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

April 4, 2017

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

RE: **Notice of Exempt Modification for AT&T/ LTE 3C Crown Site BU: 803175**
AT&T Site ID: CT5379
167 Coccomo Circle, New Britain, CT 06051
Latitude: 41° 41' 11.8"/ Longitude: -72° 45' 27.8"

Dear Ms. Bachman:

AT&T currently maintains nine (9) antennas at the 189-foot level of the existing 188-foot monopole tower at 167 Coccomo Circle in New Britain, CT. The tower and property is owned by Crown Castle. AT&T intends to replace three (3) antennas with three (3) new antennas, replace three (3) RRUs with three (3) new RRU models, and install six (6) tower mounted switches.

The City of New Britain could not confirm the original date and conditions of zoning.

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

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

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

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

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

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

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

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

Sincerely,

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

Attachments:

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

cc: The Honorable Erin Stewart, Mayor
City of New Britain
27 West Main Street
New Britain, CT 06051

Planning & Zoning
City of New Britain
27 West Main Street
New Britain, CT 06051

City of New Britain, CT

Property Listing Report

Map Block Lot: A5D 22

Account: 15950167

Property Information

Property Location	167 COCCOMO CIR
Owner	CROWN ATLANTIC COMPANY LLC
Co-Owner	
Mailing Address	4017 WASHINGTON RD PMB 353 MCMURRAY PA 15317
Land Use	1010 Single Family
Land Class	R
Zoning Code	I2
Census Tract	416300

Neighborhood	104
Acreage	0.32
Utilities	All Public
Lot Setting/Desc	Level
Additional Info	

Photo

Sketch

Primary Construction Details

Year Built	1918
Stories	1.25
Building Style	Conventional
Building Use	Residential
Building Condition	C
Floors	Carpet
Total Rooms	4

Bedrooms	2 Bedrooms
Full Bathrooms	1
Half Bathrooms	0
Bath Style	Average
Kitchen Style	Average
Roof Style	Gable
Roof Cover	Asphalt Shingl

Exterior Walls	Vinyl Siding
Interior Walls	Plaster
Heating Type	99
Heating Fuel	Yes
AC Type	None
Gross Bldg Area	1988
Total Living Area	624

Report Created On 4/4/2017

City of New Britain, CT

Property Listing Report | Map Block Lot A5D 22 | Account 15950167

Valuation Summary

(Assessed value = 70% of Appraised Value)

Item	Appraised	Assessed
Buildings	39900	27930
Extras	0	0
Improvements	39900	27930
Outbuildings	0	0
Land	32800	22960
Total	72700	50890

Outbuilding and Extra Items

Type	Description

Sub Areas

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
Open Porch	50	0
First Floor	624	624
Enclosed Porch	66	0
Attic, Expansion, Unfinished	624	0
Unfin Raised Basement	624	0
Total Area	1988	624

Sales History

Owner of Record	Book/ Page	Sale Date	Sale Price
CROWN ATLANTIC COMPANY LLC	1359/ 428	2/13/2001	90000
BALAVENDER JOHN S +	1284/ 180	8/26/1998	44000
	1281/ 173	7/15/1998	
	770/ 808	10/29/1981	
CLARA MARY DOUCETTE	725/ 121	3/2/1977	
FRANCISZKA BARANOWSKI + CLARA	594/ 393	1/20/1966	
FRANCISZKA BARANOWSKI	532/ 263	3/14/1962	
FRANCISZKA + EDWARD R	365/ 244	3/16/1953	

Report Created On 4/4/2017

City of New Britain, Connecticut - Assessment Parcel Map

MBL: A5D 22 **Address:** 167 COCCOMO CIR

Approximate Scale:

1 inch = 100 feet

Disclaimer:
This map is for informational purposes only.
All information is subject to verification by any user.
The City of New Britain and its mapping contractors
assume no legal responsibility for the information contained herein.

Map Produced Feb 2017

WIRELESS COMMUNICATIONS FACILITY
CT5379 - LTE BWE
NEW BRITAIN EAST
CROWN CASTLE SITE NO.: 803175
167 COCCOMO CIRCLE
(a.k.a 178 LESTER STREET)
NEW BRITAIN, CT 06051

GENERAL NOTES

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

SITE DIRECTIONS

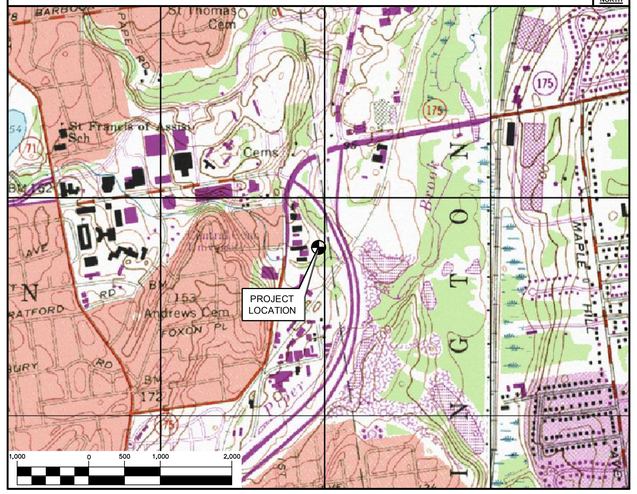
FROM: 500 ENTERPRISE DRIVE, ROCKY HILL, CONNECTICUT
TO: 178 LESTER STREET, NEW BRITAIN, CONNECTICUT

1.	HEAD NORTHEAST ON ENTERPRISE DR TOWARD CAPITAL BLVD	0.30 MI
2.	TURN LEFT ONTO CAPITAL BLVD	0.20 MI
3.	TURN LEFT ONTO WEST ST	0.30 MI
4.	TURN LEFT TO MERGE ONTO I-91 S TOWARD NEW HAVEN	1.40 MI
5.	TAKE EXIT 22N TO MERGE ONTO CT-9 N TOWARD NEW BRITAIN	8.50 MI
6.	TAKE EXIT 29 FOR CT-175 TOWARD NEWINGTON	0.20 MI
7.	TURN LEFT ONTO CT-175 W/CEDAR ST	0.70 MI
8.	TURN LEFT ONTO ST. CLAIR AVE	0.20 MI
9.	ST. CLAIR AVE TURNS SLIGHTLY LEFT AND BECOMES COCCOMO CIR/LESTER ST	407 FT

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 LTE ANTENNA FOR PROPOSED LTE 12-PORT ANTENNA, (1) PER SECTOR.
   - B. REMOVE AND REPLACE EXISTING RRUS-11 (1) PER SECTOR, INSTALL (3) NEW RRUS-32 B2, (1) PER SECTOR/(3) TOTAL.

PROJECT INFORMATION

AT&T SITE NUMBER:	CT5379
AT&T SITE NAME:	NEW BRITAIN EAST
SITE ADDRESS:	CROWN CASTLE SITE NO.: 803175 167 COCCOMO CIRCLE (a.k.a 178 LESTER STREET) NEW BRITAIN, CT 06051
LESSEE/APPLICANT:	AT&T MOBILITY 500 ENTERPRISE DRIVE, SUITE 3A ROCKY HILL, CT 06067
ENGINEER:	CENTEK ENGINEERING, INC. 63-2 NORTH BRANFORD RD. BRANFORD, CT 06405
PROJECT COORDINATES:	LATITUDE: 41°-41'-23.61" N LONGITUDE: 72°-45'-30.24" W GROUND ELEVATION: ±91' AMSL SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

SHEET INDEX

SHT. NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	0
N-1	NOTES AND SPECIFICATIONS	0
C-1	PLANS AND ELEVATION	0
C-2	LTE BWE AND EQUIPMENT DETAILS	0
E-1	TYPICAL ELECTRICAL DETAILS	0
E-2	ELECTRICAL NOTES AND PLUMBING DIAGRAM	0

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	03/30/17	LGL	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
NEW BRITAIN EAST
CT5379 - LTE BWE
167 COCCOMO CIRCLE (a.k.a. 178 LESTER ST)
NEW BRITAIN, CT 06051

DATE: 02/16/17
SCALE: AS NOTED
JOB NO. 17004.17

TITLE SHEET

T-1

Sheet No. 1 of 6

NOTES AND SPECIFICATIONS

DESIGN BASIS:

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

1. DESIGN CRITERIA:

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

GENERAL NOTES:

1. ALL CONSTRUCTION SHALL BE IN COMPLIANCE WITH THE GOVERNING BUILDING CODE.
2. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
3. BEFORE BEGINNING THE WORK, THE CONTRACTOR IS RESPONSIBLE FOR MAKING SUCH INVESTIGATIONS CONCERNING PHYSICAL CONDITIONS (SURFACE AND SUBSURFACE) AT OR CONTIGUOUS TO THE SITE WHICH MAY AFFECT PERFORMANCE AND COST OF THE WORK.
4. DIMENSIONS AND DETAILS SHALL BE CHECKED AGAINST EXISTING FIELD CONDITIONS.
5. THE CONTRACTOR SHALL VERIFY AND COORDINATE THE SIZE AND LOCATION OF ALL OPENINGS, SLEEVES AND ANCHOR BOLTS AS REQUIRED BY ALL TRADES.
6. ALL DIMENSIONS, ELEVATIONS, AND OTHER REFERENCES TO EXISTING STRUCTURES, SURFACE, AND SUBSURFACE CONDITIONS ARE APPROXIMATE. NO GUARANTEE IS MADE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THE CONTRACTOR SHALL VERIFY AND COORDINATE ALL DIMENSIONS, ELEVATIONS, ANGLES WITH EXISTING CONDITIONS AND WITH ARCHITECTURAL AND SITE DRAWINGS BEFORE PROCEEDING WITH ANY WORK.
7. AS THE WORK PROGRESSES, THE CONTRACTOR SHALL NOTIFY THE OWNER OF ANY CONDITIONS WHICH ARE IN CONFLICT OR OTHERWISE NOT CONSISTENT WITH THE CONSTRUCTION DOCUMENTS AND SHALL NOT PROCEED WITH SUCH WORK UNTIL THE CONFLICT IS SATISFACTORILY RESOLVED.
8. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE SAFETY CODES AND REGULATIONS DURING ALL PHASES OF CONSTRUCTION. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR PROVIDING AND MAINTAINING ADEQUATE SHORING, BRACING, AND BARRICADES AS MAY BE REQUIRED FOR THE PROTECTION OF EXISTING PROPERTY, CONSTRUCTION WORKERS, AND FOR PUBLIC SAFETY.
9. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY. MAINTAIN EXISTING SITE OPERATIONS, COORDINATE WORK WITH NORTHEAST UTILITIES
10. THE STRUCTURE IS DESIGNED TO BE SELF–SUPPORTING AND STABLE AFTER FOUNDATION REMEDIATION WORK IS COMPLETE. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE AND TO ENSURE THE SAFETY OF THE STRUCTURE AND ITS COMPONENT PARTS DURING ERECTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, TEMPORARY BRACING, GUYS OR TIEDOWNS, WHICH MIGHT BE NECESSARY.
11. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
12. SHOP DRAWINGS, CONCRETE MIX DESIGNS, TEST REPORTS, AND OTHER SUBMITTALS PERTAINING TO STRUCTURAL WORK SHALL BE FORWARDED TO THE OWNER FOR REVIEW BEFORE FABRICATION AND/OR INSTALLATION IS MADE. SHOP DRAWINGS SHALL INCLUDE ERECTION DRAWINGS AND COMPLETE DETAILS OF CONNECTIONS AS WELL AS MANUFACTURER'S SPECIFICATION DATA WHERE APPROPRIATE. SHOP DRAWINGS SHALL BE CHECKED BY THE CONTRACTOR AND BEAR THE CHECKER'S INITIALS BEFORE BEING SUBMITTED FOR REVIEW.
13. NO DRILLING WELDING OR TAPING ON EVERSOURCE 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.

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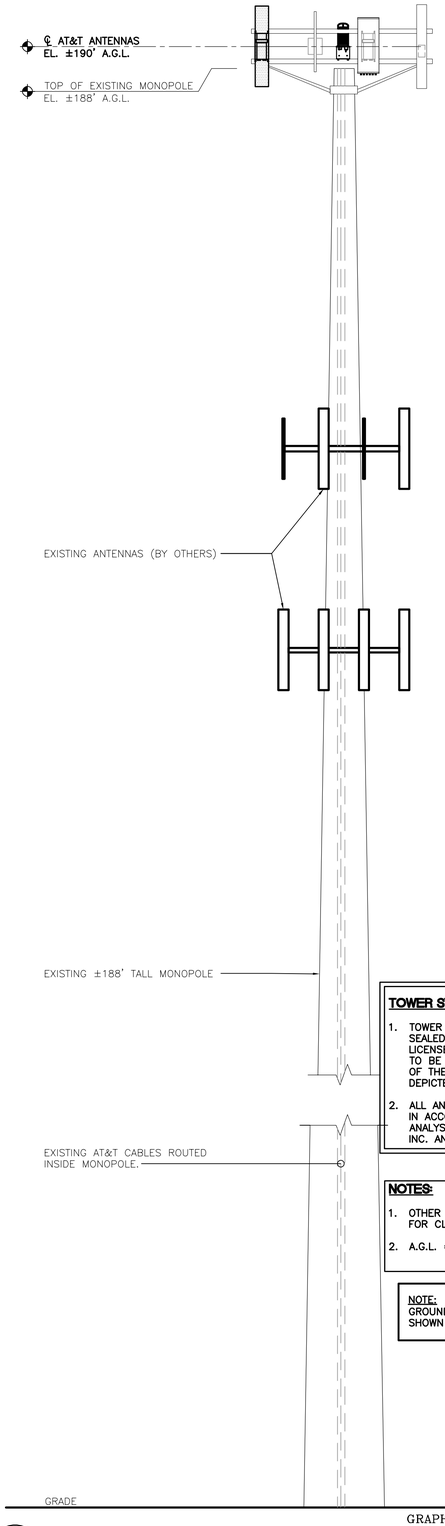
DATE: 02/16/17
SCALE: AS NOTED
JOB NO. 17004.17

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 CROWN CASTLE, INC. AND FINAL AT&T RF DATA SHEET.

