	A	Surface Af (CaAa)	141.00 - 0.00	1	1	0.000 0.000	4.0000	8.5000	0.00
4" Wrap Seams	B	Surface Af (CaAa)	141.00 - 0.00	1	1	0.000 0.000	4.0000	8.5000	0.00
4" Wrap Seams	C	Surface Af (CaAa)	141.00 - 0.00	1	1	0.000 0.000	4.0000	8.5000	0.00
***									

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
***								
1 1/4 Coax	C	No	Inside Pole	151.50 - 5.00	12	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
						1" Ice	0.00	0.66
0.78 8 AWG 6	C	No	Inside Pole	151.50 - 5.00	2	No Ice	0.00	0.54
						1/2" Ice	0.00	0.54
						1" Ice	0.00	0.54
0.78 8 AWG 6	C	No	Inside Pole	151.50 - 5.00	2	No Ice	0.00	0.54
						1/2" Ice	0.00	0.54
						1" Ice	0.00	0.54
0.39 Fiber Trunk	C	No	Inside Pole	151.50 - 5.00	1	No Ice	0.00	0.25
						1/2" Ice	0.00	0.25
						1" Ice	0.00	0.25
0.39 Fiber Trunk	C	No	Inside Pole	151.50 - 5.00	1	No Ice	0.00	0.25
						1/2" Ice	0.00	0.25
						1" Ice	0.00	0.25
3 Conduit	C	No	Inside Pole	151.50 - 5.00	1	No Ice	0.00	1.78
						1/2" Ice	0.00	1.78
						1" Ice	0.00	1.78
1 5/8 Coax	C	No	Inside Pole	142.00 - 5.00	6	No Ice	0.00	1.04
						1/2" Ice	0.00	1.04
						1" Ice	0.00	1.04
***								
1 1/4 Hybriflex	C	No	Inside Pole	128.00 - 5.00	4	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
						1" Ice	0.00	0.66
***								
***								

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C_AA_A ft^2/ft	Weight plf
***							
***							

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	151.50-141.00	A	0.000	0.000	0.198	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.14
L2	141.00-120.33	A	0.000	0.000	17.873	0.000	0.02
		B	0.000	0.000	13.780	0.000	0.00
		C	0.000	0.000	13.780	0.000	0.40
L3	120.33-111.19	A	0.000	0.000	7.903	0.000	0.01
		B	0.000	0.000	16.088	0.000	0.13
		C	0.000	0.000	6.093	0.000	0.19
L4	111.19-82.08	A	0.000	0.000	25.170	0.000	0.03
		B	0.000	0.000	65.517	0.000	0.61
		C	0.000	0.000	19.407	0.000	0.62
L5	82.08-70.06	A	0.000	0.000	10.393	0.000	0.01
		B	0.000	0.000	27.053	0.000	0.25
		C	0.000	0.000	8.013	0.000	0.26
L6	70.06-42.24	A	0.000	0.000	24.055	0.000	0.03
		B	0.000	0.000	62.614	0.000	0.58
		C	0.000	0.000	18.547	0.000	0.59
L7	42.24-32.71	A	0.000	0.000	8.240	0.000	0.01
		B	0.000	0.000	21.449	0.000	0.20
		C	0.000	0.000	6.353	0.000	0.20
L8	32.71-0.00	A	0.000	0.000	27.293	0.000	0.03
		B	0.000	0.000	65.699	0.000	0.58
		C	0.000	0.000	21.807	0.000	0.59

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	151.50-141.00	A	2.321	0.000	0.000	0.662	0.000	0.01
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.14
L2	141.00-120.33	A	2.295	0.000	0.000	36.846	0.000	0.59
		B		0.000	0.000	23.267	0.000	0.32
		C		0.000	0.000	23.267	0.000	0.72
L3	120.33-111.19	A	2.267	0.000	0.000	16.193	0.000	0.25
		B		0.000	0.000	29.885	0.000	0.63
		C		0.000	0.000	10.238	0.000	0.33
L4	111.19-82.08	A	2.226	0.000	0.000	51.090	0.000	0.79
		B		0.000	0.000	122.404	0.000	2.67
		C		0.000	0.000	32.367	0.000	1.04
L5	82.08-70.06	A	2.174	0.000	0.000	20.846	0.000	0.32
		B		0.000	0.000	50.106	0.000	1.08
		C		0.000	0.000	13.240	0.000	0.43
L6	70.06-42.24	A	2.108	0.000	0.000	47.516	0.000	0.70
		B		0.000	0.000	114.687	0.000	2.43

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
		C		0.000	0.000	30.277	0.000	0.97
L7	42.24-32.71	A	2.025	0.000	0.000	15.961	0.000	0.23
		B		0.000	0.000	38.735	0.000	0.80
		C		0.000	0.000	10.214	0.000	0.32
L8	32.71-0.00	A	1.861	0.000	0.000	49.787	0.000	0.64
		B		0.000	0.000	114.640	0.000	2.23
		C		0.000	0.000	33.984	0.000	0.96

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	151.50-141.00	-0.0246	-0.0179	-0.0643	-0.0467
L2	141.00-120.33	-0.1341	-0.0974	-0.3043	-0.2211
L3	120.33-111.19	0.6427	-0.3963	0.6504	-0.4670
L4	111.19-82.08	0.9418	-0.5161	0.9641	-0.5633
L5	82.08-70.06	0.9776	-0.5356	1.0204	-0.5951
L6	70.06-42.24	1.0056	-0.5508	1.0661	-0.6203
L7	42.24-32.71	1.0306	-0.5644	1.1084	-0.6429
L8	32.71-0.00	0.9199	-0.5037	1.0323	-0.5949

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	13	1 5/8 Fiber	141.00 - 142.00	1.0000	1.0000
L2	13	1 5/8 Fiber	120.33 - 141.00	1.0000	1.0000
L2	27	4" Wrap Seams	120.33 - 141.00	1.0000	1.0000
L2	28	4" Wrap Seams	120.33 - 141.00	1.0000	1.0000
L2	29	4" Wrap Seams	120.33 - 141.00	1.0000	1.0000
L3	13	1 5/8 Fiber	111.19 - 120.33	1.0000	1.0000
L3	18	1 5/8 Coax	111.19 - 117.50	1.0000	1.0000
L3	19	1 5/8 Fiber	111.19 - 117.50	1.0000	1.0000
L3	27	4" Wrap Seams	111.19 - 120.33	1.0000	1.0000
L3	28	4" Wrap Seams	111.19 - 120.33	1.0000	1.0000
L3	29	4" Wrap Seams	111.19 - 120.33	1.0000	1.0000
L4	13	1 5/8 Fiber	82.08 - 111.19	1.0000	1.0000
L4	18	1 5/8 Coax	82.08 - 111.19	1.0000	1.0000
L4	19	1 5/8 Fiber	82.08 - 111.19	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L4	27	4" Wrap Seams	82.08 - 111.19	1.0000	1.0000
L4	28	4" Wrap Seams	82.08 - 111.19	1.0000	1.0000
L4	29	4" Wrap Seams	82.08 - 111.19	1.0000	1.0000
L5	13	1 5/8 Fiber	70.06 - 82.08	1.0000	1.0000
L5	18	1 5/8 Coax	70.06 - 82.08	1.0000	1.0000
L5	19	1 5/8 Fiber	70.06 - 82.08	1.0000	1.0000
L5	27	4" Wrap Seams	70.06 - 82.08	1.0000	1.0000
L5	28	4" Wrap Seams	70.06 - 82.08	1.0000	1.0000
L5	29	4" Wrap Seams	70.06 - 82.08	1.0000	1.0000
L6	13	1 5/8 Fiber	42.24 - 70.06	1.0000	1.0000
L6	18	1 5/8 Coax	42.24 - 70.06	1.0000	1.0000
L6	19	1 5/8 Fiber	42.24 - 70.06	1.0000	1.0000
L6	27	4" Wrap Seams	42.24 - 70.06	1.0000	1.0000
L6	28	4" Wrap Seams	42.24 - 70.06	1.0000	1.0000
L6	29	4" Wrap Seams	42.24 - 70.06	1.0000	1.0000
L7	13	1 5/8 Fiber	32.71 - 42.24	1.0000	1.0000
L7	18	1 5/8 Coax	32.71 - 42.24	1.0000	1.0000
L7	19	1 5/8 Fiber	32.71 - 42.24	1.0000	1.0000
L7	27	4" Wrap Seams	32.71 - 42.24	1.0000	1.0000
L7	28	4" Wrap Seams	32.71 - 42.24	1.0000	1.0000
L7	29	4" Wrap Seams	32.71 - 42.24	1.0000	1.0000
L8	13	1 5/8 Fiber	5.00 - 32.71	1.0000	1.0000
L8	18	1 5/8 Coax	5.00 - 32.71	1.0000	1.0000
L8	19	1 5/8 Fiber	5.00 - 32.71	1.0000	1.0000
L8	27	4" Wrap Seams	0.00 - 32.71	1.0000	1.0000
L8	28	4" Wrap Seams	0.00 - 32.71	1.0000	1.0000
L8	29	4" Wrap Seams	0.00 - 32.71	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
AT&T OAA645075									
DC6-48-60-18-8F	B	From Leg	0.50	0.0000	151.50	No Ice	1.28	0.79	0.02
			0.00			1/2" Ice	1.27	1.27	0.04
			1.50			1" Ice	1.45	1.45	0.05
***									
AT&T OAA694673									
7020.00 Dual Band RET	A	From Leg	4.00	0.0000	151.50	No Ice	0.40	0.40	0.00
			0.00			1/2" Ice	0.54	0.54	0.01
			1.50			1" Ice	0.68	0.68	0.01
7020.00 Dual Band RET	B	From Leg	4.00	0.0000	151.50	No Ice	0.40	0.40	0.00
			0.00			1/2" Ice	0.54	0.54	0.01
			1.50			1" Ice	0.68	0.68	0.01
7020.00 Dual Band RET	C	From Leg	4.00	0.0000	151.50	No Ice	0.40	0.40	0.00
			0.00			1/2" Ice	0.54	0.54	0.01
			1.50			1" Ice	0.68	0.68	0.01
(2) TPX-070821	A	From Leg	4.00	0.0000	151.50	No Ice	0.55	0.18	0.01
			0.00			1/2" Ice	0.56	0.25	0.01
			1.50			1" Ice	0.66	0.32	0.02

