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

January 23, 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: 806364**
AT&T Site ID: CT5841
143R Old Blue Hill Road, Durham, CT 06422
Latitude: 41° 27' 33.67"/ Longitude: -72° 39' 45.83"

Dear Ms. Bachman:

AT&T currently maintains nine (9) antennas at the 74-foot level of the existing 120-foot monopole tower at 143R Old Blue Hill Road in Durham, CT. The tower and property is owned by Crown Castle. AT&T now intends to replace three (3) RRUs with three (3) new RRUs, six (6) diplexers with six (6) new diplexers, as well as install twelve (12) tower mounted switches, and three (3) BiasT.

This facility was approved by the Connecticut Siting Council in Docket 161 on March 11, 1994. This approval included the conditions that:

1. The tower shall be constructed as a monopole, no taller than necessary to provide the proposed communications service and the tower shall not to exceed a total height of 113 feet above ground level (AGL), with antennas and appurtenances.
2. The road design and drainage system for improvements on approximately 1600 feet of the Old Blue Hills Road right-of-way shall be subject to approval by the Town of Durham.

This modification complies with the aforementioned condition(s).

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 Ms. Laura L. Francis, First-Selectman, Town of Durham, 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: Ms. Laura Francis, First-Selectman
Town of Durham
30 Townhouse Road
PO Box 428
Durham, CT 06422

ORIGINAL

DOCKET NO. 161 - An application of Metro Mobile CTS of Hartford Inc., for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance, and operation of a cellular telecommunications facility. The proposed prime site is located off of Old Blue Hills Road approximately 2,000 feet from the end of the improved portion of the road in Durham, Connecticut. The proposed alternate sites are located at 199R Cherry Lane and 100 New Haven Road, Durham, Connecticut.

Connecticut

Siting

Council

March 11, 1994

Decision and Order

Pursuant to the foregoing Findings of Fact, and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, operation, and maintenance of a cellular telecommunications tower and equipment building at the proposed prime site in Durham, Connecticut, including effects on the natural environment; ecological integrity and balance; public health and safety; scenic, historic, and recreational values; forests and parks; air and water purity; and fish and wildlife are not disproportionate either alone or cumulatively with other effects when compared to need, are not in conflict with the policies of the State concerning such effects, and are not sufficient reason to deny the application and therefore directs that a Certificate of Environmental Compatibility and Public Need as provided by section 16-50k of the Connecticut General Statutes (CGS), be issued to Metro Mobile CTS of Hartford, Inc. (Metro Mobile), for the construction, operation, and maintenance of a cellular telecommunications tower, associated equipment, and building at the proposed prime site located off of Old Blue Hills Road, Durham, Connecticut. We find the effects on scenic resources and adjacent land uses of the alternative sites to be significant, and therefore deny certification of these sites.

The facility shall be constructed, operated, and maintained substantially as specified in the Council's record in this matter, and subject to the following conditions:

1. The self-supporting monopole tower shall be no taller than necessary to provide the proposed communications service and the tower shall not exceed a total height of 113 feet above ground level (AGL), with antennas and appurtenances.

2. The road design and drainage system for improvements on approximately 1,600 feet of the Old Blue Hills Road right-of-way shall be subject to approval by the Town of Durham.

3. The Certificate Holder shall prepare a Development and Management (D&M) plan for this site in compliance with sections 16-50j-75 through 16-50j-77 of the Regulations of State Agencies. The D&M plan shall include detailed plans of the tower, antenna placement on the tower including entities sharing tower space, tower foundation, equipment building, access road, utility connection, security fence, and erosion and sedimentation controls consistent with the Connecticut Guidelines for Soil Erosion and Sedimentation Control (as amended).

4. The Certificate Holder shall make provision for a Phase I archaeological reconnaissance survey, subject to the consent of the landowner, at the Merwin Cave site, due within six months after the commencement of construction. A final report of this survey shall be provided to the Council upon completion. The Certificate Holder shall not be liable for any site protection, collection and exhibition of artifacts, or other actions beyond a Phase I reconnaissance survey.

5. The Certificate Holder shall comply with any existing and future radio frequency (RF) standard promulgated by State or federal regulatory agencies. Upon the establishment of any new governmental RF standards, the facility granted herein shall be brought into compliance with such standards.

6. The Certificate Holder shall provide the Council a recalculated report of electromagnetic radio frequency power density if and when circumstances in operation cause a change in power density above the levels originally calculated and provided in the application.

7. The Certificate Holder shall permit public or private entities to share space on the proposed tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing.

8. If the facility does not initially provide, or permanently ceases to provide cellular or other services following completion of construction, this Decision and Order shall be void, and the Certificate holder shall dismantle the tower and remove all associated equipment or reapplication for any continued or new use shall be made to the Council before any such use is made.

9. Unless otherwise approved by the Council, this Decision and Order shall be void if all construction authorized herein is not completed within three years of the effective date of this Decision and Order or within three years after all appeals to this Decision and Order have been resolved.

Pursuant to CGS section 16-50p, we hereby direct that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed below, and notice of issuance shall be published in the Hartford Courant and Middletown Press.

By this Decision and Order, the Council disposes of the legal rights, duties, and privileges of each party named or admitted to the proceeding in accordance with section 16-50j-17 of the Regulations of State Agencies.

The parties and intervenors to this proceeding are:

APPLICANT	ITS REPRESENTATIVES
Metro Mobile CTS of Hartford, Inc.	Metro Mobile CTS of Hartford, Inc. 20 Alexander Drive Wallingford, CT 06492 Attn: David S. Malko, P.E. Manager, Engineering and Regulatory Services Robinson & Cole One Commercial Plaza Hartford, CT 06103-3597 Attn: Brian C. S. Freeman, Esq.
PARTY	ITS REPRESENTATIVE
Town of Durham	Henry A. Robinson First Selectman 30 Town House Road P.O. Box 428 Durham, CT 06422
INTERVENOR	ITS REPRESENTATIVE
Springwich Cellular Limited Partnership	Peter J. Tyrrell Senior Attorney Springwich Cellular Limited Partnership 227 Church Street New Haven, CT 06506

CERTIFICATION

The undersigned members of the Connecticut Siting Council (Council) hereby certify that they have heard this case, or read the record thereof, in Docket No. 161 - Certificate of Environmental Compatibility and Public Need for the construction, maintenance, and operation of a cellular telecommunications facility, in Durham, Connecticut, and voted as follows to approve the proposed prime site located off of Old Blue Hills Road:

Council Members	Vote Cast
Mortimer A. Gelston Chairman	YES
Commissioner Reginald J. Smith Designee: Gerald J. Heffernan	YES
Commissioner Timothy R.E. Keeney Designee: Brian Emerick	YES
Harry E. Covey	ABSENT
Daniel P. Lynch, Jr.	YES
Gloria Dibble Pond	YES
William H. Smith	YES
Colin C. Tait	YES
Dana J. Wright	ABSENT

Dated at New Britain, Connecticut, March 11, 1994.

7697E

STATE OF CONNECTICUT)
:
ss. New Britain, Connecticut
COUNTY OF HARTFORD)

I hereby certify that the foregoing is a true and correct copy of the Findings of Fact, Opinion, and Decision and Order issued by the Connecticut Siting Council, State of Connecticut.

ATTEST:

Joel M. Rinebold
Executive Director
Connecticut Siting Council

I certify that a copy of the Findings of Fact, Opinion, and Decision and Order in Docket 161 have been forwarded by Certified First Class Return Receipt Requested mail on March 11, 1994, to all parties and intervenors of record as listed on the attached service list, dated December 7, 1993.

ATTEST:

Stanley J. Modzelesky
Executive Assistant
Connecticut Siting Council

7697E-1

Durham, CT : Commercial Property Record Card

[Back to Search Results] [Start a New Search][Help with Printing]

Search For Properties

Parcel ID **Name** **Street Name**

OLD BLUE HILLS RD Search Reset

Parcel ID	Card	Routing No	Location	Zoning	State Class	Acres
M0162401	1	69 12A	143R OLD BLUE HILLS RD	FR	504 - n/a	2.750

Living Units
0

Owner Information
Bell Atlantic Nynex Behrens

Deed Information
Book/Page: 0
Deed Date: 1984/08/24

Building Information
Building No: 1
Year Built: 1994
No of Units: 1
Structure Type: Tadio/Tv Transmitting Building
Grade: C+
Identical Units: 1

Valuation
Land:	$144,000
Building:	$156,600
Total:	$300,600
Net Assessment:	$210,420

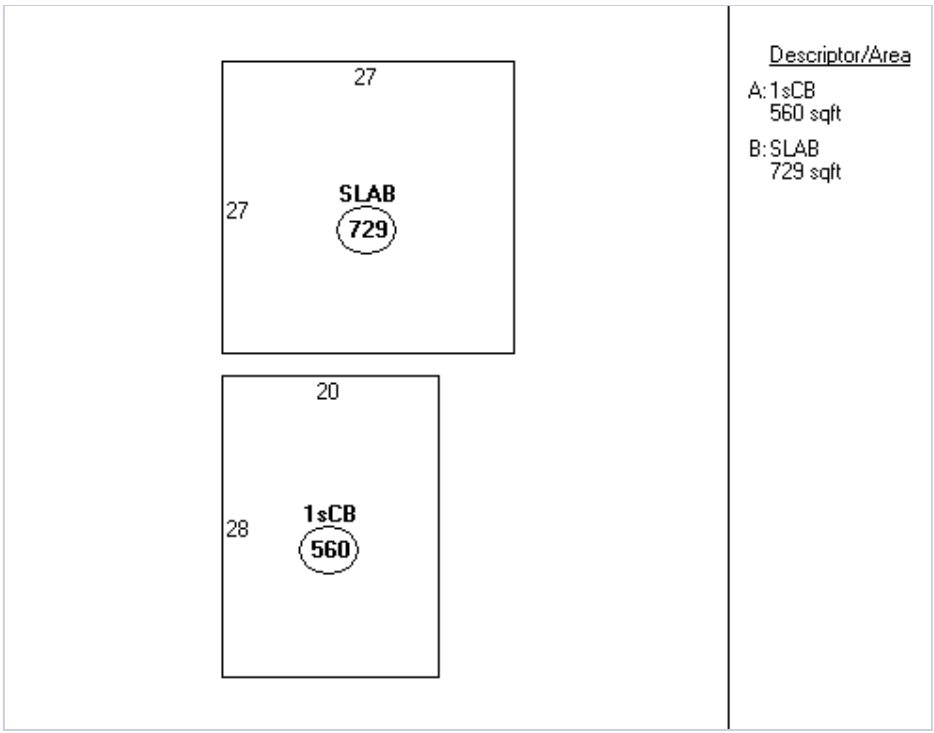
Property Picture


Sales History
Book/Page	Date	Price	Type	Validity

Out Building Information
Structure Code	Width	Lgth/SqFt	Year	RCNLD
Asphalt Parking	1	2400	1994	$1,940
Paving Conc Heavy	27	27	1994	$12,800
Fence Chain	8	260	1994	$4,160
Shed Frame	10	12	1994	$990
Paving Conc Heavy	1	680	1994	$950
Cell Tower	1	250	1994	$90,000

Exterior/Interior Information
Levels	Size	Use Type	Ext. Walls	Const. Type	Partitions	Heating	A/C	Plumbing	Condition	Func. Utility	Unadj. RCNLD
01-01	1x560	Multi-Use Storage	Conc. Block	Fireproof	Normal	None	Unit	None	Good	Good	21200

Building Sketch



Notice

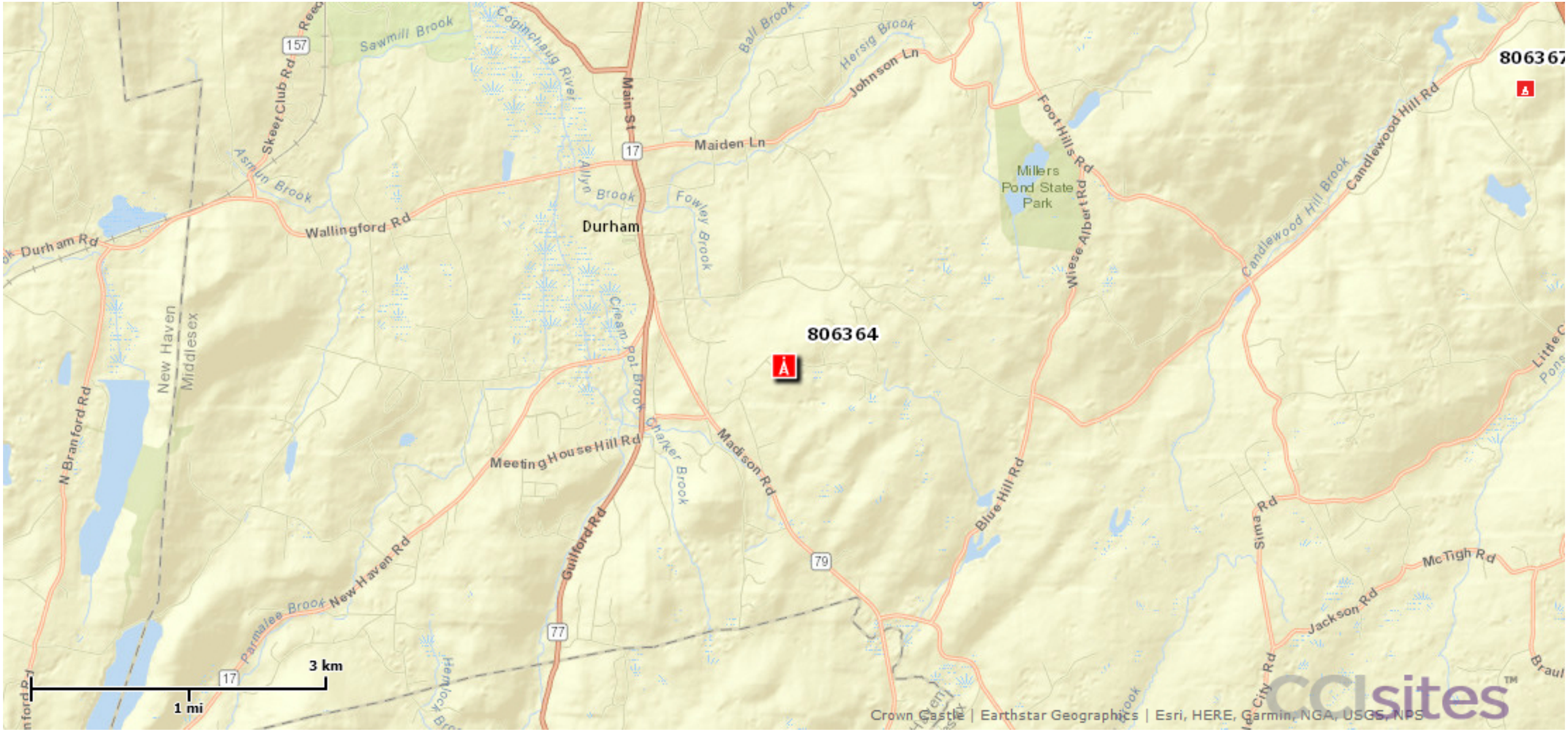
The information delivered through this on-line database is provided in the spirit of open access to government information and is intended as an enhanced service and convenience for citizens of Durham, CT.

The providers of this database: CLT, Big Room Studios, and Durham, CT assume no liability for any error or omission in the information provided here.

Currently All Values Have Not Been Finalized and Are Subject To Change.