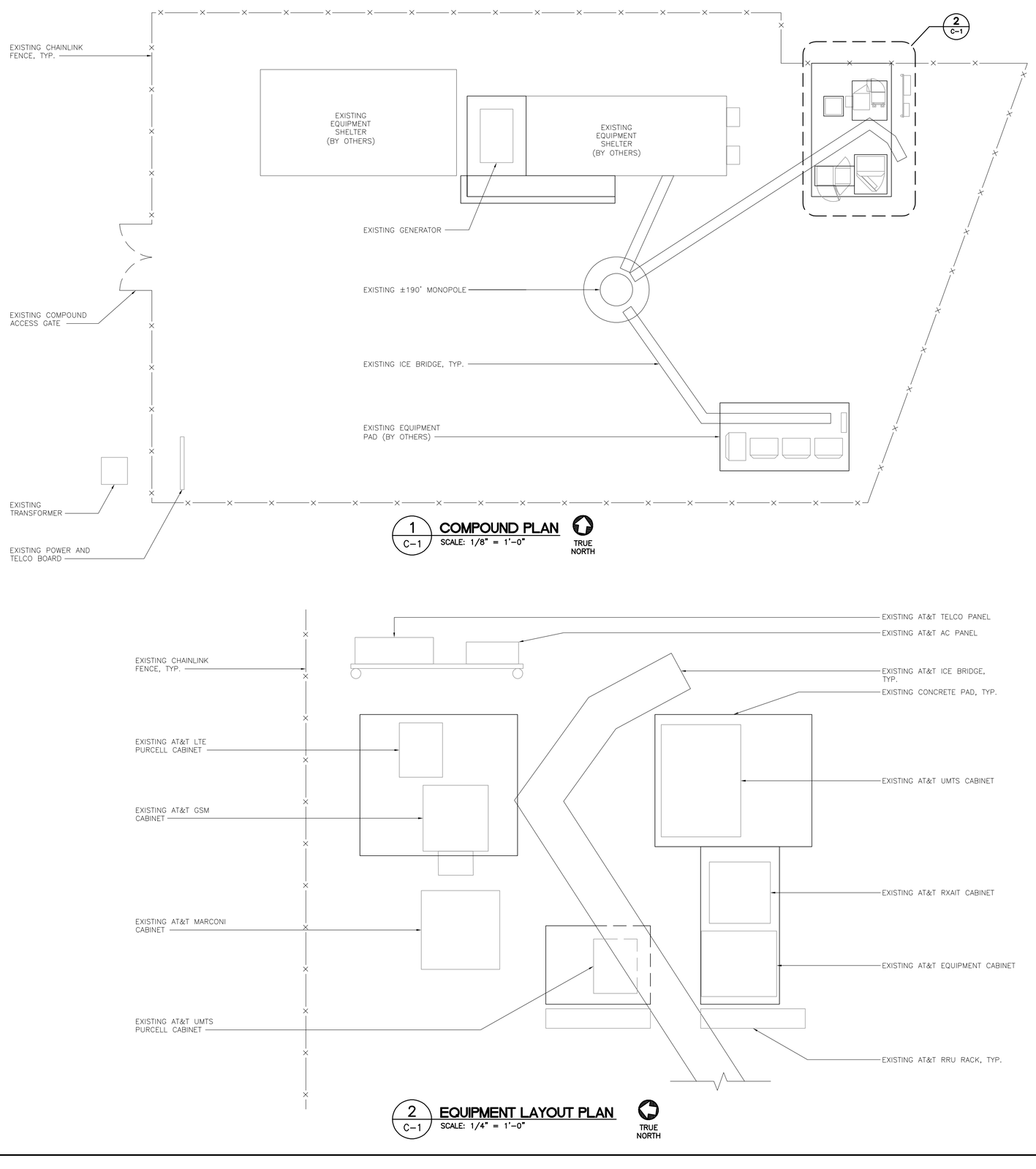
NOTES:

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

NOTE:
GROUND EQUIPMENT NOT SHOWN FOR CLARITY.

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

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



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

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

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PLANS AND ELEVATION

C-1

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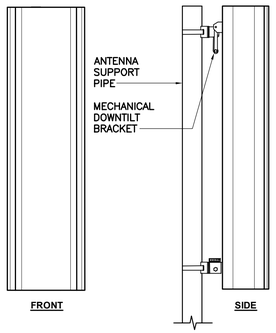
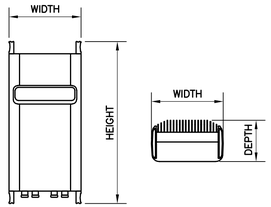


ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: QUINTEL MODEL: QS46512-2	52"L x 12"W x 10.8"D	75 LBS.
MAKE: QUINTEL MODEL: QS66512-2	72"L x 12"W x 9.6"D	111 LBS.

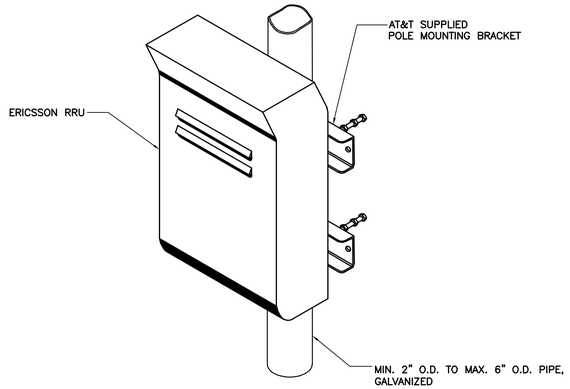
5 C-2 PROPOSED ANTENNA DETAIL
SCALE: 1/2" = 1'-0"



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

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

6 C-2 ERICSSON RRUS 32 B2 DETAIL
SCALE: 1" = 1'-0"

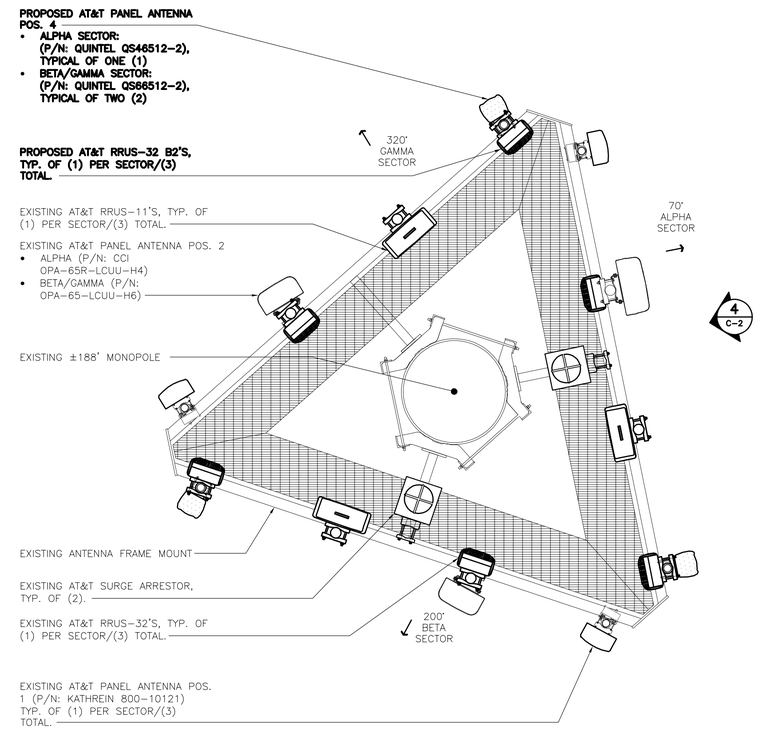


ISOMETRIC VIEW

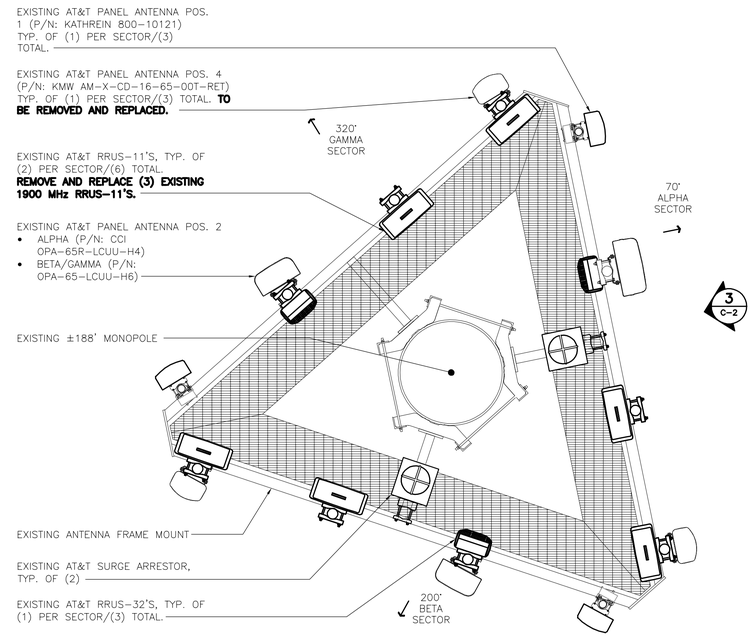
NOTES:

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

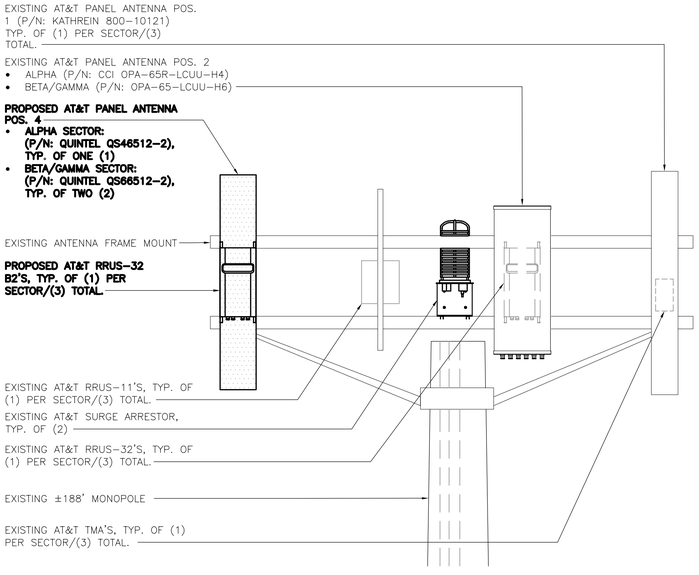
7 C-2 TYPICAL RRUS MOUNTING DETAILS
SCALE: NTS



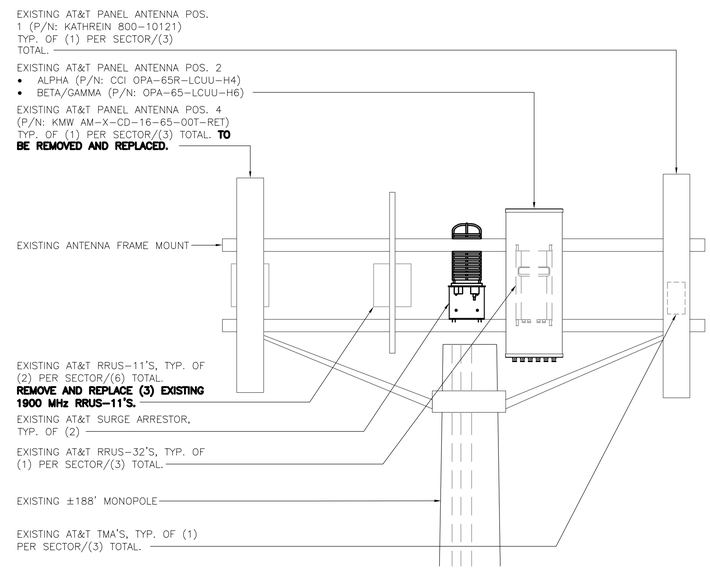
2 C-2 PROPOSED ANTENNA PLAN
SCALE: 1/2" = 1'-0"
NORTH