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) TPX-070821	B	From Leg	4.00 0.00 1.50	0.0000	151.50	No Ice 1/2" Ice 1" Ice	0.55 0.56 0.66	0.18 0.25 0.32	0.01 0.01 0.02
(2) TPX-070821	C	From Leg	4.00 0.00 1.50	0.0000	151.50	No Ice 1/2" Ice 1" Ice	0.55 0.56 0.66	0.18 0.25 0.32	0.01 0.01 0.02
RRUS 11 (Band 12)	A	From Leg	4.00 0.00 1.50	0.0000	151.50	No Ice 1/2" Ice 1" Ice	2.52 2.72 2.92	1.07 1.21 1.36	0.06 0.07 0.10
RRUS 11 (Band 12)	B	From Leg	4.00 0.00 1.50	0.0000	151.50	No Ice 1/2" Ice 1" Ice	2.52 2.72 2.92	1.07 1.21 1.36	0.06 0.07 0.10
RRUS 11 (Band 12)	C	From Leg	4.00 0.00 1.50	0.0000	151.50	No Ice 1/2" Ice 1" Ice	2.52 2.72 2.92	1.07 1.21 1.36	0.06 0.07 0.10
RRUS-32	A	From Leg	4.00 0.00 1.50	0.0000	151.50	No Ice 1/2" Ice 1" Ice	2.69 3.56 3.81	2.42 2.64 2.86	0.08 0.10 0.14
RRUS-32	B	From Leg	4.00 0.00 1.50	0.0000	151.50	No Ice 1/2" Ice 1" Ice	2.69 3.56 3.81	2.42 2.64 2.86	0.08 0.10 0.14
RRUS-32	C	From Leg	4.00 0.00 1.50	0.0000	151.50	No Ice 1/2" Ice 1" Ice	2.69 3.56 3.81	2.42 2.64 2.86	0.08 0.10 0.14
RRUS 32 B2	A	From Leg	4.00 0.00 1.50	0.0000	151.50	No Ice 1/2" Ice 1" Ice	2.74 2.96 3.19	1.67 1.86 2.05	0.05 0.07 0.10
RRUS 32 B2	A	From Leg	4.00 0.00 1.50	0.0000	151.50	No Ice 1/2" Ice 1" Ice	2.74 2.96 3.19	1.67 1.86 2.05	0.05 0.07 0.10
RRUS 32 B2	C	From Leg	4.00 0.00 1.50	0.0000	151.50	No Ice 1/2" Ice 1" Ice	2.74 2.96 3.19	1.67 1.86 2.05	0.05 0.07 0.10
7770.00	A	From Leg	4.00 0.00 1.50	0.0000	151.50	No Ice 1/2" Ice 1" Ice	5.51 6.31 6.75	2.93 3.27 3.63	0.04 0.07 0.11
7770.00	B	From Leg	4.00 0.00 1.50	0.0000	151.50	No Ice 1/2" Ice 1" Ice	5.51 6.31 6.75	2.93 3.27 3.63	0.04 0.07 0.11
7770.00	C	From Leg	4.00 0.00 1.50	0.0000	151.50	No Ice 1/2" Ice 1" Ice	5.51 6.31 6.75	2.93 3.27 3.63	0.04 0.07 0.11
QS66512-2	A	From Leg	4.00 0.00 1.50	0.0000	151.50	No Ice 1/2" Ice 1" Ice	8.13 9.23 10.33	5.00 5.80 6.60	0.11 0.17 0.23
QS66512-2	B	From Leg	4.00 0.00 1.50	0.0000	151.50	No Ice 1/2" Ice 1" Ice	8.13 9.23 10.33	5.00 5.80 6.60	0.11 0.17 0.23
QS66512-2	C	From Leg	4.00 0.00 1.50	0.0000	151.50	No Ice 1/2" Ice 1" Ice	8.13 9.23 10.33	5.00 5.80 6.60	0.11 0.17 0.23
OPA-65R-LCUU-H6	A	From Leg	4.00 -3.00 1.50	0.0000	151.50	No Ice 1/2" Ice 1" Ice	9.66 10.13 10.61	5.52 5.97 6.43	0.07 0.13 0.20
OPA-65R-LCUU-H6	B	From Leg	4.00 -3.00 1.50	0.0000	151.50	No Ice 1/2" Ice 1" Ice	9.66 10.13 10.61	5.52 5.97 6.43	0.07 0.13 0.20

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
OPA-65R-LCUU-H6	C	From Leg	4.00	0.0000	151.50	No Ice	9.66	5.52	0.07
			-3.00			1/2" Ice	10.13	5.97	0.13
			1.50			1" Ice	10.61	6.43	0.20
(2) LGP21401	A	From Leg	4.00	0.0000	151.50	No Ice	1.10	0.36	0.01
			0.00			1/2" Ice	1.45	0.48	0.02
			1.50			1" Ice	1.61	0.60	0.03
(2) LGP21401	B	From Leg	4.00	0.0000	151.50	No Ice	1.10	0.36	0.01
			0.00			1/2" Ice	1.45	0.48	0.02
			1.50			1" Ice	1.61	0.60	0.03
(2) LGP21401	C	From Leg	4.00	0.0000	151.50	No Ice	1.10	0.36	0.01
			0.00			1/2" Ice	1.45	0.48	0.02
			1.50			1" Ice	1.61	0.60	0.03
DC6-48-60-18-8F	B	From Leg	0.50	0.0000	151.50	No Ice	1.28	0.79	0.02
			0.00			1/2" Ice	1.27	1.27	0.04
			1.50			1" Ice	1.45	1.45	0.05
DC6-48-60-18-8F	C	From Leg	0.50	0.0000	151.50	No Ice	1.28	0.79	0.02
			0.00			1/2" Ice	1.27	1.27	0.04
			1.50			1" Ice	1.45	1.45	0.05
Flat Platform w/ Handrails	C	None		0.0000	153.00	No Ice	42.40	42.40	2.00
						1/2" Ice	48.40	48.40	2.45
						1" Ice	54.40	54.40	2.90
***									
KRY 112 144/1	A	From Leg	4.00	0.0000	142.00	No Ice	0.41	0.16	0.01
			0.00			1/2" Ice	0.43	0.21	0.01
			0.00			1" Ice	0.51	0.28	0.02
KRY 112 144/1	B	From Leg	4.00	0.0000	142.00	No Ice	0.41	0.16	0.01
			0.00			1/2" Ice	0.43	0.21	0.01
			0.00			1" Ice	0.51	0.28	0.02
KRY 112 144/1	C	From Leg	4.00	0.0000	142.00	No Ice	0.41	0.16	0.01
			0.00			1/2" Ice	0.43	0.21	0.01
			0.00			1" Ice	0.51	0.28	0.02
RRUS 11 B12	C	From Leg	4.00	0.0000	142.00	No Ice	2.79	1.19	0.05
			0.00			1/2" Ice	3.00	1.34	0.07
			0.00			1" Ice	3.21	1.50	0.10
RRUS 11 B12	B	From Leg	4.00	0.0000	142.00	No Ice	2.79	1.19	0.05
			0.00			1/2" Ice	3.00	1.34	0.07
			0.00			1" Ice	3.21	1.50	0.10
RRUS 11 B12	C	From Leg	4.00	0.0000	142.00	No Ice	2.79	1.19	0.05
			0.00			1/2" Ice	3.00	1.34	0.07
			0.00			1" Ice	3.21	1.50	0.10
AIR 21, 1.3 M, B2A B4P	A	From Leg	4.00	0.0000	142.00	No Ice	6.05	4.36	0.08
			0.00			1/2" Ice	6.42	4.70	0.12
			0.00			1" Ice	6.80	5.06	0.17
AIR 21, 1.3 M, B2A B4P	B	From Leg	4.00	0.0000	142.00	No Ice	6.05	4.36	0.08
			0.00			1/2" Ice	6.42	4.70	0.12
			0.00			1" Ice	6.80	5.06	0.17
AIR 21, 1.3 M, B2A B4P	C	From Leg	4.00	0.0000	142.00	No Ice	6.05	4.36	0.08
			0.00			1/2" Ice	6.42	4.70	0.12
			0.00			1" Ice	6.80	5.06	0.17
AIR 21 B4A/B12P-B5P 6ft	A	From Leg	4.00	0.0000	142.00	No Ice	10.61	8.90	0.13
			2.00			1/2" Ice	12.16	9.50	0.20
			0.00			1" Ice	12.79	10.11	0.28
AIR 21 B4A/B12P-B5P 6ft	B	From Leg	4.00	0.0000	142.00	No Ice	10.61	8.90	0.13
			2.00			1/2" Ice	12.16	9.50	0.20
			0.00			1" Ice	12.79	10.11	0.28
AIR 21 B4A/B12P-B5P 6ft	C	From Leg	4.00	0.0000	142.00	No Ice	10.61	8.90	0.13
			2.00			1/2" Ice	12.16	9.50	0.20

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1" Ice	12.79	10.11	0.28
(3) T-Arms	C	None		0.0000	142.00	No Ice	17.20	17.20	0.33
						1/2" Ice	24.50	24.50	0.45
						1" Ice	31.80	31.80	0.57
***									
***									
***									
800 MHz 2X50W RRH w/	A	From Leg	1.00	0.0000	128.00	No Ice	2.06	1.93	0.06
Filter			0.00			1/2" Ice	2.24	2.11	0.09
			-4.00			1" Ice	2.43	2.29	0.11
800 MHz 2X50W RRH w/	B	From Leg	1.00	0.0000	128.00	No Ice	2.06	1.93	0.06
Filter			0.00			1/2" Ice	2.24	2.11	0.09
			-4.00			1" Ice	2.43	2.29	0.11
800 MHz 2X50W RRH w/	C	From Leg	1.00	0.0000	128.00	No Ice	2.06	1.93	0.06
Filter			0.00			1/2" Ice	2.24	2.11	0.09
			-4.00			1" Ice	2.43	2.29	0.11
4x40W RRH	A	From Leg	1.00	0.0000	128.00	No Ice	3.26	3.80	0.09
			0.00			1/2" Ice	3.14	4.06	0.12
			4.00			1" Ice	3.39	4.34	0.15
4x40W RRH	C	From Leg	1.00	0.0000	128.00	No Ice	3.26	3.80	0.09
			0.00			1/2" Ice	3.14	4.06	0.12
			4.00			1" Ice	3.39	4.34	0.15
4x40W RRH	B	From Leg	1.00	0.0000	128.00	No Ice	3.26	3.80	0.09
			0.00			1/2" Ice	3.14	4.06	0.12
			4.00			1" Ice	3.39	4.34	0.15
4x40W RRH	A	From Face	1.00	0.0000	128.00	No Ice	3.26	3.80	0.09
			0.00			1/2" Ice	3.14	4.06	0.12
			4.00			1" Ice	3.39	4.34	0.15
4x40W RRH	B	From Face	1.00	0.0000	128.00	No Ice	3.26	3.80	0.09
			0.00			1/2" Ice	3.14	4.06	0.12
			4.00			1" Ice	3.39	4.34	0.15
4x40W RRH	C	From Face	1.00	0.0000	128.00	No Ice	3.26	3.80	0.09
			0.00			1/2" Ice	3.14	4.06	0.12
			4.00			1" Ice	3.39	4.34	0.15
TD-RRH8x20	A	From Face	1.00	0.0000	128.00	No Ice	3.69	1.40	0.07
			0.00			1/2" Ice	4.59	1.61	0.09
			-4.00			1" Ice	4.88	1.82	0.12
TD-RRH8x20	B	From Face	1.00	0.0000	128.00	No Ice	3.69	1.40	0.07
			0.00			1/2" Ice	4.59	1.61	0.09
			-4.00			1" Ice	4.88	1.82	0.12
TD-RRH8x20	C	From Face	1.00	0.0000	128.00	No Ice	3.69	1.40	0.07
			0.00			1/2" Ice	4.59	1.61	0.09
			-4.00			1" Ice	4.88	1.82	0.12
APXVTM14-C-I20	A	From Leg	1.00	0.0000	128.00	No Ice	6.34	3.61	0.05
			0.00			1/2" Ice	6.72	3.97	0.09
			0.00			1" Ice	7.10	4.33	0.14
APXVTM14-C-I20	B	From Leg	1.00	0.0000	128.00	No Ice	6.34	3.61	0.05
			0.00			1/2" Ice	6.72	3.97	0.09
			0.00			1" Ice	7.10	4.33	0.14
APXVTM14-C-I20	C	From Leg	1.00	0.0000	128.00	No Ice	6.24	3.61	0.05
			0.00			1/2" Ice	6.72	3.97	0.09
			0.00			1" Ice	7.10	4.33	0.14
APXVSPP18-C-A20	A	From Leg	1.00	0.0000	128.00	No Ice	8.02	5.28	0.06
			0.00			1/2" Ice	8.48	5.74	0.11
			4.00			1" Ice	8.94	6.20	0.16
APXVSPP18-C-A20	B	From Leg	1.00	0.0000	128.00	No Ice	8.02	5.28	0.06
			0.00			1/2" Ice	8.48	5.74	0.11

