



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

July 27, 2016

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

RE: Notice of Exempt Modification for AT&T/ LTE 3C Crown Site BU: 881536
AT&T Site ID: CT5107
120 Universal Drive, North Haven, CT 06473
Latitude: 41° 20' 40.01"/ Longitude: -72° 52' 14.92"

Dear Ms. Bachman:

AT&T currently maintains nine (9) antennas at the 121-foot level of the existing 120-foot monopole at 120 Universal Drive in North Haven, CT. The tower is owned by Crown Castle. The property is owned by 120 Universal Drive Associates, LLC. AT&T now intends to replace three (3) antennas with three (3) new CCI 1.9 GHz antennas. These antennas would be installed at the 121-foot level of the tower. AT&T also intends to install three (3) RRUs and one (1) squid.

This facility was approved by the by the Town of North Haven Planning and Zoning Commission in Special Permit Application P2000-44 on November 13, 2000. This approval included the conditions that:

1. Submit three (3) revised plans which include:
 - a.) Revised plans must address/include all comments/conditions of this approval and the related site plan approval #P200-45.
 - b.) Live certification.

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 Mr. Michael J. Freda, First Selectman, Town of North Haven 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.

Melanie A. Bachman

July 27, 2016

Page 2

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:

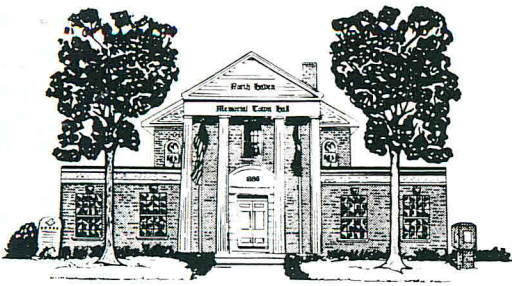
Tab 1: Exhibit-1: Compound plan and elevation depicting the planned changes

Tab 2: Exhibit-2: Structural Modification Report

Tab 3: Exhibit-3: General Power Density Table Report (RF Emissions Analysis Report)

cc: Mr. Michael Freda, First Selectman
Town of North Haven
18 Church Street
North Haven, CT 06473

120 Universal Drive Associates, LLC
120 Universal Drive
North Haven, CT 06473



TOWN OF NORTH HAVEN

MEMORIAL TOWN HALL / 18 CHURCH STREET

NORTH HAVEN, CONNECTICUT 06473



REPLY TO:

PLANNING & ZONING COMMISSION

Tel. (203) 239-5321

Fax (203) 234-2130

November 20, 2000

Mr. Stephen Longobardi
Candid Communications of North Haven, II LLC
110 Washington Avenue
North Haven, CT 06473

Re: #P2000-44 Special Permit application, (as authorized by Section 3A.6.), of Candid Communications of North Haven, II LLC, relative to 120 Universal Drive South, (Map 11, Route 1). Plan Entitled: Candid Communications, LLC, Multi-User Wireless Communications Facility, North Haven Tower Site, Universal Drive, North Haven, Connecticut, Prepared By URS Greiner Woodward Clyde A-E-S, Dated 9-8-00, Rev. 11-1-00 Scale 1" = 30'. IL-30 Zoning District.

Dear Mr. Longobardi:

Please be advised that during the deliberation session of the Planning & Zoning Commission meeting held on Monday, November 13, 2000, the Commission unanimously voted to approve the above referenced application subject to the following conditions:

1. Submit three (3) revised plans which include:
 - a.) Revised plans must address/include all comments and conditions of this approval and the related Site Plan approval #P2000-45.
 - b.) Live certification.

In accordance with the Connecticut State Statutes, Section 8-3d, the Special Permit is not effective until a certified copy of the Commission's decision has been recorded on the Land Records, at the owner's expense. Accordingly, you must record this certified decision letter at the Town Clerk's Office, 18 Church Street, North Haven, CT. Immediately after filing with the Town Clerk, please submit a copy of the decision letter, stamped as recorded, to the Land Use Office, for our permanent record.

#P2000-44

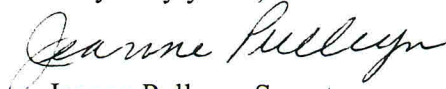
Page 2

Please note that one (1) set of revised drawings should be submitted for review after all outstanding issues (conditions of approval as set forth above), are adequately addressed. If there are any questions relative to the conditions of approval, please call the Town prior to submitting the revised plans. This will avoid costly and time consuming revisions and reviews, therefore expediting the process for you as the applicant.

This approval is subject to compliance with any and all Zoning Regulations of the Town of North Haven.

You may not proceed with this approval until you have received a signed plan from the Land Use Office.

Very truly yours,



Jeanne Pulleyn, Secretary
Planning & Zoning Commission

JP/ts

cc: First Selectman

Engineering Dept.

Building Dept.

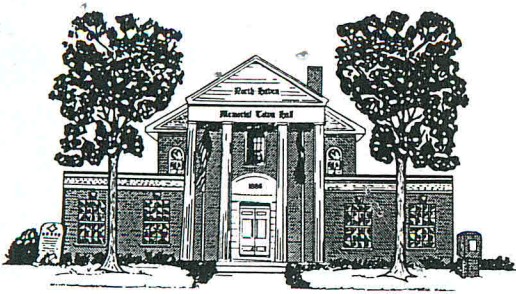
CERTIFIED MAIL R/R

RECEIVED AND FILED
TOWN CLERKS OFFICE
NORTH HAVEN, CONN.

MAR 20 2001 @ 1:15 PM



TOWN CLERK



TOWN OF NORTH HAVEN

MEMORIAL TOWN HALL / 18 CHURCH STREET

NORTH HAVEN, CONNECTICUT 06473



REPLY TO: PLANNING & ZONING COMMISSION

Tel. (203) 239-5321
Fax (203) 234-2130

November 20, 2000

Mr. Stephen Longobardi
Candid Communications of North Haven, II LLC
110 Washington Avenue
North Haven, CT 06473

Re: #P2000-45 Site Plan application of Candid Communications of North Haven, II LLC, relative to 120 Universal Drive South, (Map 11, Route 1). Plan Entitled: Candid Communications, LLC, Multi-User Wireless Communications Facility, North Haven Tower Site, Universal Drive, North Haven, Connecticut, Prepared By URS Greiner Woodward Clyde A-E-S, Dated 9-8-00, Rev. 11-1-00 Scale 1" = 30'. IL-30 Zoning District.

Dear Mr. Longobardi:

Please be advised that during the deliberation session of the Planning & Zoning Commission meeting held on Monday, November 13, 2000, the Commission unanimously voted to approve the above referenced application subject to the following conditions:

1. Submit eight (8) revised plans which include:
 - a.) The zoning table must reference the following:

Minimum lot area (sq ft)	30,000 (req'd column),	130,929 (existing column)
Minimum lot width (ft.)	100 (req'd column)	
Building height	12' (proposed column)	
Minimum side yard setback	30' (existing column),	52' (proposed column)
Minimum rear yard setback	27' (existing column)	
Minimum side yard tower setback	90' (proposed column)	
 - b.) Plans must be numbered to indicate a submission set of 5 sheets (1 of 5 through 5 of 5).
 - c.) The boundary/survey plan must be referenced in the sheet index on Sheet T-1.
 - d.) Provide all the information required by Section 3A.6. (b) (1) (iii) and (xi).
 - e.) Siltation control must be provided along the rear property line.
 - f.) The remaining access drive off the rear of the existing building must be marked as a fire lane.

- g.) The proposed parking area must be permanently marked with signage and curbing/islands so that the area does not remain open for use as spillover storage of vehicles, etc.
 - h.) Limits of green (lawn or non-impervious) areas need to be more clearly indicated. Note, said areas must be protected by curbing.
 - i.) The relocated scrap metal recycle dumpster must include respective enclosure and island protection with landscaping.
 - j.) Curbing and grass/landscaped areas along the rear property line must be provided in order to discourage continuance of unapproved outside storage activities.
2. The property owner and/or applicant must remove all outside storage (several trailer bodies, steel hoist, debris) located at the west side of the property as well as on the railroad property. All outside storage must be removed from the site. No building permit will be issued until the cleanup of this area occurs.
 3. Proposed contours and/or spot elevations must be provided.
 4. Parking spaces must be line striped.
 5. Proposed fencing must be reviewed by the Zoning Enforcement Officer prior to installation to insure zoning compliance.
 6. Soil and erosion controls must be inspected by the Zoning Enforcement Officer before work may commence.
 7. The property owner must maintain (repair/replace when necessary) the siltation control until all development activity is completed and all disturbed areas are permanently stabilized.
 8. Submit an as-built prior to bond release.
 9. Submit a bond in the amount of \$15,000.00 (forms are enclosed). Note, two separate bonds (for \$10,000.00 and \$5,000.00) are recommended, considering that the \$5,000.00 amount covering the required site cleanup work can be released prior to issuance of a building permit, contingent on completion and acceptance of said cleanup.

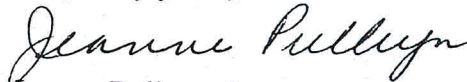
#P2000-45
Page 3

Please note that one (1) set of revised drawings should be submitted for review after all outstanding issues (conditions of approval as set forth above), are adequately addressed. If there are any questions relative to the conditions of approval, please call the Town prior to submitting the revised plans. This will avoid costly and time consuming revisions and reviews, therefore expediting the process for you as the applicant.

This approval is subject to compliance with any and all Zoning Regulations of the Town of North Haven.

You may not proceed with this approval until you have received a signed plan from the Land Use Office.

Very truly yours,



Jeanne Pulleyn, Secretary
Planning & Zoning Commission

JP/ts

cc: First Selectman
Engineering Dept.
Building Dept.