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



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



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

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LTE BWE EQUIPMENT DETAIL

C-2

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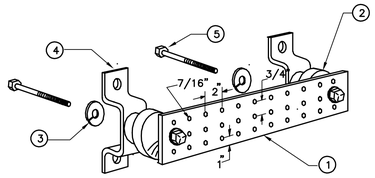
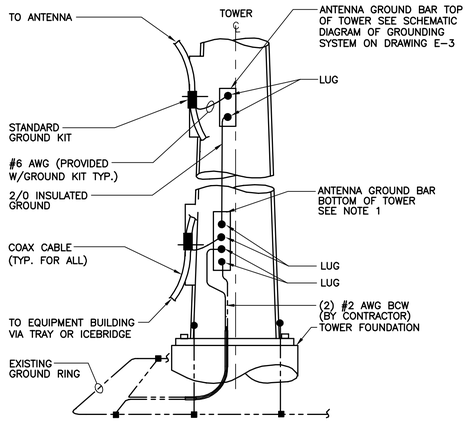


LEGEND

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

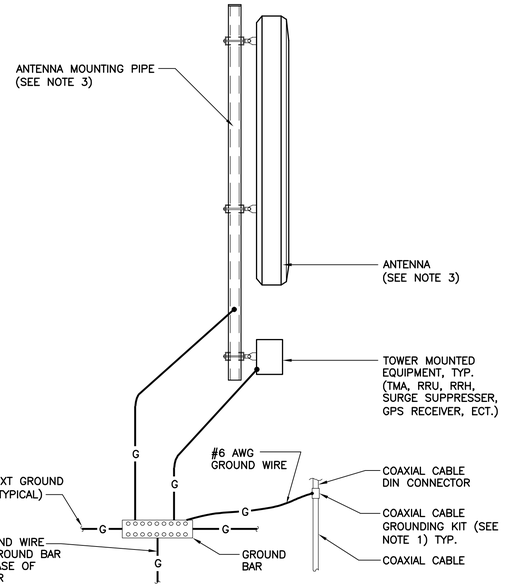


NOTES:

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

2 E–1 ANTENNA CABLE GROUNDING – TOWER

NOT TO SCALE



NOTES:

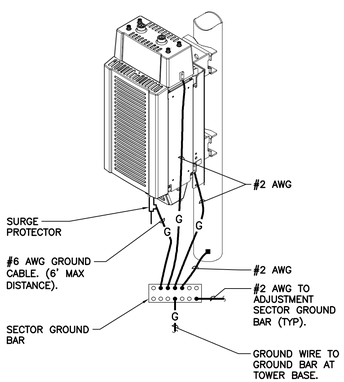
1. BOND COAXIAL CABLE GROUND KITS TO EACH OWNER'S GROUND BAR ALONG ENTIRE COAX RUN FROM ANTENNA TO SHELTER.
2. BOND ALL EQUIPMENT TO GROUND PER NEC AND MANUFACTURERS SPECIFICATIONS.
3. DETAIL IS TYPICAL FOR ALL ANTENNA SECTORS, INCLUDING GPS ANTENNA.

1 E–1 TYPICAL ANTENNA GROUNDING DETAIL

NOT TO SCALE

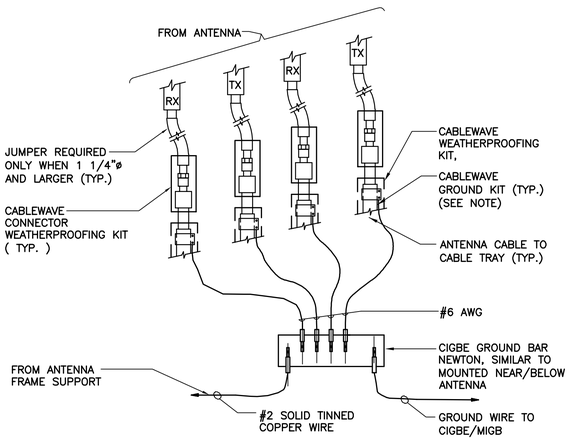
EACH RRH CABINET SHALL BE GROUNDED IN THE FOLLOWING MANNER:

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



6 E–1 RRU POLE MOUNT GROUNDING

NOT TO SCALE

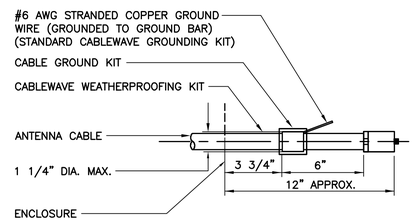


NOTE:

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



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

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TYPICAL ELECTRICAL DETAILS

E–1

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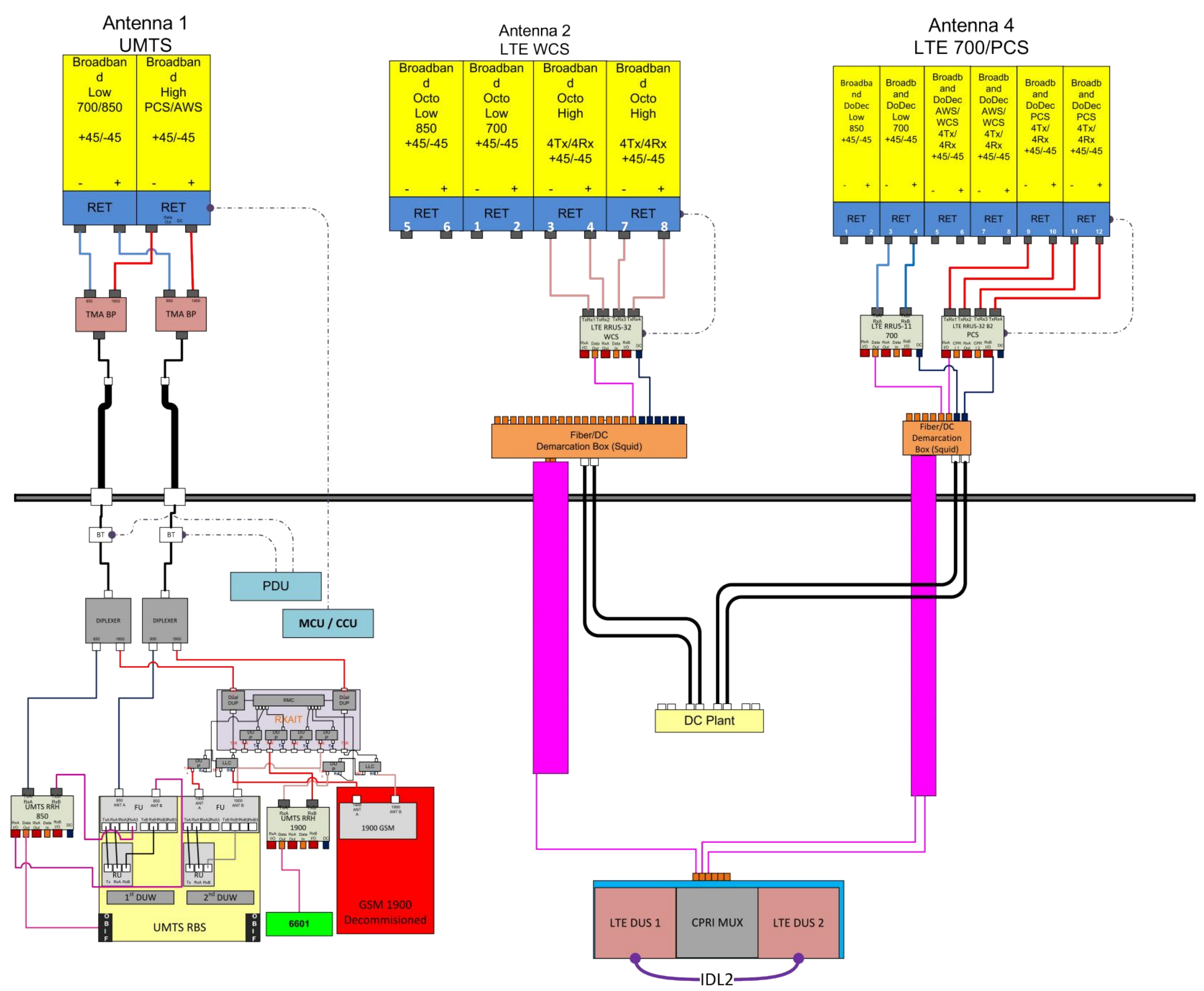

1
E-2
RFDS PLUMBING DIAGRAM
NOT TO SCALE

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.

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DATE: 02/16/17
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JOB NO. 17004.17

ELECTRICAL NOTES AND PLUMBING DIAGRAM

E-2

Date: **February 21, 2017**

Charles Trask
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277

2000 Corporate Drive
Canonsburg, PA 15317
(724) 416-2000

Subject: **Structural Analysis Report**

Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CT5379
	Carrier Site Name:	New Britain CT
Crown Castle Designation:	**Crown Castle BU Number:**	803175
	Crown Castle Site Name:	CT NEW BRITAIN 3 CAC 803175
	Crown Castle JDE Job Number:	419581
	Crown Castle Work Order Number:	1364571
	Crown Castle Application Number:	377601 Rev. 1
Engineering Firm Designation:	**Crown Castle Project Number:**	1364571
Site Data:	**Lester Road, New Britain, Hartford County, CT**	
	Latitude *41° 41' 11.8"*, Longitude *-72° 45' 27.8"*	
	188 Foot - Monopole Tower	

Dear Charles Trask,

Crown Castle is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 1364571, in accordance with application 377601, revision 1.

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

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

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

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

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

Structural analysis prepared by: Jeremy Hesson, E.I.T. / Shan

Respectfully submitted by:

Terry P. Styran, P.E.
Senior Project Engineer

STATE OF CONNECTICUT
TERRY P. STYRAN
31522
LICENSED PROFESSIONAL ENGINEER

2/23/2017

tnxTower Report - version 7.0.5.1

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 188 ft. Monopole tower designed by SUMMIT in November of 2000. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

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

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
188.0	189.0	1	cci antennas	OPA-65R-LCUU-H4	1 2 1	3/8 3/4 2" conduit	-
		2	cci antennas	OPA-65R-LCUU-H6			
		3	ericsson	RRUS 32 B2			
		3	ericsson	RRUS 32 B30			
		6	kathrein	860 10025			
		1	quintel tech.	QS46512-2			
		2	quintel tech.	QS66512-2			
		1	raycap	DC6-48-60-18-8F			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
188.0	189.0	3	kathrein	800 10121	6 2 1	1-5/8 3/4 3/8	1
		3	ericsson	RRUS-11			
		6	powerwave tech.	LGP21401			
		1	raycap	DC6-48-60-18-8F			
		1	kmw	AM-X-CD-14-65-00T-RET	1	1-5/8	3
		2	kmw	AM-X-CD-16-65-00T-RET			
	188.0	3	ericsson	RRUS-11			
		1	tower mounts	Miscellaneous [NA 507-3]	-	-	1
		1	tower mounts	Platform Mount [LP 1201-1]			
160.0	163.0	3	commscope	LNX-6515DS-VTM w/ Mount Pipe	13	1-5/8	1
		3	ericsson	AIR -32 B2A/B66AA w/ Mount Pipe			
		3	ericsson	AIR 21 B2A B4P w/ Mount Pipe			
		3	ericsson	RRUS 11 B12			
		1	rfs celwave	ATMAA1412D-1A20			
	160.0	2	rfs cellwave	ATMAA1412D-1A20			
		1	tower mounts	Platform Mount [LP 601-1]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
145.0	150.0	1	gps	GPS_A	13 1	1-5/8 1/2	1
	145.0	2	andrew	LNX-6512DS-T4M w/ Mount Pipe			
		3	antel	BXA-80063/6 w/ Mount Pipe			
		1	tower mounts	Platform Mount [LP 601-1]			
		3	alcatel lucent	RRH2X60-AWS	1	1-5/8	2
		3	alcatel lucent	RRH2X60-PCS			
		3	alcatel lucent	RRH2x60-700			
		6	andrew	SBNHH-1D65B w/ Mount Pipe			
		1	kathrein	800 10735V01 w/ Mount Pipe			
		1	rfs celwave	DB-T1-6Z-8AB-0Z			

Notes:
1) Existing Equipment
2) Reserved Equipment
3) Equipment to be removed, not considered in this analysis

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
188	188	12	Generic	1' x 5' x 3" Panel	-	-
177	177	12	Generic	1' x 5' x 3" Panel	-	-
162	162	12	Generic	1' x 5' x 3" Panel	-	-
147	147	12	Generic	1' x 5' x 3" Panel	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Clough, Harbor & Associates	679661	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	PJF	-	ON FILE
4-TOWER MANUFACTURER DRAWINGS	Summit	679659	CCISITES

3.1) Analysis Method

tnxTower (version 7.0.5.1), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

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

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	188 - 137	Pole	TP32.711x22x0.25	1	-12.63	1738.73	53.6	Pass
L2	137 - 90.25	Pole	TP42.03x31.3184x0.3125	2	-22.15	2768.52	79.0	Pass
L3	90.25 - 44.5	Pole	TP51.014x40.3023x0.375	3	-35.42	4014.89	79.6	Pass
L4	44.5 - 0	Pole	TP59.61x48.8988x0.5	4	-57.88	6652.09	63.3	Pass
							Summary	
						Pole (L3)	79.6	Pass
						RATING =	**79.6**	**Pass**

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	72.1	Pass
1	Base Plate	0	67.8	Pass
1	Base Foundation (structure)	0	55.3	Pass
1	Base Foundation (soil Interaction)	0	66.4	Pass