Comments regarding this service should be directed to: jphilip@townofdurhamct.org

BUILT BY bigRoom STUDIOS


806364
806367
Durham
Maiden Ln
Johnson Ln
Wallingford Rd
Durham Rd
Meeting House Hill Rd
New Haven Rd
Guilford Rd
Madison Rd
Blue Hill Rd
Foot Hills Rd
Wiese Albert Rd
Candlewood Hill Rd
Candlewood Hill Brook
Millers Pond State Park
Main St
Skeet Club Rd
Sawmill Brook
Coginchaug River
Ball Brook
Hersig Brook
Asnuntuck Brook
Allyn Brook
Fowley Brook
Cream Pot Brook
Quarter Brook
Parmalee Brook
New Haven
Middlesex
N Branford Rd
Sima Rd
McTigh Rd
Jackson Rd
157
17
77
79
3 km
1 mi
Crown Castle | Earthstar Geographics | Esri, HERE, Garmin, NGA, USGS, NPS
CCIsites™

WIRELESS COMMUNICATIONS FACILITY
CT5841 - LTE BWE
DURHAM CENTRAL
CROWN CASTLE SITE NO.: 806364
143 R OLD BLUE HILLS ROAD
DURHAM, CT 06422

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

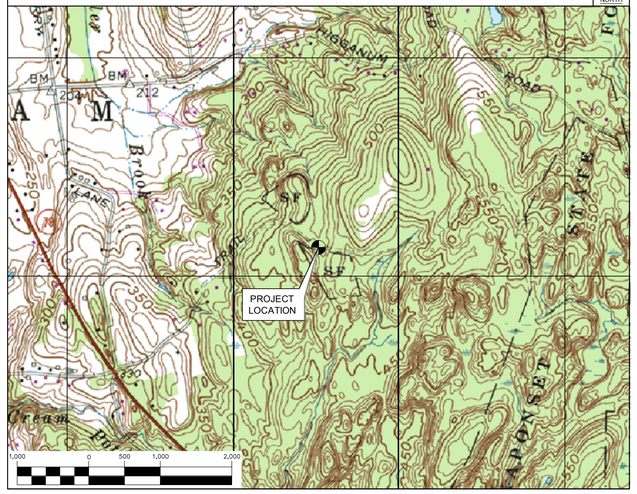
FROM: 500 ENTERPRISE DRIVE, ROCKY HILL, CONNECTICUT **TO:** 143 R OLD BLUE HILLS ROAD, DURHAM, CONNECTICUT

1.	HEAD NORTHEAST ON ENTERPRISE DR TOWARD CAPITAL BLVD	0.36 MI
2.	TURN LEFT ONTO CAPITAL BLVD	0.27 MI
3.	TURN LEFT ONTO WEST ST	0.30 MI
4.	TURN LEFT TO MERGE ONTO I-91 S TOWARD NEW HAVEN	1.41 MI
5.	MERGE ONTO CT-9 S via EXIT 22S ON THE LEFT TOWARD MIDDLETOWN/OLD SAYBROOK	6.37 MI
6.	MERGE ONTO CT-17 S via EXIT 13 TOWARD NEW HAVEN	0.51 MI
7.	TURN LEFT ONTO CT-17/S via EXIT 13 TOWARD NEW HAVEN	0.51 MI
8.	TURN LEFT ONTO CT-17/S MAIN ST.	6.39 MI
9.	STAY STRAIGHT TO GO ONTO MADISON RD/CT-79	0.85 MI
10.	TAKE THE 2ND LEFT ONTO OLD BLUE HILLS RD	0.53 MI

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 (3) EXISTING RRUS-11'S FOR PROPOSED RRUS-12'S MOUNTED BEHIND EXISTING POSITION 3 ANTENNA.

PROJECT INFORMATION

AT&T SITE NUMBER:	CT5841
AT&T SITE NAME:	DURHAM CENTRAL
SITE ADDRESS:	CROWN CASTLE SITE NO.: 806364 143 R OLD BLUE HILLS ROAD DURHAM, CT 06422
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°-27'-33.71" N LONGITUDE: 72°-39'-45.90" W GROUND ELEVATION: ±538' 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 EQUIPMENT DETAILS	0
E-1	TYPICAL ELECTRICAL DETAILS & NOTES	0

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	01/11/17	KAW/JR	CAG	CONSTRUCTION DOCUMENTS - ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

at&t

EMPIRE telecom

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

AT&T MOBILITY
WIRELESS COMMUNICATIONS FACILITY
DURHAM CENTRAL
CT5841 - LTE BWE
143 R OLD BLUE HILLS ROAD
DURHAM, CT 06422

DATE:	01/09/17
SCALE:	AS NOTED
JOB NO.	16071.95

TITLE SHEET

T-1

Sheet No. 1 of 5

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): 100–120 MPH (3 SECOND GUST)
- RISK CATEGORY: II (BASED ON IBC TABLE 1604.5)
- NOMINAL DESIGN SPEED (OTHER STRUCTURE): 101 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. <u>ANTENNA PANELS:</u>

   A. SHERWIN WILLIAMS POLANE–B
   B. COLOR TO BE MATCHED WITH EXISTING TOWER STRUCTURE.

2. <u>COAXIAL CABLES:</u>

   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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NOTES AND SPECIFICATIONS

N–1

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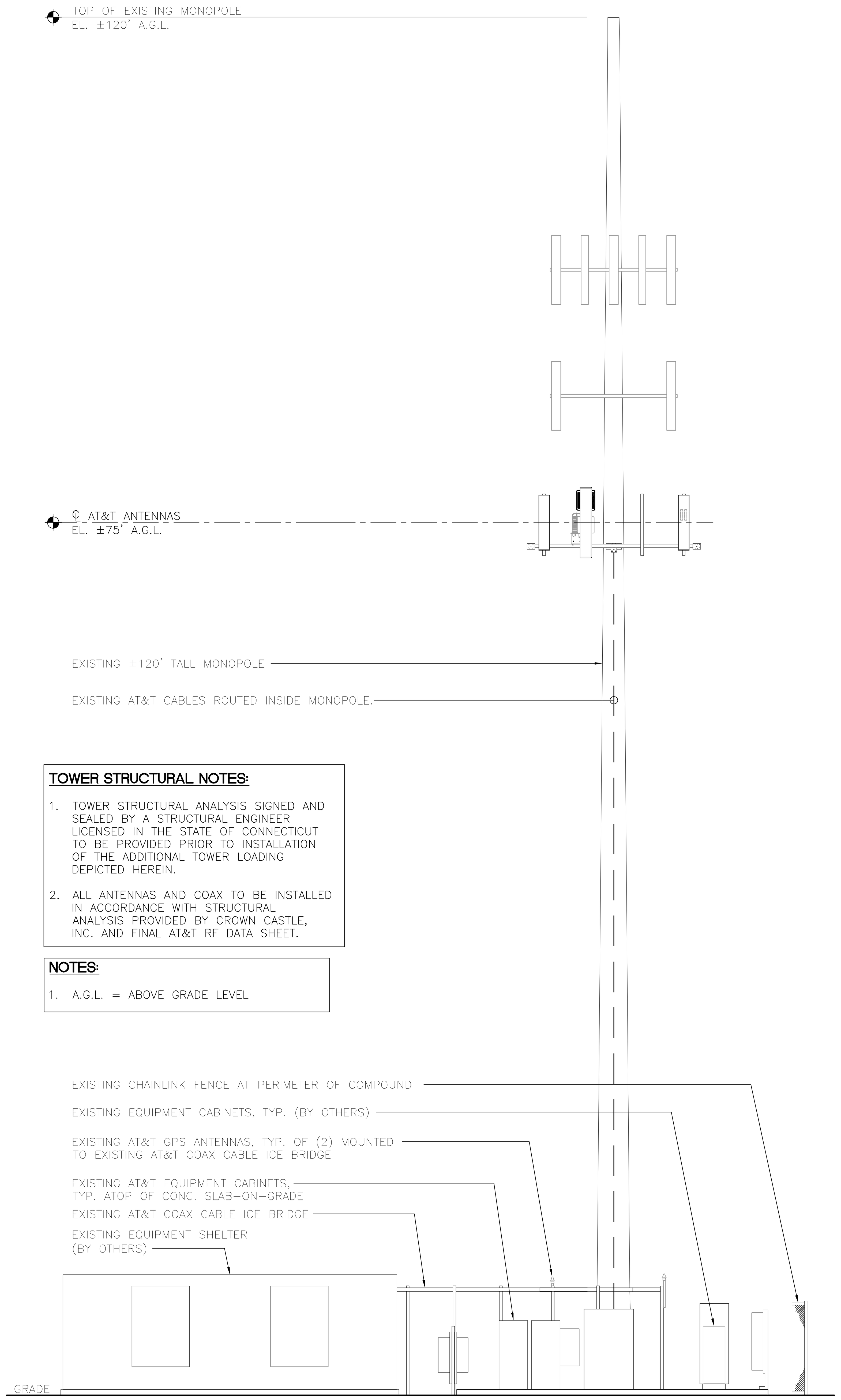


TOWER STRUCTURAL NOTES:

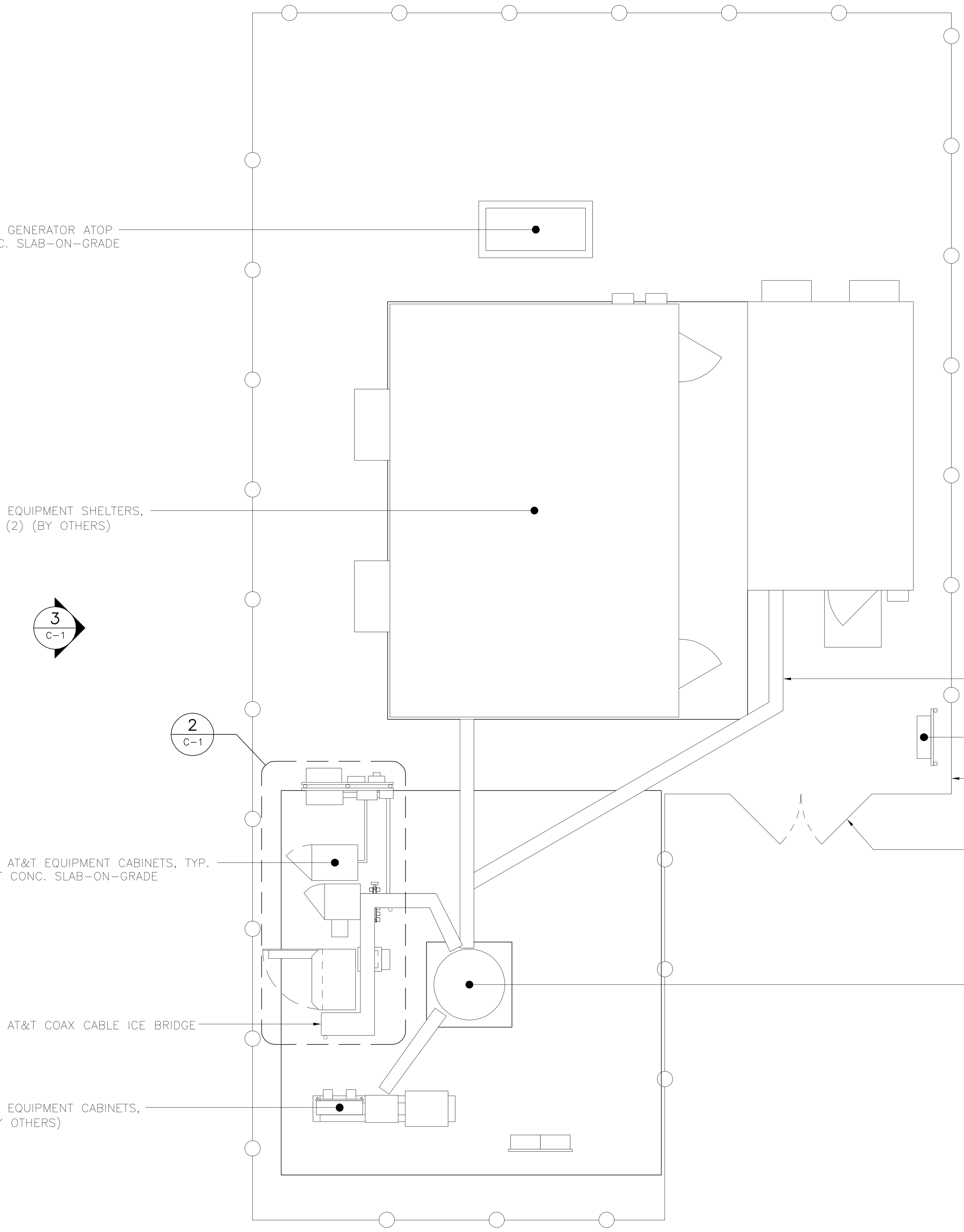
1. TOWER STRUCTURAL ANALYSIS SIGNED AND SEALED BY A STRUCTURAL ENGINEER LICENSED IN THE STATE OF CONNECTICUT TO BE PROVIDED PRIOR TO INSTALLATION OF THE ADDITIONAL TOWER LOADING DEPICTED HEREIN.
2. ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE,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

NOTES:

1. A.G.L. = ABOVE GRADE LEVEL

3 C-1 TOWER ELEVATION
SCALE: 1" = 7'

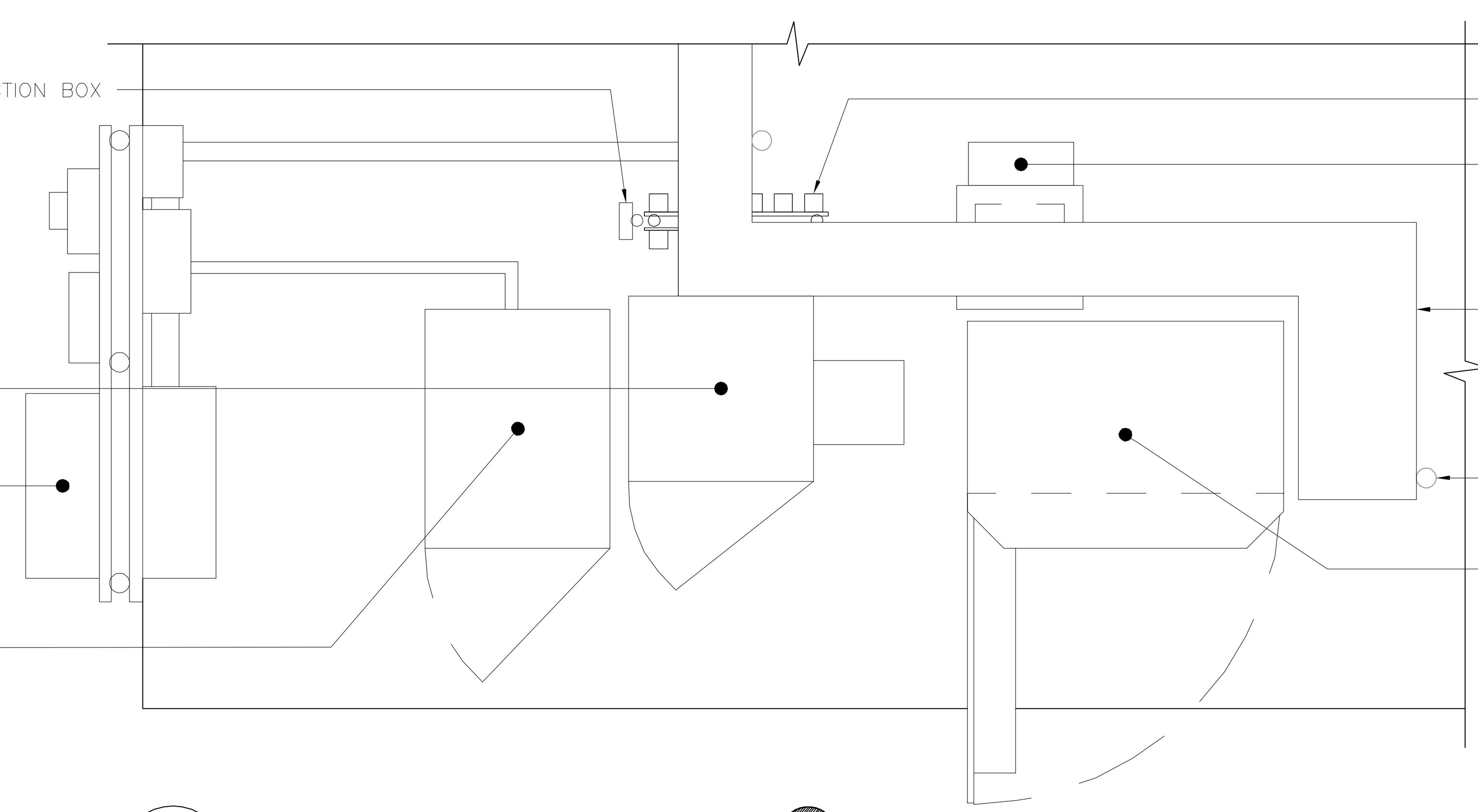
GRAPHIC SCALE 7 0 3.5 7 14 28 (IN FEET) 1 inch = 7 ft.