CERTIFIED MAIL R/R

Enclosures

120 UNIVERSAL DR

Location 120 UNIVERSAL DR

Mblu 011/ / 001/ /

Acct# 027540

Owner 120 UNIVERSAL DRIVE ASSOCIATES LLC

Assessment \$996,030

Appraisal \$1,422,900

PID 8457

Building Count 1

Current Value

Appraisal			
Valuation Year	Improvements	Land	Total
2014	\$1,025,400	\$397,500	\$1,422,900

Assessment			
Valuation Year	Improvements	Land	Total
2014	\$717,780	\$278,250	\$996,030

Owner of Record

Owner	120 UNIVERSAL DRIVE ASSOCIATES LLC	Sale Price	\$0
Co-Owner		Certificate	
Address	120 UNIVERSAL DR NORTH HAVEN, CT 06473	Book & Page	799/ 46
		Sale Date	10/28/2008

Ownership History

Ownership History				
Owner	Sale Price	Certificate	Book & Page	Sale Date
120 UNIVERSAL DRIVE ASSOCIATES LLC	\$0		799/ 46	10/28/2008
BERLUTI MARIO	\$0	1	482/ 458	07/18/1995
BERLUTI, MARIO & HELEN	\$0	3		09/01/1990
BERLUTI MARIO & HELEN & SURV	\$0	4	305/ 427	12/06/1978

Building Information

Building 1 : Section 1

Year Built: 1985
Living Area: 19,180
Replacement Cost: \$1,089,079
Building Percent 78
Good:
Replacement Cost
Less Depreciation: \$849,500

Building Photo

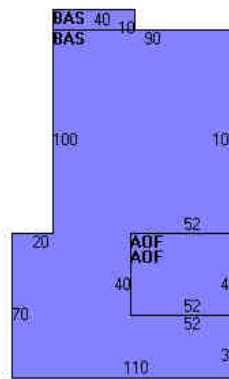
Building Attributes

Field	Description
STYLE	Service Shop
MODEL	Comm/Ind
Grade	C +
Stories:	1
Occupancy	1
Exterior Wall 1	Metal
Exterior Wall 2	
Roof Structure	Flat
Roof Cover	Metal/Tin
Interior Wall 1	Drywall
Interior Wall 2	
Interior Floor 1	Average
Interior Floor 2	
Heating Fuel	Gas
Heating Type	Hot Air-no Duc
AC Type	None
Bldg Use	AUTO REPAIR
Total Rooms	
Total Bedrms	
Total Baths	
1st Floor Use:	
Heat/AC	NONE
Frame Type	WOOD FRAME
Baths/Plumbing	AVERAGE
Ceiling/Wall	SUS-CEIL/MN WL
Rooms/Prtns	AVERAGE
Wall Height	20
% Conn Wall	



(http://images.vgsi.com/photos/NorthHavenCTPhotos//\00\01\26\42.jpg)

Building Layout



Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	15,020	15,020
AOF	Office	4,160	4,160
		19,180	19,180

Extra Features

Extra Features				Legend
Code	Description	Size	Value	Bldg #
A/C	AIR CONDITION	6612 S.F.	\$10,300	1
SPR1	SPRINKLERS-WET	19220 S.F.	\$13,500	1
MEZ1	MEZZANINE-UNF	2500 S.F.	\$17,600	1

Land

Land Use

Use Code 3320
 Description AUTO REPAIR
 Zone IL30
 Neighborhood 305

Land Line Valuation

Size (Acres) 3
 Frontage
 Depth
 Assessed Value \$278,250

Alt Land Appr No
Category

Appraised Value \$397,500

Outbuildings

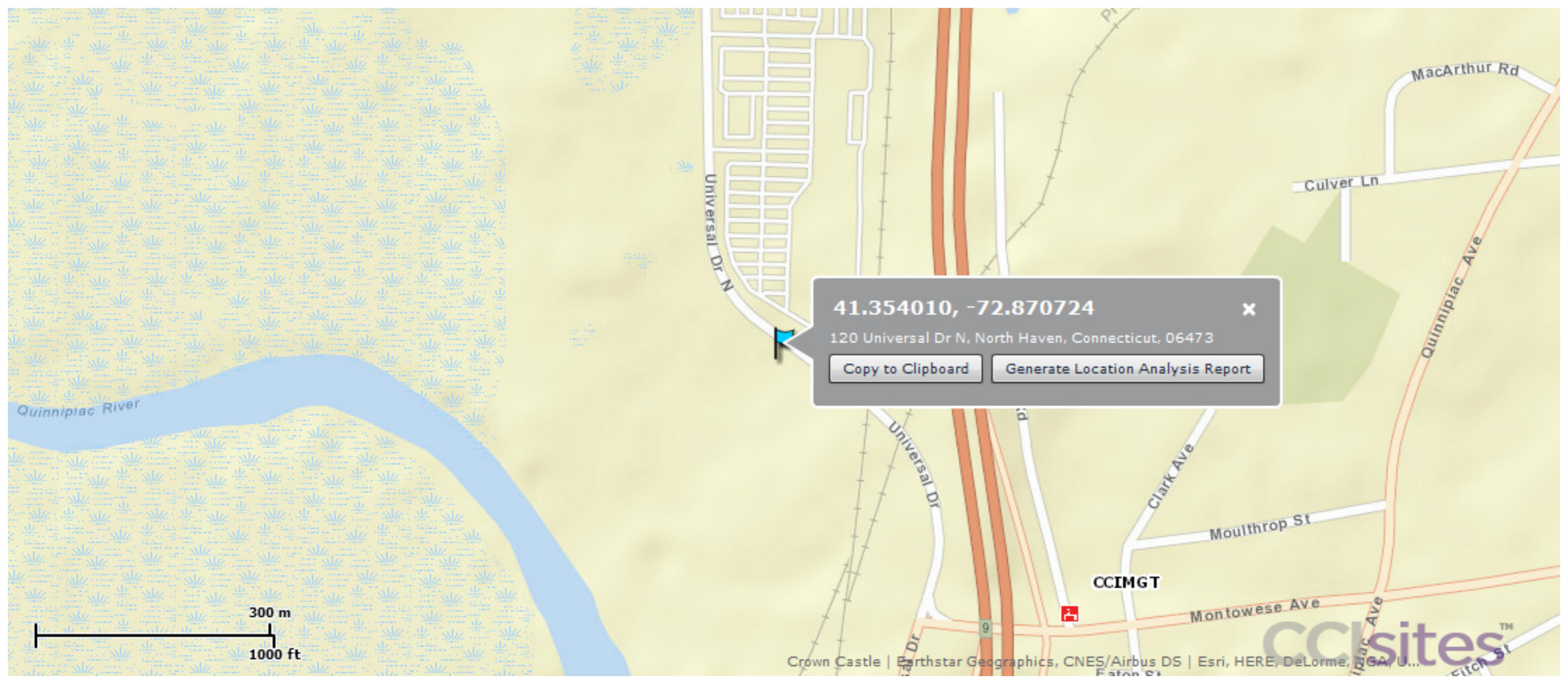
Outbuildings						Legend
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
FN3	FENCE-6' CHAIN			640 L.F.	\$2,900	1
PAV1	PAVING-ASPHALT			52000 S.F.	\$35,100	1
SHD7	COMM GOOD			240 S.F.	\$9,900	1
TWR1	COMMU-TOWER			1 UNITS	\$112,500	1
SHD7	COMM GOOD			240 S.F.	\$9,900	1

Valuation History

Appraisal			
Valuation Year	Improvements	Land	Total
2013	\$1,238,100	\$450,000	\$1,688,100
2008	\$733,900	\$450,000	\$1,183,900
2007		\$315,000	\$828,730

Assessment			
Valuation Year	Improvements	Land	Total
2013	\$866,670	\$315,000	\$1,181,670
2008	\$513,730	\$315,000	\$828,730
2007		\$315,000	\$828,730

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41.354010, -72.870724



120 Universal Dr N, North Haven, Connecticut, 06473

Copy to Clipboard

Generate Location Analysis Report

300 m
1000 ft

CCIMGT

ccl sites™



WIRELESS COMMUNICATIONS FACILITY

CT5107 - LTE PCS 1900 RETROFIT

CROWN CASTLE SITE NO.: 881536

NORTH HAVEN SOUTH

120 UNIVERSAL DRIVE

NORTH HAVEN, CT 06473

GENERAL NOTES

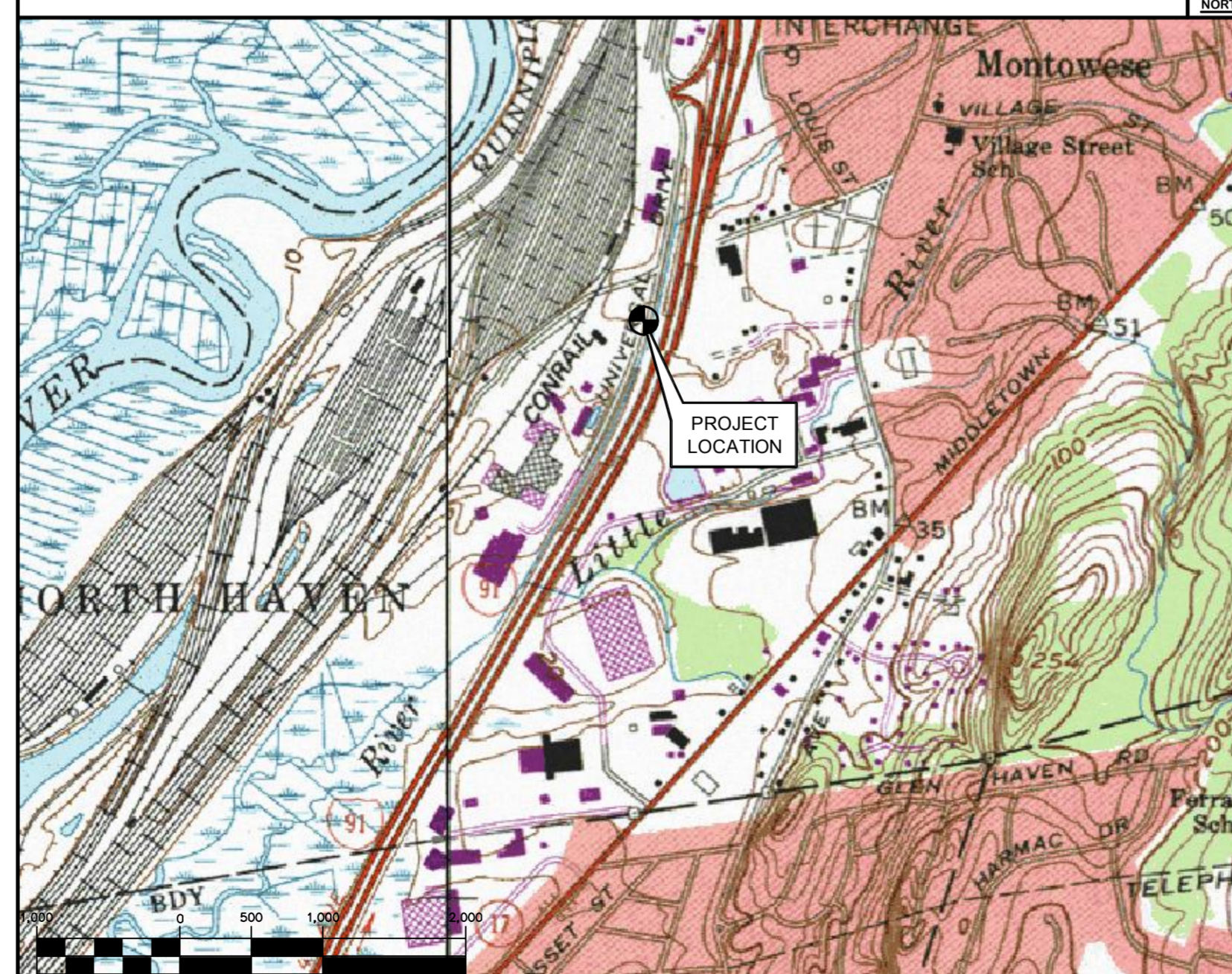
1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2003 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2005 CONNECTICUT SUPPLEMENT AND 2009 AMENDMENTS, INCLUDING THE TA/EIA-222 REVISION "F" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES," 2005 CONNECTICUT FIRE SAFETY CODE AND 2009 AMENDMENTS, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. THE COMPOUND, TOWER, PRIMARY GROUND RING, ELECTRICAL SERVICE TO THE METER BANK AND TELEPHONE SERVICE TO THE DEMARCATION POINT ARE PROVIDED BY SITE OWNER. AS BUILT FIELD CONDITIONS REGARDING THESE ITEMS SHALL BE CONFIRMED BY THE CONTRACTOR. SHOULD ANY FIELD CONDITIONS PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL NOT PROCEED WITH ANY AFFECTED WORK.
3. CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
4. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
5. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
6. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION, PLUMBING, ELECTRICAL AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
7. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN 'AS-BUILT' SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
8. LOCATION OF EQUIPMENT, AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
9. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY. MAINTAIN EXISTING BUILDING'S/PROPERTY'S OPERATIONS, COORDINATE WORK WITH BUILDING/PROPERTY OWNER.
10. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
11. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
12. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MFR.'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
13. ANY AND ALL ERRORS, DISCREPANCIES, AND 'MISSED' ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE AT&T CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO 'EXTRA' WILL BE ALLOWED FOR MISSED ITEMS.
14. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
15. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
16. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
17. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUIT AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
18. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUB-CONTRACTORS FOR ANY CONDITION PER THE MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
19. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
20. THE CONTRACTOR SHALL CONTACT "CALL BEFORE YOU DIG" AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1-800-922-4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED PRIOR TO ANY EXCAVATION WORK. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
21. CONTRACTOR SHALL COMPLY WITH OWNERS ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.