Structure Rating (max from all components) =	**79.6%**

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

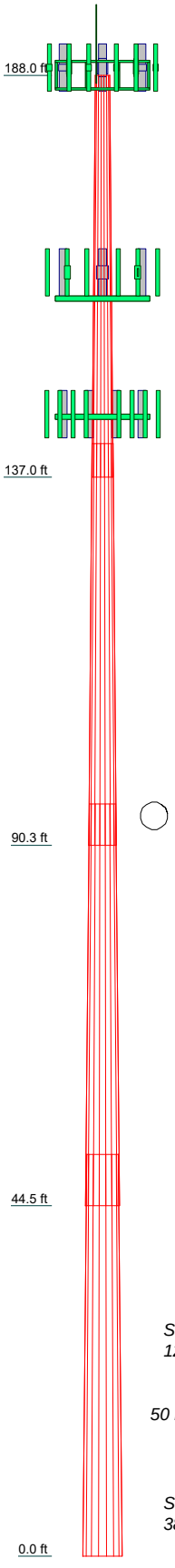
4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	51.00	18	0.2500	4.25	22.0000	32.7110	A607-65	3.7
2	51.00	18	0.3125	5.25	31.3184	42.0300		6.3
3	51.00	18	0.3750	6.50	40.3023	51.0140		9.4
4	51.00	18	0.5000		48.8988	59.6100		14.8
								34.1



ALL REACTIONS ARE FACTORED

AXIAL 102 K

SHEAR 12 K

MOMENT 1628 kip-ft

TORQUE 0 kip-ft

50 mph WIND - 1.0000 in ICE

AXIAL 58 K

SHEAR 38 K

MOMENT 5045 kip-ft

TORQUE 1 kip-ft

REACTIONS - 97 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lighting Rod 3/4" x 8'	188	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	160
800 10121	188	AIR -32 B2A/B66AA w/ Mount Pipe	160
800 10121	188	AIR -32 B2A/B66AA w/ Mount Pipe	160
800 10121	188	AIR -32 B2A/B66AA w/ Mount Pipe	160
(2) LGP21401	188	RRUS 11 B12	160
(2) LGP21401	188	RRUS 11 B12	160
(2) LGP21401	188	RRUS 11 B12	160
RRUS-11	188	ATMAA1412D-1A20	160
RRUS-11	188	ATMAA1412D-1A20	160
RRUS-11	188	ATMAA1412D-1A20	160
Platform Mount [LP 1201-1]	188	Platform Mount [LP 601-1]	160
Miscellaneous [NA 507-3]	188	BXA-80063/6 w/ Mount Pipe	145
OPA-65R-LCUU-H6	188	BXA-80063/6 w/ Mount Pipe	145
OPA-65R-LCUU-H4	188	BXA-80063/6 w/ Mount Pipe	145
OPA-65R-LCUU-H6	188	LNX-6512DS-T4M w/ Mount Pipe	145
QS66512-2	188	LNX-6512DS-T4M w/ Mount Pipe	145
QS46512-2	188	GPS_A	145
QS66512-2	188	(2) SBNHH-1D65B w/ Mount Pipe	145
RRUS 32 B2	188	(2) SBNHH-1D65B w/ Mount Pipe	145
RRUS 32 B2	188	(2) SBNHH-1D65B w/ Mount Pipe	145
RRUS 32 B2	188	800 10735V01 w/ Mount Pipe	145
RRUS 32 B30	188	RRH2x60-700	145
RRUS 32 B30	188	RRH2x60-700	145
RRUS 32 B30	188	RRH2x60-700	145
(2) 860 10025	188	RRH2X60-AWS	145
(2) 860 10025	188	RRH2X60-AWS	145
(2) 860 10025	188	RRH2X60-AWS	145
(2) DC6-48-60-18-8F	188	RRH2X60-PCS	145
LNX-6515DS-VTM w/ Mount Pipe	160	RRH2X60-PCS	145
LNX-6515DS-VTM w/ Mount Pipe	160	RRH2X60-PCS	145
LNX-6515DS-VTM w/ Mount Pipe	160	DB-T1-6Z-8AB-0Z	145
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	160	Platform Mount [LP 601-1]	145
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	160		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 79.6%

CROWN CASTLE
The Foundation For A Wireless World

Crown Castle
2000 Corporate Drive
Canonsburg, PA 15317
Phone: (724) 416-2000
FAX:

Job: *BU 803175*			
Project:			
Client: Crown Castle	Drawn by: JHesson		App'd:
Code: TIA-222-G	Date: 02/22/17		Scale: NTS
Path: R:\SA Models - Letters\Work Area\JHesson\WIP\803175 WO 1364571\DNU Files\803175.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:

1) Tower is located in Hartford County, Connecticut.
2) Basic wind speed of 97 mph.
3) Structure Class II.
4) Exposure Category C.
5) Topographic Category 1.
6) Crest Height 0.00 ft.
7) Nominal ice thickness of 1.0000 in.
8) Ice thickness is considered to increase with height.
9) Ice density of 56 pcf.
10) A wind speed of 50 mph is used in combination with ice.
11) Temperature drop of 50 °F.
12) Deflections calculated using a wind speed of 60 mph.
13) A non-linear (P-delta) analysis was used.
14) Pressures are calculated at each section.
15) Stress ratio used in pole design is 1.
16) 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
L1	188.00-137.00	51.00	4.25	18	22.0000	32.7110	0.2500	1.0000	A607-65 (65 ksi)
L2	137.00-90.25	51.00	5.25	18	31.3184	42.0300	0.3125	1.2500	A607-65 (65 ksi)
L3	90.25-44.50	51.00	6.50	18	40.3023	51.0140	0.3750	1.5000	A607-65 (65 ksi)
L4	44.50-0.00	51.00		18	48.8988	59.6100	0.5000	2.0000	A607-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	22.3394	17.2586	1031.4832	7.7212	11.1760	92.2945	2064.3237	8.6310	3.4320	13.728
	33.2156	25.7578	3429.0204	11.5237	16.6172	206.3538	6862.5527	12.8813	5.3171	21.269
L2	32.7080	30.7540	3735.3228	11.0071	15.9098	234.7819	7475.5606	15.3799	4.9620	15.879
	42.6784	41.3785	9098.0688	14.8097	21.3512	426.1143	18208.1091	20.6932	6.8473	21.911
L3	42.0437	47.5235	9571.6471	14.1742	20.4736	467.5120	19155.8887	23.7663	6.4332	17.155
	51.8010	60.2731	19526.7966	17.9768	25.9151	753.4907	39079.2871	30.1423	8.3185	22.183
L4	51.0393	76.8089	22730.9630	17.1816	24.8406	915.0736	45491.8360	38.4117	7.7262	15.452
	60.5296	93.8076	41409.2395	20.9841	30.2819	1367.4593	82872.9664	46.9127	9.6114	19.223

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 188.00-137.00				1	1	1			
L2 137.00-90.25				1	1	1			
L3 90.25-44.50				1	1	1			
L4 44.50-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

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

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
*188								
LDF7-50A(1-5/8")	B	No	Inside Pole	188.00 - 0.00	6	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
FB-L98B-002-75000(3/8")	B	No	Inside Pole	188.00 - 0.00	1	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
WR-VG86ST-BRD(3/4")	B	No	Inside Pole	188.00 - 0.00	2	No Ice	0.00	0.58
						1/2" Ice	0.00	0.58
						1" Ice	0.00	0.58
2" Flex Conduit	B	No	Inside Pole	188.00 - 0.00	1	No Ice	0.00	0.36
						1/2" Ice	0.00	0.36
						1" Ice	0.00	0.36
2" Flex Conduit	B	No	Inside Pole	188.00 - 0.00	1	No Ice	0.00	0.36
						1/2" Ice	0.00	0.36
						1" Ice	0.00	0.36
FB-L98B-034-XXXXXX(3/8")	B	No	Inside Pole	188.00 - 0.00	1	No Ice	0.00	0.05
						1/2" Ice	0.00	0.05

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
						1" Ice	0.00	0.05
WR-VG86ST-BRD(3/4")	B	No	Inside Pole	188.00 - 0.00	2	No Ice	0.00	0.58
						1/2" Ice	0.00	0.58
						1" Ice	0.00	0.58
*160								
LCF158-50J(1-5/8")	C	No	Inside Pole	160.00 - 0.00	12	No Ice	0.00	0.92
						1/2" Ice	0.00	0.92
						1" Ice	0.00	0.92
MLE Hybrid 9Power/18Fiber RL 2(1-5/8")	C	No	Inside Pole	160.00 - 0.00	1	No Ice	0.00	1.07
						1/2" Ice	0.00	1.07
						1" Ice	0.00	1.07
*145								
HB158-1-08U8-S8J18(1-5/8")	C	No	Inside Pole	145.00 - 0.00	1	No Ice	0.00	1.30
						1/2" Ice	0.00	1.30
						1" Ice	0.00	1.30
LCF12-50J(1/2")	C	No	Inside Pole	145.00 - 0.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
LCF158-50J(1-5/8")	C	No	Inside Pole	145.00 - 0.00	12	No Ice	0.00	0.92
						1/2" Ice	0.00	0.92
						1" Ice	0.00	0.92
HB158-1-08U8-S8J18(1-5/8")	C	No	Inside Pole	145.00 - 0.00	1	No Ice	0.00	1.30
						1/2" Ice	0.00	1.30
						1" Ice	0.00	1.30
***								

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	188.00-137.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.41
		C	0.000	0.000	0.000	0.000	0.39
L2	137.00-90.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.38
		C	0.000	0.000	0.000	0.000	1.21
L3	90.25-44.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.37
		C	0.000	0.000	0.000	0.000	1.18
L4	44.50-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.36
		C	0.000	0.000	0.000	0.000	1.15

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	188.00-137.00	A	2.344	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.41
		C		0.000	0.000	0.000	0.000	0.39
L2	137.00-90.25	A	2.262	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.38
		C		0.000	0.000	0.000	0.000	1.21
L3	90.25-44.50	A	2.147	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.37
		C		0.000	0.000	0.000	0.000	1.18
L4	44.50-0.00	A	1.925	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.36
		C		0.000	0.000	0.000	0.000	1.15

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L1	188.00-137.00	0.0000	0.0000	0.0000	0.0000
L2	137.00-90.25	0.0000	0.0000	0.0000	0.0000
L3	90.25-44.50	0.0000	0.0000	0.0000	0.0000
L4	44.50-0.00	0.0000	0.0000	0.0000	0.0000

Shielding Factor Ka

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

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
Lighting Rod 3/4'' x 8'	C	From Leg	0.00 0.00 4.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice	0.60 1.41 2.25	0.60 1.41 2.25	0.03 0.04 0.05
188									
800 10121	A	From Leg	4.00 0.00 1.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice	5.15 5.50 5.86	3.29 3.63 3.99	0.05 0.08 0.12
800 10121	B	From Leg	4.00 0.00 1.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice	5.15 5.50 5.86	3.29 3.63 3.99	0.05 0.08 0.12
800 10121	C	From Leg	4.00 0.00 1.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice	5.15 5.50 5.86	3.29 3.63 3.99	0.05 0.08 0.12
(2) LGP21401	A	From Leg	4.00 0.00 1.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice	1.10 1.24 1.38	0.21 0.27 0.35	0.01 0.02 0.03
(2) LGP21401	B	From Leg	4.00 0.00 1.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice	1.10 1.24 1.38	0.21 0.27 0.35	0.01 0.02 0.03
(2) LGP21401	C	From Leg	4.00 0.00 1.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice	1.10 1.24 1.38	0.21 0.27 0.35	0.01 0.02 0.03
RRUS-11	A	From Leg	4.00 0.00 1.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice	2.78 2.99 3.21	1.19 1.33 1.49	0.05 0.07 0.09
RRUS-11	B	From Leg	4.00 0.00 1.00	0.0000	188.00	No Ice 1/2" Ice 1" Ice	2.78 2.99 3.21	1.19 1.33 1.49	0.05 0.07 0.09
RRUS-11	C	From Leg	4.00	0.0000	188.00	No Ice	2.78	1.19	0.05