1 C-1 COMPOUND PLAN
SCALE: 1" = 6'

GRAPHIC SCALE 6 0 3 6 12 24 (IN FEET) 1 inch = 6 ft.

TRUE NORTH



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

TRUE NORTH

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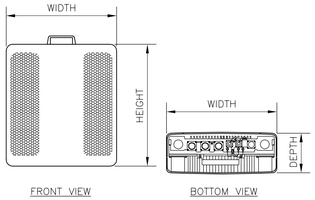
PLANS AND ELEVATION

C-1

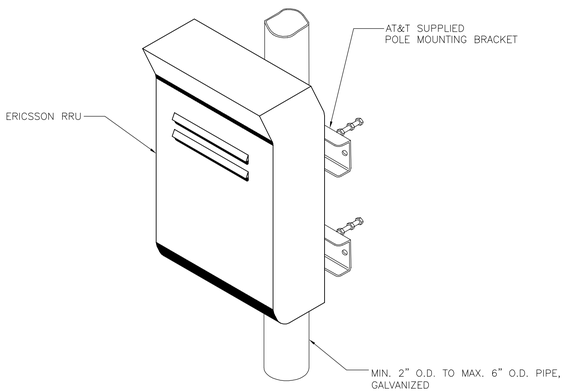
Sheet No. 3 of 5



RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RRUS 12	20.4"L x 18.5"W x 7.5"D	50 LBS.	ABOVE: 16" MIN. BELOW: 12" MIN. FRONT: 36" MIN.

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

5 / C-2 **ERICSSON RRUS 12 DETAIL**
SCALE: 1" = 1'-0"

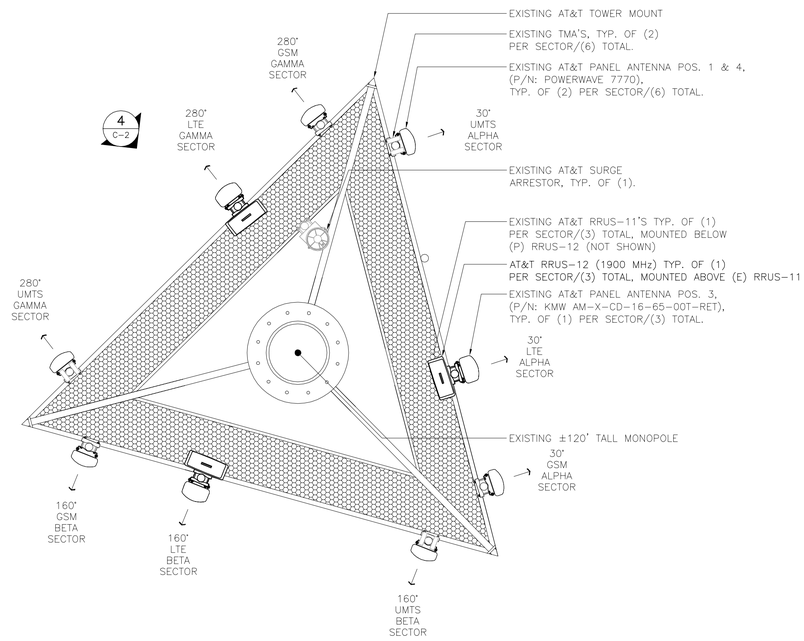


ISOMETRIC VIEW

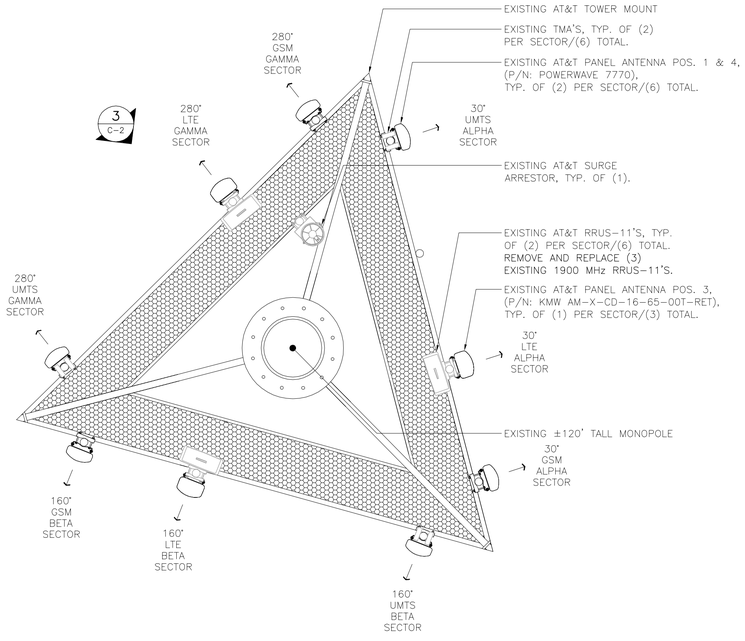
NOTES:

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.

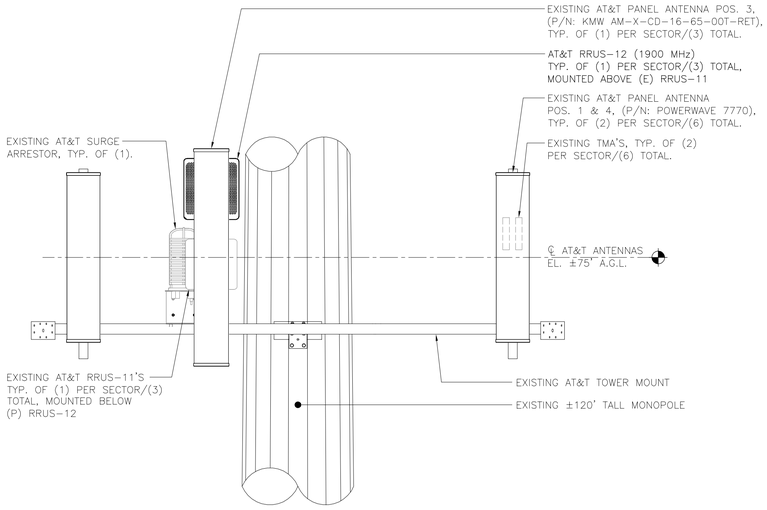
6 / C-2 **TYPICAL RRUS MOUNTING DETAILS**
SCALE: NTS



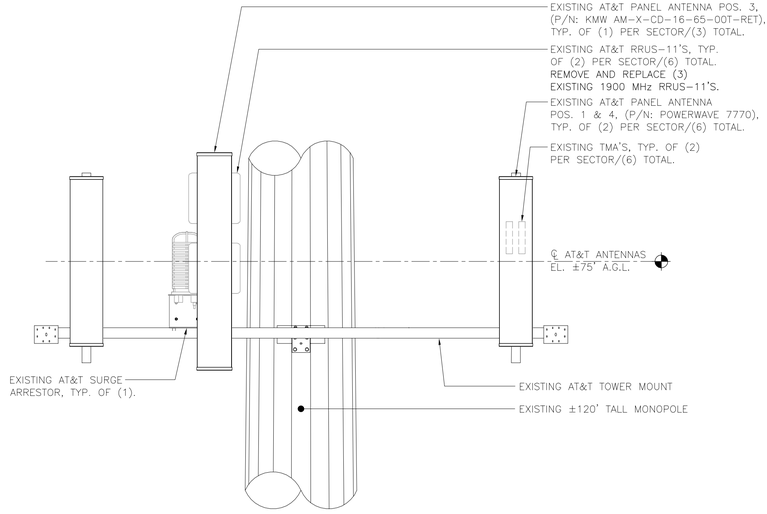
2 / C-2 **PROPOSED ANTENNA PLAN**
SCALE: 3/8" = 1'-0"
NORTH



1 / C-2 **EXISTING ANTENNA PLAN**
SCALE: 3/8" = 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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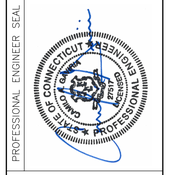

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LTE BWE EQUIPMENT DETAILS

C-2

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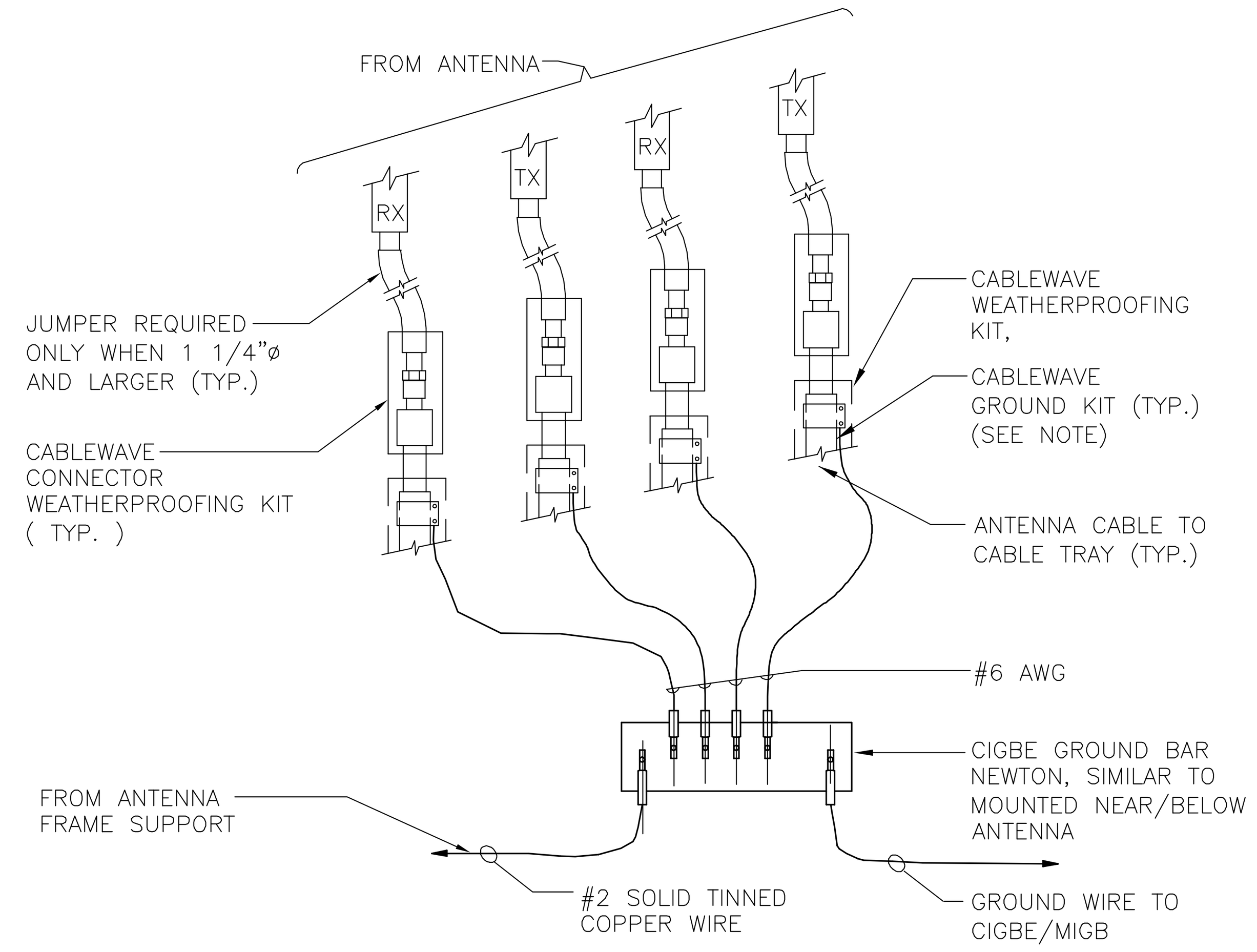
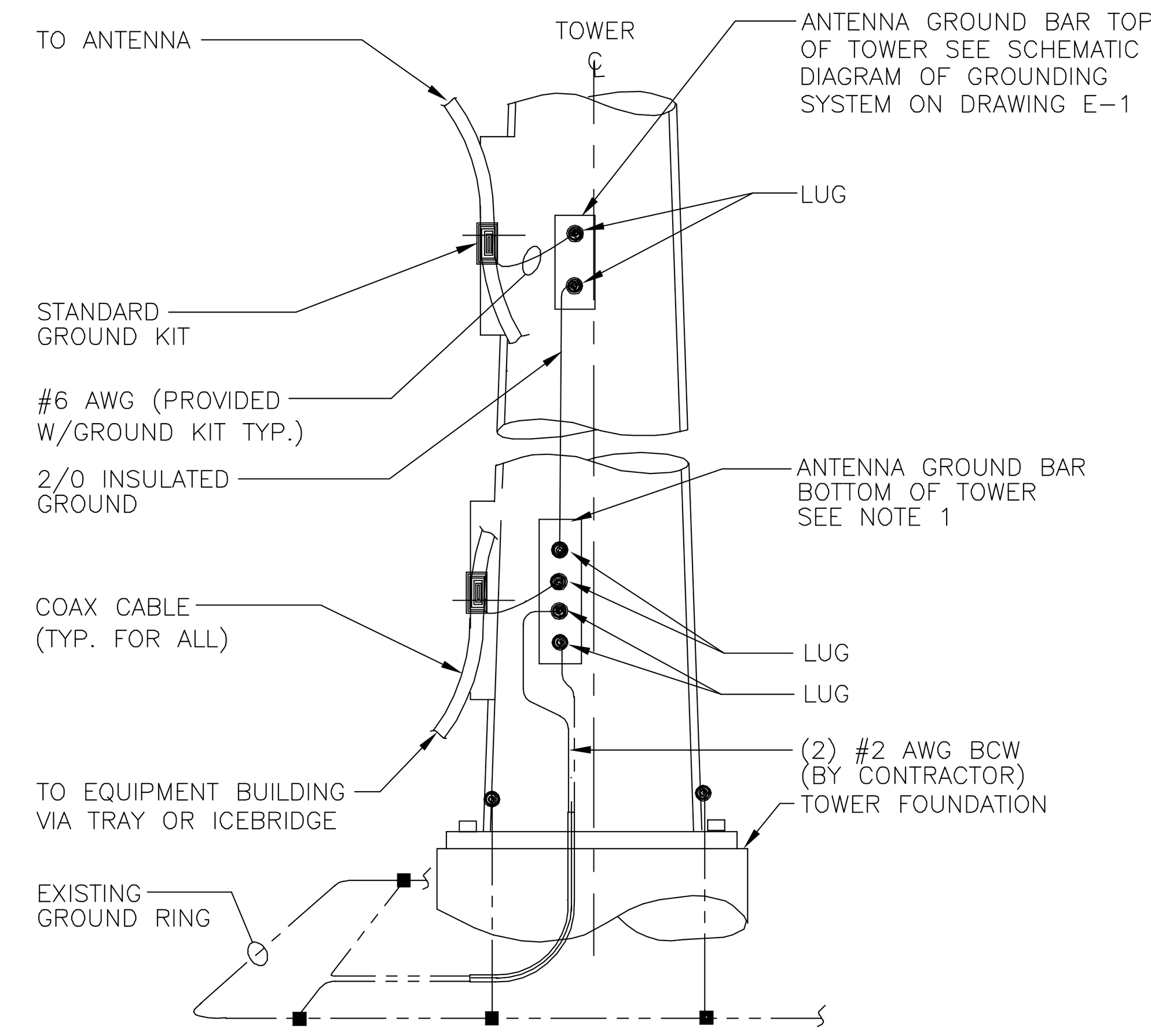