SITE DIRECTIONS

- FROM:** 500 ENTERPRISE DRIVE
ROCKY HILL, CONNECTICUT
- TO:** 120 UNIVERSAL DR
NORTH HAVEN, CT 06473
1. HEAD NORTHEAST ON ENTERPRISE DR TOWARD CAPITAL BLVD 0.3 mi
 2. TURN LEFT ONTO CAPITAL BLVD 0.2 mi
 3. USE THE LEFT 2 LANES TO TURN LEFT ONTO STATE HWY 411 0.3 mi
 4. TURN LEFT TO MERGE ONTO I-91 S 24.6 mi
 5. TAKE EXIT 9 TOWARD MONTWESSE AVENUE 0.1 mi
 6. SLIGHT LEFT ONTO UNIVERSAL DR 0.4 mi
 7. DESTINATION WILL BE ON THE RIGHT

VICINITY MAP

SCALE: 1" = 1000'



PROJECT SUMMARY

1. THE PROPOSED SCOPE OF WORK CONSISTS OF A MODIFICATION TO THE EXISTING UNMANNED TELECOMMUNICATIONS FACILITY INCLUDING THE FOLLOWING:
 - A. REMOVE AND REPLACE EXISTING POSITION 3 ANTENNA FOR PROPOSED (12) PORT ANTENNA, (1) PER SECTOR AND SWAP TO POSITION 4.
 - B. REMOVE & REPLACE (3) EXISTING RRUS-12 (1900MHz WITH (3) NEW RRUS-32 B2 MOUNTED BY ANTENNA ON EXISTING TOWER.

PROJECT INFORMATION

AT&T SITE NUMBER: CT5107
 AT&T SITE NAME: NORTH HAVEN SOUTH
 SITE ADDRESS: CROWN CASTLE SITE NO.: 881536
 120 UNIVERSAL DRIVE
 NORTH HAVEN, CT 06473

LESSEE/APPLICANT: AT&T MOBILITY
 500 ENTERPRISE DRIVE, SUITE 3A
 ROCKY HILL, CT 06067

CONTACT PERSON: LAUREN GROPPI
 EMPIRE TELECOM, LLC
 (978) 430-2534

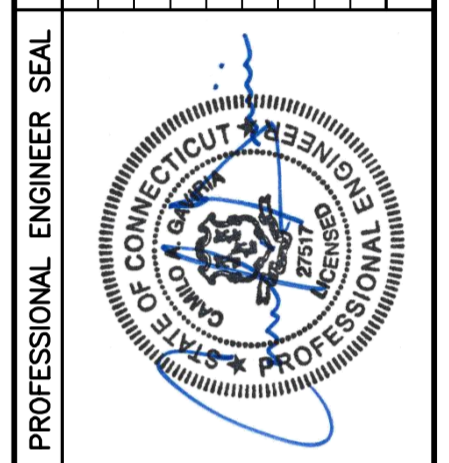
ENGINEER: CENTEK ENGINEERING, INC.
 63-2 NORTH BRANFORD RD.
 BRANFORD, CT. 06405

PROJECT COORDINATES: LATITUDE: 41°-20'-38.76" N
 LONGITUDE: 72°-52'-14.16" W
 GROUND ELEVATION: ±21' AMSL

SHEET INDEX

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

REV.	DATE	BY	CHK'D	DESCRIPTION
0	06/02/16	KAW	CAG	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION



CENTEK engineering
 Centek Solutions
 (203) 498-0380
 (203) 498-3587 Fax
 632 North Branford Road
 Branford, CT 06405
 www.CentekEng.com

AT&T MOBILITY
 WIRELESS COMMUNICATIONS FACILITY
NORTH HAVEN SOUTH
SITE NUMBER: CT5107
120 UNIVERSAL DRIVE
NORTH HAVEN, CT 06473

DATE: 04/08/16
 SCALE: AS NOTED
 JOB NO. 16002.15

TITLE SHEET

T-1

Sheet No. 1 of 5

NOTES AND SPECIFICATIONS

DESIGN BASIS

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

1. DESIGN CRITERIA:

- WIND LOAD: PER EIA/TIA 222 F-96 (ANTENNA MOUNTS): 85 MPH (FASTEST MILE), EQUIVALENT TO 105 MPH (3 SECOND GUST).
- BUILDING CLASSIFICATION: II (BASED ON IBC TABLE 1604.5)
- BASIC WIND SPEED (OTHER STRUCTURE): 110 MPH (3 SECOND GUST) (EXPOSURE B/IMPORTANCE FACTOR 1.0 BASED ON ASCE 7-02) PER 2003 INTERNATIONAL BUILDING CODE (IBC) AS MODIFIED BY THE 2005 CONNECTICUT SUPPLEMENT AND 2009 AMENDMENT.
- SEISMIC LOAD (DOES NOT CONTROL): PER ASCE 7-02 MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES.

GENERAL NOTES:

1. ALL CONSTRUCTION SHALL BE IN COMPLIANCE WITH THE GOVERNING BUILDING CODE.
2. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
3. BEFORE BEGINNING THE WORK, THE CONTRACTOR IS RESPONSIBLE FOR MAKING SUCH INVESTIGATIONS CONCERNING PHYSICAL CONDITIONS (SURFACE AND SUBSURFACE) AT OR CONTIGUOUS TO THE SITE WHICH MAY AFFECT PERFORMANCE AND COST OF THE WORK.
4. DIMENSIONS AND DETAILS SHALL BE CHECKED AGAINST EXISTING FIELD CONDITIONS.
5. THE CONTRACTOR SHALL VERIFY AND COORDINATE THE SIZE AND LOCATION OF ALL OPENINGS, SLEEVES AND ANCHOR BOLTS AS REQUIRED BY ALL TRADES.
6. ALL DIMENSIONS, ELEVATIONS, AND OTHER REFERENCES TO EXISTING STRUCTURES, SURFACE, AND SUBSURFACE CONDITIONS ARE APPROXIMATE. NO GUARANTEE IS MADE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THE CONTRACTOR SHALL VERIFY AND COORDINATE ALL DIMENSIONS, ELEVATIONS, ANGLES WITH EXISTING CONDITIONS AND WITH ARCHITECTURAL AND SITE DRAWINGS BEFORE PROCEEDING WITH ANY WORK.
7. AS THE WORK PROGRESSES, THE CONTRACTOR SHALL NOTIFY THE OWNER OF ANY CONDITIONS WHICH ARE IN CONFLICT OR OTHERWISE NOT CONSISTENT WITH THE CONSTRUCTION DOCUMENTS AND SHALL NOT PROCEED WITH SUCH WORK UNTIL THE CONFLICT IS SATISFACTORILY RESOLVED.
8. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE SAFETY CODES AND REGULATIONS DURING ALL PHASES OF CONSTRUCTION. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR PROVIDING AND MAINTAINING ADEQUATE SHORING, BRACING, AND BARRICADES AS MAY BE REQUIRED FOR THE PROTECTION OF EXISTING PROPERTY, CONSTRUCTION WORKERS, AND FOR PUBLIC SAFETY.
9. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY. MAINTAIN EXISTING SITE OPERATIONS, COORDINATE WORK WITH NORTHEAST UTILITIES
10. THE STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER FOUNDATION REMEDIATION WORK IS COMPLETE. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE AND TO ENSURE THE SAFETY OF THE STRUCTURE AND ITS COMPONENT PARTS DURING ERECTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, TEMPORARY BRACING, GUYS OR TIEDOWNS, WHICH MIGHT BE NECESSARY.
11. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
12. SHOP DRAWINGS, CONCRETE MIX DESIGNS, TEST REPORTS, AND OTHER SUBMITTALS PERTAINING TO STRUCTURAL WORK SHALL BE FORWARDED TO THE OWNER FOR REVIEW BEFORE FABRICATION AND/OR INSTALLATION IS MADE. SHOP DRAWINGS SHALL INCLUDE ERECTION DRAWINGS AND COMPLETE DETAILS OF CONNECTIONS AS WELL AS MANUFACTURER'S SPECIFICATION DATA WHERE APPROPRIATE. SHOP DRAWINGS SHALL BE CHECKED BY THE CONTRACTOR AND BEAR THE CHECKER'S INITIALS BEFORE BEING SUBMITTED FOR REVIEW.
13. NO DRILLING WELDING OR TAPING ON CL&P OWNED EQUIPMENT.
14. REFER TO DRAWING T1 FOR ADDITIONAL NOTES AND REQUIREMENTS.

STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL IS DESIGNED BY ALLOWABLE STRESS DESIGN (ASD)
 - A. STRUCTURAL STEEL (W SHAPES)---ASTM A992 (FY = 50 KSI)
 - B. STRUCTURAL STEEL (OTHER SHAPES)---ASTM A36 (FY = 36 KSI)
 - C. STRUCTURAL HSS (RECTANGULAR SHAPES)---ASTM A500 GRADE B, (FY = 46 KSI)
 - D. STRUCTURAL HSS (ROUND SHAPES)---ASTM A500 GRADE B, (FY = 42 KSI)
 - E. PIPE---ASTM A53 (FY = 35 KSI)
 - F. CONNECTION BOLTS---ASTM A325-N
 - G. U-BOLTS---ASTM A36
 - H. ANCHOR RODS---ASTM F 1554
 - I. WELDING ELECTRODE---ASTM E 70XX
2. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE ENGINEER FOR REVIEW. SHOP DRAWINGS SHALL INCLUDE THE FOLLOWING: SECTION PROFILES, SIZES, CONNECTION ATTACHMENTS, REINFORCING, ANCHORAGE, SIZE AND TYPE OF FASTENERS AND ACCESSORIES. INCLUDE ERECTION DRAWINGS, ELEVATIONS AND DETAILS.
3. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AISC MANUAL OF STEEL CONSTRUCTION.
4. PROVIDE ALL PLATES, CLIP ANGLES, CLOSURE PIECES, STRAP ANCHORS, MISCELLANEOUS PIECES AND HOLES REQUIRED TO COMPLETE THE STRUCTURE.
5. FIT AND SHOP ASSEMBLE FABRICATIONS IN THE LARGEST PRACTICAL SECTIONS FOR DELIVERY TO SITE.
6. INSTALL FABRICATIONS PLUMB AND LEVEL, ACCURATELY FITTED, AND FREE FROM DISTORTIONS OR DEFECTS.
7. AFTER ERECTION OF STRUCTURES, TOUCHUP ALL WELDS, ABRASIONS AND NON-GALVANIZED SURFACES WITH A 95% ORGANIC ZINC RICH PAINT IN ACCORDANCE WITH ASTM 780.
8. ALL STEEL MATERIAL (EXPOSED TO WEATHER) SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT DIPPED GALVANIZED) COATINGS" ON IRONS AND STEEL PRODUCTS.
9. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE".
10. THE ENGINEER SHALL BE NOTIFIED OF ANY INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON CONFORMING MATERIALS OR CONDITIONS TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER REVIEW.
11. CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES.
12. STRUCTURAL CONNECTION BOLTS SHALL CONFORM TO ASTM A325. ALL BOLTS SHALL BE 3/4" DIAMETER MINIMUM AND SHALL HAVE A MINIMUM OF TWO BOLTS, UNLESS OTHERWISE ON THE DRAWINGS.
13. LOCK WASHER ARE NOT PERMITTED FOR A325 STEEL ASSEMBLIES.
14. SHOP CONNECTIONS SHALL BE WELDED OR HIGH STRENGTH BOLTED.
15. MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.
16. FABRICATE BEAMS WITH MILL CAMBER UP.
17. LEVEL AND PLUMB INDIVIDUAL MEMBERS OF THE STRUCTURE TO AN ACCURACY OF 1:500, BUT NOT TO EXCEED 1/4" IN THE FULL HEIGHT OF THE COLUMN.
18. COMMENCEMENT OF STRUCTURAL STEEL WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.
19. INSPECTION AND TESTING OF ALL WELDING AND HIGH STRENGTH BOLTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY.
20. FOUR COPIES OF ALL INSPECTION TEST REPORTS SHALL BE SUBMITTED TO THE ENGINEER WITHIN TEN (10) WORKING DAYS OF THE DATE OF INSPECTION.

PAINT NOTES

PAINTING SCHEDULE:

1. **ANTENNA PANELS:**

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

2. **COAXIAL CABLES:**

- A. ONE COAT OF DTM BONDING PRIMER (2-5 MILS. DRY FINISH)
- B. TWO COATS OF DTM ACRYLIC PRIMER/FINISH (2.5-5 MILS. DRY FINISH)
- C. COLOR TO BE FIELD MATCHED WITH EXISTING STRUCTURE.

EXAMINATION AND PREPARATION:

1. DO NOT APPLY PAINT IN SNOW, RAIN, FOG OR MIST OR WHEN RELATIVE HUMIDITY EXCEEDS 85%. DO NOT APPLY PAINT TO DAMP OR WET SURFACES.
2. VERIFY THAT SUBSTRATE CONDITIONS ARE READY TO RECEIVE WORK. EXAMINE SURFACE SCHEDULED TO BE FINISHED PRIOR TO COMMENCEMENT OF WORK. REPORT ANY CONDITION THAT MAY POTENTIALLY AFFECT PROPER APPLICATION.
3. TEST SHOP APPLIED PRIMER FOR COMPATIBILITY WITH SUBSEQUENT COVER MATERIALS.
4. PERFORM PREPARATION AND CLEANING PROCEDURE IN STRICT ACCORDANCE WITH COATING MANUFACTURER'S INSTRUCTIONS FOR EACH SUBSTRATE CONDITION.
5. CORRECT DEFECTS AND CLEAN SURFACES WHICH AFFECT WORK OF THIS SECTION. REMOVE EXISTING COATINGS THAT EXHIBIT LOOSE SURFACE DEFECTS.
6. IMPERVIOUS SURFACE: REMOVE MILDEW BY SCRUBBING WITH SOLUTION OF TRI-SODIUM PHOSPHATE AND BLEACH. RINSE WITH CLEAN WATER AND ALLOW SURFACE TO DRY.
7. ALUMINUM SURFACE SCHEDULED FOR PAINT FINISH: REMOVE SURFACE CONTAMINATION BY STEAM OR HIGH-PRESSURE WATER. REMOVE OXIDATION WITH ACID ETCH AND SOLVENT WASHING. APPLY ETCHING PRIMER IMMEDIATELY FOLLOWING CLEANING.
8. FERROUS METALS: CLEAN UNGALVANIZED FERROUS METAL SURFACES THAT HAVE NOT BEEN SHOP COATED; REMOVE OIL, GREASE, DIRT, LOOSE MILL SCALE, AND OTHER FOREIGN SUBSTANCES. USE SOLVENT OR MECHANICAL CLEANING METHODS THAT COMPLY WITH THE STEEL STRUCTURES PAINTING COUNCIL'S (SSPC) RECOMMENDATIONS. TOUCH UP BARE AREAS AND SHOP APPLIED PRIME COATS THAT HAVE BEEN DAMAGED. WIRE BRUSH, CLEAN WITH SOLVENTS RECOMMENDED BY PAINT MANUFACTURER, AND TOUCH UP WITH THE SAME PRIMER AS THE SHOP COAT.
9. GALVANIZED SURFACES: CLEAN GALVANIZED SURFACES WITH NON-PETROLEUM-BASED SOLVENTS SO SURFACE IS FREE OF OIL AND SURFACE CONTAMINANTS. REMOVE PRETREATMENT FROM GALVANIZED SHEET METAL FABRICATED FROM COIL STOCK BY MECHANICAL METHODS.
10. ANTENNA PANELS: REMOVE ALL OIL, DUST, GREASE, DIRT, AND OTHER FOREIGN MATERIAL TO ENSURE ADEQUATE ADHESION. PANELS MUST BE WIPED WITH METHYL ETHYL KETONE (MEK).
11. COAXIAL CABLES: REMOVE ALL OIL, DUST, GREASE, DIRT, AND OTHER FOREIGN MATERIAL TO ENSURE ADEQUATE ADHESION.

CLEANING:

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

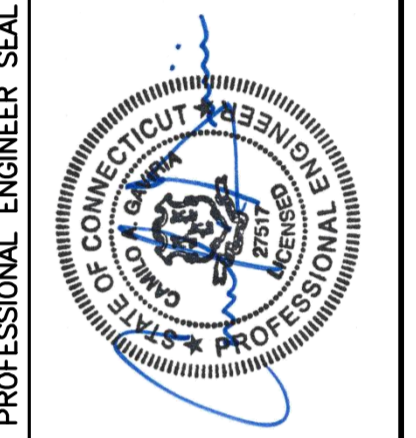
APPLICATION:

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

COMPLETED WORK:

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

CONSTRUCTION DRAWINGS -	ISSUED FOR CONSTRUCTION
CAG	DRAWN BY/CHK'D BY/DESCRIPTION
KAW	DATE
0	06/02/16
REV.	

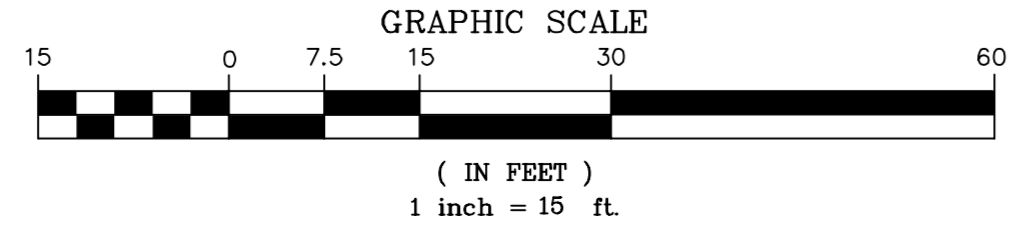
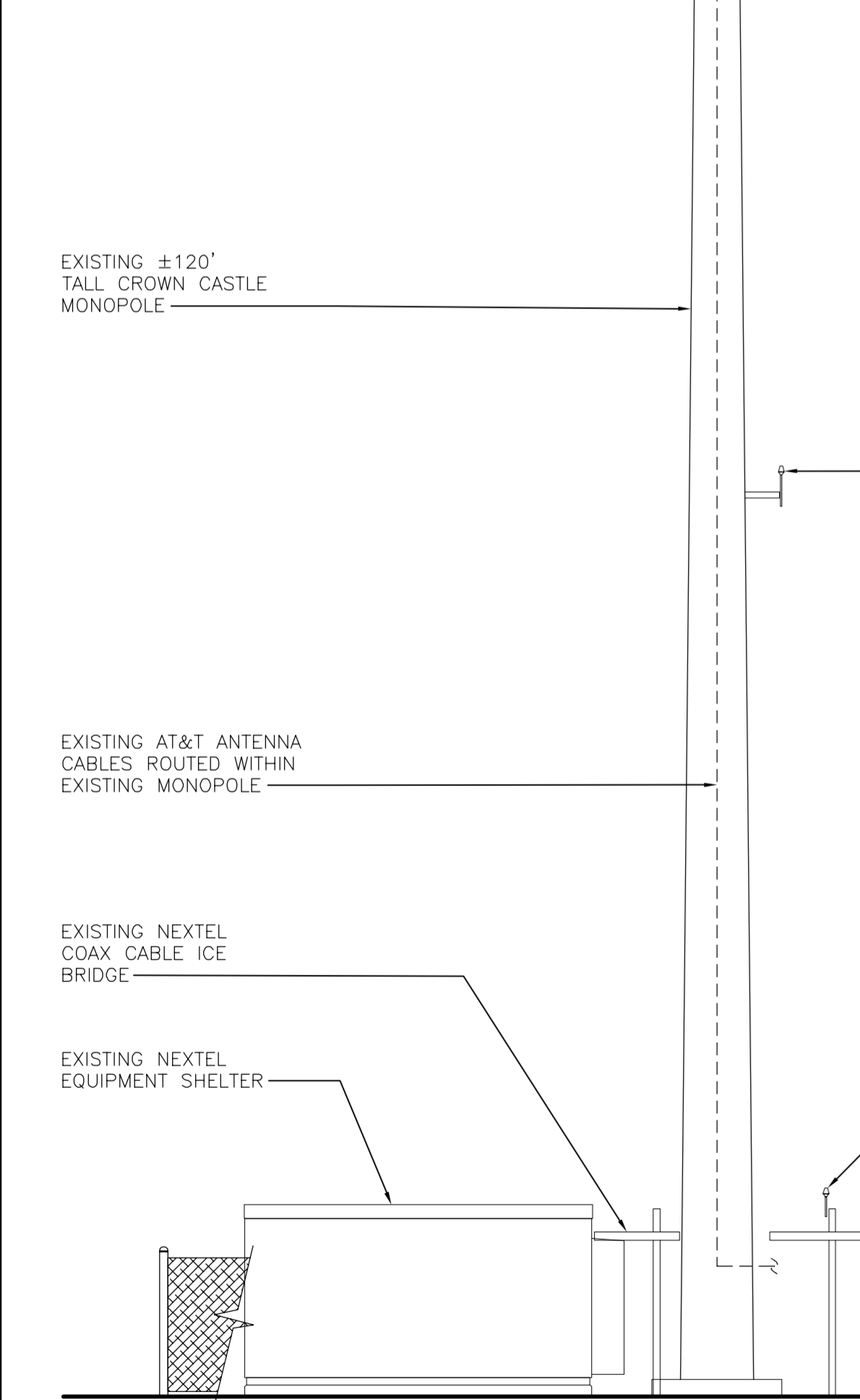
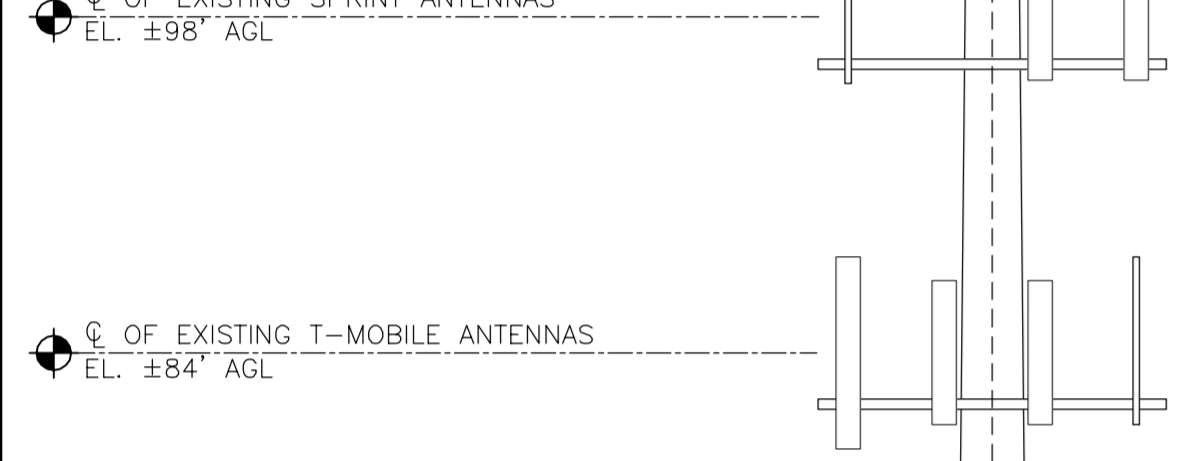
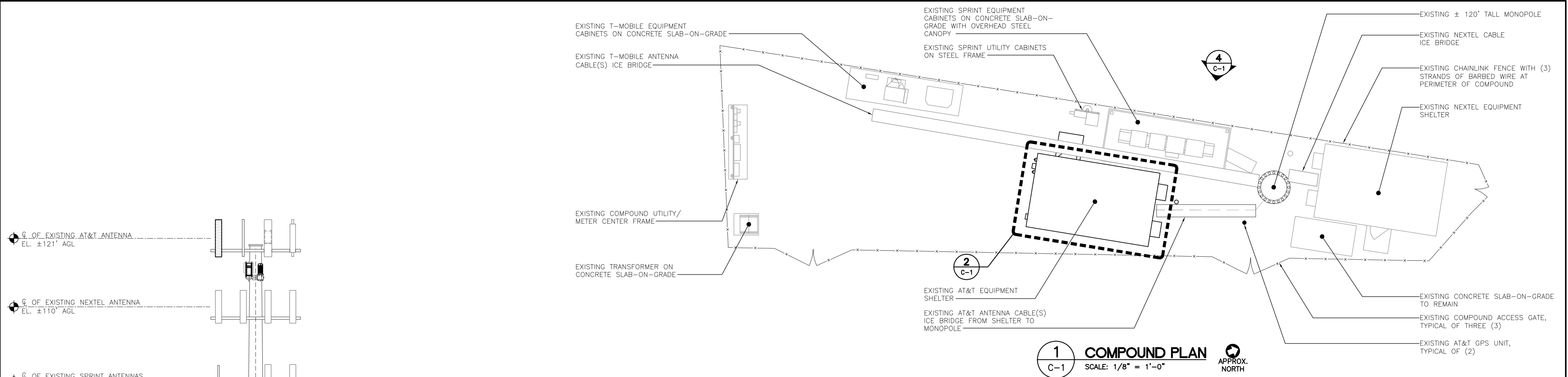