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			4.00				1" Ice	8.94	6.20	0.16
APXV9ERR18-C-A20	C	From Leg	1.00		0.0000	128.00	No Ice	8.02	5.81	0.06
			0.00				1/2" Ice	8.48	6.27	0.11
			4.00				1" Ice	8.94	6.73	0.17
Flush Mount	C	None			0.0000	128.00	No Ice	0.00	0.00	0.00
							1/2" Ice	0.00	0.00	0.00
							1" Ice	0.00	0.00	0.00
***										
RRH2X60-AWS	A	From Leg	4.00		0.0000	117.50	No Ice	1.88	1.49	0.04
			0.00				1/2" Ice	2.40	1.67	0.06
			1.00				1" Ice	2.61	1.86	0.08
RRH2X60-AWS	B	From Leg	4.00		0.0000	117.50	No Ice	1.88	1.49	0.04
			0.00				1/2" Ice	2.40	1.67	0.06
			1.00				1" Ice	2.61	1.86	0.08
RRH2X60-AWS	C	From Leg	4.00		0.0000	117.50	No Ice	1.88	1.49	0.04
			0.00				1/2" Ice	2.40	1.67	0.06
			1.00				1" Ice	2.61	1.86	0.08
RRH2X60-1900	A	From Leg	4.00		0.0000	117.50	No Ice	1.88	1.22	0.04
			0.00				1/2" Ice	2.05	1.37	0.06
			1.00				1" Ice	2.24	1.52	0.08
RRH2X60-1900	B	From Leg	4.00		0.0000	117.50	No Ice	1.88	1.22	0.04
			0.00				1/2" Ice	2.05	1.37	0.06
			1.00				1" Ice	2.24	1.52	0.08
RRH2X60-1900	C	From Leg	4.00		0.0000	117.50	No Ice	1.88	1.22	0.04
			0.00				1/2" Ice	2.05	1.37	0.06
			1.00				1" Ice	2.24	1.52	0.08
RRH2x60 700	A	From Leg	4.00		0.0000	117.50	No Ice	2.15	1.61	0.06
			0.00				1/2" Ice	2.34	1.79	0.08
			1.00				1" Ice	2.54	1.97	0.10
RRH2x60 700	B	From Leg	4.00		0.0000	117.50	No Ice	2.15	1.61	0.06
			0.00				1/2" Ice	2.34	1.79	0.08
			1.00				1" Ice	2.54	1.97	0.10
RRH2x60 700	C	From Leg	4.00		0.0000	117.50	No Ice	2.15	1.61	0.06
			0.00				1/2" Ice	2.34	1.79	0.08
			1.00				1" Ice	2.54	1.97	0.10
DB-T1-6Z-8AB-0Z	B	From Leg	0.50		0.0000	117.50	No Ice	4.80	2.00	0.04
			0.00				1/2" Ice	5.07	2.19	0.08
			1.00				1" Ice	5.35	2.39	0.12
DB-T1-6Z-8AB-0Z	C	From Leg	0.50		0.0000	117.50	No Ice	4.80	2.00	0.04
			0.00				1/2" Ice	5.07	2.19	0.08
			1.00				1" Ice	5.35	2.39	0.12
(2) SBNHH-1D65B	A	From Leg	4.00		0.0000	117.50	No Ice	8.17	5.41	0.05
			2.00				1/2" Ice	8.63	5.86	0.10
			1.00				1" Ice	9.10	6.33	0.16
(2) SBNHH-1D65B	B	From Leg	4.00		0.0000	117.50	No Ice	8.17	5.41	0.05
			2.00				1/2" Ice	8.63	5.86	0.10
			1.00				1" Ice	9.10	6.33	0.16
(2) SBNHH-1D65B	C	From Leg	4.00		0.0000	117.50	No Ice	8.17	5.41	0.05
			2.00				1/2" Ice	8.63	5.86	0.10
			1.00				1" Ice	9.10	6.33	0.16
LNX-6514DS-A1M	A	From Leg	4.00		0.0000	117.50	No Ice	8.17	5.41	0.04
			0.00				1/2" Ice	8.63	5.86	0.09
			1.00				1" Ice	9.10	6.33	0.15
LNX-6514DS-A1M	B	From Leg	4.00		0.0000	117.50	No Ice	8.17	5.41	0.04
			0.00				1/2" Ice	8.63	5.86	0.09
			1.00				1" Ice	9.10	6.33	0.15
LNX-6514DS-A1M	C	From Leg	4.00		0.0000	117.50	No Ice	8.17	5.41	0.04

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
			0.00			1/2" Ice	8.63	5.86	0.09
			1.00			1" Ice	9.10	6.33	0.15
(2) LPA-80063-6CF-EDIN-X	A	From Leg	4.00	0.0000	117.50	No Ice	9.73	9.06	0.03
			-2.00			1/2" Ice	11.07	9.61	0.10
			1.00			1" Ice	11.64	10.16	0.18
(2) LPA-80063-6CF-EDIN-X	B	From Leg	4.00	0.0000	117.50	No Ice	9.73	9.06	0.03
			-2.00			1/2" Ice	11.07	9.61	0.10
			1.00			1" Ice	11.64	10.16	0.18
(2) LPA-80063-6CF-EDIN-X	C	From Leg	4.00	0.0000	117.50	No Ice	9.73	9.06	0.03
			-2.00			1/2" Ice	11.07	9.61	0.10
			1.00			1" Ice	11.64	10.16	0.18
Round Low Profile Platform	C	None		0.0000	117.50	No Ice	21.70	21.70	1.50
						1/2" Ice	27.20	27.20	1.70
						1" Ice	32.70	32.70	1.90
***									
***									

Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	24.47					
Bracing Weight	0.00					
Total Member Self-Weight	24.47			-2.06	-3.39	
Total Weight	38.34			-2.06	-3.39	
Wind 90 deg - No Ice		20.90	-0.01	-4.25	-2153.73	0.02
Member Ice	15.96					
Total Weight Ice	87.71			-7.03	-10.43	
Wind 90 deg - Ice		9.21	-0.01	-8.03	-939.10	0.02
Total Weight	38.34			-2.06	-3.39	
Wind 90 deg - Service		7.15	-0.00	-0.64	-735.75	0.01

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 90 deg - No Ice
3	0.9 Dead+1.6 Wind 90 deg - No Ice
4	1.2 Dead+1.0 Ice+1.0 Temp
5	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
6	Dead+Wind 90 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	151.5 - 141	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	4	-16.41	1.44	-0.15
			Max. Mx	2	-5.42	-68.54	0.10
			Max. My	5	-11.86	-17.05	1.23
			Max. Vy	2	8.72	-68.54	0.10
			Max. Vx	2	-0.04	-68.54	0.10
			Max. Torque	2			0.45
L2	141 - 120.33	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	4	-27.49	1.70	0.12
			Max. Mx	2	-9.50	-303.22	0.74
			Max. My	2	-9.50	-303.22	0.74
			Max. Vy	2	14.36	-303.22	0.74
			Max. Vx	2	-0.04	-124.89	0.33
			Max. Torque	2			0.13
L3	120.33 - 111.19	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	4	-41.22	1.05	0.12
			Max. Mx	2	-13.70	-481.46	1.01
			Max. My	2	-13.70	-481.46	1.01
			Max. Vy	2	21.35	-481.46	1.01
			Max. Vx	2	-0.03	-481.46	1.01
			Max. Torque	2			0.10
L4	111.19 - 82.08	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	4	-53.30	-2.31	2.22
			Max. Mx	2	-19.65	-1155.61	2.34
			Max. My	5	-53.18	-338.76	2.77
			Max. Vy	2	24.95	-1155.61	2.34
			Max. Vx	2	-0.03	-640.24	1.34
			Max. Torque	3			-0.02
L5	82.08 - 70.06	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	4	-58.90	-3.80	3.13
			Max. Mx	2	-22.73	-1464.67	2.91
			Max. My	5	-58.79	-430.36	3.79
			Max. Vy	2	26.42	-1464.67	2.91
			Max. Vx	2	-0.03	-1180.69	2.39
			Max. Torque	3			-0.02
L6	70.06 - 42.24	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	4	-72.54	-7.32	5.29
			Max. Mx	2	-30.71	-2243.84	4.25
			Max. My	5	-72.46	-659.42	6.18
			Max. Vy	2	29.54	-2243.84	4.25
			Max. Vx	2	-0.03	-1501.56	2.97
			Max. Torque	3			-0.02
L7	42.24 - 32.71	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	4	-77.69	-8.53	6.03
			Max. Mx	2	-33.97	-2530.20	4.72
			Max. My	5	-77.63	-742.61	7.00
			Max. Vy	2	30.50	-2530.20	4.72
			Max. Vx	2	-0.03	-2275.20	4.31
			Max. Torque	3			-0.02
L8	32.71 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	4	-95.38	-11.87	8.03
			Max. Mx	2	-45.99	-3577.43	6.22
			Max. My	5	-95.38	-1039.61	9.33
			Max. Vy	2	33.46	-3577.43	6.22
			Max. Vx	2	-0.02	-2580.24	4.80
			Max. Torque	3			-0.02

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	4	95.38	0.00	-0.00
	Max. H_x	4	95.38	0.00	-0.00
	Max. H_z	3	34.51	-33.43	0.02
	Max. M_x	5	9.33	-9.21	0.01
	Max. M_z	2	3577.43	-33.43	0.02
	Max. Torsion	4	0.00	0.00	-0.00
	Min. Vert	3	34.51	-33.43	0.02
	Min. H_x	3	34.51	-33.43	0.02
	Min. H_z	4	95.38	0.00	-0.00
	Min. M_x	1	2.06	-0.00	0.00
	Min. M_z	1	3.39	-0.00	0.00
	Min. Torsion	3	-0.02	-33.43	0.02

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	38.34	0.00	-0.00	-2.06	-3.39	0.00
1.2 Dead+1.6 Wind 90 deg - No Ice	46.01	33.43	-0.02	-6.22	-3577.43	0.02
0.9 Dead+1.6 Wind 90 deg - No Ice	34.51	33.43	-0.02	-5.52	-3540.89	0.02
1.2 Dead+1.0 Ice+1.0 Temp	95.38	-0.00	0.00	-8.03	-11.87	-0.00
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	95.38	9.21	-0.01	-9.33	-1039.61	0.01
Dead+Wind 90 deg - Service	38.34	7.15	-0.00	-2.91	-763.93	0.00

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-38.34	0.00	-0.00	38.34	0.00	0.000%
2	33.44	-46.01	-0.02	-33.43	46.01	0.02	0.012%
3	33.44	-34.51	-0.02	-33.43	34.51	0.02	0.010%
4	0.00	-95.38	0.00	0.00	95.38	-0.00	0.001%
5	9.21	-95.38	-0.01	-9.21	95.38	0.01	0.001%
6	7.15	-38.34	-0.00	-7.15	38.34	0.00	0.003%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance

1	Yes	6	0.00000001	0.00000001
2	Yes	15	0.00012928	0.00012676
3	Yes	15	0.00008911	0.00010987
4	Yes	11	0.00000001	0.00004732
5	Yes	19	0.00000001	0.00008316
6	Yes	15	0.00010704	0.00003561

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	151.5 - 141	20.812	6	1.1464	0.0000
L2	141 - 120.33	18.326	6	1.1027	0.0000
L3	120.33 - 111.19	13.663	6	1.0403	0.0000
L4	111.19 - 82.08	11.718	6	0.9888	0.0000
L5	82.08 - 70.06	6.385	6	0.7443	0.0000
L6	70.06 - 42.24	4.641	6	0.6389	0.0000
L7	42.24 - 32.71	1.673	6	0.3748	0.0000
L8	32.71 - 0	1.008	6	0.2913	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
153.00	Flat Platform w/ Handrails	6	20.812	1.1464	0.0007	31095
151.50	DC6-48-60-18-8F	6	20.812	1.1464	0.0007	31095
142.00	KRY 112 144/1	6	18.560	1.1062	0.0001	17149
128.00	800 MHz 2X50W RRH w/ Filter	6	15.354	1.0669	0.0000	15133
117.50	RRH2X60-AWS	6	13.051	1.0267	0.0000	11981

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	151.5 - 141	97.591	2	5.3906	0.0000
L2	141 - 120.33	85.923	2	5.1808	0.0000
L3	120.33 - 111.19	64.048	2	4.8844	0.0001
L4	111.19 - 82.08	54.928	2	4.6414	0.0001
L5	82.08 - 70.06	29.926	2	3.4912	0.0001
L6	70.06 - 42.24	21.751	2	2.9960	0.0000
L7	42.24 - 32.71	7.839	2	1.7566	0.0000
L8	32.71 - 0	4.721	2	1.3650	0.0000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
153.00	Flat Platform w/ Handrails	2	97.591	5.3906	0.0032	6595
151.50	DC6-48-60-18-8F	2	97.591	5.3906	0.0032	6595
142.00	KRY 112 144/1	2	87.023	5.1977	0.0004	3638
128.00	800 MHz 2X50W RRH w/ Filter	2	71.978	5.0101	0.0000	3235
117.50	RRH2X60-AWS	2	61.179	4.8201	0.0002	2574