NOTE:

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

5 E-1 CONNECTION OF GROUND WIRES TO GROUND BAR

NOT TO SCALE

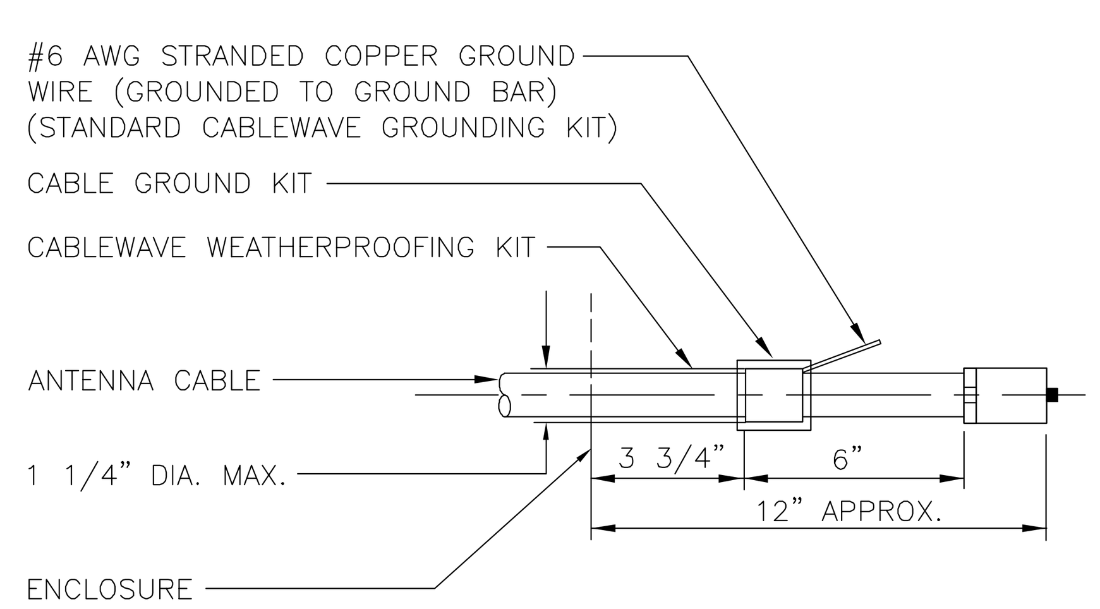


NOTES:

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

2 E-1 ANTENNA CABLE GROUNDING - TOWER

NOT TO SCALE

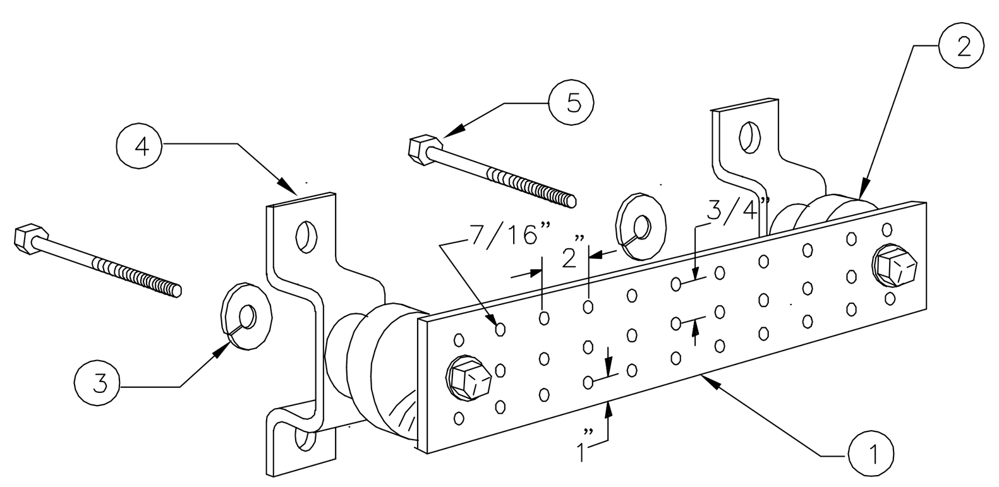


NOTE:

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

4 E-1 ANTENNA CABLE GROUNDING DETAIL

NOT TO SCALE

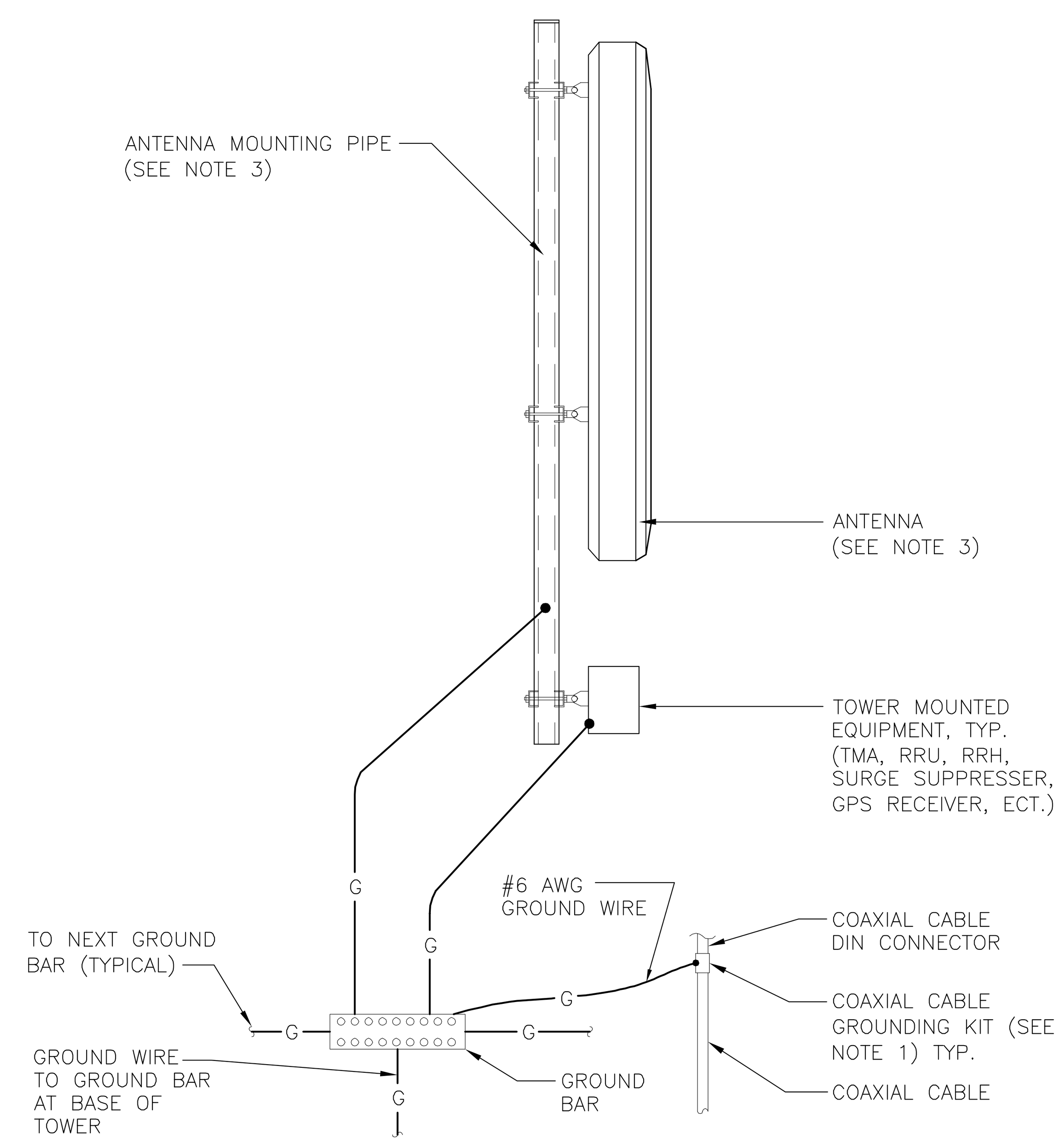


LEGEND

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. 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

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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DURHAM CENTRAL

CT5841 - LTE BWE

143 R OLD BLUE HILLS ROAD
DURHAM, CT 06422

DATE: 01/09/17
SCALE: AS NOTED
JOB NO. 16071.95

TYPICAL ELECTRICAL DETAILS & NOTES

E-1

Date: **January 12, 2017**

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

Crown Castle
2000 Corporate Drive
Canonsburg, PA, 15317
(724) 416-9160

Subject:	**Structural Analysis Report**	
Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	10071003
	Carrier Site Name:	CT5841
Crown Castle Designation:	**Crown Castle BU Number:**	806364
	Crown Castle Site Name:	HRT 106(B) 943202
	Crown Castle JDE Job Number:	414991
	Crown Castle Work Order Number:	1347869
	Crown Castle Application Number:	373779 Rev. 0
Engineering Firm Designation:	**Crown Castle Project Number:**	1347869
Site Data:	**143 R Old Blue Hill Road, DURHAM, Middlesex County, CT** **Latitude *41° 27' 33.67"*, Longitude *-72° 39' 45.83"*** **120 Foot - Monopole Tower**	

Dear Charles McGuirt,

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 1347869, in accordance with application 373779, revision 0.

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 130 mph converted to a nominal 3-second gust wind speed of 101 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 B 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: Michael Lopienski, E.I.T./ AGH

Respectfully submitted by:

Maribel Dentinger, P.E.
Sr. Project Engineer
tnxTower Report - version
7.0.5.1

STATE OF CONNECTICUT
MARIBEL DENTINGER
No. 23524
LICENSED
PROFESSIONAL ENGINEER

01/12/17

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 120 ft Monopole tower designed by VALMONT in March of 1994. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-E.

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 101 mph with no ice, 50 mph with 0.75 inch ice thickness and 60 mph under service loads, exposure category B.

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
73.0	74.0	3	ericsson	RRUS 12	-	-	-
		3	powerwave technologies	1001940			
		12	powerwave technologies	7020.00			
		6	powerwave technologies	LGP21901			

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
118.0	125.0	1	decibel	DB809MT3-XT	3	7/8	1
	123.0	1	decibel	DB201-A			
	118.0	2	tower mounts	Side Arm Mount [SO 701-1]			
107.0	107.0	1	gabriel electronics	GLF6-450	1	7/8	1
		1	tower mounts	Pipe Mount [PM 601-1]			
98.0	100.0	3	alcatel lucent	B13 RRH4X30-4R	1	1-5/8	2
		3	alcatel lucent	B66A RRH4X45			
		6	andrew	SBNHH-1D65B w/ Mount Pipe			
		1	antel	LPA-80080/6CF w/ Mount Pipe			
		2	raycap	RXXDC-3315-PF-48			
		3	alcatel lucent	RRH2X60-PCS	12 1	7/8 1-5/8	1
		5	antel	LPA-80080/6CF w/ Mount Pipe			
	98.0	1	tower mounts	Platform Mount [LP 602-1]			
87.0	89.0	6	decibel	DB980H90E-M w/ Mount Pipe	6	1-1/4	1
	87.0	1	radwin	RADWIN 2000C	1	23/64	2
		1	tower mounts	Platform Mount [LP 602-1]	-	-	1
73.0	79.0	1	decibel	DB636-C	1	7/8	1
	74.0	3	ericsson	RRUS 11			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
		3	ericsson	RRUS 11	-	-	3
		6	powerwave technologies	LGP21903			
		3	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe	1 2 12 1	3/8 3/4 7/8 2" Conduit	1
		6	powerwave technologies	7770.00 w/ Mount Pipe			
		6	powerwave technologies	LGP21401			
		1	raycap	DC6-48-60-18-8F			
	73.0	1	tower mounts	Platform Mount [LP 1201-1]			
50.0	57.0	1	rfs celwave	PD1142-1	1 3	1/2 7/8	1
	54.0	1	decibel	ASP-655			
	53.0	1	celwave	PD1121-6			
	50.0	1	decibel	DB492A			
		1	tower mounts	Side Arm Mount [SO 701-3]			
40.0	41.0	1	tekelec systemes	EPSILON GPS ANTENNA 35 DB	1 1	1/2 2" conduit	1
	40.0	1	tower mounts	Side Arm Mount [SO 701-1]			

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)
97	97	12	-	8RL41OC4R105	-	-
87	87	9	-	8RL41OC4R105	-	-
75	75	1	-	A8P710	-	-
		1	Telewave	450F6 Antenna		
50	50	1	-	A8P701	-	-
		1	-	A8P710		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Clarence Welti	262150	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	SAC	297341	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Valmont	262153	CCISITES
4-TOWER EXTENSION DESIGN	Valmont	942187	CCISITES

3.1) Analysis Method

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

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) The existing base plate grout was not considered in this analysis.