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 Centek on Solutions™
 (203) 498-0380
 (203) 498-3387 Fax
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 WIRELESS COMMUNICATIONS FACILITY
NORTH HAVEN SOUTH
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120 UNIVERSAL DRIVE
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DATE: 04/08/16
 SCALE: AS NOTED
 JOB NO. 16002.15

NOTES AND SPECIFICATIONS

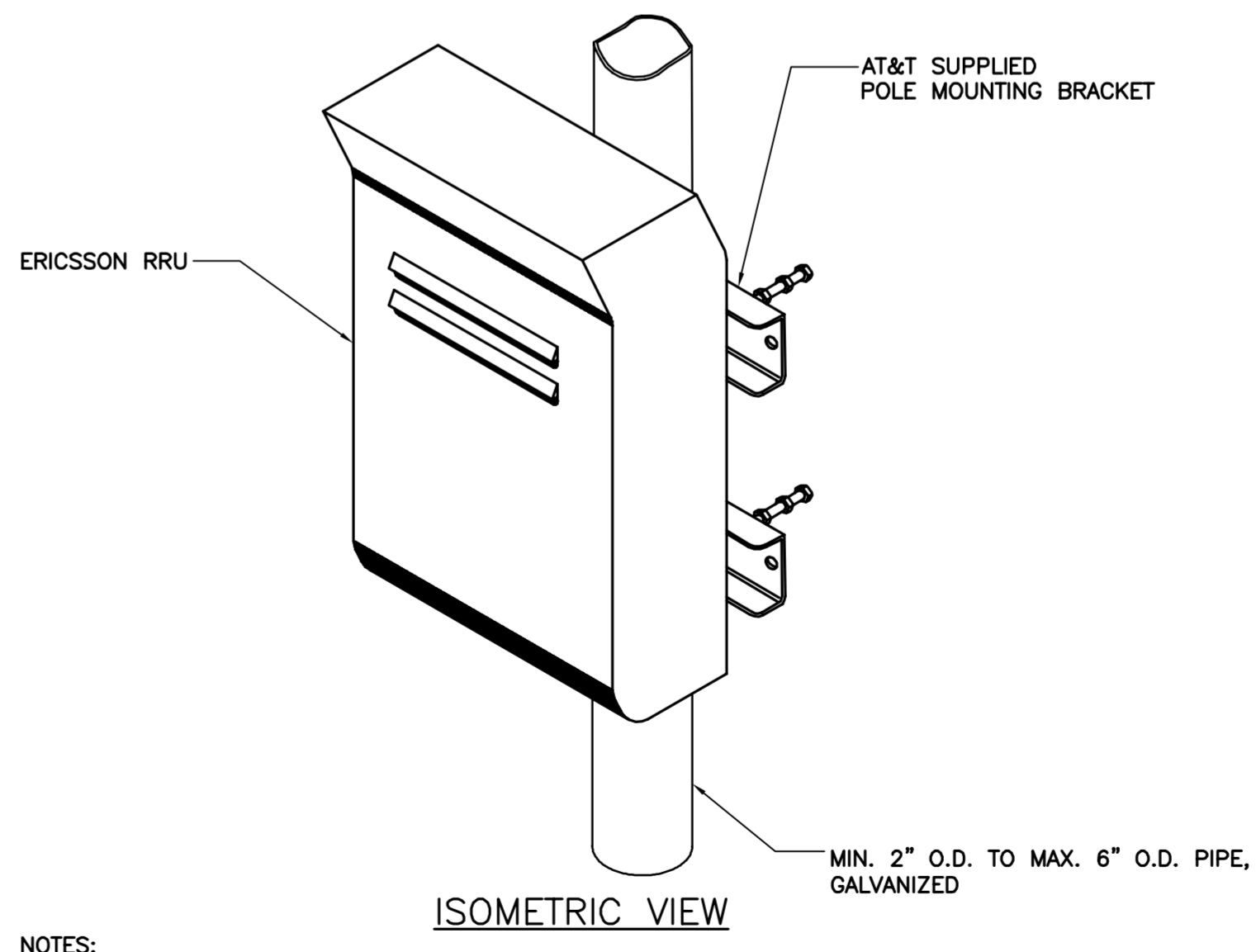
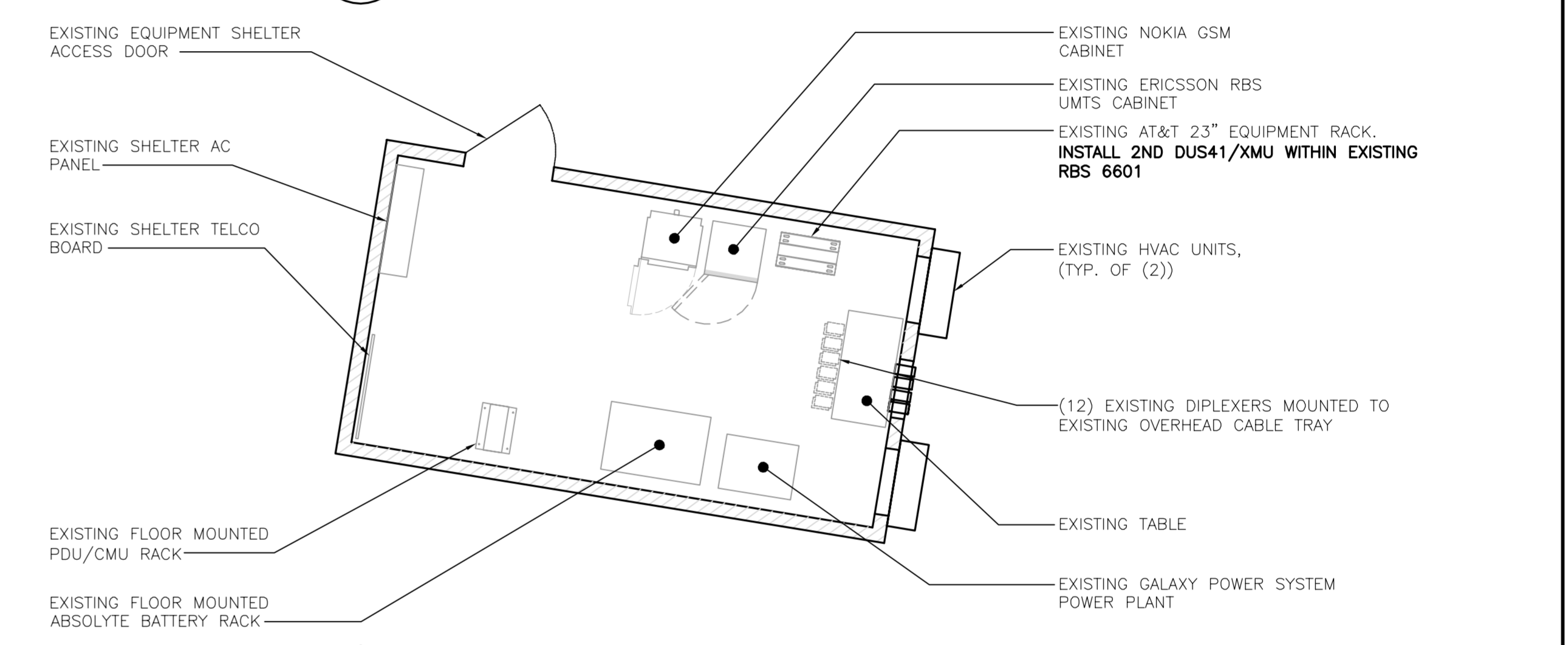