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	151.5 - 150.45	TP17.7841x17.1872x0.24	10.50	0.00	0.0	13.1429	-3.68	968.76	0.004
	150.45 - 149.4					13.1891	-3.74	972.16	0.004
	149.4 - 148.35					13.2352	-3.81	975.57	0.004
	148.35 - 147.3					13.2813	-3.88	978.97	0.004
	147.3 - 146.25					13.3274	-3.95	982.37	0.004
	146.25 - 145.2					13.3736	-4.01	985.77	0.004
	145.2 - 144.15					13.4197	-4.08	989.17	0.004
	144.15 - 143.1					13.4658	-4.15	992.57	0.004
	143.1 - 142.05					13.5120	-4.22	995.97	0.004
	142.05 - 141					13.5581	-5.42	999.37	0.005
L2	141 - 139.967	TP31.557x28.783x0.3059	20.67	0.00	0.0	28.1865	-5.55	2029.49	0.003
	139.967 - 138.933					28.3231	-5.69	2035.95	0.003
	138.933 - 137.899					28.4597	-5.82	2042.37	0.003
	137.899 - 136.866					28.5964	-5.96	2048.77	0.003
	136.866 - 135.833					28.7330	-6.10	2055.13	0.003
	135.833 - 134.799					28.8696	-6.24	2061.46	0.003
	134.799 - 133.766					29.0062	-6.38	2067.75	0.003
	133.766 - 132.732					29.1428	-6.51	2074.01	0.003
	132.732 - 131.699					29.2795	-6.66	2080.25	0.003
	131.699 - 130.665					29.4161	-6.80	2086.44	0.003
	130.665 - 129.631					29.5527	-6.94	2092.61	0.003
	129.631 - 128.598					29.6893	-7.08	2098.74	0.003
	128.598 - 127.565					29.8259	-8.47	2104.84	0.004
	127.565 - 126.531					29.9626	-8.61	2110.91	0.004
	126.531 - 125.498					30.0992	-8.76	2116.94	0.004
	125.498 - 124.464					30.2358	-8.90	2122.95	0.004

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
	124.464 - 123.43					30.3724	-9.05	2128.91	0.004
	123.43 - 122.397					30.5090	-9.20	2134.85	0.004
	122.397 - 121.364					30.6457	-9.35	2140.76	0.004
	121.364 - 120.33					30.7823	-9.50	2146.63	0.004
L3	120.33 - 119.314	TP33.028x31.557x0.3063	9.14	0.00	0.0	30.9833	-9.67	2157.40	0.004
	119.314 - 118.299					31.1445	-9.84	2164.25	0.005
	118.299 - 117.283					31.3057	-12.64	2171.06	0.006
	117.283 - 116.268					31.4669	-12.82	2177.82	0.006
	116.268 - 115.252					31.6281	-12.99	2184.54	0.006
	115.252 - 114.237					31.7893	-13.17	2191.21	0.006
	114.237 - 113.221					31.9505	-13.34	2197.84	0.006
	113.221 - 112.206					32.1118	-13.52	2204.42	0.006
	112.206 - 111.19					32.2730	-13.70	2210.95	0.006
L4	111.19 - 109.735	TP38.347x33.028x0.3141	29.11	0.00	0.0	33.3559	-13.97	2301.21	0.006
	109.735 - 108.279					33.6249	-14.25	2312.28	0.006
	108.279 - 106.824					33.8939	-14.53	2323.22	0.006
	106.824 - 105.368					34.1628	-14.81	2334.05	0.006
	105.368 - 103.912					34.4318	-15.10	2344.76	0.006
	103.912 - 102.457					34.7008	-15.39	2355.35	0.007
	102.457 - 101.001					34.9698	-15.67	2365.82	0.007
	101.001 - 99.546					35.2388	-15.97	2376.16	0.007
	99.546 - 98.0905					35.5077	-16.26	2386.39	0.007
	98.0905 - 96.635					35.7767	-16.56	2396.50	0.007
	96.635 - 95.1795					36.0457	-16.86	2406.49	0.007
	95.1795 - 93.724					36.3147	-17.16	2416.36	0.007
	93.724 - 92.2685					36.5837	-17.46	2426.11	0.007
	92.2685 - 90.813					36.8527	-17.77	2435.74	0.007
	90.813 - 89.3575					37.1216	-18.07	2445.25	0.007
	89.3575 - 87.902					37.3906	-18.39	2454.64	0.007
	87.902 - 86.4465					37.6596	-18.70	2463.91	0.008

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
	86.4465 - 84.991					37.9286	-19.01	2473.06	0.008
	84.991 - 83.5355					38.1976	-19.33	2482.09	0.008
	83.5355 - 82.08					38.4666	-19.65	2491.00	0.008
L5	82.08 - 81.0783	TP39.711x38.347x0.3804	12.02	0.00	0.0	46.6441	-19.91	3277.98	0.006
	81.0783 - 80.0767					46.7833	-20.16	3284.09	0.006
	80.0767 - 79.075					46.9225	-20.41	3290.18	0.006
	79.075 - 78.0733					47.0617	-20.67	3296.24	0.006
	78.0733 - 77.0717					47.2010	-20.92	3302.28	0.006
	77.0717 - 76.07					47.3402	-21.18	3308.30	0.006
	76.07 - 75.0683					47.4794	-21.43	3314.30	0.006
	75.0683 - 74.0667					47.6187	-21.69	3320.27	0.007
	74.0667 - 73.065					47.7579	-21.95	3326.23	0.007
	73.065 - 72.0633					47.8971	-22.21	3332.16	0.007
	72.0633 - 71.0617					48.0364	-22.47	3338.07	0.007
	71.0617 - 70.06					48.1756	-22.73	3343.96	0.007
L6	70.06 - 68.669	TP43.95x39.711x0.4014	27.82	0.00	0.0	51.0819	-23.11	3611.99	0.006
	68.669 - 67.278					51.3559	-23.49	3624.22	0.006
	67.278 - 65.887					51.6298	-23.87	3636.39	0.007
	65.887 - 64.496					51.9038	-24.26	3648.47	0.007
	64.496 - 63.105					52.1777	-24.65	3660.48	0.007
	63.105 - 61.714					52.4517	-25.03	3672.41	0.007
	61.714 - 60.323					52.7256	-25.43	3684.27	0.007
	60.323 - 58.932					52.9995	-25.82	3696.05	0.007
	58.932 - 57.541					53.2735	-26.22	3707.75	0.007
	57.541 - 56.15					53.5474	-26.61	3719.38	0.007
	56.15 - 54.759					53.8214	-27.01	3730.93	0.007
	54.759 - 53.368					54.0953	-27.42	3742.41	0.007
	53.368 - 51.977					54.3693	-27.82	3753.81	0.007
	51.977 - 50.586					54.6432	-28.23	3765.13	0.007
	50.586 - 49.195					54.9172	-28.63	3776.38	0.008
	49.195 - 47.804					55.1911	-29.04	3787.55	0.008
	47.804 -					55.4651	-29.46	3798.65	0.008

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
	46.413								
	46.413 - 45.022					55.7390	-29.87	3809.67	0.008
	45.022 - 43.631					56.0130	-30.29	3820.61	0.008
	43.631 - 42.24					56.2869	-30.71	3831.48	0.008
L7	42.24 - 41.1811	TP45.064x43.95x0.4706	9.53	0.00	0.0	66.0733	-31.07	4772.92	0.007
	41.1811 - 40.1222					66.2609	-31.43	4781.89	0.007
	40.1222 - 39.0633					66.4484	-31.79	4790.82	0.007
	39.0633 - 38.0044					66.6360	-32.15	4799.74	0.007
	38.0044 - 36.9456					66.8235	-32.51	4808.62	0.007
	36.9456 - 35.8867					67.0111	-32.88	4817.48	0.007
	35.8867 - 34.8278					67.1987	-33.24	4826.32	0.007
	34.8278 - 33.7689					67.3862	-33.61	4835.13	0.007
	33.7689 - 32.71					67.5738	-33.97	4843.91	0.007
L8	32.71 - 31.0745	TP49.552x45.064x0.4906	32.71	0.00	0.0	70.7685	-34.54	5137.08	0.007
	31.0745 - 29.439					71.1230	-35.12	5154.25	0.007
	29.439 - 27.8035					71.4775	-35.70	5171.34	0.007
	27.8035 - 26.168					71.8320	-36.28	5188.34	0.007
	26.168 - 24.5325					72.1865	-36.87	5205.26	0.007
	24.5325 - 22.897					72.5410	-37.45	5222.10	0.007
	22.897 - 21.2615					72.8955	-38.05	5238.84	0.007
	21.2615 - 19.626					73.2500	-38.64	5255.51	0.007
	19.626 - 17.9905					73.6045	-39.24	5272.08	0.007
	17.9905 - 16.355					73.9589	-39.84	5288.58	0.008
	16.355 - 14.7195					74.3134	-40.44	5304.98	0.008
	14.7195 - 13.084					74.6679	-41.04	5321.30	0.008
	13.084 - 11.4485					75.0224	-41.65	5337.54	0.008
	11.4485 - 9.813					75.3769	-42.26	5353.69	0.008
	9.813 - 8.1775					75.7314	-42.88	5369.76	0.008
	8.1775 - 6.542					76.0859	-43.50	5385.74	0.008
	6.542 - 4.9065					76.4404	-44.12	5401.63	0.008
	4.9065 - 3.271					76.7949	-44.74	5417.44	0.008
	3.271 - 1.6355					77.1494	-45.36	5433.17	0.008
	1.6355 - 0					77.5039	-45.99	5448.80	0.008