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	120 - 100	Pole	TP20.263x15.0403x0.1875	1	-1.37	829.59	9.7	Pass
L2	100 - 47.0833	Pole	TP33.13x20.263x0.2813	2	-15.21	1920.74	56.8	Pass
L3	47.0833 - 0	Pole	TP44x31.372x0.375	3	-27.71	3477.10	58.8	Pass
							Summary	
						Pole (L3)	58.8	Pass
						Rating =	58.8	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	55.4	Pass
1	Base Plate	0	29.9	Pass
1	Base Foundation	0	23.4	Pass
1	Base Foundation Soil Interaction	0	25.5	Pass
1	Flange Connection (Bolts/Plate)	100	14.3/3.9	Pass

Structure Rating (max from all components) =	**58.8%**

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

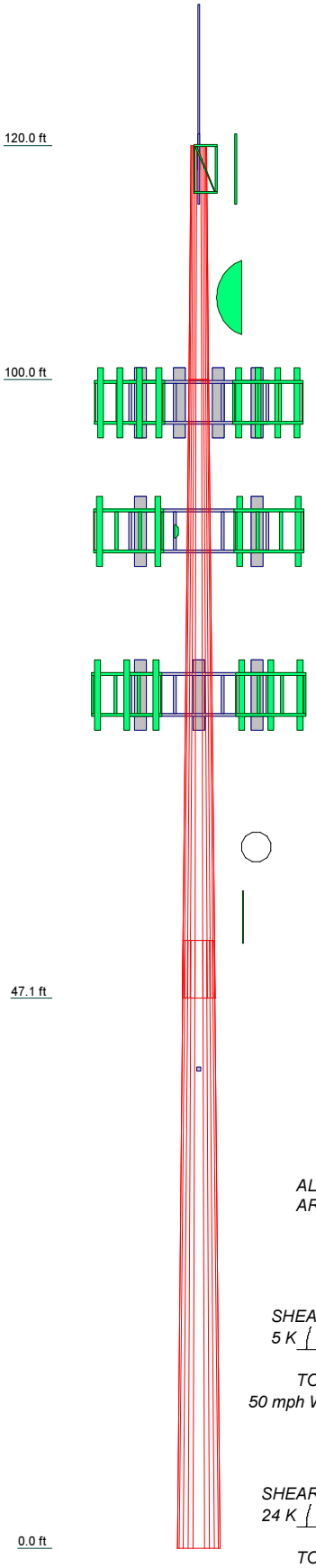
4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the 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	20.00	12	0.1875		15.0403	20.2630		0.7
2	52.92	12	0.2813	4.92	20.2630	33.1300	A572-65	4.3
3	52.00	12	0.3750		31.3720	44.0000		8.0
								13.0



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
DB809MT3-XT	118	(2) 7770.00 w/ Mount Pipe	73
DB201-A	118	(2) 7770.00 w/ Mount Pipe	73
6' x 2" Mount Pipe	118	(2) 7770.00 w/ Mount Pipe	73
6' x 2" Mount Pipe	118	DB636-C	73
Side Arm Mount [SO 102-3]	118	RRUS 11	73
Side Arm Mount [SO 701-1]	118	RRUS 11	73
Side Arm Mount [SO 701-1]	118	RRUS 11	73
Pipe Mount [PM 601-1]	107	DC6-48-60-18-8F	73
GLF6-450	107	(2) LGP21401	73
(2) LPA-80080/6CF w/ Mount Pipe	98	(2) LGP21401	73
LPA-80080/6CF w/ Mount Pipe	98	(2) LGP21401	73
RRH2X60-PCS	98	RRUS 12	73
RRH2X60-PCS	98	RRUS 12	73
RRH2X60-PCS	98	RRUS 12	73
(2) SBNHH-1D65B w/ Mount Pipe	98	1001940	73
(2) SBNHH-1D65B w/ Mount Pipe	98	1001940	73
(2) SBNHH-1D65B w/ Mount Pipe	98	1001940	73
LPA-80080/6CF w/ Mount Pipe	98	(4) 7020.00	73
B13 RRH4X30-4R	98	(4) 7020.00	73
B13 RRH4X30-4R	98	(4) 7020.00	73
B13 RRH4X30-4R	98	(2) LGP21901	73
B66A RRH4X45	98	(2) LGP21901	73
B66A RRH4X45	98	(2) LGP21901	73
B66A RRH4X45	98	Platform Mount [LP 1201-1]	73
(2) RXXDC-3315-PF-48	98	AM-X-CD-16-65-00T-RET w/ Mount Pipe	73
Platform Mount [LP 602-1]	98		
(2) LPA-80080/6CF w/ Mount Pipe	98	AM-X-CD-16-65-00T-RET w/ Mount Pipe	73
(2) DB980H90E-M w/ Mount Pipe	87		
(2) DB980H90E-M w/ Mount Pipe	87	ASP-655	50
6' x 2" Mount Pipe	87	PD1121-6	50
Platform Mount [LP 602-1]	87	Side Arm Mount [SO 701-3]	50
(2) DB980H90E-M w/ Mount Pipe	87	PD1142-1	50
RADWIN 2000C	87	DB492A	50
AM-X-CD-16-65-00T-RET w/ Mount Pipe	73	EPSILON GPS ANTENNA 35 DB	40
		Side Arm Mount [SO 701-1]	40

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Middlesex County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 101 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 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: 58.8%

ALL REACTIONS ARE FACTORED

AXIAL 50 K

SHEAR 5 K *MOMENT 438 kip-ft*

TORQUE 1 kip-ft
50 mph WIND - 0.7500 in ICE

AXIAL 28 K

SHEAR 24 K *MOMENT 1792 kip-ft*

TORQUE 1 kip-ft
REACTIONS - 101 mph WIND

CROWN CASTLE
The Foundation for a Wireless World

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Job: ***BU# 806364***			
Project:			
Client: CCI	Drawn by: MLopienski		App'd:
Code: TIA-222-G	Date: 01/12/17		Scale: NTS
Path: R:\SA Models - Letters\Work Area\MLopienski\WIP\806364 WO 1347869\806364.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:

4) Tower is located in Middlesex County, Connecticut.
5) Basic wind speed of 101 mph.
6) Structure Class II.
7) Exposure Category B.
8) Topographic Category 1.
9) Crest Height 0.00 ft.
10) Nominal ice thickness of 0.7500 in.
11) Ice thickness is considered to increase with height.
12) Ice density of 56.00 pcf.
13) A wind speed of 50 mph is used in combination with ice.
14) Deflections calculated using a wind speed of 60 mph.
15) A non-linear (P-delta) analysis was used.
16) Pressures are calculated at each section.
17) Stress ratio used in pole design is 1.
18) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	*Elevation*	*Section Length*	*Splice Length*	*Number of*	*Top Diameter*	*Bottom Diameter*	*Wall Thickness*	*Bend Radius*	*Pole Grade*
	ft	*ft*	*ft*	*Sides*	*in*	*in*	*in*	*in*	
L1	120.00-100.00	20.00	0.00	12	15.0403	20.2630	0.1875	0.7500	A572-65 (65 ksi)
L2	100.00-47.08	52.92	4.92	12	20.2630	33.1300	0.2813	1.1250	A572-65 (65 ksi)
L3	47.08-0.00	52.00		12	31.3720	44.0000	0.3750	1.5000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	15.5709	8.9674	252.5039	5.3173	7.7909	32.4102	511.6414	4.4135	3.5283	18.818
	20.9778	12.1206	623.5083	7.1870	10.4962	59.4030	1263.3968	5.9654	4.9280	26.283
L2	20.9778	18.0960	922.2208	7.1535	10.4962	87.8621	1868.6694	8.9063	4.6767	16.628
	34.2987	29.7486	4097.2352	11.7599	17.1613	238.7480	8302.1094	14.6414	8.1251	28.889
L3	33.7148	37.4288	4590.1943	11.0969	16.2507	282.4616	9300.9781	18.4213	7.4027	19.741
	45.5522	52.6772	12796.1526	15.6177	22.7920	561.4318	25928.4743	25.9261	10.7870	28.765

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 120.00-100.00				1	1	1			
L2 100.00-47.08				1	1	1			
L3 47.08-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight klf
04-001-55(23/64")	C	Surface Ar (CaAa)	87.00 - 0.00	1	1	0.000 0.200	0.3600		0.00
2" Rigid Conduit	C	Surface Ar (CaAa)	40.00 - 0.00	1	1	0.200 0.500	2.0000		0.00

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
LDF5-50A(7/8")	A	No	Inside Pole	118.00 - 0.00	3	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
***								
VXL5-50(7/8")	A	No	Inside Pole	107.00 - 0.00	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
***								
LDF5-50A(7/8")	C	No	Inside Pole	98.00 - 0.00	12	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
HB158-1-08U8-S8J18(1-5/8)	C	No	Inside Pole	98.00 - 0.00	2	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
***								
LDF6-50A(1-1/4")	C	No	Inside Pole	87.00 - 0.00	6	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
***								
LDF5-50A(7/8")	A	No	Inside Pole	73.00 - 0.00	12	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
VXL5-50(7/8")	A	No	Inside Pole	73.00 - 0.00	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
L98B-002-XXX_DB(3/8")	A	No	Inside Pole	73.00 - 0.00	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
						1" Ice	0.00	0.00
WR-VG86ST-BRD(3/4)	A	No	Inside Pole	73.00 - 0.00	2	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
2" Conduit	A	No	Inside Pole	73.00 - 0.00	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
***								
LDF4-50A(1/2")	A	No	Inside Pole	50.00 - 0.00	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
LDF5-50A(7/8")	A	No	Inside Pole	50.00 - 0.00	3	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
***								
LDF4-50A(1/2")	C	No	Inside Pole	40.00 - 0.00	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	120.00-100.00	A	0.000	0.000	0.000	0.000	0.02
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L2	100.00-47.08	A	0.000	0.000	0.000	0.000	0.24
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	1.437	0.000	0.49
L3	47.08-0.00	A	0.000	0.000	0.000	0.000	0.43
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	9.695	0.000	0.62

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	120.00-100.00	A	1.691	0.000	0.000	0.000	0.000	0.02
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L2	100.00-47.08	A	1.622	0.000	0.000	0.000	0.000	0.24
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	14.385	0.000	0.65
L3	47.08-0.00	A	1.444	0.000	0.000	0.000	0.000	0.43
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	37.944	0.000	1.09

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	120.00-100.00	0.0000	0.0000	0.0000	0.0000
L2	100.00-47.08	-0.0087	0.0408	-0.0711	0.3345
L3	47.08-0.00	-0.1770	0.2336	-0.4327	0.7777

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L2	9	04-001-55(23/64")	47.08 - 87.00	1.0000	1.0000
L2	21	2" Rigid Conduit	47.08 - 40.00	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
DB809MT3-XT	A	From Leg	3.00 0.00 7.00	0.00	118.00	No Ice 1/2" Ice 1" Ice	2.84 4.29 5.75	2.84 4.29 5.75	0.03 0.05 0.08
DB201-A	B	From Leg	3.00 0.00 5.00	0.00	118.00	No Ice 1/2" Ice 1" Ice	1.10 1.98 2.86	1.10 1.98 2.86	0.03 0.03 0.04
6' x 2" Mount Pipe	A	From Leg	3.00 0.00 0.00	0.00	118.00	No Ice 1/2" Ice 1" Ice	1.43 1.92 2.29	1.43 1.92 2.29	0.02 0.03 0.05
6' x 2" Mount Pipe	B	From Leg	3.00 0.00 0.00	0.00	118.00	No Ice 1/2" Ice 1" Ice	1.43 1.92 2.29	1.43 1.92 2.29	0.02 0.03 0.05
Side Arm Mount [SO 102-3]	B	None		0.00	118.00	No Ice 1/2" Ice 1" Ice	3.00 3.48 3.96	3.00 3.48 3.96	0.08 0.11 0.14
Side Arm Mount [SO 701-1]	A	From Leg	0.00 0.00 0.00	0.00	118.00	No Ice 1/2" Ice 1" Ice	0.85 1.14 1.43	1.67 2.34 3.01	0.07 0.08 0.09
Side Arm Mount [SO 701-1]	B	From Leg	0.00 0.00 0.00	0.00	118.00	No Ice 1/2" Ice 1" Ice	0.85 1.14 1.43	1.67 2.34 3.01	0.07 0.08 0.09
***									
Pipe Mount [PM 601-1]	B	None		0.00	107.00	No Ice 1/2" Ice 1" Ice	3.00 3.74 4.48	0.90 1.12 1.34	0.07 0.08 0.09
***									
(2) LPA-80080/6CF w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.00	98.00	No Ice 1/2" Ice 1" Ice	4.56 5.11 5.61	10.26 11.43 12.31	0.05 0.11 0.19
(2) LPA-80080/6CF w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.00	98.00	No Ice 1/2" Ice	4.56 5.11 5.61	10.26 11.43 12.31	0.05 0.11 0.19

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" Ice			
LPA-80080/6CF w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.00	98.00	No Ice 1/2" Ice 1" Ice	4.56 5.11 5.61	10.26 11.43 12.31	0.05 0.11 0.19
RRH2X60-PCS	A	From Leg	4.00 0.00 2.00	0.00	98.00	No Ice 1/2" Ice 1" Ice	2.20 2.39 2.59	1.72 1.90 2.09	0.06 0.08 0.10
RRH2X60-PCS	B	From Leg	4.00 0.00 2.00	0.00	98.00	No Ice 1/2" Ice 1" Ice	2.20 2.39 2.59	1.72 1.90 2.09	0.06 0.08 0.10
RRH2X60-PCS	C	From Leg	4.00 0.00 2.00	0.00	98.00	No Ice 1/2" Ice 1" Ice	2.20 2.39 2.59	1.72 1.90 2.09	0.06 0.08 0.10
(2) SBNHH-1D65B w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.00	98.00	No Ice 1/2" Ice 1" Ice	8.39 8.95 9.48	7.08 8.28 9.19	0.08 0.15 0.22
(2) SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.00	98.00	No Ice 1/2" Ice 1" Ice	8.39 8.95 9.48	7.08 8.28 9.19	0.08 0.15 0.22
(2) SBNHH-1D65B w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.00	98.00	No Ice 1/2" Ice 1" Ice	8.39 8.95 9.48	7.08 8.28 9.19	0.08 0.15 0.22
LPA-80080/6CF w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.00	98.00	No Ice 1/2" Ice 1" Ice	4.56 5.11 5.61	10.26 11.43 12.31	0.05 0.11 0.19
B13 RRH4X30-4R	A	From Leg	4.00 0.00 2.00	0.00	98.00	No Ice 1/2" Ice 1" Ice	2.16 2.35 2.55	1.62 1.79 1.97	0.06 0.08 0.10
B13 RRH4X30-4R	B	From Leg	4.00 0.00 2.00	0.00	98.00	No Ice 1/2" Ice 1" Ice	2.16 2.35 2.55	1.62 1.79 1.97	0.06 0.08 0.10
B13 RRH4X30-4R	C	From Leg	4.00 0.00 2.00	0.00	98.00	No Ice 1/2" Ice 1" Ice	2.16 2.35 2.55	1.62 1.79 1.97	0.06 0.08 0.10
B66A RRH4X45	A	From Leg	4.00 0.00 2.00	0.00	98.00	No Ice 1/2" Ice 1" Ice	2.58 2.79 3.01	1.63 1.81 2.00	0.07 0.09 0.11
B66A RRH4X45	B	From Leg	4.00 0.00 2.00	0.00	98.00	No Ice 1/2" Ice 1" Ice	2.58 2.79 3.01	1.63 1.81 2.00	0.07 0.09 0.11
B66A RRH4X45	C	From Leg	4.00 0.00 2.00	0.00	98.00	No Ice 1/2" Ice 1" Ice	2.58 2.79 3.01	1.63 1.81 2.00	0.07 0.09 0.11
(2) RXXDC-3315-PF-48	C	From Leg	4.00 0.00 2.00	0.00	98.00	No Ice 1/2" Ice 1" Ice	3.01 3.23 3.46	1.96 2.15 2.35	0.02 0.05 0.08
Platform Mount [LP 602-1]	C	None		0.00	98.00	No Ice 1/2" Ice 1" Ice	32.03 38.71 45.39	32.03 38.71 45.39	1.34 1.80 2.26