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2" Ice	2.99	1.33	0.07
			1.00			1" Ice	3.21	1.49	0.09
Platform Mount [LP 1201-1]	C	None		0.0000	188.00	No Ice	23.10	23.10	2.10
						1/2" Ice	26.80	26.80	2.50
						1" Ice	30.50	30.50	2.90
Miscellaneous [NA 507-3]	C	None		0.0000	188.00	No Ice	18.50	18.50	0.51
						1/2" Ice	26.40	26.40	0.70
						1" Ice	34.30	34.30	0.90
OPA-65R-LCUU-H6	A	From Leg	4.00	0.0000	188.00	No Ice	9.66	5.52	0.07
			0.00			1/2" Ice	10.13	5.97	0.13
			1.00			1" Ice	10.61	6.43	0.20
OPA-65R-LCUU-H4	B	From Leg	4.00	0.0000	188.00	No Ice	5.94	3.36	0.06
			0.00			1/2" Ice	6.28	3.66	0.10
			1.00			1" Ice	6.62	3.97	0.14
OPA-65R-LCUU-H6	C	From Leg	4.00	0.0000	188.00	No Ice	9.66	5.52	0.07
			0.00			1/2" Ice	10.13	5.97	0.13
			1.00			1" Ice	10.61	6.43	0.20
QS66512-2	A	From Leg	4.00	0.0000	188.00	No Ice	8.13	6.80	0.11
			0.00			1/2" Ice	8.59	7.27	0.17
			1.00			1" Ice	9.05	7.72	0.23
QS46512-2	B	From Leg	4.00	0.0000	188.00	No Ice	5.55	4.61	0.10
			0.00			1/2" Ice	5.90	4.94	0.15
			1.00			1" Ice	6.26	5.29	0.19
QS66512-2	C	From Leg	4.00	0.0000	188.00	No Ice	8.13	6.80	0.11
			0.00			1/2" Ice	8.59	7.27	0.17
			1.00			1" Ice	9.05	7.72	0.23
RRUS 32 B2	A	From Leg	4.00	0.0000	188.00	No Ice	2.73	1.67	0.05
			0.00			1/2" Ice	2.95	1.86	0.07
			1.00			1" Ice	3.18	2.05	0.10
RRUS 32 B2	B	From Leg	4.00	0.0000	188.00	No Ice	2.73	1.67	0.05
			0.00			1/2" Ice	2.95	1.86	0.07
			1.00			1" Ice	3.18	2.05	0.10
RRUS 32 B2	C	From Leg	4.00	0.0000	188.00	No Ice	2.73	1.67	0.05
			0.00			1/2" Ice	2.95	1.86	0.07
			1.00			1" Ice	3.18	2.05	0.10
RRUS 32 B30	A	From Leg	4.00	0.0000	188.00	No Ice	2.69	1.57	0.06
			0.00			1/2" Ice	2.91	1.76	0.08
			1.00			1" Ice	3.14	1.95	0.10
RRUS 32 B30	B	From Leg	4.00	0.0000	188.00	No Ice	2.69	1.57	0.06
			0.00			1/2" Ice	2.91	1.76	0.08
			1.00			1" Ice	3.14	1.95	0.10
RRUS 32 B30	C	From Leg	4.00	0.0000	188.00	No Ice	2.69	1.57	0.06
			0.00			1/2" Ice	2.91	1.76	0.08
			1.00			1" Ice	3.14	1.95	0.10
(2) 860 10025	A	From Leg	4.00	0.0000	188.00	No Ice	0.14	0.12	0.00
			0.00			1/2" Ice	0.20	0.17	0.00
			1.00			1" Ice	0.26	0.23	0.01
(2) 860 10025	B	From Leg	4.00	0.0000	188.00	No Ice	0.14	0.12	0.00
			0.00			1/2"	0.20	0.17	0.00

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
			1.00			Ice	0.26	0.23	0.01
						1" Ice			
(2) 860 10025	C	From Leg	4.00	0.0000	188.00	No Ice	0.14	0.12	0.00
			0.00			1/2"	0.20	0.17	0.00
			1.00			Ice	0.26	0.23	0.01
						1" Ice			
(2) DC6-48-60-18-8F	B	From Leg	4.00	0.0000	188.00	No Ice	0.79	0.79	0.02
			0.00			1/2"	1.27	1.27	0.04
			1.00			Ice	1.45	1.45	0.05
						1" Ice			
*160									
LNX-6515DS-VTM w/ Mount Pipe	A	From Leg	4.00	0.0000	160.00	No Ice	11.68	9.84	0.08
			0.00			1/2"	12.40	11.37	0.17
			3.00			Ice	13.14	12.91	0.27
						1" Ice			
LNX-6515DS-VTM w/ Mount Pipe	B	From Leg	4.00	0.0000	160.00	No Ice	11.68	9.84	0.08
			0.00			1/2"	12.40	11.37	0.17
			3.00			Ice	13.14	12.91	0.27
						1" Ice			
LNX-6515DS-VTM w/ Mount Pipe	C	From Leg	4.00	0.0000	160.00	No Ice	11.68	9.84	0.08
			0.00			1/2"	12.40	11.37	0.17
			3.00			Ice	13.14	12.91	0.27
						1" Ice			
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.00	0.0000	160.00	No Ice	6.33	5.64	0.11
			0.00			1/2"	6.78	6.43	0.17
			3.00			Ice	7.21	7.13	0.23
						1" Ice			
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.00	0.0000	160.00	No Ice	6.33	5.64	0.11
			0.00			1/2"	6.78	6.43	0.17
			3.00			Ice	7.21	7.13	0.23
						1" Ice			
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.00	0.0000	160.00	No Ice	6.33	5.64	0.11
			0.00			1/2"	6.78	6.43	0.17
			3.00			Ice	7.21	7.13	0.23
						1" Ice			
AIR -32 B2A/B66AA w/ Mount Pipe	A	From Leg	4.00	0.0000	160.00	No Ice	6.75	6.07	0.15
			0.00			1/2"	7.20	6.87	0.21
			3.00			Ice	7.65	7.58	0.28
						1" Ice			
AIR -32 B2A/B66AA w/ Mount Pipe	B	From Leg	4.00	0.0000	160.00	No Ice	6.75	6.07	0.15
			0.00			1/2"	7.20	6.87	0.21
			3.00			Ice	7.65	7.58	0.28
						1" Ice			
AIR -32 B2A/B66AA w/ Mount Pipe	C	From Leg	4.00	0.0000	160.00	No Ice	6.75	6.07	0.15
			0.00			1/2"	7.20	6.87	0.21
			3.00			Ice	7.65	7.58	0.28
						1" Ice			
RRUS 11 B12	A	From Leg	4.00	0.0000	160.00	No Ice	2.83	1.18	0.05
			0.00			1/2"	3.04	1.33	0.07
			3.00			Ice	3.26	1.48	0.10
						1" Ice			
RRUS 11 B12	B	From Leg	4.00	0.0000	160.00	No Ice	2.83	1.18	0.05
			0.00			1/2"	3.04	1.33	0.07
			3.00			Ice	3.26	1.48	0.10
						1" Ice			
RRUS 11 B12	C	From Leg	4.00	0.0000	160.00	No Ice	2.83	1.18	0.05
			0.00			1/2"	3.04	1.33	0.07
			3.00			Ice	3.26	1.48	0.10
						1" Ice			
ATMAA1412D-1A20	A	From Leg	4.00	0.0000	160.00	No Ice	0.41	1.00	0.01
			0.00			1/2"	0.50	1.13	0.02
			0.00			Ice	0.59	1.26	0.03
						1" Ice			
ATMAA1412D-1A20	B	From Leg	4.00	0.0000	160.00	No Ice	0.41	1.00	0.01
			0.00			1/2"	0.50	1.13	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
			3.00			Ice	0.59	1.26	0.03
						1" Ice			
ATMAA1412D-1A20	C	From Leg	4.00	0.0000	160.00	No Ice	0.00	0.00	0.00
			0.00			1/2"	0.00	0.00	0.00
			0.00			Ice	0.00	0.00	0.00
						1" Ice			
Platform Mount [LP 601-1]	C	None		0.0000	160.00	No Ice	28.47	28.47	1.12
						1/2"	33.59	33.59	1.51
						Ice	38.71	38.71	1.91
						1" Ice			
*145									
BXA-80063/6 w/ Mount Pipe	A	From Leg	4.00	0.0000	145.00	No Ice	7.82	5.41	0.04
			0.00			1/2"	8.37	6.56	0.10
			0.00			Ice	8.89	7.42	0.17
						1" Ice			
BXA-80063/6 w/ Mount Pipe	B	From Leg	4.00	0.0000	145.00	No Ice	7.82	5.41	0.04
			0.00			1/2"	8.37	6.56	0.10
			0.00			Ice	8.89	7.42	0.17
						1" Ice			
BXA-80063/6 w/ Mount Pipe	C	From Leg	4.00	0.0000	145.00	No Ice	7.82	5.41	0.04
			0.00			1/2"	8.37	6.56	0.10
			0.00			Ice	8.89	7.42	0.17
						1" Ice			
LNX-6512DS-T4M w/ Mount Pipe	B	From Leg	4.00	0.0000	145.00	No Ice	5.27	4.48	0.04
			0.00			1/2"	5.65	5.08	0.09
			0.00			Ice	6.05	5.70	0.14
						1" Ice			
LNX-6512DS-T4M w/ Mount Pipe	C	From Leg	4.00	0.0000	145.00	No Ice	5.27	4.48	0.04
			0.00			1/2"	5.65	5.08	0.09
			0.00			Ice	6.05	5.70	0.14
						1" Ice			
GPS_A	A	From Leg	4.00	0.0000	145.00	No Ice	0.26	0.26	0.00
			0.00			1/2"	0.32	0.32	0.00
			5.00			Ice	0.39	0.39	0.01
						1" Ice			
(2) SBNHH-1D65B w/ Mount Pipe	A	From Leg	4.00	0.0000	145.00	No Ice	8.39	7.08	0.08
			0.00			1/2"	8.95	8.28	0.15
			0.00			Ice	9.48	9.19	0.22
						1" Ice			
(2) SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.00	0.0000	145.00	No Ice	8.39	7.08	0.08
			0.00			1/2"	8.95	8.28	0.15
			0.00			Ice	9.48	9.19	0.22
						1" Ice			
(2) SBNHH-1D65B w/ Mount Pipe	C	From Leg	4.00	0.0000	145.00	No Ice	8.39	7.08	0.08
			0.00			1/2"	8.95	8.28	0.15
			0.00			Ice	9.48	9.19	0.22
						1" Ice			
800 10735V01 w/ Mount Pipe	A	From Leg	4.00	0.0000	145.00	No Ice	8.87	5.49	0.06
			0.00			1/2"	9.46	6.71	0.12
			0.00			Ice	10.01	7.69	0.19
						1" Ice			
RRH2x60-700	A	From Leg	4.00	0.0000	145.00	No Ice	3.50	1.82	0.06
			0.00			1/2"	3.76	2.05	0.08
			0.00			Ice	4.03	2.29	0.11
						1" Ice			
RRH2x60-700	B	From Leg	4.00	0.0000	145.00	No Ice	3.50	1.82	0.06
			0.00			1/2"	3.76	2.05	0.08
			0.00			Ice	4.03	2.29	0.11
						1" Ice			
RRH2x60-700	C	From Leg	4.00	0.0000	145.00	No Ice	3.50	1.82	0.06
			0.00			1/2"	3.76	2.05	0.08
			0.00			Ice	4.03	2.29	0.11
						1" Ice			
RRH2X60-AWS	A	From Leg	4.00	0.0000	145.00	No Ice	3.50	1.82	0.06
			0.00			1/2"	3.76	2.05	0.08

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			Ice	4.03	2.29	0.11
						1" Ice			
RRH2X60-AWS	B	From Leg	4.00	0.0000	145.00	No Ice	3.50	1.82	0.06
			0.00			1/2"	3.76	2.05	0.08
			0.00			Ice	4.03	2.29	0.11
						1" Ice			
RRH2X60-AWS	C	From Leg	4.00	0.0000	145.00	No Ice	3.50	1.82	0.06
			0.00			1/2"	3.76	2.05	0.08
			0.00			Ice	4.03	2.29	0.11
						1" Ice			
RRH2X60-PCS	A	From Leg	4.00	0.0000	145.00	No Ice	2.20	1.72	0.06
			0.00			1/2"	2.39	1.90	0.08
			0.00			Ice	2.59	2.09	0.10
						1" Ice			
RRH2X60-PCS	B	From Leg	4.00	0.0000	145.00	No Ice	2.20	1.72	0.06
			0.00			1/2"	2.39	1.90	0.08
			0.00			Ice	2.59	2.09	0.10
						1" Ice			
RRH2X60-PCS	C	From Leg	4.00	0.0000	145.00	No Ice	2.20	1.72	0.06
			0.00			1/2"	2.39	1.90	0.08
			0.00			Ice	2.59	2.09	0.10
						1" Ice			
DB-T1-6Z-8AB-0Z	A	From Leg	4.00	0.0000	145.00	No Ice	4.80	2.00	0.04
			0.00			1/2"	5.07	2.19	0.08
			0.00			Ice	5.35	2.39	0.12
						1" Ice			
Platform Mount [LP 601-1]	C	None		0.0000	145.00	No Ice	28.47	28.47	1.12
						1/2"	33.59	33.59	1.51
						Ice	38.71	38.71	1.91
						1" Ice			
***									

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice

Comb. No.	Description
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	188 - 137	Pole	Max Tension	26	0.00	0.00	-0.00
			Max. Compression	26	-40.42	-0.37	2.39
			Max. Mx	8	-12.69	-590.16	3.01
			Max. My	2	-12.63	-2.92	594.10
			Max. Vy	8	23.78	-590.16	3.01
			Max. Vx	2	-24.07	-2.92	594.10
			Max. Torque	7			1.31
L2	137 - 90.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-54.67	-0.39	2.52
			Max. Mx	8	-22.19	-1788.61	6.09
			Max. My	2	-22.15	-5.92	1806.06
			Max. Vy	8	28.61	-1788.61	6.09
			Max. Vx	2	-28.91	-5.92	1806.06
			Max. Torque	7			1.31
L3	90.25 - 44.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-73.28	-0.39	2.52
			Max. Mx	8	-35.44	-3169.83	9.00
			Max. My	2	-35.42	-8.80	3200.39
			Max. Vy	8	33.36	-3169.83	9.00
			Max. Vx	2	-33.65	-8.80	3200.39
			Max. Torque	7			1.30
L4	44.5 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-102.43	-0.39	2.52
			Max. Mx	8	-57.88	-4999.49	12.19
			Max. My	2	-57.88	-11.99	5044.72
			Max. Vy	8	38.06	-4999.49	12.19
			Max. Vx	2	-38.34	-11.99	5044.72
			Max. Torque	7			1.30