Pole Bending Design Data

Section No.	Elevation	Size	M_{ux}	ϕM_{nx}	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy}	ϕM_{ny}	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	ft		kip-ft	kip-ft		kip-ft	kip-ft	
L1	151.5 - 150.45	TP17.7841x17.1872x0.24	12.64	333.61	0.038	0.00	333.61	0.000
	150.45 - 149.4		18.26	335.97	0.054	0.00	335.97	0.000
	149.4 - 148.35		23.96	338.34	0.071	0.00	338.34	0.000
	148.35 - 147.3		29.73	340.72	0.087	0.00	340.72	0.000
	147.3 - 146.25		35.59	343.10	0.104	0.00	343.10	0.000
	146.25 - 145.2		41.52	345.50	0.120	0.00	345.50	0.000
	145.2 - 144.15		47.54	347.90	0.137	0.00	347.90	0.000
	144.15 - 143.1		53.63	350.32	0.153	0.00	350.32	0.000
	143.1 - 142.05		59.80	352.74	0.170	0.00	352.74	0.000
	142.05 - 141		68.54	355.17	0.193	0.00	355.17	0.000
L2	141 - 139.967	TP31.557x28.783x0.3059	77.61	1179.91	0.066	0.00	1179.91	0.000
	139.967 - 138.933		86.81	1189.47	0.073	0.00	1189.47	0.000
	138.933 - 137.899		96.14	1199.03	0.080	0.00	1199.03	0.000
	137.899 - 136.866		105.60	1208.63	0.087	0.00	1208.63	0.000
	136.866 - 135.833		115.18	1218.22	0.095	0.00	1218.22	0.000
	135.833 - 134.799		124.90	1227.85	0.102	0.00	1227.85	0.000
	134.799 - 133.766		134.74	1237.49	0.109	0.00	1237.49	0.000
	133.766 - 132.732		144.71	1247.14	0.116	0.00	1247.14	0.000
	132.732 - 131.699		154.81	1256.82	0.123	0.00	1256.82	0.000
	131.699 - 130.665		165.04	1266.50	0.130	0.00	1266.50	0.000
	130.665 - 129.631		175.40	1276.20	0.137	0.00	1276.20	0.000
	129.631 - 128.598		185.89	1285.92	0.145	0.00	1285.92	0.000
	128.598 - 127.565		202.65	1295.65	0.156	0.00	1295.65	0.000
	127.565 - 126.531		216.62	1305.39	0.166	0.00	1305.39	0.000
	126.531 - 125.498		230.72	1315.16	0.175	0.00	1315.16	0.000
	125.498 - 124.464		244.96	1324.93	0.185	0.00	1324.93	0.000
	124.464 - 123.43		259.32	1334.72	0.194	0.00	1334.72	0.000
	123.43 - 122.397		273.82	1344.53	0.204	0.00	1344.53	0.000
	122.397 - 121.364		288.46	1354.33	0.213	0.00	1354.33	0.000
	121.364 - 120.33		303.23	1364.17	0.222	0.00	1364.17	0.000
L3	120.33 - 119.314	TP33.028x31.557x0.3063	317.89	1378.22	0.231	0.00	1378.22	0.000
	119.314 - 118.299		332.68	1389.85	0.239	0.00	1389.85	0.000
	118.299 - 117.283		353.57	1401.51	0.252	0.00	1401.51	0.000
	117.283 -		374.56	1413.18	0.265	0.00	1413.18	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	116.268							
	116.268 - 115.252		395.69	1424.88	0.278	0.00	1424.88	0.000
	115.252 - 114.237		416.94	1436.58	0.290	0.00	1436.58	0.000
	114.237 - 113.221		438.32	1448.30	0.303	0.00	1448.30	0.000
	113.221 - 112.206		459.82	1460.03	0.315	0.00	1460.03	0.000
	112.206 - 111.19		481.46	1471.78	0.327	0.00	1471.78	0.000
L4	111.19 - 109.735	TP38.347x33.028x0.3141	512.70	1543.70	0.332	0.00	1543.70	0.000
	109.735 - 108.279		544.20	1563.75	0.348	0.00	1563.75	0.000
	108.279 - 106.824		575.96	1583.84	0.364	0.00	1583.84	0.000
	106.824 - 105.368		607.97	1603.97	0.379	0.00	1603.97	0.000
	105.368 - 103.912		640.24	1624.13	0.394	0.00	1624.13	0.000
	103.912 - 102.457		672.76	1644.33	0.409	0.00	1644.33	0.000
	102.457 - 101.001		705.55	1664.55	0.424	0.00	1664.55	0.000
	101.001 - 99.546		738.59	1684.81	0.438	0.00	1684.81	0.000
	99.546 - 98.0905		771.90	1705.09	0.453	0.00	1705.09	0.000
	98.0905 - 96.635		805.46	1725.40	0.467	0.00	1725.40	0.000
	96.635 - 95.1795		839.29	1745.73	0.481	0.00	1745.73	0.000
	95.1795 - 93.724		873.38	1766.09	0.495	0.00	1766.09	0.000
	93.724 - 92.2685		907.73	1786.46	0.508	0.00	1786.46	0.000
	92.2685 - 90.813		942.34	1806.85	0.522	0.00	1806.85	0.000
	90.813 - 89.3575		977.23	1827.26	0.535	0.00	1827.26	0.000
	89.3575 - 87.902		1012.37	1847.68	0.548	0.00	1847.68	0.000
	87.902 - 86.4465		1047.78	1868.12	0.561	0.00	1868.12	0.000
	86.4465 - 84.991		1083.46	1888.56	0.574	0.00	1888.56	0.000
	84.991 - 83.5355		1119.40	1909.01	0.586	0.00	1909.01	0.000
	83.5355 - 82.08		1155.62	1929.46	0.599	0.00	1929.46	0.000
L5	82.08 - 81.0783	TP39.711x38.347x0.3804	1180.69	2537.84	0.465	0.00	2537.84	0.000
	81.0783 - 80.0767		1205.90	2550.23	0.473	0.00	2550.23	0.000
	80.0767 - 79.075		1231.22	2562.64	0.480	0.00	2562.64	0.000
	79.075 - 78.0733		1256.67	2575.06	0.488	0.00	2575.06	0.000
	78.0733 -		1282.24	2587.48	0.496	0.00	2587.48	0.000

Section No.	Elevation	Size	M_{ux}	ϕM_{nx}	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy}	ϕM_{ny}	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	ft		kip-ft	kip-ft		kip-ft	kip-ft	
	77.0717							
	77.0717 - 76.07		1307.93	2599.92	0.503	0.00	2599.92	0.000
	76.07 - 75.0683		1333.75	2612.37	0.511	0.00	2612.37	0.000
	75.0683 - 74.0667		1359.69	2624.82	0.518	0.00	2624.82	0.000
	74.0667 - 73.065		1385.75	2637.30	0.525	0.00	2637.30	0.000
	73.065 - 72.0633		1411.93	2649.78	0.533	0.00	2649.78	0.000
	72.0633 - 71.0617		1438.24	2662.27	0.540	0.00	2662.27	0.000
	71.0617 - 70.06		1464.68	2674.77	0.548	0.00	2674.77	0.000
L6	70.06 - 68.669	TP43.95x39.711x0.4014	1501.57	2901.79	0.517	0.00	2901.79	0.000
	68.669 - 67.278		1538.68	2927.40	0.526	0.00	2927.40	0.000
	67.278 - 65.887		1576.02	2953.04	0.534	0.00	2953.04	0.000
	65.887 - 64.496		1613.57	2978.73	0.542	0.00	2978.73	0.000
	64.496 - 63.105		1651.33	3004.47	0.550	0.00	3004.47	0.000
	63.105 - 61.714		1689.32	3030.24	0.557	0.00	3030.24	0.000
	61.714 - 60.323		1727.52	3056.06	0.565	0.00	3056.06	0.000
	60.323 - 58.932		1765.93	3081.92	0.573	0.00	3081.92	0.000
	58.932 - 57.541		1804.57	3107.81	0.581	0.00	3107.81	0.000
	57.541 - 56.15		1843.43	3133.74	0.588	0.00	3133.74	0.000
	56.15 - 54.759		1882.49	3159.72	0.596	0.00	3159.72	0.000
	54.759 - 53.368		1921.78	3185.72	0.603	0.00	3185.72	0.000
	53.368 - 51.977		1961.28	3211.76	0.611	0.00	3211.76	0.000
	51.977 - 50.586		2001.00	3237.83	0.618	0.00	3237.83	0.000
	50.586 - 49.195		2040.93	3263.94	0.625	0.00	3263.94	0.000
	49.195 - 47.804		2081.08	3290.07	0.633	0.00	3290.07	0.000
	47.804 - 46.413		2121.45	3316.25	0.640	0.00	3316.25	0.000
	46.413 - 45.022		2162.03	3342.45	0.647	0.00	3342.45	0.000
	45.022 - 43.631		2202.83	3368.68	0.654	0.00	3368.68	0.000
	43.631 - 42.24		2243.84	3394.93	0.661	0.00	3394.93	0.000
L7	42.24 - 41.1811	TP45.064x43.95x0.4706	2275.21	4227.81	0.538	0.00	4227.81	0.000
	41.1811 - 40.1222		2306.68	4247.90	0.543	0.00	4247.90	0.000
	40.1222 - 39.0633		2338.28	4268.02	0.548	0.00	4268.02	0.000
	39.0633 - 38.0044		2369.98	4288.15	0.553	0.00	4288.15	0.000
	38.0044 -		2401.80	4308.32	0.557	0.00	4308.32	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	36.9456							
	36.9456 - 35.8867		2433.73	4328.49	0.562	0.00	4328.49	0.000
	35.8867 - 34.8278		2465.78	4348.70	0.567	0.00	4348.70	0.000
	34.8278 - 33.7689		2497.93	4368.93	0.572	0.00	4368.93	0.000
	33.7689 - 32.71		2530.20	4389.17	0.576	0.00	4389.17	0.000
L8	32.71 - 31.0745	TP49.552x45.064x0.4906	2580.25	4674.31	0.552	0.00	4674.31	0.000
	31.0745 - 29.439		2630.54	4713.68	0.558	0.00	4713.68	0.000
	29.439 - 27.8035		2681.08	4753.13	0.564	0.00	4753.13	0.000
	27.8035 - 26.168		2731.88	4792.67	0.570	0.00	4792.67	0.000
	26.168 - 24.5325		2782.92	4832.28	0.576	0.00	4832.28	0.000
	24.5325 - 22.897		2834.20	4871.97	0.582	0.00	4871.97	0.000
	22.897 - 21.2615		2885.72	4911.73	0.588	0.00	4911.73	0.000
	21.2615 - 19.626		2937.50	4951.57	0.593	0.00	4951.57	0.000
	19.626 - 17.9905		2989.51	4991.48	0.599	0.00	4991.48	0.000
	17.9905 - 16.355		3041.77	5031.46	0.605	0.00	5031.46	0.000
	16.355 - 14.7195		3094.27	5071.51	0.610	0.00	5071.51	0.000
	14.7195 - 13.084		3147.01	5111.63	0.616	0.00	5111.63	0.000
	13.084 - 11.4485		3199.98	5151.82	0.621	0.00	5151.82	0.000
	11.4485 - 9.813		3253.20	5192.07	0.627	0.00	5192.07	0.000
	9.813 - 8.1775		3306.65	5232.39	0.632	0.00	5232.39	0.000
	8.1775 - 6.542		3360.34	5272.77	0.637	0.00	5272.77	0.000
	6.542 - 4.9065		3414.27	5313.23	0.643	0.00	5313.23	0.000
	4.9065 - 3.271		3468.43	5353.73	0.648	0.00	5353.73	0.000
	3.271 - 1.6355		3522.81	5394.31	0.653	0.00	5394.31	0.000
	1.6355 - 0		3577.43	5434.94	0.658	0.00	5434.94	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	151.5 - 150.45	TP17.7841x17.1872x0.24	5.31	484.38	0.011	0.45	676.45	0.001
	150.45 - 149.4		5.39	486.08	0.011	0.45	681.24	0.001
	149.4 - 148.35		5.47	487.78	0.011	0.45	686.04	0.001
	148.35 - 147.3		5.54	489.48	0.011	0.45	690.87	0.001
	147.3 - 146.25		5.62	491.18	0.011	0.45	695.71	0.001
	146.25 - 145.2		5.69	492.88	0.012	0.45	700.57	0.001
	145.2 - 144.15		5.77	494.58	0.012	0.45	705.44	0.001

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
	144.15 - 143.1		5.84	496.28	0.012	0.45	710.33	0.001
	143.1 - 142.05		5.92	497.98	0.012	0.45	715.24	0.001
	142.05 - 141		8.72	499.68	0.017	0.45	720.16	0.001
L2	141 - 139.967	TP31.557x28.783x0.3059	8.84	1014.74	0.009	0.13	2392.49	0.000
	139.967 - 138.933		8.97	1017.97	0.009	0.13	2411.87	0.000
	138.933 - 137.899		9.09	1021.19	0.009	0.13	2431.27	0.000
	137.899 - 136.866		9.21	1024.38	0.009	0.13	2450.71	0.000
	136.866 - 135.833		9.34	1027.56	0.009	0.13	2470.18	0.000
	135.833 - 134.799		9.46	1030.73	0.009	0.13	2489.70	0.000
	134.799 - 133.766		9.59	1033.88	0.009	0.13	2509.24	0.000
	133.766 - 132.732		9.71	1037.01	0.009	0.13	2528.82	0.000
	132.732 - 131.699		9.84	1040.12	0.009	0.13	2548.43	0.000
	131.699 - 130.665		9.97	1043.22	0.010	0.13	2568.07	0.000
	130.665 - 129.631		10.09	1046.30	0.010	0.13	2587.73	0.000
	129.631 - 128.598		10.22	1049.37	0.010	0.13	2607.44	0.000
	128.598 - 127.565		13.46	1052.42	0.013	0.13	2627.18	0.000
	127.565 - 126.531		13.59	1055.45	0.013	0.10	2646.93	0.000
	126.531 - 125.498		13.71	1058.47	0.013	0.10	2666.72	0.000
	125.498 - 124.464		13.84	1061.47	0.013	0.10	2686.55	0.000
	124.464 - 123.43		13.97	1064.46	0.013	0.10	2706.39	0.000
	123.43 - 122.397		14.10	1067.43	0.013	0.10	2726.27	0.000
	122.397 - 121.364		14.23	1070.38	0.013	0.10	2746.18	0.000
	121.364 - 120.33		14.36	1073.31	0.013	0.10	2766.10	0.000
L3	120.33 - 119.314	TP33.028x31.557x0.3063	14.48	1078.70	0.013	0.10	2794.58	0.000
	119.314 - 118.299		14.61	1082.13	0.014	0.10	2818.19	0.000
	118.299 - 117.283		20.59	1085.53	0.019	0.10	2841.82	0.000
	117.283 - 116.268		20.72	1088.91	0.019	0.02	2865.50	0.000
	116.268 - 115.252		20.85	1092.27	0.019	0.02	2889.20	0.000
	115.252 - 114.237		20.97	1095.60	0.019	0.02	2912.93	0.000
	114.237 - 113.221		21.10	1098.92	0.019	0.02	2936.70	0.000
	113.221 - 112.206		21.22	1102.21	0.019	0.02	2960.49	0.000
	112.206 - 111.19		21.35	1105.48	0.019	0.02	2984.32	0.000