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
***									
(2) DB980H90E-M w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.00	87.00	No Ice 1/2" Ice 1" Ice	4.04 4.50 4.95	3.62 4.48 5.22	0.03 0.07 0.11
(2) DB980H90E-M w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.00	87.00	No Ice 1/2" Ice 1" Ice	4.04 4.50 4.95	3.62 4.48 5.22	0.03 0.07 0.11
(2) DB980H90E-M w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.00	87.00	No Ice 1/2" Ice 1" Ice	4.04 4.50 4.95	3.62 4.48 5.22	0.03 0.07 0.11
6' x 2" Mount Pipe	C	From Leg	0.00 0.00 0.00	0.00	87.00	No Ice 1/2" Ice 1" Ice	1.43 1.92 2.29	1.43 1.92 2.29	0.02 0.03 0.05
Platform Mount [LP 602-1]	C	None		0.00	87.00	No Ice 1/2" Ice 1" Ice	32.03 38.71 45.39	32.03 38.71 45.39	1.34 1.80 2.26
***									
AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.00	73.00	No Ice 1/2" Ice 1" Ice	8.26 8.82 9.35	6.30 7.48 8.37	0.07 0.14 0.21
AM-X-CD-16-65-00T-RET w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.00	73.00	No Ice 1/2" Ice 1" Ice	8.26 8.82 9.35	6.30 7.48 8.37	0.07 0.14 0.21
AM-X-CD-16-65-00T-RET w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.00	73.00	No Ice 1/2" Ice 1" Ice	8.26 8.82 9.35	6.30 7.48 8.37	0.07 0.14 0.21
(2) 7770.00 w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.00	73.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	0.06 0.10 0.16
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.00	73.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	0.06 0.10 0.16
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.00	73.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	0.06 0.10 0.16
DB636-C	B	From Leg	4.00 0.00 6.00	0.00	73.00	No Ice 1/2" Ice 1" Ice	2.51 3.59 4.68	2.51 3.59 4.68	0.03 0.05 0.07
RRUS 11	A	From Leg	4.00 0.00 1.00	0.00	73.00	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	0.00	73.00	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 0.00 1.00	0.00	73.00	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
DC6-48-60-18-8F	A	From Leg	4.00 0.00 1.00	0.00	73.00	No Ice 1/2" Ice	0.79 1.27 1.45	0.79 1.27 1.45	0.02 0.04 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
(2) LGP21401	A	From Leg	4.00 0.00 1.00	0.00	73.00	1" Ice 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	0.00	73.00	1" Ice 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	0.00	73.00	1" Ice 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 12	A	From Leg	4.00 0.00 1.00	0.00	73.00	1" Ice No Ice 1/2" Ice 1" Ice	3.15 3.36 3.59	1.29 1.44 1.60	0.06 0.08 0.11
RRUS 12	B	From Leg	4.00 0.00 1.00	0.00	73.00	1" Ice No Ice 1/2" Ice 1" Ice	3.15 3.36 3.59	1.29 1.44 1.60	0.06 0.08 0.11
RRUS 12	C	From Leg	4.00 0.00 1.00	0.00	73.00	1" Ice No Ice 1/2" Ice 1" Ice	3.15 3.36 3.59	1.29 1.44 1.60	0.06 0.08 0.11
1001940	A	From Leg	4.00 0.00 1.00	0.00	73.00	1" Ice No Ice 1/2" Ice 1" Ice	0.18 0.23 0.30	0.08 0.13 0.18	0.00 0.00 0.01
1001940	B	From Leg	4.00 0.00 1.00	0.00	73.00	1" Ice No Ice 1/2" Ice 1" Ice	0.18 0.23 0.30	0.08 0.13 0.18	0.00 0.00 0.01
1001940	C	From Leg	4.00 0.00 1.00	0.00	73.00	1" Ice No Ice 1/2" Ice 1" Ice	0.18 0.23 0.30	0.08 0.13 0.18	0.00 0.00 0.01
(4) 7020.00	A	From Leg	4.00 0.00 1.00	0.00	73.00	1" Ice No Ice 1/2" Ice 1" Ice	0.10 0.15 0.20	0.17 0.24 0.31	0.00 0.01 0.01
(4) 7020.00	B	From Leg	4.00 0.00 1.00	0.00	73.00	1" Ice No Ice 1/2" Ice 1" Ice	0.10 0.15 0.20	0.17 0.24 0.31	0.00 0.01 0.01
(4) 7020.00	C	From Leg	4.00 0.00 1.00	0.00	73.00	1" Ice No Ice 1/2" Ice 1" Ice	0.10 0.15 0.20	0.17 0.24 0.31	0.00 0.01 0.01
(2) LGP21901	A	From Leg	4.00 0.00 1.00	0.00	73.00	1" Ice No Ice 1/2" Ice 1" Ice	0.23 0.29 0.36	0.16 0.21 0.28	0.01 0.01 0.01
(2) LGP21901	B	From Leg	4.00 0.00 1.00	0.00	73.00	1" Ice No Ice 1/2" Ice 1" Ice	0.23 0.29 0.36	0.16 0.21 0.28	0.01 0.01 0.01
(2) LGP21901	C	From Leg	4.00 0.00 1.00	0.00	73.00	1" Ice No Ice 1/2" Ice 1" Ice	0.23 0.29 0.36	0.16 0.21 0.28	0.01 0.01 0.01
Platform Mount [LP 1201-1]	C	None		0.00	73.00	1" Ice No Ice 1/2" Ice 1" Ice	23.10 26.80 30.50	23.10 26.80 30.50	2.10 2.50 2.90

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
***									
PD1142-1	A	From Leg	3.00 0.00 7.00	0.00	50.00	No Ice 1/2" Ice 1" Ice	1.32 3.21 5.12	1.32 3.21 5.12	0.01 0.02 0.05
DB492A	A	From Leg	3.00 0.00 0.00	0.00	50.00	No Ice 1/2" Ice 1" Ice	1.10 1.98 2.86	1.10 1.98 2.86	0.01 0.01 0.01
ASP-655	B	From Leg	3.00 0.00 4.00	0.00	50.00	No Ice 1/2" Ice 1" Ice	0.56 1.02 1.30	0.56 1.02 1.30	0.00 0.01 0.01
PD1121-6	C	From Leg	3.00 0.00 3.00	0.00	50.00	No Ice 1/2" Ice 1" Ice	0.23 0.41 0.60	0.23 0.41 0.60	0.00 0.00 0.00
Side Arm Mount [SO 701-3]	C	None		0.00	50.00	No Ice 1/2" Ice 1" Ice	2.83 3.92 5.01	2.83 3.92 5.01	0.20 0.24 0.28
***									
EPSILON GPS ANTENNA 35 DB	A	From Leg	3.00 0.00 1.00	0.00	40.00	No Ice 1/2" Ice 1" Ice	0.11 0.16 0.21	0.11 0.16 0.21	0.00 0.00 0.00
Side Arm Mount [SO 701-1]	A	None		0.00	40.00	No Ice 1/2" Ice 1" Ice	0.85 1.14 1.43	1.67 2.34 3.01	0.07 0.08 0.09
*									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
GLF6-450	B	Grid	From Leg	1.00 0.00 0.00	0.00		107.00	6.40	No Ice 1/2" Ice 1" Ice	32.17 33.01 33.86	0.20 0.37 0.54
RADWIN 2000C	C	Paraboloid w/o Radome	From Leg	1.00 0.00 0.00	0.00		87.00	1.22	No Ice 1/2" Ice 1" Ice	1.16 1.33 1.49	0.01 0.01 0.02

Tower Pressures - No Ice

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z ksf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg % 	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1 120.00-100.00	109.51	1.014	0.03	30.457	A B	0.000 0.000	30.457 30.457	30.457	100.00 100.00	0.000 0.000	0.000 0.000

Section Elevation ft	z ft	K_Z	q_z ksf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
					C	0.000	30.457		100.00	0.000	0.000
L2 100.00-47.08	72.10	0.9	0.02	121.877	A	0.000	121.877	121.877	100.00	0.000	0.000
					B	0.000	121.877		100.00	0.000	0.000
					C	0.000	121.877		100.00	1.437	0.000
L3 47.08-0.00	22.63	0.7	0.02	155.506	A	0.000	155.506	155.506	100.00	0.000	0.000
					B	0.000	155.506		100.00	0.000	0.000
					C	0.000	155.506		100.00	9.695	0.000

Tower Pressure - With Ice

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z ksf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 120.00-100.00	109.51	1.014	0.01	1.6912	36.094	A	0.000	36.094	36.094	100.00	0.000	0.000
						B	0.000	36.094		100.00	0.000	0.000
						C	0.000	36.094		100.00	0.000	0.000
L2 100.00-47.08	72.10	0.9	0.01	1.6219	136.182	A	0.000	136.182	136.182	100.00	0.000	0.000
						B	0.000	136.182		100.00	0.000	0.000
						C	0.000	136.182		100.00	14.385	0.000
L3 47.08-0.00	22.63	0.7	0.00	1.4445	168.234	A	0.000	168.234	168.234	100.00	0.000	0.000
						B	0.000	168.234		100.00	0.000	0.000
						C	0.000	168.234		100.00	37.944	0.000

Tower Pressure - Service

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z ksf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 120.00-100.00	109.51	1.014	0.01	30.457	A	0.000	30.457	30.457	100.00	0.000	0.000
					B	0.000	30.457		100.00	0.000	0.000
					C	0.000	30.457		100.00	0.000	0.000
L2 100.00-47.08	72.10	0.9	0.01	121.877	A	0.000	121.877	121.877	100.00	0.000	0.000
					B	0.000	121.877		100.00	0.000	0.000
					C	0.000	121.877		100.00	1.437	0.000
L3 47.08-0.00	22.63	0.7	0.01	155.506	A	0.000	155.506	155.506	100.00	0.000	0.000
					B	0.000	155.506		100.00	0.000	0.000
					C	0.000	155.506		100.00	9.695	0.000

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

Comb. No.	Description
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice
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	120 - 100	Pole	Max Tension	36	0.00	0.00	-0.00
			Max. Compression	26	-3.46	-1.76	-0.10
			Max. Mx	8	-1.38	-31.96	-0.38
			Max. My	14	-1.40	-1.11	-29.69
			Max. Vy	8	2.88	-31.96	-0.38
			Max. Vx	14	2.66	-1.11	-29.69
			Max. Torque	2			-1.62
L2	100 - 47.0833	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-32.99	-1.12	-0.89
			Max. Mx	8	-15.22	-690.23	-1.13
			Max. My	14	-15.24	-4.93	-674.24
			Max. Vy	8	18.44	-690.23	-1.13
			Max. Vx	2	-18.14	-0.42	673.60
			Max. Torque	2			-1.62
L3	47.0833 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-49.63	-0.66	-1.28
			Max. Mx	8	-27.71	-1786.41	-1.38
			Max. My	14	-27.71	-8.72	-1755.30
			Max. Vy	8	23.51	-1786.41	-1.38

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	2	-23.23	-1.42	1754.58
			Max. Torque	2			-1.38

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	37	49.63	4.69	2.69
	Max. H_x	20	27.73	23.47	-0.01
	Max. H_z	2	27.73	-0.02	23.20
	Max. M_x	2	1754.58	-0.02	23.20
	Max. M_z	8	1786.41	-23.49	-0.00
	Max. Torsion	14	1.32	-0.07	-23.20
	Min. Vert	5	20.80	-11.69	19.93
	Min. H_x	8	27.73	-23.49	-0.00
	Min. H_z	14	27.73	-0.07	-23.20
	Min. M_x	14	-1755.30	-0.07	-23.20
	Min. M_z	20	-1783.71	23.47	-0.01
	Min. Torsion	2	-1.38	-0.02	23.20

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	23.11	0.00	0.00	0.23	-0.28	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	27.73	0.02	-23.20	-1754.58	-1.42	1.38
0.9 Dead+1.6 Wind 0 deg - No Ice	20.80	0.02	-23.20	-1743.01	-1.33	1.37
1.2 Dead+1.6 Wind 30 deg - No Ice	27.73	11.69	-19.93	-1501.47	-886.53	0.98
0.9 Dead+1.6 Wind 30 deg - No Ice	20.80	11.69	-19.93	-1491.60	-880.55	0.97
1.2 Dead+1.6 Wind 60 deg - No Ice	27.73	20.27	-11.55	-871.35	-1538.59	0.90
0.9 Dead+1.6 Wind 60 deg - No Ice	20.80	20.27	-11.55	-865.65	-1528.27	0.90
1.2 Dead+1.6 Wind 90 deg - No Ice	27.73	23.49	0.00	1.38	-1786.41	0.42
0.9 Dead+1.6 Wind 90 deg - No Ice	20.80	23.49	0.00	1.29	-1774.43	0.42
1.2 Dead+1.6 Wind 120 deg - No Ice	27.73	20.43	11.67	886.52	-1556.96	-0.45
0.9 Dead+1.6 Wind 120 deg - No Ice	20.80	20.43	11.67	880.55	-1546.50	-0.45
1.2 Dead+1.6 Wind 150 deg - No Ice	27.73	11.76	20.19	1530.77	-895.17	-1.20
0.9 Dead+1.6 Wind 150 deg - No Ice	20.80	11.76	20.19	1520.53	-889.11	-1.19
1.2 Dead+1.6 Wind 180 deg - No Ice	27.73	0.07	23.20	1755.30	-8.71	-1.32
0.9 Dead+1.6 Wind 180 deg - No Ice	20.80	0.07	23.20	1743.59	-8.55	-1.31
1.2 Dead+1.6 Wind 210 deg - No Ice	27.73	-11.52	20.00	1509.86	868.27	-0.94
0.9 Dead+1.6 Wind 210 deg - No Ice	20.80	-11.52	20.00	1499.79	862.61	-0.93
1.2 Dead+1.6 Wind 240 deg - No Ice	27.73	-20.21	11.57	873.82	1532.11	-0.93

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 240 deg - No Ice	20.80	-20.21	11.57	867.96	1522.03	-0.92
1.2 Dead+1.6 Wind 270 deg - No Ice	27.73	-23.47	0.01	0.86	1783.71	-0.55
0.9 Dead+1.6 Wind 270 deg - No Ice	20.80	-23.47	0.01	0.78	1771.93	-0.54
1.2 Dead+1.6 Wind 300 deg - No Ice	27.73	-20.32	-11.67	-884.74	1544.37	0.42
0.9 Dead+1.6 Wind 300 deg - No Ice	20.80	-20.32	-11.67	-878.93	1534.18	0.42
1.2 Dead+1.6 Wind 330 deg - No Ice	27.73	-11.72	-20.21	-1532.62	890.29	1.28
0.9 Dead+1.6 Wind 330 deg - No Ice	20.80	-11.72	-20.21	-1522.51	884.46	1.27
1.2 Dead+1.0 Ice	49.63	0.00	0.00	1.28	-0.66	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice	49.63	-0.28	-5.29	-424.66	31.92	0.17
1.2 Dead+1.0 Wind 30 deg+1.0 Ice	49.63	2.59	-4.44	-351.82	-207.49	0.35
1.2 Dead+1.0 Wind 60 deg+1.0 Ice	49.63	4.54	-2.57	-203.65	-364.82	0.22
1.2 Dead+1.0 Wind 90 deg+1.0 Ice	49.63	5.26	-0.01	0.48	-424.04	-0.00
1.2 Dead+1.0 Wind 120 deg+1.0 Ice	49.63	4.59	2.62	212.31	-371.47	-0.38
1.2 Dead+1.0 Wind 150 deg+1.0 Ice	49.63	2.63	4.52	364.39	-211.82	-0.66
1.2 Dead+1.0 Wind 180 deg+1.0 Ice	49.63	0.03	5.18	415.86	-3.71	-0.60
1.2 Dead+1.0 Wind 210 deg+1.0 Ice	49.63	-2.58	4.44	354.79	204.61	-0.34
1.2 Dead+1.0 Wind 240 deg+1.0 Ice	49.63	-4.75	2.39	184.96	387.93	0.21
1.2 Dead+1.0 Wind 270 deg+1.0 Ice	49.63	-5.37	-0.18	-18.98	434.71	0.40
1.2 Dead+1.0 Wind 300 deg+1.0 Ice	49.63	-4.69	-2.69	-217.11	380.72	0.38
1.2 Dead+1.0 Wind 330 deg+1.0 Ice	49.63	-2.83	-4.53	-362.38	234.39	0.26
Dead+Wind 0 deg - Service	23.11	0.00	-4.58	-344.77	-0.51	0.27
Dead+Wind 30 deg - Service	23.11	2.31	-3.93	-295.01	-174.52	0.19
Dead+Wind 60 deg - Service	23.11	4.00	-2.28	-171.13	-302.72	0.18
Dead+Wind 90 deg - Service	23.11	4.64	0.00	0.45	-351.45	0.08
Dead+Wind 120 deg - Service	23.11	4.03	2.30	174.48	-306.34	-0.09
Dead+Wind 150 deg - Service	23.11	2.32	3.98	301.14	-176.22	-0.24
Dead+Wind 180 deg - Service	23.11	0.01	4.58	345.28	-1.94	-0.26
Dead+Wind 210 deg - Service	23.11	-2.27	3.95	297.02	170.47	-0.18
Dead+Wind 240 deg - Service	23.11	-3.99	2.28	171.98	300.99	-0.18
Dead+Wind 270 deg - Service	23.11	-4.63	0.00	0.35	350.46	-0.11
Dead+Wind 300 deg - Service	23.11	-4.01	-2.30	-173.76	303.40	0.08
Dead+Wind 330 deg - Service	23.11	-2.31	-3.99	-301.14	174.81	0.25