TOWER STRUCTURAL NOTES:

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

NOTES:

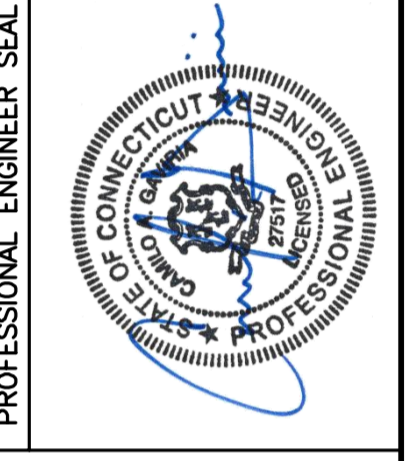
1. OTHER CARRIER EQUIPMENT NOT SHOWN FOR CLARITY.
2. AGL = ABOVE GRADE LEVEL



NOTES:

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

REV.	DATE	BY	CHKD	DESCRIPTION
0	05/02/16	KAW	CAG	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION

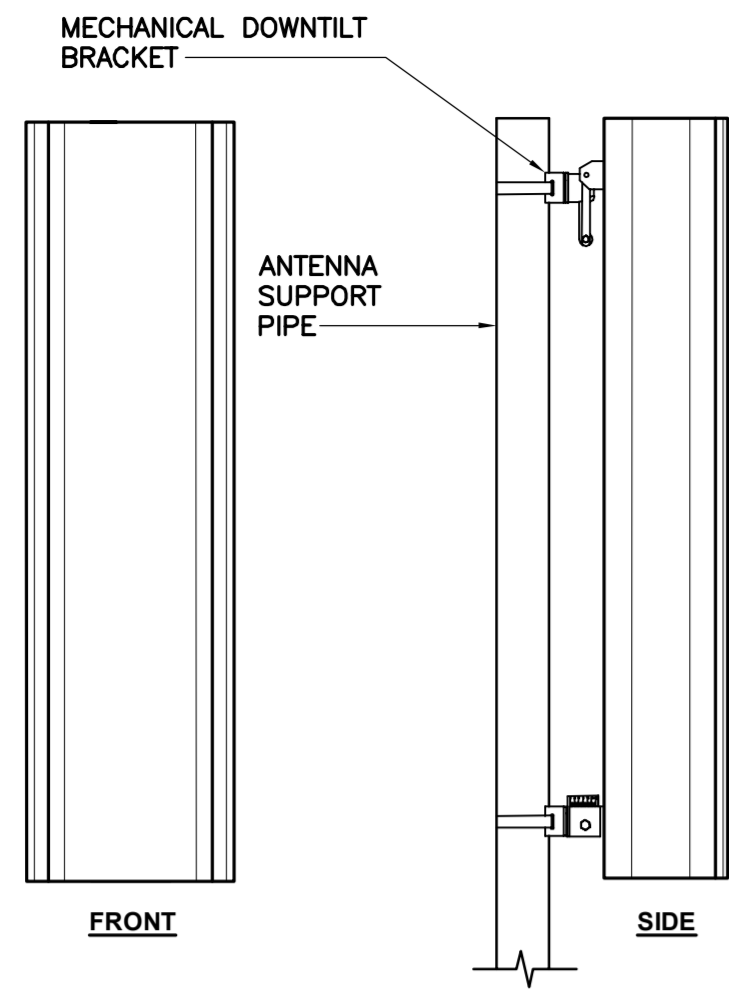


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 2031 488-0390 Fax
 2031 488-3397
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PLANS, ELEVATION AND DETAILS

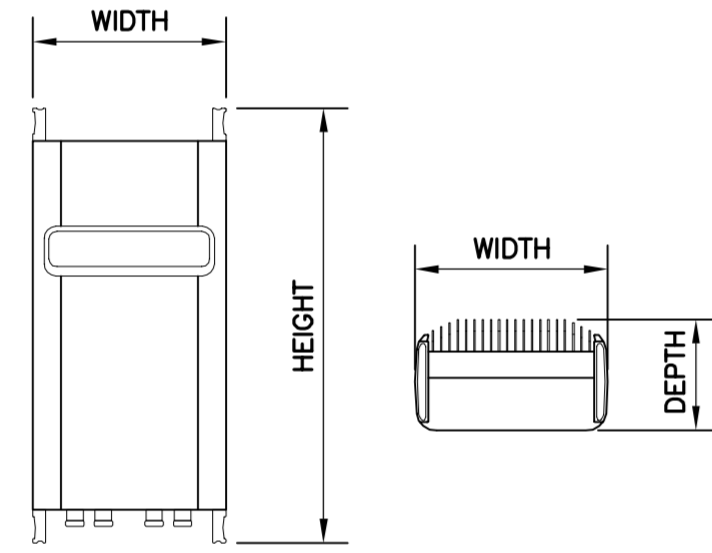


ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: QUINTEL MODEL: QS66512-2	72.0"H x 12.0"W x 9.6"D	111.0-LBS

BOTTOM

9 PROPOSED ANTENNA DETAIL

- SCALE: NTS
- NOTES:
- INSTALL ANTENNA TO EXISTING PIPE MAST USING MANUFACTURERS SUPPLIED BRACKETS AND MOUNTING HARDWARE
 - SET MECHANICAL DOWNTILT TO VALUE SPECIFIED IN LATEST RFDS



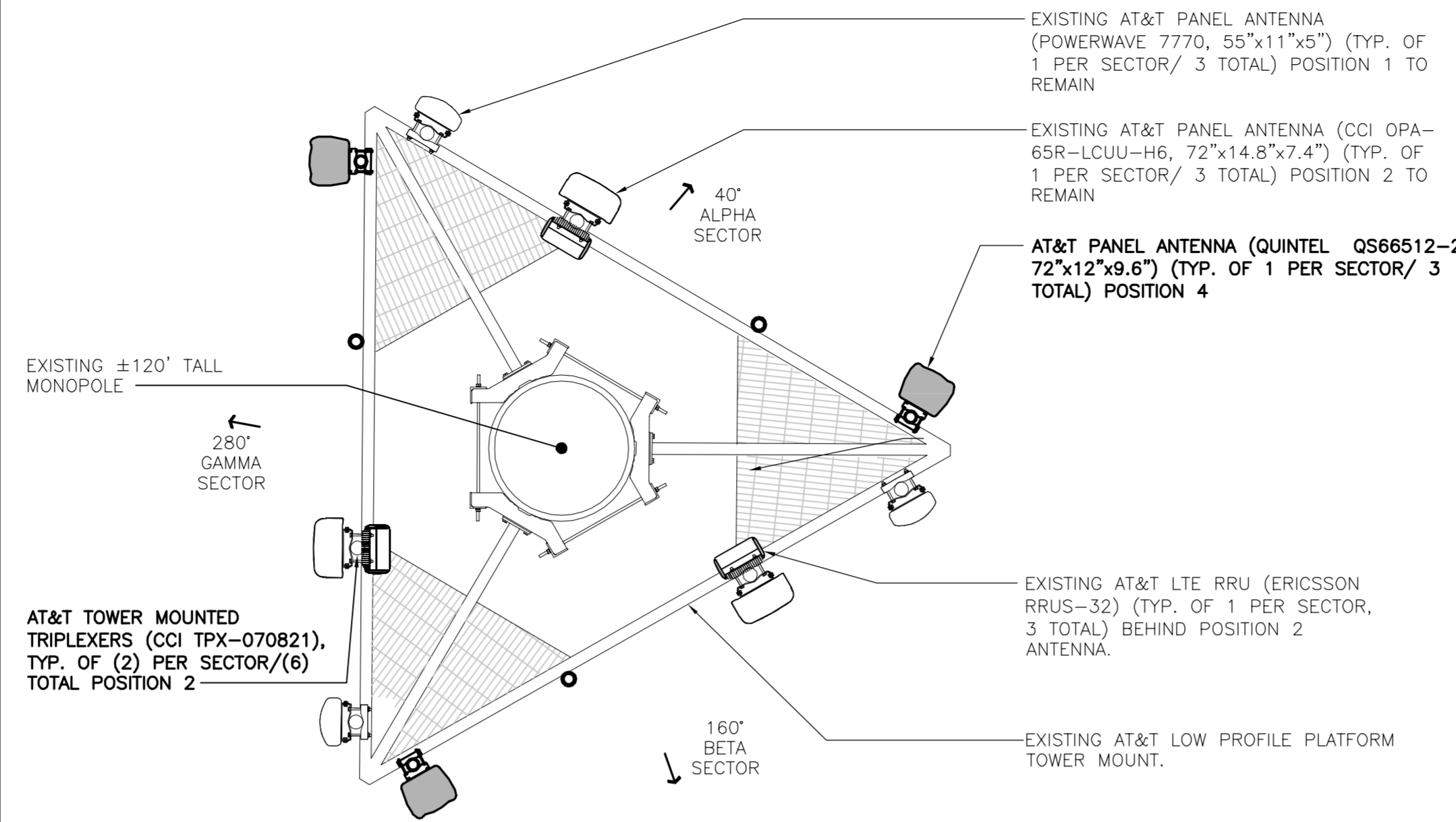
RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RRUS 32	27.17"H x 12.05"W x 7.01"D	52.91 LBS.	ABOVE: 16" MIN. BELOW: 12" MIN. FRONT: 36" MIN.