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L4	111.19 - 109.735	TP38.347x33.028x0.3141	21.53	1150.60	0.019	0.02	3130.14	0.000
	109.735 - 108.279		21.70	1156.14	0.019	0.02	3170.80	0.000
	108.279 - 106.824		21.88	1161.61	0.019	0.02	3211.53	0.000
	106.824 - 105.368		22.05	1167.03	0.019	0.02	3252.35	0.000
	105.368 - 103.912		22.23	1172.38	0.019	0.02	3293.22	0.000
	103.912 - 102.457		22.41	1177.67	0.019	0.02	3334.18	0.000
	102.457 - 101.001		22.59	1182.91	0.019	0.02	3375.19	0.000
	101.001 - 99.546		22.77	1188.08	0.019	0.02	3416.27	0.000
	99.546 - 98.0905		22.94	1193.20	0.019	0.02	3457.39	0.000
	98.0905 - 96.635		23.12	1198.25	0.019	0.02	3498.57	0.000
	96.635 - 95.1795		23.30	1203.25	0.019	0.02	3539.80	0.000
	95.1795 - 93.724		23.49	1208.18	0.019	0.02	3581.07	0.000
	93.724 - 92.2685		23.67	1213.05	0.020	0.02	3622.38	0.000
	92.2685 - 90.813		23.85	1217.87	0.020	0.02	3663.73	0.000
	90.813 - 89.3575		24.03	1222.62	0.020	0.02	3705.12	0.000
	89.3575 - 87.902		24.21	1227.32	0.020	0.02	3746.52	0.000
	87.902 - 86.4465		24.40	1231.95	0.020	0.02	3787.95	0.000
	86.4465 - 84.991		24.58	1236.53	0.020	0.02	3829.40	0.000
	84.991 - 83.5355		24.77	1241.04	0.020	0.02	3870.87	0.000
	83.5355 - 82.08		24.95	1245.50	0.020	0.02	3912.34	0.000
L5	82.08 - 81.0783	TP39.711x38.347x0.3804	25.07	1638.99	0.015	0.02	5145.96	0.000
	81.0783 - 80.0767		25.19	1642.05	0.015	0.02	5171.08	0.000
	80.0767 - 79.075		25.32	1645.09	0.015	0.02	5196.23	0.000
	79.075 - 78.0733		25.44	1648.12	0.015	0.02	5221.41	0.000
	78.0733 - 77.0717		25.56	1651.14	0.015	0.02	5246.61	0.000
	77.0717 - 76.07		25.69	1654.15	0.016	0.02	5271.82	0.000
	76.07 - 75.0683		25.81	1657.15	0.016	0.02	5297.07	0.000
	75.0683 - 74.0667		25.93	1660.14	0.016	0.02	5322.33	0.000
	74.0667 - 73.065		26.05	1663.11	0.016	0.02	5347.62	0.000
	73.065 - 72.0633		26.18	1666.08	0.016	0.02	5372.92	0.000

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
	72.0633 - 71.0617		26.30	1669.03	0.016	0.02	5398.25	0.000
	71.0617 - 70.06		26.42	1671.98	0.016	0.02	5423.59	0.000
L6	70.06 - 68.669	TP43.95x39.711x0.4014	26.58	1805.99	0.015	0.02	5883.93	0.000
	68.669 - 67.278		26.73	1812.11	0.015	0.02	5935.85	0.000
	67.278 - 65.887		26.89	1818.19	0.015	0.02	5987.85	0.000
	65.887 - 64.496		27.05	1824.24	0.015	0.02	6039.94	0.000
	64.496 - 63.105		27.20	1830.24	0.015	0.02	6092.12	0.000
	63.105 - 61.714		27.36	1836.21	0.015	0.02	6144.39	0.000
	61.714 - 60.323		27.52	1842.13	0.015	0.02	6196.73	0.000
	60.323 - 58.932		27.67	1848.02	0.015	0.02	6249.17	0.000
	58.932 - 57.541		27.83	1853.88	0.015	0.02	6301.67	0.000
	57.541 - 56.15		27.98	1859.69	0.015	0.02	6354.26	0.000
	56.15 - 54.759		28.14	1865.47	0.015	0.02	6406.92	0.000
	54.759 - 53.368		28.30	1871.20	0.015	0.02	6459.64	0.000
	53.368 - 51.977		28.45	1876.90	0.015	0.02	6512.44	0.000
	51.977 - 50.586		28.61	1882.57	0.015	0.02	6565.32	0.000
	50.586 - 49.195		28.76	1888.19	0.015	0.02	6618.25	0.000
	49.195 - 47.804		28.92	1893.78	0.015	0.02	6671.25	0.000
	47.804 - 46.413		29.08	1899.32	0.015	0.02	6724.32	0.000
	46.413 - 45.022		29.23	1904.83	0.015	0.02	6777.43	0.000
	45.022 - 43.631		29.39	1910.31	0.015	0.02	6830.62	0.000
	43.631 - 42.24		29.54	1915.74	0.015	0.02	6883.86	0.000
L7	42.24 - 41.1811	TP45.064x43.95x0.4706	29.65	2386.46	0.012	0.02	8572.67	0.000
	41.1811 - 40.1222		29.75	2390.94	0.012	0.02	8613.42	0.000
	40.1222 - 39.0633		29.86	2395.41	0.012	0.02	8654.17	0.000
	39.0633 - 38.0044		29.97	2399.87	0.012	0.02	8695.00	0.000
	38.0044 - 36.9456		30.08	2404.31	0.013	0.02	8735.92	0.000
	36.9456 - 35.8867		30.18	2408.74	0.013	0.02	8776.83	0.000
	35.8867 - 34.8278		30.29	2413.16	0.013	0.02	8817.83	0.000
	34.8278 - 33.7689		30.39	2417.56	0.013	0.02	8858.83	0.000
	33.7689 - 32.71		30.50	2421.95	0.013	0.02	8899.83	0.000
L8	32.71 - 31.0745	TP49.552x45.064x0.4906	30.66	2568.54	0.012	0.02	9478.00	0.000

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
	31.0745 - 29.439		30.81	2577.13	0.012	0.02	9557.92	0.000
	29.439 - 27.8035		30.96	2585.67	0.012	0.02	9637.92	0.000
	27.8035 - 26.168		31.11	2594.17	0.012	0.02	9718.00	0.000
	26.168 - 24.5325		31.27	2602.63	0.012	0.02	9798.33	0.000
	24.5325 - 22.897		31.42	2611.05	0.012	0.02	9878.83	0.000
	22.897 - 21.2615		31.57	2619.42	0.012	0.02	9959.42	0.000
	21.2615 - 19.626		31.71	2627.75	0.012	0.02	10040.25	0.000
	19.626 - 17.9905		31.86	2636.04	0.012	0.02	10121.17	0.000
	17.9905 - 16.355		32.01	2644.29	0.012	0.02	10202.25	0.000
	16.355 - 14.7195		32.16	2652.49	0.012	0.02	10283.42	0.000
	14.7195 - 13.084		32.31	2660.65	0.012	0.02	10364.75	0.000
	13.084 - 11.4485		32.45	2668.77	0.012	0.02	10446.25	0.000
	11.4485 - 9.813		32.60	2676.85	0.012	0.02	10527.92	0.000
	9.813 - 8.1775		32.74	2684.88	0.012	0.02	10609.67	0.000
	8.1775 - 6.542		32.89	2692.87	0.012	0.02	10691.58	0.000
	6.542 - 4.9065		33.03	2700.82	0.012	0.02	10773.58	0.000
	4.9065 - 3.271		33.17	2708.72	0.012	0.02	10855.67	0.000
	3.271 - 1.6355		33.32	2716.58	0.012	0.02	10938.00	0.000
	1.6355 - 0		33.46	2724.40	0.012	0.02	11020.33	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	151.5 - 150.45	0.004	0.038	0.000	0.011	0.001	0.042 ✔	1.000	4.8.2 ✔
	150.45 - 149.4	0.004	0.054	0.000	0.011	0.001	0.058 ✔	1.000	4.8.2 ✔
	149.4 - 148.35	0.004	0.071	0.000	0.011	0.001	0.075 ✔	1.000	4.8.2 ✔
	148.35 - 147.3	0.004	0.087	0.000	0.011	0.001	0.091 ✔	1.000	4.8.2 ✔
	147.3 - 146.25	0.004	0.104	0.000	0.011	0.001	0.108 ✔	1.000	4.8.2 ✔
	146.25 - 145.2	0.004	0.120	0.000	0.012	0.001	0.124 ✔	1.000	4.8.2 ✔
	145.2 - 144.15	0.004	0.137	0.000	0.012	0.001	0.141 ✔	1.000	4.8.2 ✔

Section No.	Elevation ft	Ratio $P_u/\phi P_n$	Ratio $M_{ux}/\phi M_{nx}$	Ratio $M_{uy}/\phi M_{ny}$	Ratio $V_u/\phi V_n$	Ratio $T_u/\phi T_n$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	144.15 - 143.1	0.004	0.153	0.000	0.012	0.001	0.157 ✔	1.000	4.8.2 ✔
	143.1 - 142.05	0.004	0.170	0.000	0.012	0.001	0.174 ✔	1.000	4.8.2 ✔
	142.05 - 141	0.005	0.193	0.000	0.017	0.001	0.199 ✔	1.000	4.8.2 ✔
L2	141 - 139.967	0.003	0.066	0.000	0.009	0.000	0.069 ✔	1.000	4.8.2 ✔
	139.967 - 138.933	0.003	0.073	0.000	0.009	0.000	0.076 ✔	1.000	4.8.2 ✔
	138.933 - 137.899	0.003	0.080	0.000	0.009	0.000	0.083 ✔	1.000	4.8.2 ✔
	137.899 - 136.866	0.003	0.087	0.000	0.009	0.000	0.090 ✔	1.000	4.8.2 ✔
	136.866 - 135.833	0.003	0.095	0.000	0.009	0.000	0.098 ✔	1.000	4.8.2 ✔
	135.833 - 134.799	0.003	0.102	0.000	0.009	0.000	0.105 ✔	1.000	4.8.2 ✔
	134.799 - 133.766	0.003	0.109	0.000	0.009	0.000	0.112 ✔	1.000	4.8.2 ✔
	133.766 - 132.732	0.003	0.116	0.000	0.009	0.000	0.119 ✔	1.000	4.8.2 ✔
	132.732 - 131.699	0.003	0.123	0.000	0.009	0.000	0.126 ✔	1.000	4.8.2 ✔
	131.699 - 130.665	0.003	0.130	0.000	0.010	0.000	0.134 ✔	1.000	4.8.2 ✔
	130.665 - 129.631	0.003	0.137	0.000	0.010	0.000	0.141 ✔	1.000	4.8.2 ✔
	129.631 - 128.598	0.003	0.145	0.000	0.010	0.000	0.148 ✔	1.000	4.8.2 ✔
	128.598 - 127.565	0.004	0.156	0.000	0.013	0.000	0.161 ✔	1.000	4.8.2 ✔
	127.565 - 126.531	0.004	0.166	0.000	0.013	0.000	0.170 ✔	1.000	4.8.2 ✔
	126.531 - 125.498	0.004	0.175	0.000	0.013	0.000	0.180 ✔	1.000	4.8.2 ✔
	125.498 - 124.464	0.004	0.185	0.000	0.013	0.000	0.189 ✔	1.000	4.8.2 ✔
	124.464 - 123.43	0.004	0.194	0.000	0.013	0.000	0.199 ✔	1.000	4.8.2 ✔
	123.43 - 122.397	0.004	0.204	0.000	0.013	0.000	0.208 ✔	1.000	4.8.2 ✔
	122.397 - 121.364	0.004	0.213	0.000	0.013	0.000	0.218 ✔	1.000	4.8.2 ✔
	121.364 - 120.33	0.004	0.222	0.000	0.013	0.000	0.227 ✔	1.000	4.8.2 ✔
L3	120.33 - 119.314	0.004	0.231	0.000	0.013	0.000	0.235 ✔	1.000	4.8.2 ✔
	119.314 - 118.299	0.005	0.239	0.000	0.014	0.000	0.244 ✔	1.000	4.8.2 ✔
	118.299 - 117.283	0.006	0.252	0.000	0.019	0.000	0.258 ✔	1.000	4.8.2 ✔