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	-23.11	0.00	0.00	23.11	0.00	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
2	0.02	-27.73	-23.20	-0.02	27.73	23.20	0.000%
3	0.02	-20.80	-23.20	-0.02	20.80	23.20	0.000%
4	11.69	-27.73	-19.93	-11.69	27.73	19.93	0.000%
5	11.69	-20.80	-19.93	-11.69	20.80	19.93	0.000%
6	20.27	-27.73	-11.55	-20.27	27.73	11.55	0.000%
7	20.27	-20.80	-11.55	-20.27	20.80	11.55	0.000%
8	23.49	-27.73	0.00	-23.49	27.73	-0.00	0.000%
9	23.49	-20.80	0.00	-23.49	20.80	-0.00	0.000%
10	20.43	-27.73	11.67	-20.43	27.73	-11.67	0.000%
11	20.43	-20.80	11.67	-20.43	20.80	-11.67	0.000%
12	11.76	-27.73	20.19	-11.76	27.73	-20.19	0.000%
13	11.76	-20.80	20.19	-11.76	20.80	-20.19	0.000%
14	0.07	-27.73	23.20	-0.07	27.73	-23.20	0.000%
15	0.07	-20.80	23.20	-0.07	20.80	-23.20	0.000%
16	-11.52	-27.73	20.00	11.52	27.73	-20.00	0.000%
17	-11.52	-20.80	20.00	11.52	20.80	-20.00	0.000%
18	-20.21	-27.73	11.57	20.21	27.73	-11.57	0.000%
19	-20.21	-20.80	11.57	20.21	20.80	-11.57	0.000%
20	-23.47	-27.73	0.01	23.47	27.73	-0.01	0.000%
21	-23.47	-20.80	0.01	23.47	20.80	-0.01	0.000%
22	-20.32	-27.73	-11.67	20.32	27.73	11.67	0.000%
23	-20.32	-20.80	-11.67	20.32	20.80	11.67	0.000%
24	-11.72	-27.73	-20.21	11.72	27.73	20.21	0.000%
25	-11.72	-20.80	-20.21	11.72	20.80	20.21	0.000%
26	0.00	-49.63	0.00	-0.00	49.63	-0.00	0.000%
27	-0.28	-49.63	-5.29	0.28	49.63	5.29	0.000%
28	2.59	-49.63	-4.44	-2.59	49.63	4.44	0.000%
29	4.54	-49.63	-2.57	-4.54	49.63	2.57	0.000%
30	5.26	-49.63	-0.01	-5.26	49.63	0.01	0.000%
31	4.59	-49.63	2.62	-4.59	49.63	-2.62	0.000%
32	2.63	-49.63	4.52	-2.63	49.63	-4.52	0.000%
33	0.03	-49.63	5.18	-0.03	49.63	-5.18	0.000%
34	-2.58	-49.63	4.44	2.58	49.63	-4.44	0.000%
35	-4.75	-49.63	2.39	4.75	49.63	-2.39	0.000%
36	-5.37	-49.63	-0.18	5.37	49.63	0.18	0.000%
37	-4.69	-49.63	-2.69	4.69	49.63	2.69	0.000%
38	-2.83	-49.63	-4.53	2.83	49.63	4.53	0.000%
39	0.00	-23.11	-4.58	-0.00	23.11	4.58	0.000%
40	2.31	-23.11	-3.93	-2.31	23.11	3.93	0.000%
41	4.00	-23.11	-2.28	-4.00	23.11	2.28	0.000%
42	4.64	-23.11	0.00	-4.64	23.11	-0.00	0.000%
43	4.03	-23.11	2.30	-4.03	23.11	-2.30	0.000%
44	2.32	-23.11	3.98	-2.32	23.11	-3.98	0.000%
45	0.01	-23.11	4.58	-0.01	23.11	-4.58	0.000%
46	-2.27	-23.11	3.95	2.27	23.11	-3.95	0.000%
47	-3.99	-23.11	2.28	3.99	23.11	-2.28	0.000%
48	-4.63	-23.11	0.00	4.63	23.11	-0.00	0.000%
49	-4.01	-23.11	-2.30	4.01	23.11	2.30	0.000%
50	-2.31	-23.11	-3.99	2.31	23.11	3.99	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00083599
3	Yes	4	0.00000001	0.00051827
4	Yes	5	0.00000001	0.00014769
5	Yes	5	0.00000001	0.00006492
6	Yes	5	0.00000001	0.00013068
7	Yes	5	0.00000001	0.00005663
8	Yes	4	0.00000001	0.00031917
9	Yes	4	0.00000001	0.00019744
10	Yes	5	0.00000001	0.00014207
11	Yes	5	0.00000001	0.00006139

12	Yes	5	0.00000001	0.00015701
13	Yes	5	0.00000001	0.00006865
14	Yes	4	0.00000001	0.00087258
15	Yes	4	0.00000001	0.00054037
16	Yes	5	0.00000001	0.00012570
17	Yes	5	0.00000001	0.00005480
18	Yes	5	0.00000001	0.00015046
19	Yes	5	0.00000001	0.00006605
20	Yes	4	0.00000001	0.00037259
21	Yes	4	0.00000001	0.00023108
22	Yes	5	0.00000001	0.00014736
23	Yes	5	0.00000001	0.00006419
24	Yes	5	0.00000001	0.00013150
25	Yes	5	0.00000001	0.00005684
26	Yes	4	0.00000001	0.00000957
27	Yes	4	0.00000001	0.00006312
28	Yes	4	0.00000001	0.00037122
29	Yes	4	0.00000001	0.00022191
30	Yes	4	0.00000001	0.00008942
31	Yes	4	0.00000001	0.00025200
32	Yes	4	0.00000001	0.00048637
33	Yes	4	0.00000001	0.00030677
34	Yes	4	0.00000001	0.00022105
35	Yes	4	0.00000001	0.00021583
36	Yes	4	0.00000001	0.00018655
37	Yes	4	0.00000001	0.00038468
38	Yes	4	0.00000001	0.00028459
39	Yes	4	0.00000001	0.00004012
40	Yes	4	0.00000001	0.00006290
41	Yes	4	0.00000001	0.00004002
42	Yes	4	0.00000001	0.00001531
43	Yes	4	0.00000001	0.00004504
44	Yes	4	0.00000001	0.00007114
45	Yes	4	0.00000001	0.00003958
46	Yes	4	0.00000001	0.00003830
47	Yes	4	0.00000001	0.00006409
48	Yes	4	0.00000001	0.00001814
49	Yes	4	0.00000001	0.00005350
50	Yes	4	0.00000001	0.00004382

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	120 - 100	12.00	43	0.81	0.01
L2	100 - 47.0833	8.66	43	0.78	0.00
L3	52 - 0	2.33	43	0.42	0.00

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
118.00	DB809MT3-XT	43	11.66	0.80	0.00	72444
107.00	GLF6-450	43	9.81	0.79	0.00	27863
98.00	(2) LPA-80080/6CF w/ Mount Pipe	43	8.34	0.77	0.00	16255
87.00	RADWIN 2000C	43	6.62	0.71	0.00	10443
73.00	AM-X-CD-16-65-00T-RET w/ Mount Pipe	43	4.64	0.61	0.00	7172
50.00	PD1142-1	43	2.16	0.40	0.00	5107
40.00	EPSILON GPS ANTENNA 35 DB	43	1.44	0.31	0.00	6343

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	120 - 100	60.84	10	4.07	0.03
L2	100 - 47.0833	43.97	10	3.94	0.01
L3	52 - 0	11.82	10	2.12	0.00

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
118.00	DB809MT3-XT	10	59.13	4.07	0.03	14948
107.00	GLF6-450	10	49.80	4.02	0.02	5748
98.00	(2) LPA-80080/6CF w/ Mount Pipe	10	42.34	3.90	0.01	3331
87.00	RADWIN 2000C	10	33.64	3.61	0.01	2101
73.00	AM-X-CD-16-65-00T-RET w/ Mount Pipe	10	23.60	3.07	0.01	1427
50.00	PD1142-1	10	10.96	2.03	0.00	1007
40.00	EPSILON GPS ANTENNA 35 DB	10	7.32	1.59	0.00	1249

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	120 - 100 (1)	TP20.263x15.0403x0.1875	20.00	0.00	0.0	12.1206	-1.37	829.59	0.002
L2	100 - 47.0833 (2)	TP33.13x20.263x0.2813	52.92	0.00	0.0	28.6660	-15.21	1920.74	0.008
L3	47.0833 - 0 (3)	TP44x31.372x0.375	52.00	0.00	0.0	52.6772	-27.71	3477.10	0.008

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	120 - 100 (1)	TP20.263x15.0403x0.1875	32.38	338.82	0.096	0.00	338.82	0.000
L2	100 - 47.0833 (2)	TP33.13x20.263x0.2813	693.09	1237.43	0.560	0.00	1237.43	0.000
L3	47.0833 - 0 (3)	TP44x31.372x0.375	1791.67	3088.23	0.580	0.00	3088.23	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	120 - 100 (1)	TP20.263x15.0403x0.1875	2.97	414.80	0.007	0.67	687.02	0.001
L2	100 - 47.0833 (2)	TP33.13x20.263x0.2813	18.49	960.37	0.019	0.14	2509.12	0.000
L3	47.0833 - 0 (3)	TP44x31.372x0.375	23.56	1738.55	0.014	0.45	6261.97	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	120 - 100 (1)	0.002	0.096	0.000	0.007	0.001	0.097 ✔	1.000	4.8.2 ✔
L2	100 - 47.0833 (2)	0.008	0.560	0.000	0.019	0.000	0.568 ✔	1.000	4.8.2 ✔
L3	47.0833 - 0 (3)	0.008	0.580	0.000	0.014	0.000	0.588 ✔	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	120 - 100	Pole	TP20.263x15.0403x0.1875	1	-1.37	829.59	9.7	Pass
L2	100 - 47.0833	Pole	TP33.13x20.263x0.2813	2	-15.21	1920.74	56.8	Pass
L3	47.0833 - 0	Pole	TP44x31.372x0.375	3	-27.71	3477.10	58.8	Pass
							Summary	
						Pole (L3)	58.8	Pass
						RATING =	**58.8**	**Pass**

APPENDIX B

BASE LEVEL DRAWING

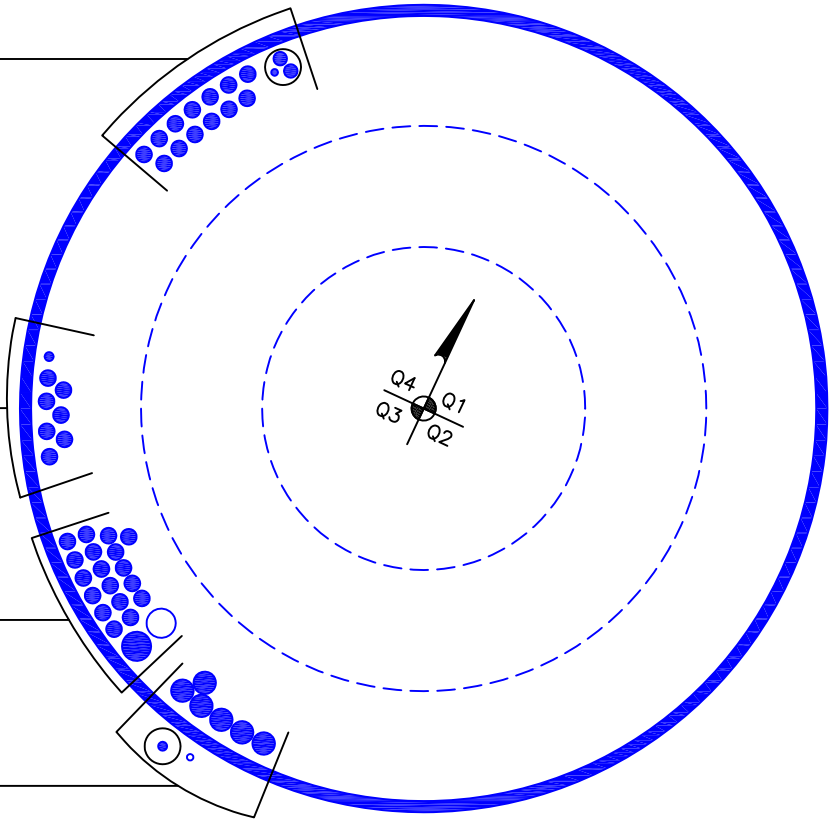
(INSTALLED)
(1) 7/8" TO 73 FT LEVEL

(INSTALLED–IN CONDUIT)
(1) 3/8" TO 73 FT LEVEL
(2) 3/4" TO 73 FT LEVEL
(INSTALLED)
(12) 7/8" TO 73 FT LEVEL

(INSTALLED)
(1) 1/2" TO 50 FT LEVEL
(3) 7/8" TO 50 FT LEVEL
(1) 7/8" TO 107 FT LEVEL
(3) 7/8" TO 118 FT LEVEL

(RESERVED)
(1) 1–5/8" TO 98 FT LEVEL
(INSTALLED)
(12) 7/8" TO 98 FT LEVEL
(1) 1–5/8" TO 98 FT LEVEL

(RESERVED)
(1) 23/64" TO 87 FT LEVEL
(INSTALLED–IN CONDUIT)
(1) 1/2" TO 40 FT LEVEL
(INSTALLED)
(6) 1–1/4" TO 87 FT LEVEL



BUSINESS UNIT: 806364 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

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

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

Site Data

BU#: *806364*
Site Name: *HRT 106(B) 943202*
App #: *373779 Rev. 0*

Pole Manufacturer:	*Other*

Reactions		
Mu:	1792	ft-kips
Axial, Pu:	28	kips
Shear, Vu:	24	kips
Eta Factor, η	0.5	TIA G (Fig. 4-4)