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	27	102.43	-0.01	11.80
	Max. H_x	21	43.43	38.02	-0.06
	Max. H_z	3	43.43	-0.06	38.30
	Max. M_x	2	5044.72	-0.06	38.30
	Max. M_z	8	4999.49	-38.02	0.06
	Max. Torsion	7	1.30	-32.96	19.20
	Min. Vert	7	43.43	-32.96	19.20
	Min. H_x	9	43.43	-38.02	0.06
	Min. H_z	15	43.43	0.06	-38.30
	Min. M_x	14	-5043.99	0.06	-38.30
	Min. M_z	20	-4999.21	38.02	-0.06
	Min. Torsion	19	-1.29	32.96	-19.20

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	48.26	0.00	0.00	-0.29	-0.11	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	57.91	0.06	-38.30	-5044.72	-11.99	-0.49
0.9 Dead+1.6 Wind 0 deg - No Ice	43.43	0.06	-38.30	-4983.09	-11.78	-0.49
1.2 Dead+1.6 Wind 30 deg - No Ice	57.91	19.06	-33.20	-4374.81	-2509.97	-1.02
0.9 Dead+1.6 Wind 30 deg - No Ice	43.43	19.06	-33.20	-4321.35	-2479.30	-1.03
1.2 Dead+1.6 Wind 60 deg - No Ice	57.91	32.96	-19.20	-2532.84	-4335.53	-1.29
0.9 Dead+1.6 Wind 60 deg - No Ice	43.43	32.96	-19.20	-2501.83	-4282.61	-1.30
1.2 Dead+1.6 Wind 90 deg - No Ice	57.91	38.02	-0.06	-12.19	-4999.49	-1.20
0.9 Dead+1.6 Wind 90 deg - No Ice	43.43	38.02	-0.06	-11.93	-4938.48	-1.21
1.2 Dead+1.6 Wind 120 deg - No Ice	57.91	32.89	19.10	2511.68	-4323.78	-0.79
0.9 Dead+1.6 Wind 120 deg - No Ice	43.43	32.89	19.10	2481.16	-4271.04	-0.80
1.2 Dead+1.6 Wind 150 deg - No Ice	57.91	18.96	33.14	4362.36	-2489.51	-0.17
0.9 Dead+1.6 Wind 150 deg - No Ice	43.43	18.96	33.14	4309.26	-2459.14	-0.17
1.2 Dead+1.6 Wind 180 deg - No Ice	57.91	-0.06	38.30	5043.99	11.69	0.50
0.9 Dead+1.6 Wind 180 deg - No Ice	43.43	-0.06	38.30	4982.56	11.56	0.50
1.2 Dead+1.6 Wind 210 deg - No Ice	57.91	-19.06	33.20	4374.10	2509.66	1.03
0.9 Dead+1.6 Wind 210 deg - No Ice	43.43	-19.06	33.20	4320.83	2479.07	1.03
1.2 Dead+1.6 Wind 240 deg - No Ice	57.91	-32.96	19.20	2532.14	4335.23	1.28
0.9 Dead+1.6 Wind 240 deg - No Ice	43.43	-32.96	19.20	2501.32	4282.39	1.29
1.2 Dead+1.6 Wind 270 deg - No Ice	57.91	-38.02	0.06	11.49	4999.21	1.19
0.9 Dead+1.6 Wind 270 deg - No Ice	43.43	-38.02	0.06	11.41	4938.27	1.20
1.2 Dead+1.6 Wind 300 deg - No Ice	57.91	-32.89	-19.10	-2512.40	4323.51	0.79
0.9 Dead+1.6 Wind 300 deg - No Ice	43.43	-32.89	-19.10	-2481.69	4270.84	0.80
1.2 Dead+1.6 Wind 330 deg - No Ice	57.91	-18.96	-33.14	-4363.09	2489.22	0.18

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
0.9 Dead+1.6 Wind 330 deg - No Ice	43.43	-18.96	-33.14	-4309.80	2458.94	0.18
1.2 Dead+1.0 Ice+1.0 Temp	102.43	0.00	-0.00	-2.52	-0.39	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	102.43	0.01	-11.80	-1628.06	-2.58	-0.05
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	102.43	5.89	-10.23	-1411.39	-811.38	-0.16
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	102.43	10.19	-5.91	-817.28	-1402.89	-0.24
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	102.43	11.76	-0.01	-4.93	-1618.61	-0.25
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	102.43	10.18	5.89	808.00	-1400.75	-0.19
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	102.43	5.87	10.22	1403.68	-807.67	-0.08
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	102.43	-0.01	11.80	1622.49	1.71	0.05
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	102.43	-5.89	10.23	1405.82	810.51	0.16
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	102.43	-10.19	5.91	811.71	1402.02	0.24
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	102.43	-11.76	0.01	-0.64	1617.75	0.25
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	102.43	-10.18	-5.89	-813.57	1399.88	0.19
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	102.43	-5.87	-10.22	-1409.25	806.80	0.08
Dead+Wind 0 deg - Service	48.26	0.01	-8.19	-1073.26	-2.63	-0.11
Dead+Wind 30 deg - Service	48.26	4.08	-7.10	-930.77	-533.96	-0.23
Dead+Wind 60 deg - Service	48.26	7.05	-4.11	-538.97	-922.25	-0.28
Dead+Wind 90 deg - Service	48.26	8.13	-0.01	-2.82	-1063.46	-0.26
Dead+Wind 120 deg - Service	48.26	7.04	4.09	533.99	-919.74	-0.17
Dead+Wind 150 deg - Service	48.26	4.06	7.09	927.64	-529.61	-0.04
Dead+Wind 180 deg - Service	48.26	-0.01	8.19	1072.65	2.40	0.11
Dead+Wind 210 deg - Service	48.26	-4.08	7.10	930.16	533.73	0.23
Dead+Wind 240 deg - Service	48.26	-7.05	4.11	538.35	922.02	0.28
Dead+Wind 270 deg - Service	48.26	-8.13	0.01	2.21	1063.22	0.26
Dead+Wind 300 deg - Service	48.26	-7.04	-4.09	-534.61	919.51	0.17
Dead+Wind 330 deg - Service	48.26	-4.06	-7.09	-928.26	529.37	0.04

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-48.26	0.00	0.00	48.26	0.00	0.000%
2	0.06	-57.91	-38.30	-0.06	57.91	38.30	0.000%
3	0.06	-43.43	-38.30	-0.06	43.43	38.30	0.000%
4	19.06	-57.91	-33.20	-19.06	57.91	33.20	0.000%
5	19.06	-43.43	-33.20	-19.06	43.43	33.20	0.000%
6	32.96	-57.91	-19.20	-32.96	57.91	19.20	0.000%
7	32.96	-43.43	-19.20	-32.96	43.43	19.20	0.000%
8	38.02	-57.91	-0.06	-38.02	57.91	0.06	0.000%
9	38.02	-43.43	-0.06	-38.02	43.43	0.06	0.000%
10	32.89	-57.91	19.10	-32.89	57.91	-19.10	0.000%
11	32.89	-43.43	19.10	-32.89	43.43	-19.10	0.000%
12	18.96	-57.91	33.14	-18.96	57.91	-33.14	0.000%
13	18.96	-43.43	33.14	-18.96	43.43	-33.14	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
14	-0.06	-57.91	38.30	0.06	57.91	-38.30	0.000%
15	-0.06	-43.43	38.30	0.06	43.43	-38.30	0.000%
16	-19.06	-57.91	33.20	19.06	57.91	-33.20	0.000%
17	-19.06	-43.43	33.20	19.06	43.43	-33.20	0.000%
18	-32.96	-57.91	19.20	32.96	57.91	-19.20	0.000%
19	-32.96	-43.43	19.20	32.96	43.43	-19.20	0.000%
20	-38.02	-57.91	0.06	38.02	57.91	-0.06	0.000%
21	-38.02	-43.43	0.06	38.02	43.43	-0.06	0.000%
22	-32.89	-57.91	-19.10	32.89	57.91	19.10	0.000%
23	-32.89	-43.43	-19.10	32.89	43.43	19.10	0.000%
24	-18.96	-57.91	-33.14	18.96	57.91	33.14	0.000%
25	-18.96	-43.43	-33.14	18.96	43.43	33.14	0.000%
26	0.00	-102.43	0.00	-0.00	102.43	0.00	0.000%
27	0.01	-102.43	-11.80	-0.01	102.43	11.80	0.000%
28	5.89	-102.43	-10.23	-5.89	102.43	10.23	0.000%
29	10.19	-102.43	-5.91	-10.19	102.43	5.91	0.000%
30	11.76	-102.43	-0.01	-11.76	102.43	0.01	0.000%
31	10.18	-102.43	5.89	-10.18	102.43	-5.89	0.000%
32	5.87	-102.43	10.22	-5.87	102.43	-10.22	0.000%
33	-0.01	-102.43	11.80	0.01	102.43	-11.80	0.000%
34	-5.89	-102.43	10.23	5.89	102.43	-10.23	0.000%
35	-10.19	-102.43	5.91	10.19	102.43	-5.91	0.000%
36	-11.76	-102.43	0.01	11.76	102.43	-0.01	0.000%
37	-10.18	-102.43	-5.89	10.18	102.43	5.89	0.000%
38	-5.87	-102.43	-10.22	5.87	102.43	10.22	0.000%
39	0.01	-48.26	-8.19	-0.01	48.26	8.19	0.000%
40	4.08	-48.26	-7.10	-4.08	48.26	7.10	0.000%
41	7.05	-48.26	-4.11	-7.05	48.26	4.11	0.000%
42	8.13	-48.26	-0.01	-8.13	48.26	0.01	0.000%
43	7.04	-48.26	4.09	-7.04	48.26	-4.09	0.000%
44	4.06	-48.26	7.09	-4.06	48.26	-7.09	0.000%
45	-0.01	-48.26	8.19	0.01	48.26	-8.19	0.000%
46	-4.08	-48.26	7.10	4.08	48.26	-7.10	0.000%
47	-7.05	-48.26	4.11	7.05	48.26	-4.11	0.000%
48	-8.13	-48.26	0.01	8.13	48.26	-0.01	0.000%
49	-7.04	-48.26	-4.09	7.04	48.26	4.09	0.000%
50	-4.06	-48.26	-7.09	4.06	48.26	7.09	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00001488
3	Yes	4	0.00000001	0.00031689
4	Yes	6	0.00000001	0.00012496
5	Yes	5	0.00000001	0.00095548
6	Yes	6	0.00000001	0.00012826
7	Yes	5	0.00000001	0.00098208
8	Yes	5	0.00000001	0.00006633
9	Yes	4	0.00000001	0.00077480
10	Yes	6	0.00000001	0.00012437
11	Yes	5	0.00000001	0.00095164
12	Yes	6	0.00000001	0.00012567
13	Yes	5	0.00000001	0.00096143
14	Yes	5	0.00000001	0.00004177
15	Yes	4	0.00000001	0.00052962
16	Yes	6	0.00000001	0.00012803
17	Yes	5	0.00000001	0.00097974
18	Yes	6	0.00000001	0.00012455
19	Yes	5	0.00000001	0.00095282
20	Yes	5	0.00000001	0.00003315
21	Yes	4	0.00000001	0.00046121
22	Yes	6	0.00000001	0.00012649
23	Yes	5	0.00000001	0.00096840

24	Yes	6	0.00000001	0.00012536
25	Yes	5	0.00000001	0.00095891
26	Yes	4	0.00000001	0.00001936
27	Yes	6	0.00000001	0.00016268
28	Yes	6	0.00000001	0.00028342
29	Yes	6	0.00000001	0.00028541
30	Yes	6	0.00000001	0.00016166
31	Yes	6	0.00000001	0.00027822
32	Yes	6	0.00000001	0.00028016
33	Yes	6	0.00000001	0.00016158
34	Yes	6	0.00000001	0.00028204
35	Yes	6	0.00000001	0.00027938
36	Yes	6	0.00000001	0.00016141
37	Yes	6	0.00000001	0.00028273
38	Yes	6	0.00000001	0.00028148
39	Yes	4	0.00000001	0.00007022
40	Yes	4	0.00000001	0.00058631
41	Yes	4	0.00000001	0.00063118
42	Yes	4	0.00000001	0.00008498
43	Yes	4	0.00000001	0.00057767
44	Yes	4	0.00000001	0.00059620
45	Yes	4	0.00000001	0.00007252
46	Yes	4	0.00000001	0.00062687
47	Yes	4	0.00000001	0.00057852
48	Yes	4	0.00000001	0.00008053
49	Yes	4	0.00000001	0.00060762
50	Yes	4	0.00000001	0.00059256

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	188 - 137	34.199	40	1.6833	0.0028
L2	141.25 - 90.25	18.811	40	1.3803	0.0013
L3	95.5 - 44.5	7.927	39	0.8503	0.0005
L4	51 - 0	2.097	39	0.3810	0.0002

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
188.00	Lighting Rod 3/4'' x 8'	40	34.199	1.6833	0.0028	47467
160.00	LNX-6515DS-VTM w/ Mount Pipe	40	24.652	1.5270	0.0018	8475
145.00	BXA-80063/6 w/ Mount Pipe	40	19.923	1.4139	0.0014	5519