Section No.	Elevation ft	Ratio $P_u/\phi P_n$	Ratio $M_{ux}/\phi M_{nx}$	Ratio $M_{uy}/\phi M_{ny}$	Ratio $V_u/\phi V_n$	Ratio $T_u/\phi T_n$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	117.283 - 116.268	0.006	0.265	0.000	0.019	0.000	0.271 ✔	1.000	4.8.2 ✔
	116.268 - 115.252	0.006	0.278	0.000	0.019	0.000	0.284 ✔	1.000	4.8.2 ✔
	115.252 - 114.237	0.006	0.290	0.000	0.019	0.000	0.297 ✔	1.000	4.8.2 ✔
	114.237 - 113.221	0.006	0.303	0.000	0.019	0.000	0.309 ✔	1.000	4.8.2 ✔
	113.221 - 112.206	0.006	0.315	0.000	0.019	0.000	0.321 ✔	1.000	4.8.2 ✔
	112.206 - 111.19	0.006	0.327	0.000	0.019	0.000	0.334 ✔	1.000	4.8.2 ✔
L4	111.19 - 109.735	0.006	0.332	0.000	0.019	0.000	0.339 ✔	1.000	4.8.2 ✔
	109.735 - 108.279	0.006	0.348	0.000	0.019	0.000	0.355 ✔	1.000	4.8.2 ✔
	108.279 - 106.824	0.006	0.364	0.000	0.019	0.000	0.370 ✔	1.000	4.8.2 ✔
	106.824 - 105.368	0.006	0.379	0.000	0.019	0.000	0.386 ✔	1.000	4.8.2 ✔
	105.368 - 103.912	0.006	0.394	0.000	0.019	0.000	0.401 ✔	1.000	4.8.2 ✔
	103.912 - 102.457	0.007	0.409	0.000	0.019	0.000	0.416 ✔	1.000	4.8.2 ✔
	102.457 - 101.001	0.007	0.424	0.000	0.019	0.000	0.431 ✔	1.000	4.8.2 ✔
	101.001 - 99.546	0.007	0.438	0.000	0.019	0.000	0.445 ✔	1.000	4.8.2 ✔
	99.546 - 98.0905	0.007	0.453	0.000	0.019	0.000	0.460 ✔	1.000	4.8.2 ✔
	98.0905 - 96.635	0.007	0.467	0.000	0.019	0.000	0.474 ✔	1.000	4.8.2 ✔
	96.635 - 95.1795	0.007	0.481	0.000	0.019	0.000	0.488 ✔	1.000	4.8.2 ✔
	95.1795 - 93.724	0.007	0.495	0.000	0.019	0.000	0.502 ✔	1.000	4.8.2 ✔
	93.724 - 92.2685	0.007	0.508	0.000	0.020	0.000	0.516 ✔	1.000	4.8.2 ✔
	92.2685 - 90.813	0.007	0.522	0.000	0.020	0.000	0.529 ✔	1.000	4.8.2 ✔
	90.813 - 89.3575	0.007	0.535	0.000	0.020	0.000	0.543 ✔	1.000	4.8.2 ✔
	89.3575 - 87.902	0.007	0.548	0.000	0.020	0.000	0.556 ✔	1.000	4.8.2 ✔
	87.902 - 86.4465	0.008	0.561	0.000	0.020	0.000	0.569 ✔	1.000	4.8.2 ✔
	86.4465 - 84.991	0.008	0.574	0.000	0.020	0.000	0.582 ✔	1.000	4.8.2 ✔
	84.991 - 83.5355	0.008	0.586	0.000	0.020	0.000	0.595 ✔	1.000	4.8.2 ✔
	83.5355 - 82.08	0.008	0.599	0.000	0.020	0.000	0.607 ✔	1.000	4.8.2 ✔

Section No.	Elevation ft	Ratio $P_u/\phi P_n$	Ratio $M_{ux}/\phi M_{nx}$	Ratio $M_{uy}/\phi M_{ny}$	Ratio $V_u/\phi V_n$	Ratio $T_u/\phi T_n$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L5	82.08 - 81.0783	0.006	0.465	0.000	0.015	0.000	0.472 ✔	1.000	4.8.2 ✔
	81.0783 - 80.0767	0.006	0.473	0.000	0.015	0.000	0.479 ✔	1.000	4.8.2 ✔
	80.0767 - 79.075	0.006	0.480	0.000	0.015	0.000	0.487 ✔	1.000	4.8.2 ✔
	79.075 - 78.0733	0.006	0.488	0.000	0.015	0.000	0.495 ✔	1.000	4.8.2 ✔
	78.0733 - 77.0717	0.006	0.496	0.000	0.015	0.000	0.502 ✔	1.000	4.8.2 ✔
	77.0717 - 76.07	0.006	0.503	0.000	0.016	0.000	0.510 ✔	1.000	4.8.2 ✔
	76.07 - 75.0683	0.006	0.511	0.000	0.016	0.000	0.517 ✔	1.000	4.8.2 ✔
	75.0683 - 74.0667	0.007	0.518	0.000	0.016	0.000	0.525 ✔	1.000	4.8.2 ✔
	74.0667 - 73.065	0.007	0.525	0.000	0.016	0.000	0.532 ✔	1.000	4.8.2 ✔
	73.065 - 72.0633	0.007	0.533	0.000	0.016	0.000	0.540 ✔	1.000	4.8.2 ✔
	72.0633 - 71.0617	0.007	0.540	0.000	0.016	0.000	0.547 ✔	1.000	4.8.2 ✔
	71.0617 - 70.06	0.007	0.548	0.000	0.016	0.000	0.555 ✔	1.000	4.8.2 ✔
L6	70.06 - 68.669	0.006	0.517	0.000	0.015	0.000	0.524 ✔	1.000	4.8.2 ✔
	68.669 - 67.278	0.006	0.526	0.000	0.015	0.000	0.532 ✔	1.000	4.8.2 ✔
	67.278 - 65.887	0.007	0.534	0.000	0.015	0.000	0.540 ✔	1.000	4.8.2 ✔
	65.887 - 64.496	0.007	0.542	0.000	0.015	0.000	0.549 ✔	1.000	4.8.2 ✔
	64.496 - 63.105	0.007	0.550	0.000	0.015	0.000	0.557 ✔	1.000	4.8.2 ✔
	63.105 - 61.714	0.007	0.557	0.000	0.015	0.000	0.565 ✔	1.000	4.8.2 ✔
	61.714 - 60.323	0.007	0.565	0.000	0.015	0.000	0.572 ✔	1.000	4.8.2 ✔
	60.323 - 58.932	0.007	0.573	0.000	0.015	0.000	0.580 ✔	1.000	4.8.2 ✔
	58.932 - 57.541	0.007	0.581	0.000	0.015	0.000	0.588 ✔	1.000	4.8.2 ✔
	57.541 - 56.15	0.007	0.588	0.000	0.015	0.000	0.596 ✔	1.000	4.8.2 ✔
	56.15 - 54.759	0.007	0.596	0.000	0.015	0.000	0.603 ✔	1.000	4.8.2 ✔
	54.759 - 53.368	0.007	0.603	0.000	0.015	0.000	0.611 ✔	1.000	4.8.2 ✔
	53.368 - 51.977	0.007	0.611	0.000	0.015	0.000	0.618 ✔	1.000	4.8.2 ✔
	51.977 - 50.586	0.007	0.618	0.000	0.015	0.000	0.626 ✔	1.000	4.8.2 ✔

Section No.	Elevation ft	Ratio $P_u/\phi P_n$	Ratio $M_{ux}/\phi M_{nx}$	Ratio $M_{uy}/\phi M_{ny}$	Ratio $V_u/\phi V_n$	Ratio $T_u/\phi T_n$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	50.586 - 49.195	0.008	0.625	0.000	0.015	0.000	0.633 ✔	1.000	4.8.2 ✔
	49.195 - 47.804	0.008	0.633	0.000	0.015	0.000	0.640 ✔	1.000	4.8.2 ✔
	47.804 - 46.413	0.008	0.640	0.000	0.015	0.000	0.648 ✔	1.000	4.8.2 ✔
	46.413 - 45.022	0.008	0.647	0.000	0.015	0.000	0.655 ✔	1.000	4.8.2 ✔
	45.022 - 43.631	0.008	0.654	0.000	0.015	0.000	0.662 ✔	1.000	4.8.2 ✔
	43.631 - 42.24	0.008	0.661	0.000	0.015	0.000	0.669 ✔	1.000	4.8.2 ✔
L7	42.24 - 41.1811	0.007	0.538	0.000	0.012	0.000	0.545 ✔	1.000	4.8.2 ✔
	41.1811 - 40.1222	0.007	0.543	0.000	0.012	0.000	0.550 ✔	1.000	4.8.2 ✔
	40.1222 - 39.0633	0.007	0.548	0.000	0.012	0.000	0.555 ✔	1.000	4.8.2 ✔
	39.0633 - 38.0044	0.007	0.553	0.000	0.012	0.000	0.560 ✔	1.000	4.8.2 ✔
	38.0044 - 36.9456	0.007	0.557	0.000	0.013	0.000	0.564 ✔	1.000	4.8.2 ✔
	36.9456 - 35.8867	0.007	0.562	0.000	0.013	0.000	0.569 ✔	1.000	4.8.2 ✔
	35.8867 - 34.8278	0.007	0.567	0.000	0.013	0.000	0.574 ✔	1.000	4.8.2 ✔
	34.8278 - 33.7689	0.007	0.572	0.000	0.013	0.000	0.579 ✔	1.000	4.8.2 ✔
	33.7689 - 32.71	0.007	0.576	0.000	0.013	0.000	0.584 ✔	1.000	4.8.2 ✔
L8	32.71 - 31.0745	0.007	0.552	0.000	0.012	0.000	0.559 ✔	1.000	4.8.2 ✔
	31.0745 - 29.439	0.007	0.558	0.000	0.012	0.000	0.565 ✔	1.000	4.8.2 ✔
	29.439 - 27.8035	0.007	0.564	0.000	0.012	0.000	0.571 ✔	1.000	4.8.2 ✔
	27.8035 - 26.168	0.007	0.570	0.000	0.012	0.000	0.577 ✔	1.000	4.8.2 ✔
	26.168 - 24.5325	0.007	0.576	0.000	0.012	0.000	0.583 ✔	1.000	4.8.2 ✔
	24.5325 - 22.897	0.007	0.582	0.000	0.012	0.000	0.589 ✔	1.000	4.8.2 ✔
	22.897 - 21.2615	0.007	0.588	0.000	0.012	0.000	0.595 ✔	1.000	4.8.2 ✔
	21.2615 - 19.626	0.007	0.593	0.000	0.012	0.000	0.601 ✔	1.000	4.8.2 ✔
	19.626 - 17.9905	0.007	0.599	0.000	0.012	0.000	0.607 ✔	1.000	4.8.2 ✔
	17.9905 - 16.355	0.008	0.605	0.000	0.012	0.000	0.612 ✔	1.000	4.8.2 ✔
	16.355 - 14.7195	0.008	0.610	0.000	0.012	0.000	0.618 ✔	1.000	4.8.2 ✔

Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	14.7195 - 13.084	0.008	0.616	0.000	0.012	0.000	0.624 ✔	1.000	4.8.2 ✔
	13.084 - 11.4485	0.008	0.621	0.000	0.012	0.000	0.629 ✔	1.000	4.8.2 ✔
	11.4485 - 9.813	0.008	0.627	0.000	0.012	0.000	0.635 ✔	1.000	4.8.2 ✔
	9.813 - 8.1775	0.008	0.632	0.000	0.012	0.000	0.640 ✔	1.000	4.8.2 ✔
	8.1775 - 6.542	0.008	0.637	0.000	0.012	0.000	0.646 ✔	1.000	4.8.2 ✔
	6.542 - 4.9065	0.008	0.643	0.000	0.012	0.000	0.651 ✔	1.000	4.8.2 ✔
	4.9065 - 3.271	0.008	0.648	0.000	0.012	0.000	0.656 ✔	1.000	4.8.2 ✔
	3.271 - 1.6355	0.008	0.653	0.000	0.012	0.000	0.662 ✔	1.000	4.8.2 ✔
	1.6355 - 0	0.008	0.658	0.000	0.012	0.000	0.667 ✔	1.000	4.8.2 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	151.5 - 141	Pole	TP17.7841x17.1872x0.24	1	-5.42	999.37	19.9	Pass
L2	141 - 120.33	Pole	TP31.557x28.783x0.3059	2	-9.50	2146.63	22.7	Pass
L3	120.33 - 111.19	Pole	TP33.028x31.557x0.3063	3	-13.70	2210.95	33.4	Pass
L4	111.19 - 82.08	Pole	TP38.347x33.028x0.3141	4	-19.65	2491.00	60.7	Pass
L5	82.08 - 70.06	Pole	TP39.711x38.347x0.3804	5	-22.73	3343.96	55.5	Pass
L6	70.06 - 42.24	Pole	TP43.95x39.711x0.4014	6	-30.71	3831.48	66.9	Pass
L7	42.24 - 32.71	Pole	TP45.064x43.95x0.4706	7	-33.97	4843.91	58.4	Pass
L8	32.71 - 0	Pole	TP49.552x45.064x0.4906	8	-45.99	5448.80	66.7	Pass
							Summary	
						Pole (L6)	66.9	Pass
						RATING =	**66.9**	**Pass**

Base/Flange Plate	Plate Type	***Baseplate***	
	Pole Diameter	51.3	in
	Pole Thickness	0.75	in
	Plate Diameter	62	in
	Plate Thickness	2	in
	Plate Fy	60	ksi
	Weld Length	0.25	in
	ϕ_s Resistance	947.30	k-in
	Applied	209.23	k-in
Stiffeners	#	***0***	

Bolts	#	***12***	
	Bolt Circle	55	in
	(R)adial / (S)quare	S	
	Bolt Gap	6	in
●	Diameter	1.75	in
	Hole Diameter	2.375	in
	Type	R71 Williams	
	Fy	127.7	ksi
	Fu	150	ksi
	ϕ_s Resistance	227.94	k
	Applied	169.08	k
Reinforcement ●	#	***0***	
Extra Bolts O	#	***8***	
	Bolt Circle	39	in
	(R)adial / (S)quare	S	
	Bolt Gap	6	in
	Offset Angle	30	°
	Diameter	2.25	in
	Type	A325	
	Fy	92	ksi
	Fu	120	ksi
	ϕ_s Resistance	311.78	k
	Applied	192.55	k

Code Rev. ***G***

Moment 3577.0 k-ft

Axial 46.0 k

Date	3/27/2017
Engineer	JDB
Site #	302483
Carrier	AT&T Mobility

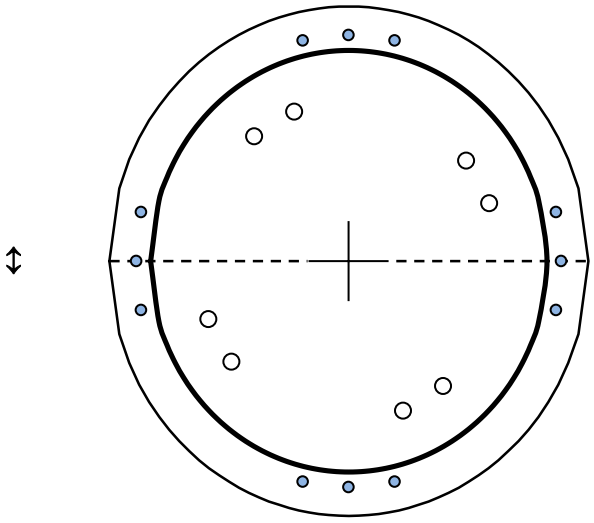


Plate Stress Ratio:

0.22 (Pass)

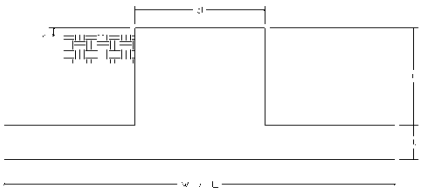
Bolt Stress Ratio:

0.74 (Pass)

Extra Bolt Stress Ratio:

0.62 (Pass)

Site Name:	Brln-Berlin	*Program Last Updated:* *5/13/2014*
Site Number:	302483	
Engineering Number:	OAA694673	
Engineer:	JDB	
Date:	03/27/17	
Tower Type:	MP	



Design Loads (Factored) - Analysis per TIA-222-G Standards

Design / Analysis / Mapping:	Mapping	
Compression/Leg:	**46.0**	
Total Shear:	**33.0**	k
Moment:	**3577.0**	k-ft
Tower + Appurtenance Weight:	**38.3**	k
Depth to Base of Foundation (l + t - h):	8.00	ft
Diameter of Pier (d):	7.00	ft
Height of Pier above Ground (h):	0.50	
Width of Pad (W):	11.00	ft
Length of Pad (L):	11.00	ft
Thickness of Pad (t):	2.58	ft
Tower Leg Center to Center:	0.00	ft
Number of Tower Legs:	1.0	(1 if MP or GT)
Tower Center from Mat Center:	0.00	ft
Depth Below Ground Surface to Water Table:	99.00	ft
Unit Weight of Concrete:	150.0	pcf
Unit Weight of Soil Above Water Table:	135.0	pcf
Unit Weight of Water:	62.4	pcf
Unit Weight of Soil Below Water Table:	72.6	pcf
Friction Angle of Uplift:	40.0	Degrees
Ultimate Coefficient of Shear Friction:	0.35	
Ultimate Compressive Bearing Pressure:	60000.0	psf
Ultimate Passive Pressure on Pad Face:	1000.0	psf
Factored Moment Applied to Rock Anchors	**2890.0**	**k-ft**
$\phi_{Soil\ and\ Concrete\ Weight}$:	0.9	
ϕ_{Soil}:	0.75	

Rock Anchor Usage

Rock Anchor Resistance:	3360.0	k
Rock Anchor Tensile Resistance:	0.91	Result: OK

Overturning Moment Usage

Design OTM:	3857.5	k-ft
Weight of Soil and Concrete OTM Resistance:	141.4	k
OTM Resistance from Soil and Concrete:	777.6	k-ft
OTM Resistance from Tower:	175.7	k-ft
OTM Resistance from Soil Facture:	527.8	k-ft
OTM Resistance from Passive Pressure on Pad Face:	32.9	k-ft
OTM Resistance:	4252.7	k-ft
Design OTM / OTM Resistance:	0.91	Result: OK

Soil Bearing Pressure Usage

Total Weight (Foundation, Soil, Tower):	177.3	k
Net Bearing Pressure:	44406	psf
Factored Nominal Bearing Pressure:	45000	psf
Net Bearing Pressure/Factored Nominal Bearing Pressure:	0.99	Result: OK
Load Direction Controling Design Bearing Pressure:	Diagonal to Pad Edge	

Sliding Factor of Safety

Total Factored Sliding Resistance:	65.7	k
Sliding Design / Sliding Resistance:	0.50	Result: OK

AMERICAN TOWER®
CORPORATION

The changes required in 11912109 are that the tower must be de-stacked, removing the upper 23' (pipe extension) reducing the height to 151.5'. This will be completed by T-Mobile or American Tower, this is still to be determined.

T-Mobile will be removing the Metro equipment currently installed at 142' and relocating their equipment to this RAD.

The Nextel equipment at 95' and corresponding L&A's will also need to be removed.

Sincerely,

Shawn Dunn
Account Project Manager
American Tower Corporation

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: CT1014

Berlin NE
260 Beckley Road
Berlin, CT 06037

June 29, 2016

EBI Project Number: 6216003024

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	11.64 %

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

June 29, 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: **CT1014 – Berlin NE**

EBI Consulting was directed to analyze the proposed AT&T facility located at **260 Beckley Road, Berlin, 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 **260 Beckley Road, Berlin, 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 GSM channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

4) 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.

5) 2 LTE channels (2300 MHz (WCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

6) 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.

7) 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.

8) 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.

9) 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.

10) The antennas used in this modeling are the **Kathrein 7770, CCI OPA-65R-LCUU-H6 and the Quintel QS66512-2** for transmission in the 700 MHz, 850 MHz, 1900 MHz (PCS) and 2300 MHz (WCS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

11) The antenna mounting height centerlines of the proposed antennas are **152 feet** above ground level (AGL) for **Sector A**, **152 feet** above ground level (AGL) for **Sector B** and **152 feet** above ground level (AGL) for Sector C.

12) 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:	Kathrein 7770	Make / Model:	Kathrein 7770	Make / Model:	Kathrein 7770
Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd
Height (AGL):	**152 feet**	Height (AGL):	**152 feet**	Height (AGL):	**152 feet**
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	6	Channel Count	6	Channel Count	6
Total TX Power(W):	180 Watts	Total TX Power(W):	180 Watts	Total TX Power(W):	180 Watts
ERP (W):	3,453.54	ERP (W):	3,453.54	ERP (W):	3,453.54
Antenna A1 MPE%	**0.69 %**	Antenna B1 MPE%	**0.69 %**	Antenna C1 MPE%	**0.69 %**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	CCI OPA-65R-LCUU-H6	Make / Model:	CCI OPA-65R-LCUU-H6	Make / Model:	CCI OPA-65R-LCUU-H6
Gain:	12.45 / 15.45 dBd	Gain:	12.45 / 15.45 dBd	Gain:	12.45 / 15.45 dBd
Height (AGL):	**152 feet**	Height (AGL):	**152 feet**	Height (AGL):	**152 feet**
Frequency Bands	850 MHz / 2300 MHz (WCS)	Frequency Bands	850 MHz / 2300 MHz (WCS)	Frequency Bands	850 MHz / 2300 MHz (WCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	180 Watts	Total TX Power(W):	180 Watts	Total TX Power(W):	180 Watts
ERP (W):	5,263.78	ERP (W):	5,263.78	ERP (W):	5,263.78
Antenna A2 MPE%	**1.02 %**	Antenna B2 MPE%	**1.02 %**	Antenna C2 MPE%	**1.02 %**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	Quintel QS66512-2	Make / Model:	Quintel QS66512-2	Make / Model:	Quintel QS66512-2
Gain:	10.85 / 13.85 dBd	Gain:	10.85 / 13.85 dBd	Gain:	10.85 / 13.85 dBd
Height (AGL):	**152 feet**	Height (AGL):	**152 feet**	Height (AGL):	**152 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):	4,371.36	ERP (W):	4,371.36	ERP (W):	4,371.36
Antenna A3 MPE%	**1.02 %**	Antenna B3 MPE%	**1.02 %**	Antenna C3 MPE%	**1.02 %**

Site Composite MPE%	
Carrier	**MPE%**
AT&T – Max per sector	**2.73 %**
MetroPCS	0.66 %
Berlin FD	0.02 %
Verizon Wireless	5.61 %
T-Mobile	0.40 %
Sprint	1.14 %
Nextel	1.08 %
Site Total MPE %:	**11.64 %**

AT&T Sector A Total:	2.73 %
AT&T Sector B Total:	2.73 %
AT&T Sector C Total:	2.73 %
Site Total:	11.64 %

AT&T _ Max Values Per Sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
AT&T 850 MHz UMTS	2	414.12	152	1.40	850 MHz	567	0.25 %
AT&T 1900 MHz (PCS) UMTS	2	656.33	152	2.21	1900 MHz (PCS)	1000	0.22 %
AT&T 1900 MHz (PCS) GSM	2	656.33	152	2.21	1900 MHz (PCS)	1000	0.22 %
AT&T 850 MHz GSM	2	527.38	152	1.78	850 MHz	567	0.31 %
AT&T 2300 MHz (WCS) LTE	2	2,104.51	152	7.10	2300 MHz (WCS)	1000	0.71 %
AT&T 700 MHz LTE	2	729.71	152	2.46	700 MHz	467	0.53 %
AT&T 1900 MHz (PCS) LTE	2	1,455.97	152	4.91	1900 MHz (PCS)	1000	0.49 %
						Total*:	**2.73 %**

NOTE: Totals may vary by 0.01% due to summing of remainders

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:	2.73 %
Sector B:	2.73 %
Sector C:	2.73 %
AT&T Maximum Total (per sector):	2.73 %
Site Total:	11.64 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **11.64 %** 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.