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

Anchor Rod Data		
Qty:	12	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	52.05	in

Anchor Rod Results

		Rigid
Max Rod (Cu+ Vu/ń):	143.9 Kips	AISC LRFD
Allowable Axial, Φ*Fu*Anet:	260.0 Kips	φ*Tn
Anchor Rod Stress Ratio:	55.4% **Pass**	

Plate Data		
Diam:	58.05	in
Thick:	2.75	in
Grade:	60	ksi
Single-Rod B-eff:	11.79	in

Base Plate Results Flexural Check

		Rigid
Base Plate Stress:	16.2 ksi	AISC LRFD
Allowable Plate Stress:	54.0 ksi	φ*Fy
Base Plate Stress Ratio:	29.9% **Pass**	Y.L. Length:
		27.81

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

n/a

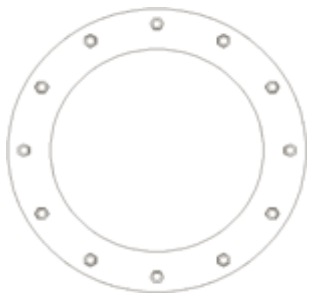
Stiffener Results

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

Pole Results

Pole Punching Shear Check:	n/a

Pole Data		
Diam:	44	in
Thick:	0.375	in
Grade:	65	ksi
# of Sides:	12	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None



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

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

Site Data

BU#: *806364*
Site Name: *HRT 106(B) 943202*
App #: *373779 Rev. 0*

Reactions		
Mu	32.38	ft-kips
Axial, Pu:	1.37	kips
Shear, Vu:	2.97	kips
Elevation:	100	feet

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

Pole Manufacturer:	Other

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

Bolt Data				
Qty:	8			
Diameter (in.):	1	Bolt Fu:	120	
Bolt Material:	A325	Bolt Fy:	92	
N/A:	100	<-- Disregard		
N/A:	75	<-- Disregard		
Circle (in.):	24.41			

Plate Data		
Diam:	26.91	in
Thick, t:	1.5	in
Grade (Fy):	60	ksi
Strength, Fu:	75	ksi
Single-Rod B-eff:	8.14	in

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

Pole Data		
Diam:	20.263	in
Thick:	0.1875	in
Grade:	65	ksi
# of Sides:	12	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Flange Bolt Results

Bolt Tension Capacity, φ*Tn,**B1**:	54.54	kips	
Adjusted φ*Tn (due to Vu=Vu/Qty), **B**:	54.54	kips	
Max Bolt directly applied Tu:	7.79	Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	0.799	in	
Min PL "treq" for actual **T w/ Pry**:	0.221	in	
Min PL "t1" for actual **T w/o Pry**:	0.302	in	
T allowable w/o Prying:	54.54	kips	α'<0 case
Prying Force, q:	0.00	kips	
Total Bolt Tension=Tu+q:	7.79	kips	
Non-Prying Bolt Stress Ratio, Tu/B:	14.3%	**Pass**	

Rigid
φ*Tn
φTn[(1-(Vu/φVn)^2]^0.5

Exterior Flange Plate Results Flexural Check

Compression Side Plate Stress:	2.1	ksi
Allowable Plate Stress:	54.0	ksi
Compression Plate Stress Ratio:	3.9%	**Pass**
No Prying		
Tension Side Stress Ratio, (treq/t)^2:	2.2%	**Pass**

Rigid
TIA G
φ*Fy
Comp. Y.L. Length: 13.61

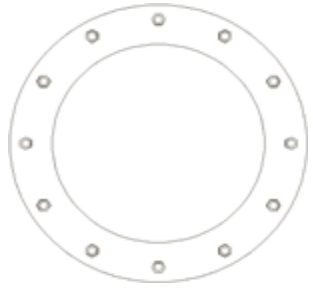
n/a

Stiffener Results

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

Pole Results

Pole Punching Shear Check: n/a



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

Monopole Block Foundation

Checks capacity of monolithic block foundation for a monopole tower per TIA-222-G

BU #: 806364
Site Name: HRT 106(B) 943202
App No.: 373779 Rev. 0

Factored Design Reactions

Shear, **S**:	24.00	kips
Moment, **M**:	1792.00	ft*kips
Height, **H**:	120.00	ft
Weight, **Wt**:	28.00	kips
Base Diameter, **BD**:	44.0	in

Foundation Dimensions

Depth, **D**:	6.0	ft
Block Width, **W**:	27.0	ft
Neglected Depth, **N**:	3.3	ft
Ext. Above Grade, **E**:	0.0	ft
Anchor Steel Length, **Lst**:	97.0	in
Clear Cover, **cc**:	4.0	in

Soil Properties

Soil Unit Weight, **γ**:	0.125	kcf
Ultimate Bearing, **Bc**:	8.000	ksf
Int. Angle of Friction, **Φ**:	34.00	deg
Cohesion, **Co**:	0.000	ksf
Passive Pressure, **Pp**:	0.000	kcf
Base Friction, **μ**:	0.2	
Seismic Zone, **z**:	1	

Material Properties

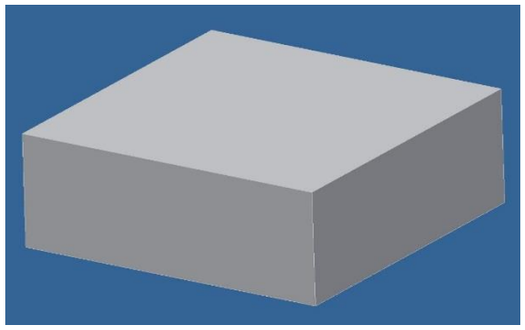
Rebar Yield Strength, **Fy**:	60000	psi
Concrete Strength, **F'c**:	3000	psi
Concrete Density, **δc**:	0.150	kcf

Rebar Properties

Pad Rebar Size, **sp**:	11	
Rebar Quanity, **mp**:	26	14

Design Checks

	Capacity/ Availability	Demands/ Limits	Check	% Capacity
Shear (ksf)	102.62	24.00	**OK**	23.39
*Overturning (ft*kips):*	9275.01	1936.00	**OK**	20.87
Bearing (ksf):	6.00	1.53	**OK**	25.48
Shear - 1-Way (kips):	102.62	24.00	**OK**	23.39
Pad Rebar Area (in²):	40.60	21.00	**OK**	
Bar Spacing (in):	11.17	18 > Bs > 2	**OK**	
Development Length (in):	158.00	60.24	**OK**	



Modification Checks

	Capacity/ Availibility	Demands/ Limits	Check
Minimum Extra Thickness (in):	0.00	0.00	**Not Used**
Pad Rebar Area-short (in²):	8.84	0.00	**Not Used**
Pad Rebar Area-long (in2):	2.21	0.00	**Not Used**
Pad Rebar Spacing-short (in2):	15.84	18 > Bs > 2	**Not Used**
Pad Rebar Spacing-long (in2):	78.06	18 > Bs > 2	**Not Used**
End Cap Width (in):	0.00	0.00	**Not Used**
End Cap Rebar Area (in2):	4.81	0.00	**Not Used**
EC Rebar Spacing (in):	-2.02	18 > Bs > 2	**Not Used**
Tie Spacing (in):	16.13	316 > s > 4.5	**Not Used**
Dowel Area (in2):	8.84	0.00	**Not Used**
Dowel Embedment (in):	6.00	6.00	**Not Used**
Shear Strength of Cone (kips):	9.87	23.86	**Not Used**
Dowel Edge Distance (in):	12.00	5.19	**Not Used**
Dowel Spacing (in):	33.33	12.00	**Not Used**
Dowel Edge Distance (vert) (in):	36.00	5.19	**Not Used**
Dowel Devel. Length (in):	-4.00	15.38	**Not Used**

Modifications

Pad Thickness, Te:	0	in	**End Cap Width**, **Wec**:	0	in
Revised Pad Thickness, **Tx**:	6	ft	Revised Width, **Wx**:	27	ft
Pad Rebar Size, **Se**:	6		EC Rebar Size, **Sec**:	7	per side, top & bottom
Rebar Quanity (long), **me**:	20	0	EC Rebar Quanity, **mec**:	8	0
Rebar Quanity (short), **mex**:	5	0	EC Tie Size, **Sect**:	4	per side
Dowel Size, **Sed**:	7		Tie Quanity, **mect**:	20	0
Dowel Quanity, **med**:	20	0	EC Dowel Size, **Secd**:	6	per side
			Dowel Quanity, **mecd**:	20	0
			Rows of Dowels, **Nd**:	2	
			Dowel Depth, **decd**:	6	in
			Edge Distance, **eecd**:	12	in

USGS Design Maps Summary Report

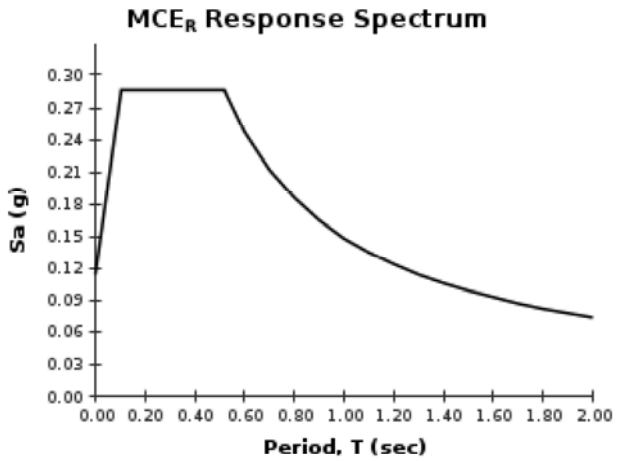
User–Specified Input

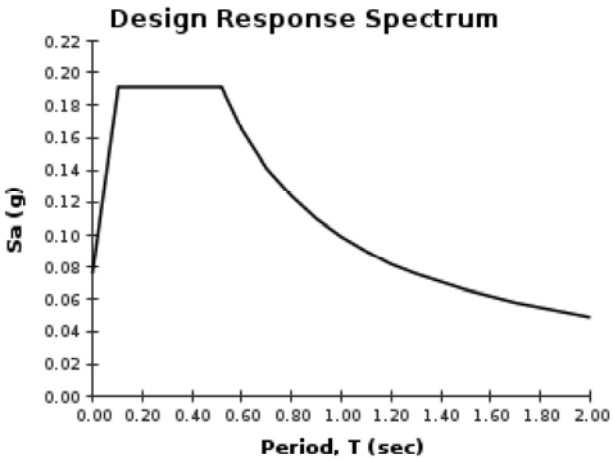
Report Title	806364 Tue October 4, 2016 18:04:22 UTC
Building Code Reference Document	2012/2015 International Building Code (which utilizes USGS hazard data available in 2008)
Site Coordinates	41.45935°N, 72.66273°W
Site Soil Classification	Site Class D – "Stiff Soil"
Risk Category	I/II/III

USGS–Provided Output

S_S =	0.179 g	S_{MS} =	0.286 g	S_{DS} =	0.191 g
S_1 =	0.062 g	S_{M1} =	0.148 g	S_{D1} =	0.099 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: 806364
Work Order: 1347869
Application: 373779 Rev. 0

CROWN CASTLE

	Degrees	Minutes	Seconds		
Site Latitude =	41	27	33.67	41.4594	degrees
Site Longitude =	-72	39	45.83	-72.6627	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 =	0.179	USGS Seismic Tool
Spectral response acceleration 1 s period, S_1 =	0.062	

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} =	0.191	*(2.7.6)*
Design spectral response acceleration 1 s period, S_{D1} =	0.099	*(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: CT5841

Durham Central
143 R Old Blue Hills Road
Durham, CT 6422

January 16, 2017

Centerline Communications Project Number: 950006-017

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**24.55 %**

January 16, 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: **CT5841 – Durham Central**

Centerline Communications, LLC ("Centerline") was directed to analyze the proposed AT&T facility located at **143 R Old Blue Hills Road, Durham, 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 **143 R Old Blue Hills Road, Durham, 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
LTE	700 MHz	2	60
LTE	1900 MHz (PCS)	2	60
GSM	850 MHz	2	30
GSM	1900 MHz (PCS)	2	30

Table 1: Channel Data Table

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

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	Powerwave 7770	75
A	2	KMW AM-X-CD-16-65-00T-RET	75
A	3	Powerwave 7770	75
B	1	Powerwave 7770	75
B	2	KMW AM-X-CD-16-65-00T-RET	75
B	3	Powerwave 7770	75
C	1	Powerwave 7770	75
C	2	KMW AM-X-CD-16-65-00T-RET	75
C	3	Powerwave 7770	75

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	Powerwave 7770	850 MHz	11.4	2	60	828.23	1.10
Antenna A2	KMW AM-X-CD-16-65-00T-RET	700 MHz / 1900 MHz (PCS)	13.35 / 15.25	4	240	6,614.85	7.23
Antenna A3	Powerwave 7770	850 MHz / 1900 MHz (PCS)	11.4 / 13.4	4	120	2,140.89	2.09
						Sector A Composite MPE%	**10.43**
Antenna B1	Powerwave 7770	850 MHz	11.4	2	60	828.23	1.10
Antenna B2	KMW AM-X-CD-16-65-00T-RET	700 MHz / 1900 MHz (PCS)	13.35 / 15.25	4	240	6,614.85	7.23
Antenna B3	Powerwave 7770	850 MHz / 1900 MHz (PCS)	11.4 / 13.4	4	120	2,140.89	2.09
						Sector B Composite MPE%	**10.43**
Antenna C1	Powerwave 7770	850 MHz	11.4	2	60	828.23	1.10
Antenna C2	KMW AM-X-CD-16-65-00T-RET	700 MHz / 1900 MHz (PCS)	13.35 / 15.25	4	240	6,614.85	7.23
Antenna C3	Powerwave 7770	850 MHz / 1900 MHz (PCS)	11.4 / 13.4	4	120	2,140.89	2.09
						Sector C Composite MPE%	**10.43**

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, all three sectors have the same configuration yielding the same results on all three sectors. *Table 5* below shows a summary for each AT&T Sector as well as the composite MPE value for the site.

Site Composite MPE%	
Carrier	**MPE%**
AT&T – Max Sector Value	**10.43 %**
Verizon	8.10 %
Nextel	0.59 %
Town	4.03 %
Sprint	1.40 %
Site Total MPE %:	**24.55 %**

Table 4: All Carrier MPE Contributions

AT&T Sector A Total:	10.43 %
AT&T Sector B Total:	10.43 %
AT&T Sector C Total:	10.43 %
Site Total:	24.55 %

Table 5: Site MPE Summary

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

AT&T _ Frequency Band / Technology	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
AT&T 850 MHz UMTS	2	414.12	75	6.25	850 MHz	567	1.10%
AT&T 700 MHz LTE	2	1,297.63	75	19.60	700 MHz	467	4.20%
AT&T 1900 MHz (PCS) LTE	2	2,009.79	75	30.35	1900 MHz (PCS)	1000	3.04%
AT&T 850 MHz GSM	2	414.12	75	6.25	850 MHz	567	1.10%
AT&T 1900 MHz (PCS) GSM	2	656.33	75	9.91	1900 MHz (PCS)	1000	0.99%
						Total:	10.43%

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:	10.43 %
Sector B:	10.43 %
Sector C:	10.43 %
AT&T Maximum Total (per sector):	10.43 %
Site Total:	24.55 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **24.55 %** 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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