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	188 - 137	160.581	2	7.9200	0.0128
L2	141.25 - 90.25	88.418	2	6.4943	0.0060
L3	95.5 - 44.5	37.279	2	4.0016	0.0023
L4	51 - 0	9.860	2	1.7924	0.0007

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
188.00	Lighting Rod 3/4" x 8'	2	160.581	7.9200	0.0129	10455
160.00	LNX-6515DS-VTM w/ Mount Pipe	2	115.818	7.1846	0.0085	1862
145.00	BXA-80063/6 w/ Mount Pipe	2	93.637	6.6524	0.0064	1208

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	188 - 137 (1)	TP32.711x22x0.25	51.00	0.00	0.0	25.0495	-12.63	1738.73	0.007
L2	137 - 90.25 (2)	TP42.03x31.3184x0.3125	51.00	0.00	0.0	40.2848	-22.15	2768.52	0.008
L3	90.25 - 44.5 (3)	TP51.014x40.3023x0.375	51.00	0.00	0.0	58.6481	-35.42	4014.89	0.009
L4	44.5 - 0 (4)	TP59.61x48.8988x0.5	51.00	0.00	0.0	93.8076	-57.88	6652.09	0.009

Pole Bending Design Data

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 $\frac{M_{uy}}{\phi M_{ny}}$
L1	188 - 137 (1)	TP32.711x22x0.25	595.54	1128.63	0.528	0.00	1128.63	0.000
L2	137 - 90.25 (2)	TP42.03x31.3184x0.3125	1806.72	2312.57	0.781	0.00	2312.57	0.000
L3	90.25 - 44.5 (3)	TP51.014x40.3023x0.375	3200.40	4069.02	0.787	0.00	4069.02	0.000
L4	44.5 - 0 (4)	TP59.61x48.8988x0.5	5044.73	8080.78	0.624	0.00	8080.78	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	188 - 137 (1)	TP32.711x22x0.25	24.05	869.37	0.028	1.04	2260.03	0.000
L2	137 - 90.25 (2)	TP42.03x31.3184x0.3125	28.89	1384.26	0.021	1.03	4630.81	0.000
L3	90.25 - 44.5 (3)	TP51.014x40.3023x0.375	33.65	2007.45	0.017	0.49	8147.98	0.000
L4	44.5 - 0 (4)	TP59.61x48.8988x0.5	38.34	3326.05	0.012	0.49	16181.33	0.000

Pole Interaction Design Data

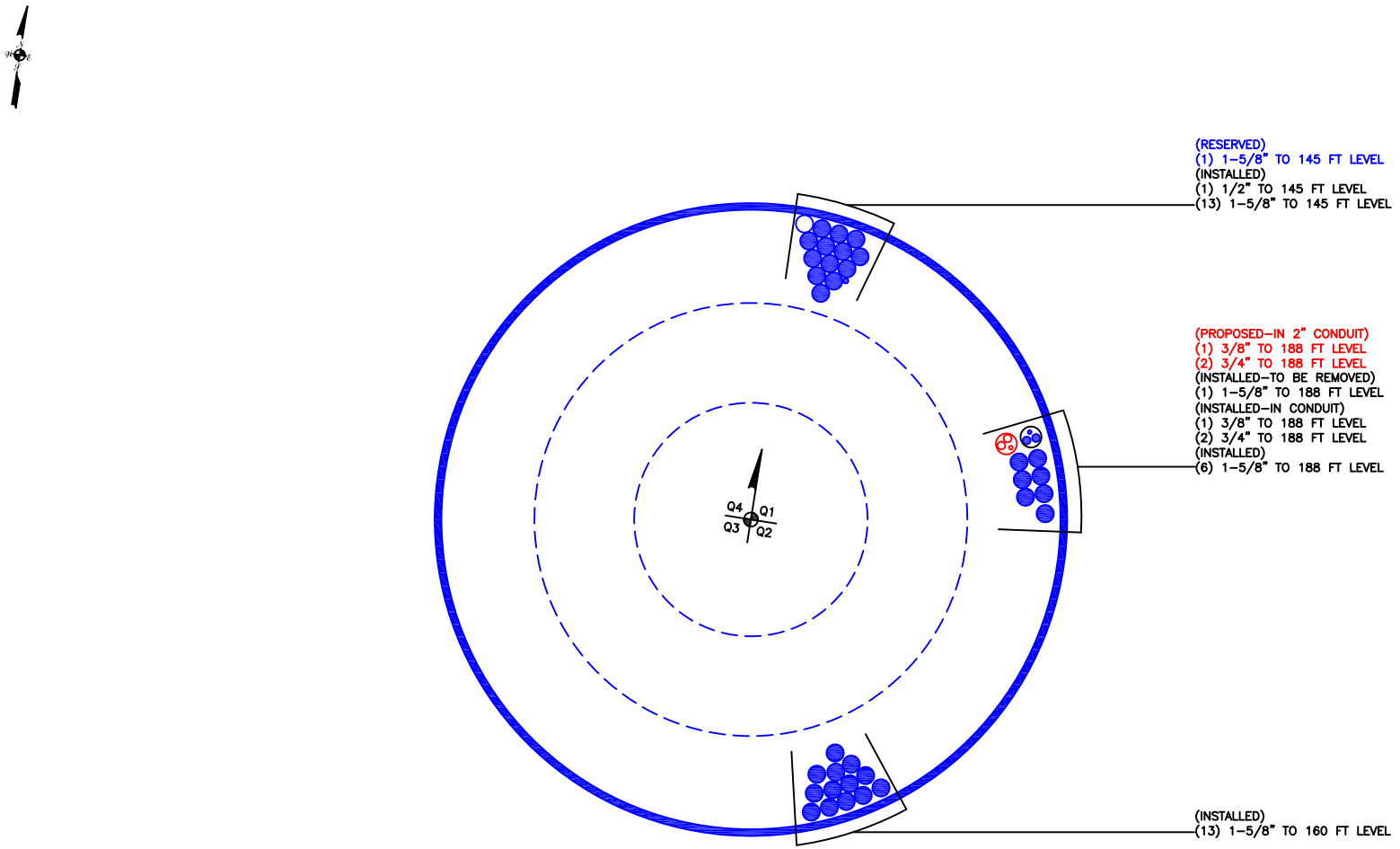
Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	188 - 137 (1)	0.007	0.528	0.000	0.028	0.000	0.536 ✔	1.000	4.8.2 ✔
L2	137 - 90.25 (2)	0.008	0.781	0.000	0.021	0.000	0.790 ✔	1.000	4.8.2 ✔
L3	90.25 - 44.5 (3)	0.009	0.787	0.000	0.017	0.000	0.796 ✔	1.000	4.8.2 ✔
L4	44.5 - 0 (4)	0.009	0.624	0.000	0.012	0.000	0.633 ✔	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	188 - 137	Pole	TP32.711x22x0.25	1	-12.63	1738.73	53.6	Pass
L2	137 - 90.25	Pole	TP42.03x31.3184x0.3125	2	-22.15	2768.52	79.0	Pass
L3	90.25 - 44.5	Pole	TP51.014x40.3023x0.375	3	-35.42	4014.89	79.6	Pass
L4	44.5 - 0	Pole	TP59.61x48.8988x0.5	4	-57.88	6652.09	63.3	Pass
							Summary	
						Pole (L3)	79.6	Pass
						RATING =	**79.6**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 803175 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

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

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

Site Data

BU#: *803175*
Site Name: *CT NEW BRITAIN 3 CAC 803*
App #: *377601-1*

Anchor Rod Data		
Eta Factor, η	0.5	TIA G (Fig. 4-4)
Qty:	20	
Diam:	2.25	in
Rod Material:	A615-J	
Yield, Fy:	75	ksi
Strength, Fu:	100	ksi
Bolt Circle:	67	in
Anchor Spacing:	6.125	in

Plate Data		
W=Side:	66	in
Thick:	3	in
Grade:	50	ksi
Clip Distance:	19.625	in

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

Pole Data		
Diam:	59.61	in
Thick:	0.5	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round

Base Reactions		
TIA Revision:	G	
Factored Moment, Mu:	5045	ft-kips
Factored Axial, Pu:	58	kips
Factored Shear, Vu:	38	kips

Anchor Rod Results

TIA G --> Max Rod (Cu+ Vu/η):	187.4	Kips
Axial Design Strength, Φ*Fu*Anet:	260.0	Kips
Anchor Rod Stress Ratio:	72.1%	**Pass**

Base Plate Results — Flexural Check

Base Plate Stress:	30.5	ksi
PL Design Bending Strength, Φ*Fy:	45.0	ksi
Base Plate Stress Ratio:	67.8%	**Pass**

PL Ref. Data
Yield Line (in): 33.73
Max PL Length: 33.73

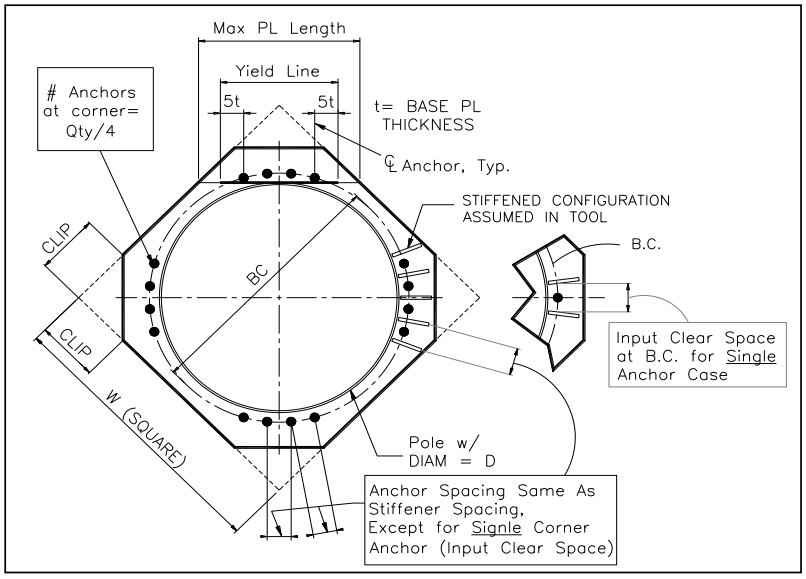
N/A - Unstiffened

Stiffener Results

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

Pole Results

Pole Punching Shear Check:	N/A



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

Monopole Pier and Pad Foundation

BU # : 803175
Site Name: CT NEW BRITAIN 3 CAC 80
App. Number: 377601-0
TIA-222 Revision: G

Design Reactions		
Shear, **S**:	38	kips
Moment, **M**:	5045	ft-kips
Tower Height, **H**:	188	ft
Tower Weight, **Wt**:	58	kips
Base Diameter, **BD**:	4.96	ft

Foundation Dimensions		
Depth, **D**:	7	ft
Pad Width, **W**:	26	ft
Neglected Depth, **N**:	4.5	ft
Thickness, **T**:	3.00	ft
Pier Diameter, **Pd**:	8.00	ft
Ext. Above Grade, **E**:	0.50	ft
BP Dist. Above Pier:	3.75	in.
Clear Cover, **Cc**:	4.0	in

Soil Properties		
Soil Unit Weight, **γ**:	0.110	kcf
Ult. Bearing Capacity, Bc:	18.0	ksf
Angle of Friction, **Φ**:	30	deg
Cohesion, **Co**:	0.000	ksf
Passive Pressure, **Pp**:	0.000	ksf
Base Friction, **μ**:	0.30	

Material Properties		
Rebar Yield Strength, **Fy**:	60000	psi
Concrete Strength, **F'c**:	3000	psi
Concrete Unit Weight, **δc**:	0.150	kcf
Seismic Zone, **z**:	1	

Rebar Properties		
Pier Rebar Size, **Sp**:	11	
Pier Rebar Quanity, **mp**:	36	24
Pad Rebar Size, **Spad**:	11	
Pad Rebar Quanity, **mpad**:	35	8
Pier Tie Size, **St**:	5	4
Tie Quanity, **mt**:	12	5

Design Checks	Capacity/ Availability	Demand/ Limits	Check
Req'd Pier Diam.(ft)	8	6.46	**OK**
Overturning (ft-kips)	7594.31	5045.00	**66.4%**
Shear Capacity (kips)	163.67	38.00	**23.2%**
Bearing (ksf)	13.50	2.89	**21.4%**
Pad Shear - 1-way (kips)	802.20	443.82	**55.3%**
Pad Shear - 2-way (kips)	2056.45	114.55	**5.6%**
Pad Moment Capacity (k-ft)	7183.33	1809.16	**25.2%**
Pier Moment Capacity (k-ft)	9939.62	5216.00	**52.5%**

Maximum Allowable Moment of a Circular Pier

Axial Load (Negative for Compression) = -58.00 kips

Pier Properties

Concrete:

Pier Diameter = 8.0 ft

Concrete Area = 7238.2 in^2

Reinforcement:

Clear Cover = 4.00 in

Cage Diameter = 7.22 ft

Bar Size = 11

Bar Diameter = 1.41 in

Bar Area = 1.56 in^2

Number of Bars = 36

Material Properties

Concrete compressive strength = 3000 psi

Reinforcement yield strength = 60000 psi

Modulus of elasticity = 29000 ksi

Reinforcement yield strain = 0.00207

Limiting compressive strain = 0.003

Seismic Properties

Seismic Zone = 1

Minimum Area of Steel

Required area of steel = 36.19 in^2

Provided area of steel = 56.16 in^2 **OK**

Axial Loading

Load factor = 1

Reduction factor = 0.9

Factored axial load = -64.4444 kips

Neutral Axis

Distance from extreme edge to neutral axis =	17.61	in
Equivalent compression zone factor =	0.85	
Distance from extreme edge to equivalent compression zone factor =	14.97	in
Distance from centroid to neutral axis =	30.39	in

Compression Zone

Area of steel in compression zone =	14.04	in^2
Angle from centroid of pier to intersection of equivalent compression zone and edge of pier =	46.51	deg
Area of concrete in compression =	719.90	in^2
Force in concrete = 0.85 * f`c * Acc =	1835.75	kips
Total reinforcement forces =	-1771.31	kips
Factored axial load =	-64.44	kips
Force in concrete =	-1835.75	kips
Sum of the forces in concrete =	0.00	kips **OK**

Maximum Moment

First moment of the concrete area in compression about the centoid =	28154.49	in^3
Distance between centroid of concrete in compression and centroid of pier =	39.11	in
Moment of concrete in compression =	71793.96	in-kips
Total reinforcement moment =	60734.31	in-kips
Nominal moment strength of column =	132528.27	in-kips
Factored moment strength of column =	119275.45	in-kips

Maximum Allowable Moment = 9939.62 ft-kips

Individual Bars

Bar #	Angle from first bar (deg)	Distance to centroid (in)	Distance to neutral axis (in)	Distance to equivalent comp. zone (in)	Strain	Area of steel in compression (in^2)	Stress (ksi)	Axial force (kips)
1	0.00	0.00	-30.39	-33.03	-0.0051789	0.00	-60.00	-93.60
2	10.00	7.52	-22.88	-25.52	-0.0038978	0.00	-60.00	-93.60
3	20.00	14.81	-15.59	-18.23	-0.0026557	0.00	-60.00	-93.60
4	30.00	21.65	-8.75	-11.39	-0.0014903	0.00	-43.22	-67.42
5	40.00	27.83	-2.56	-5.21	-0.0004369	0.00	-12.67	-19.77
6	50.00	33.17	2.77	0.13	0.0004724	1.56	13.70	17.39
7	60.00	37.49	7.10	4.46	0.00121	1.56	35.09	50.76
8	70.00	40.68	10.29	7.65	0.0017534	1.56	50.85	75.35
9	80.00	42.64	12.24	9.60	0.0020862	1.56	60.00	89.62
10	90.00	43.30	12.90	10.26	0.0021983	1.56	60.00	89.62
11	100.00	42.64	12.24	9.60	0.0020862	1.56	60.00	89.62
12	110.00	40.68	10.29	7.65	0.0017534	1.56	50.85	75.35
13	120.00	37.49	7.10	4.46	0.00121	1.56	35.09	50.76
14	130.00	33.17	2.77	0.13	0.0004724	1.56	13.70	17.39
15	140.00	27.83	-2.56	-5.21	-0.0004369	0.00	-12.67	-19.77
16	150.00	21.65	-8.75	-11.39	-0.0014903	0.00	-43.22	-67.42
17	160.00	14.81	-15.59	-18.23	-0.0026557	0.00	-60.00	-93.60
18	170.00	7.52	-22.88	-25.52	-0.0038978	0.00	-60.00	-93.60
19	180.00	0.00	-30.39	-33.03	-0.0051789	0.00	-60.00	-93.60
20	190.00	-7.52	-37.91	-40.55	-0.0064599	0.00	-60.00	-93.60
21	200.00	-14.81	-45.20	-47.84	-0.007702	0.00	-60.00	-93.60
22	210.00	-21.65	-52.04	-54.68	-0.0088674	0.00	-60.00	-93.60
23	220.00	-27.83	-58.22	-60.86	-0.0099208	0.00	-60.00	-93.60
24	230.00	-33.17	-63.56	-66.20	-0.0108301	0.00	-60.00	-93.60
25	240.00	-37.49	-67.89	-70.53	-0.0115677	0.00	-60.00	-93.60
26	250.00	-40.68	-71.08	-73.72	-0.0121111	0.00	-60.00	-93.60
27	260.00	-42.64	-73.03	-75.67	-0.0124439	0.00	-60.00	-93.60
28	270.00	-43.30	-73.69	-76.33	-0.012556	0.00	-60.00	-93.60
29	280.00	-42.64	-73.03	-75.67	-0.0124439	0.00	-60.00	-93.60
30	290.00	-40.68	-71.08	-73.72	-0.0121111	0.00	-60.00	-93.60
31	300.00	-37.49	-67.89	-70.53	-0.0115677	0.00	-60.00	-93.60
32	310.00	-33.17	-63.56	-66.20	-0.0108301	0.00	-60.00	-93.60
33	320.00	-27.83	-58.22	-60.86	-0.0099208	0.00	-60.00	-93.60
34	330.00	-21.65	-52.04	-54.68	-0.0088674	0.00	-60.00	-93.60
35	340.00	-14.81	-45.20	-47.84	-0.007702	0.00	-60.00	-93.60
36	350.00	-7.52	-37.91	-40.55	-0.0064599	0.00	-60.00	-93.60

USGS Design Maps Summary Report

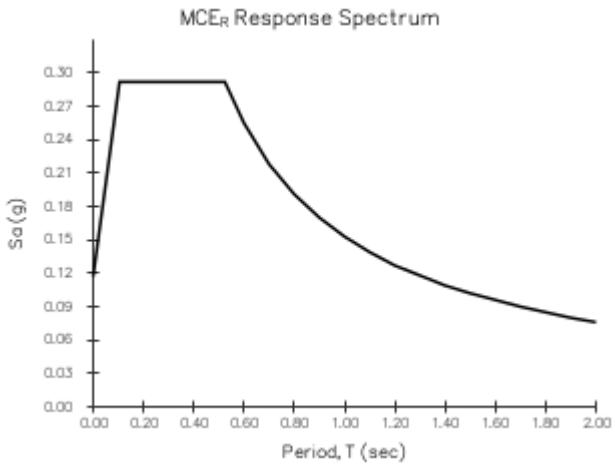
User–Specified Input

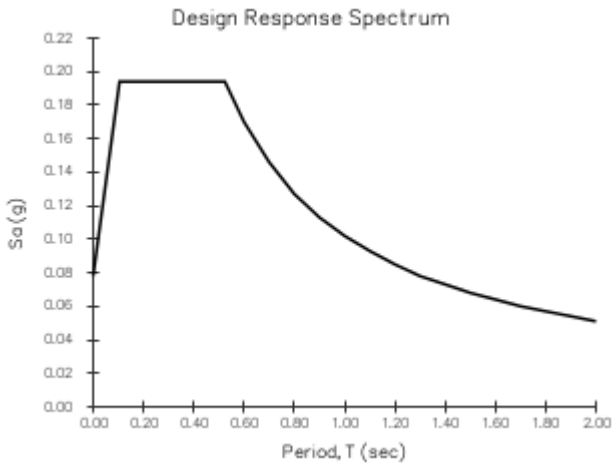
Report Title	803175 Tue February 21, 2017 21:41:50 UTC
Building Code Reference Document	2012/2015 International Building Code (which utilizes USGS hazard data available in 2008)
Site Coordinates	41.68661°N, 72.75772°W
Site Soil Classification	Site Class D – "Stiff Soil"
Risk Category	I/II/III

USGS–Provided Output

S_S =	0.182 g	S_{MS} =	0.292 g	S_{DS} =	0.194 g
S_1 =	0.064 g	S_{M1} =	0.153 g	S_{D1} =	0.102 g

For information on how the SS and S1 values above have been calculated from probabilistic (risk-targeted) and deterministic ground motions in the direction of maximum horizontal response, please return to the application and select the "2009 NEHRP" building code reference document.





CCISeismic - Design Category

Per *2012/2015 IBC*

Site BU:	803175
Work Order:	1364571
Application:	377601 Rev. 1

	Degrees	Minutes	Seconds		
Site Latitude =	41	41	11.79	41.6866	degrees
Site Longitude =	-72	45	27.79	-72.7577	degrees
Ground Supported Structure =	Yes				
Structure Class =	II			*(Table 2-1)*	
Site Class =	D - Stiff Soil			*(Table 2-11)*	

Spectral response acceleration short periods, S_S =	0.182	USGS Seismic Tool
Spectral response acceleration 1 s period, S_1 =	0.064	

Importance Factor, I =	1.0	*(Table 2-3)*
Acceleration-based site coefficient, F_a =	1.6	*(Table 2-12)*
Velocity-based site coefficient, F_v =	2.4	*(Table 2-13)*

Design spectral response acceleration short period, S_{DS} =	0.194	*(2.7.6)*
Design spectral response acceleration 1 s period, S_{D1} =	0.102	*(2.7.6)*

Seismic Design Category - Short Period Response =	B	*ASCE 7-05 Table 11.6-1*
Seismic Design Category - 1s Period Response =	B	*ASCE 7-05 Table 11.6-2*

Worst Case Seismic Design Category =	B	*ASCE 7-05 Tables 11.6-1 and 6-2*

Radio Frequency Emissions Analysis Report

AT&T Existing Facility

Site ID: CT5379

New Britain East
178 Lester Street
New Britain, CT 6051

March 7, 2017

Centerline Communications Project Number: 950006-041

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**7.20 %**

March 7, 2017

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

Emissions Analysis for Site: **CT5379 – New Britain East**

Centerline Communications, LLC ("Centerline") was directed to analyze the proposed AT&T facility located at **178 Lester Street, New Britain, CT**, for the purpose of determining whether the emissions from the Proposed AT&T Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were performed for the proposed AT&T Wireless antenna facility located at **178 Lester Street, New Britain, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since AT&T is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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

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

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

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

Table 1: Channel Data Table

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

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	Kathrein 800-10121	189
A	2	CCI OPA-65R-LCUU-H4	189
A	3	Quintel QS46512-2	189
B	1	Kathrein 800-10121	189
B	2	CCI OPA-65R-LCUU-H6	189
B	3	Quintel QS66512-2	189
C	1	Kathrein 800-10121	189
C	2	CCI OPA-65R-LCUU-H6	189
C	3	Quintel QS66512-2	189

Table 2: Antenna Data

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

RESULTS

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

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	Kathrein 800-10121	850 MHz / 1900 MHz (PCS)	11.45 / 14.35	4	120	2,471.44	0.33
Antenna A2	CCI OPA-65R-LCUU-H4	2300 MHz (WCS)	14.65	2	120	3,500.91	0.38
Antenna A3	Quintel QS46512-2	700 MHz / 1900 MHz (PCS)	10.55 / 13.15 / 0 / 0	4	240	3,840.47	0.58
						Sector A Composite MPE%	**1.29**
Antenna B1	Kathrein 800-10121	850 MHz / 1900 MHz (PCS)	11.45 / 14.35	4	120	2,471.44	0.33
Antenna B2	CCI OPA-65R-LCUU-H6	2300 MHz (WCS)	15.45	2	120	4,209.02	0.45
Antenna B3	Quintel QS66512-2	700 MHz / 1900 MHz (PCS)	10.85 / 13.85	4	240	4,371.36	0.65
						Sector B Composite MPE%	**1.43**
Antenna C1	Kathrein 800-10121	850 MHz / 1900 MHz (PCS)	11.45 / 14.35	4	120	2,471.44	0.33
Antenna C2	CCI OPA-65R-LCUU-H6	2300 MHz (WCS)	15.45	2	120	4,209.02	0.45
Antenna C3	Quintel QS66512-2	700 MHz / 1900 MHz (PCS)	10.85 / 13.85	4	240	4,371.36	0.65
						Sector C Composite MPE%	**1.43**

Table 3: AT&T Emissions Levels

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

Site Composite MPE%	
Carrier	**MPE%**
AT&T – Max Sector Value	**1.43 %**
T-Mobile	2.31 %
Verizon Wireless	3.46 %
Site Total MPE %:	**7.20 %**

Table 4: All Carrier MPE Contributions

AT&T Sector A Total:	1.29 %
AT&T Sector B Total:	1.43 %
AT&T Sector C Total:	1.43 %
Site Total:	7.20 %

Table 5: Site MPE Summary

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

AT&T _ Frequency Band / Technology (Sectors B&C)	# 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	418.91	189	0.90	850 MHz	567	0.16%
AT&T 1900 MHz (PCS) UMTS	2	816.81	189	1.75	1900 MHz (PCS)	1000	0.18%
AT&T 2300 MHz (WCS) LTE	2	2,104.51	189	4.52	2300 MHz (WCS)	1000	0.45%
AT&T 700 MHz LTE	2	729.71	189	1.57	700 MHz	467	0.34%
AT&T 1900 MHz (PCS) LTE	2	1,455.97	189	3.13	1900 MHz (PCS)	1000	0.31%
						Total:	1.43%

Table 6: AT&T Maximum Sector MPE Power Values

Summary

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

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

AT&T Sector	Power Density Value (%)
Sector A:	1.29 %
Sector B:	1.43 %
Sector C:	1.43 %
AT&T Maximum Total (per sector):	1.43 %
Site Total:	7.20 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **7.20 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

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