NOTES:

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

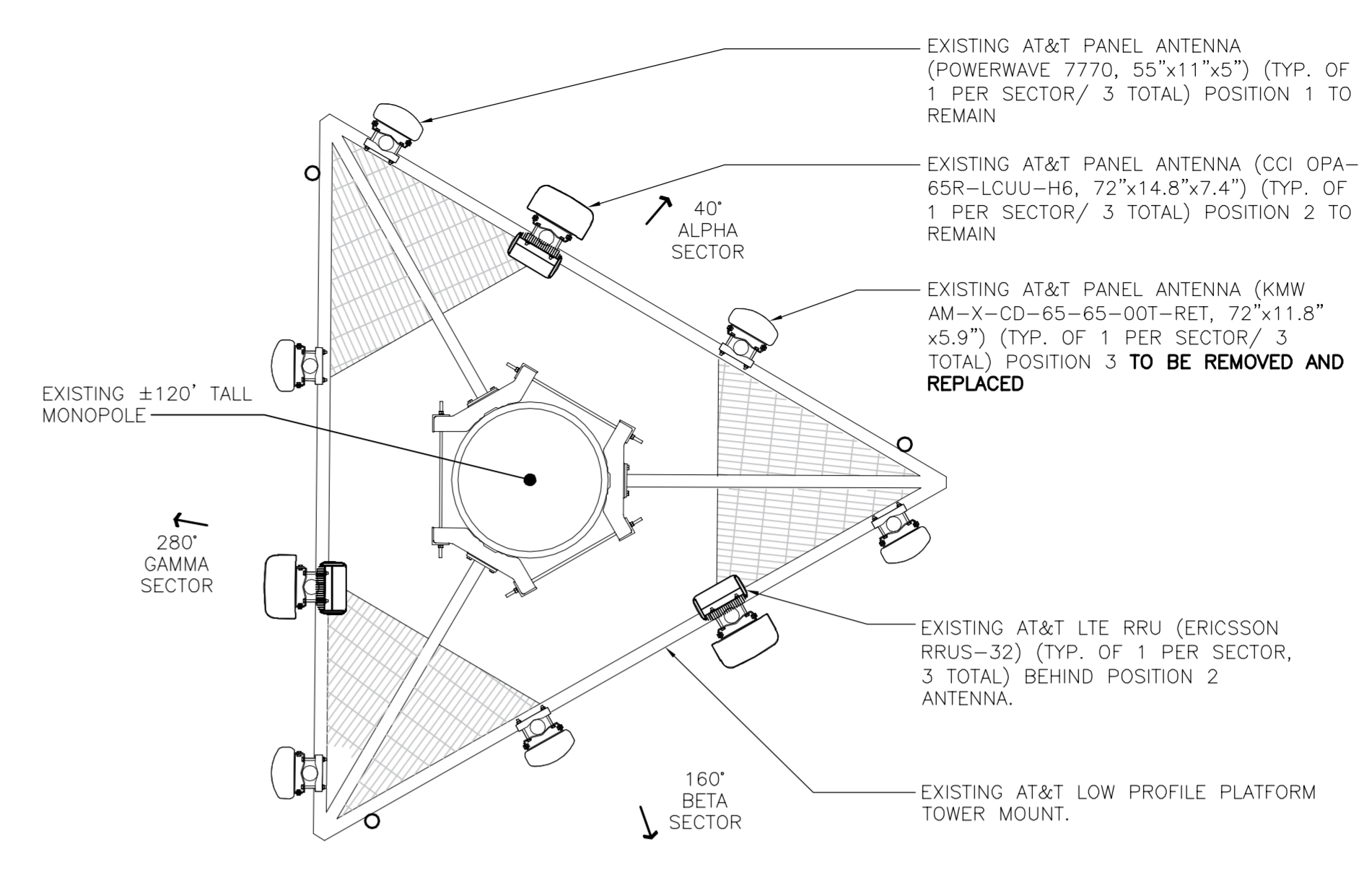
8 ERICSSON RRUS 32 B2 DETAIL

SCALE: 1" = 1'-0"



2 PROPOSED ANTENNA PLAN

SCALE: 3/16" = 1'-0"

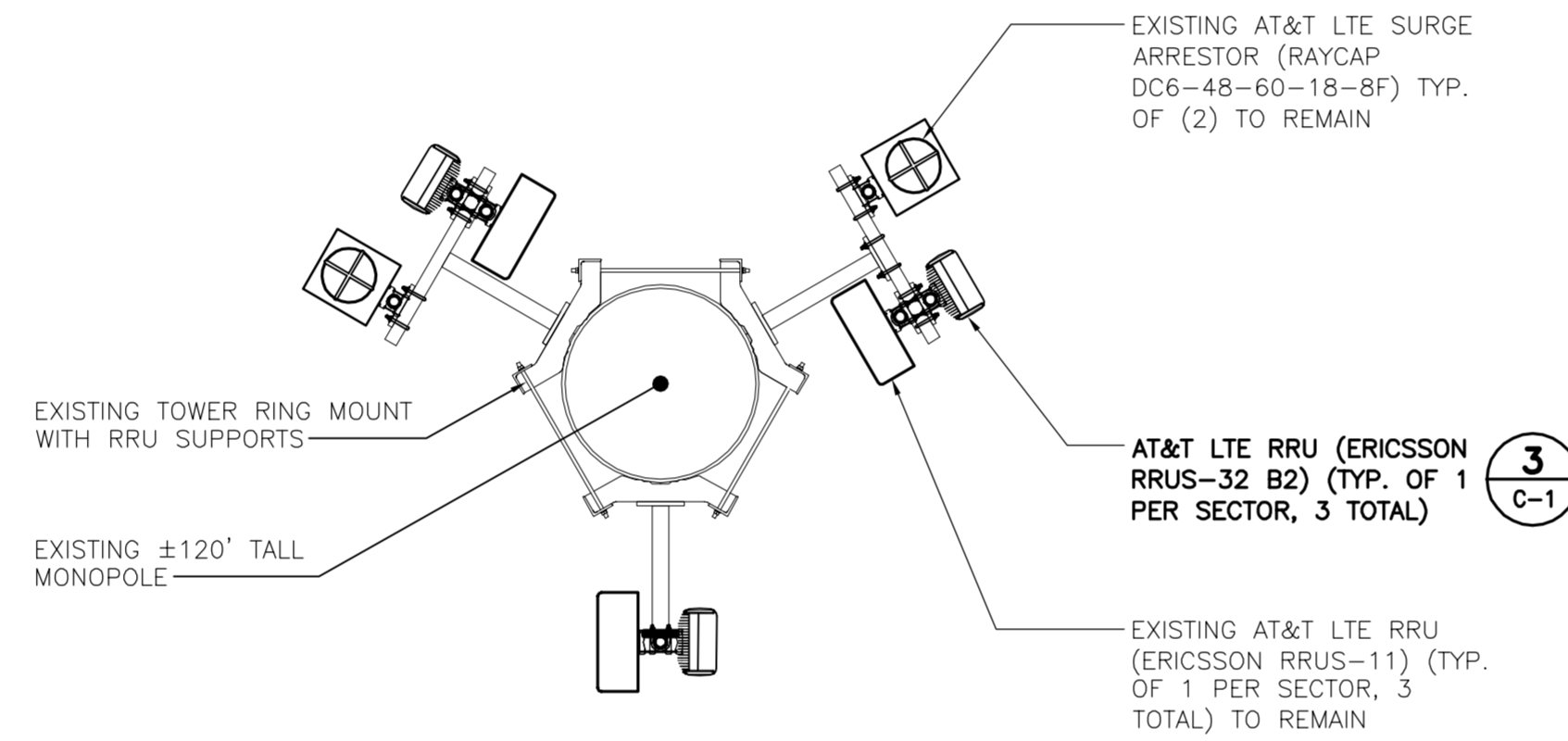


1 EXISTING ANTENNA PLAN

SCALE: 3/16" = 1'-0"

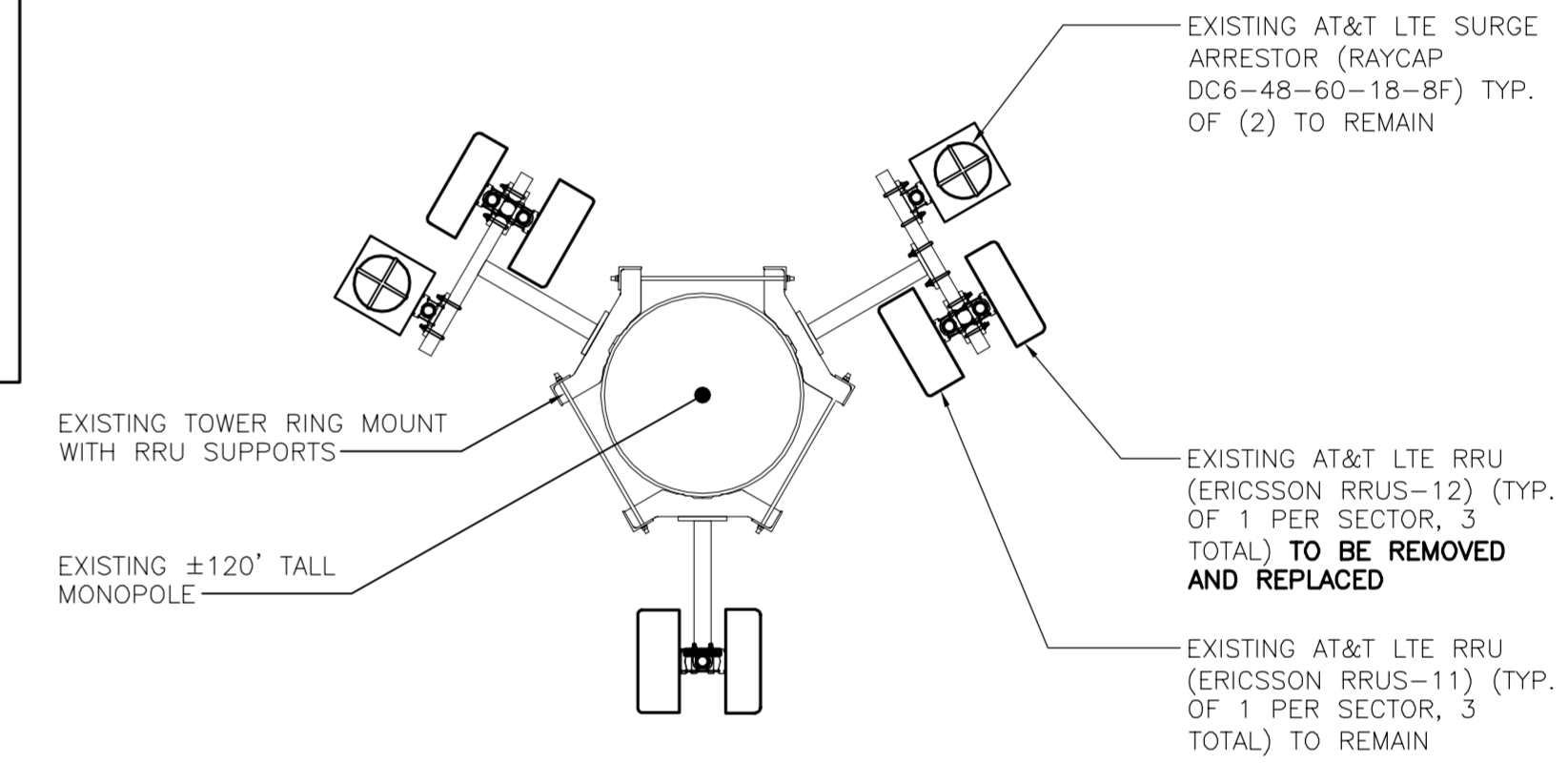
NOTES:

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



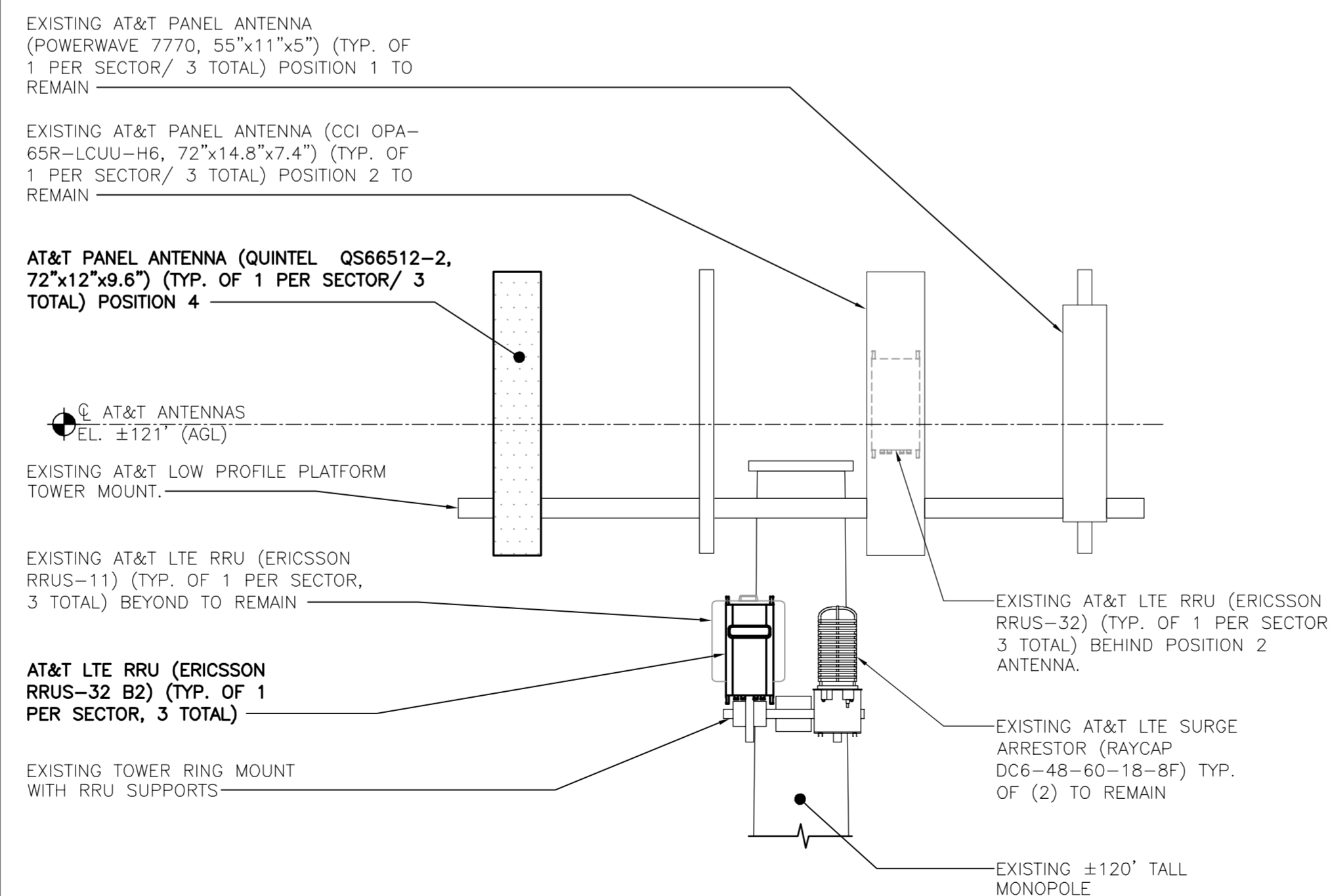
4 PROPOSED RRU PLAN

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



3 EXISTING RRU PLAN

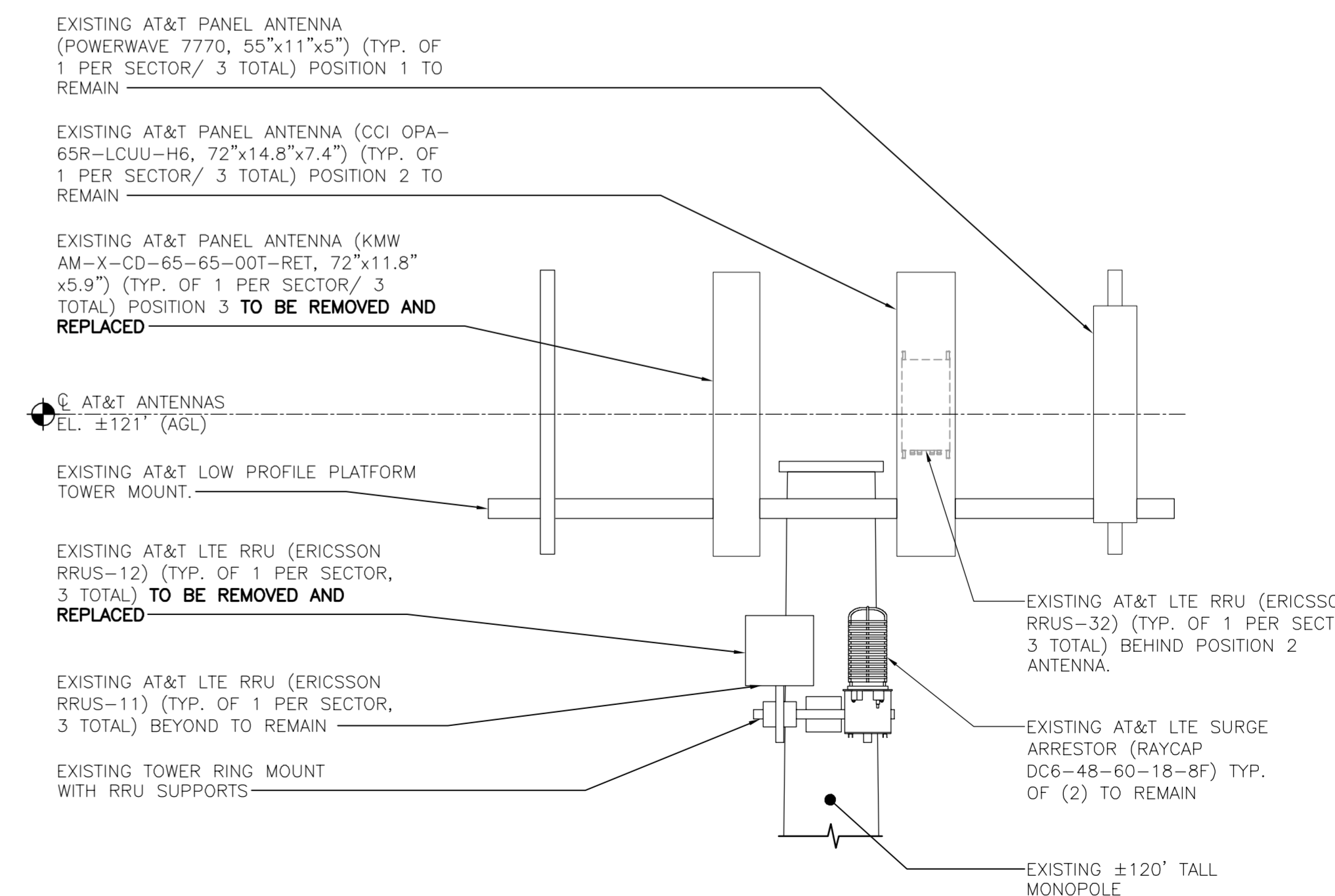
SCALE: 3/8" = 1'-0"



6 PROPOSED ANTENNA PLAN

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

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

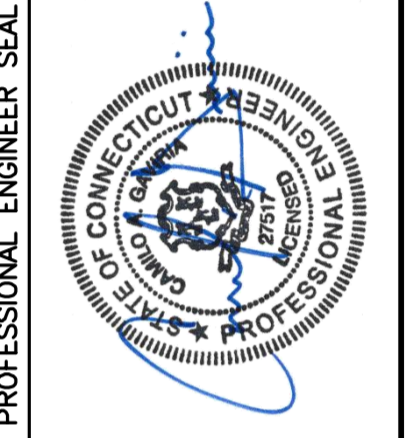


5 EXISTING ANTENNA PLAN

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

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

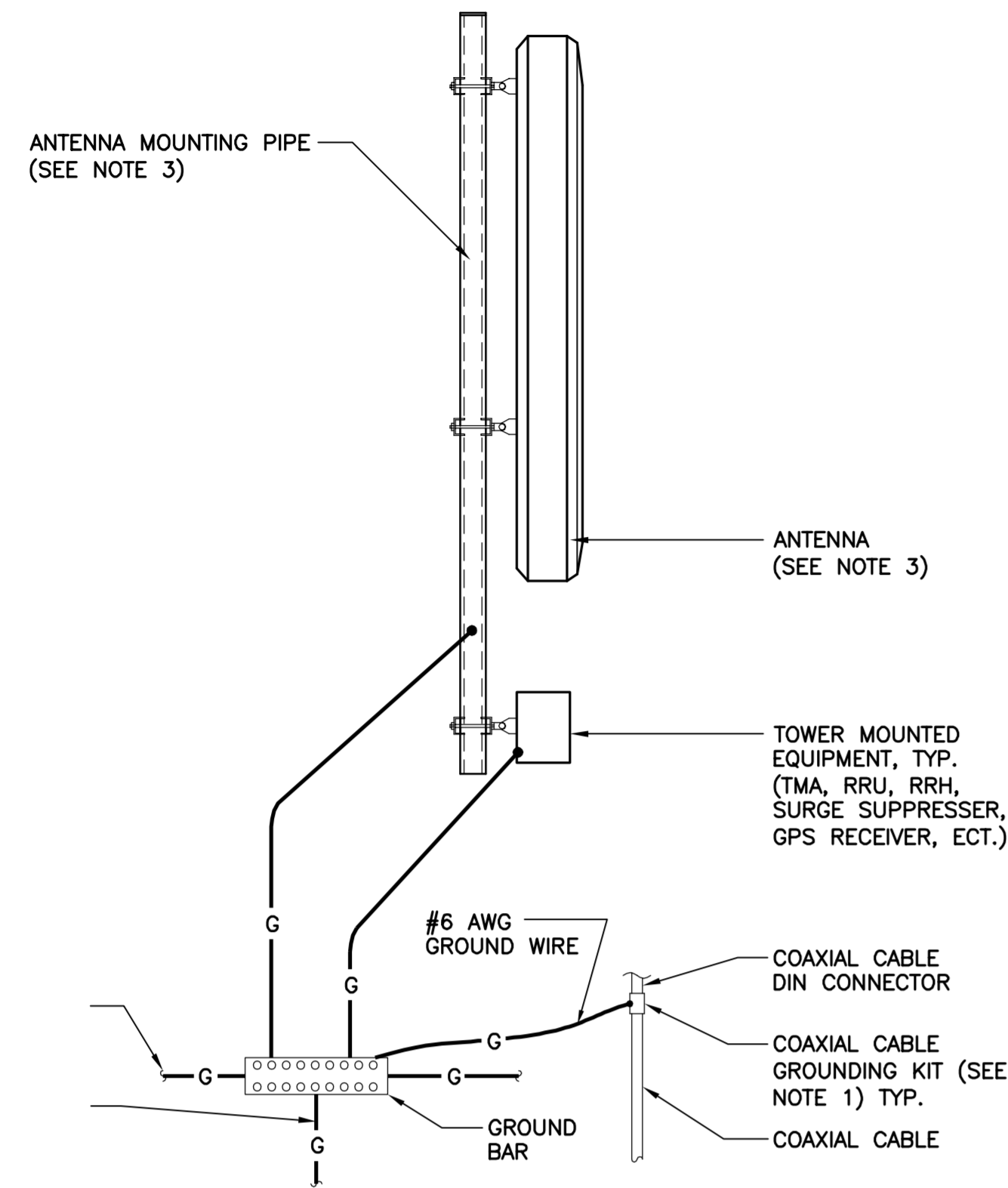
REV.	DATE	BY	CHKD	DESCRIPTION
0	05/12/16	KAW	CAG	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION



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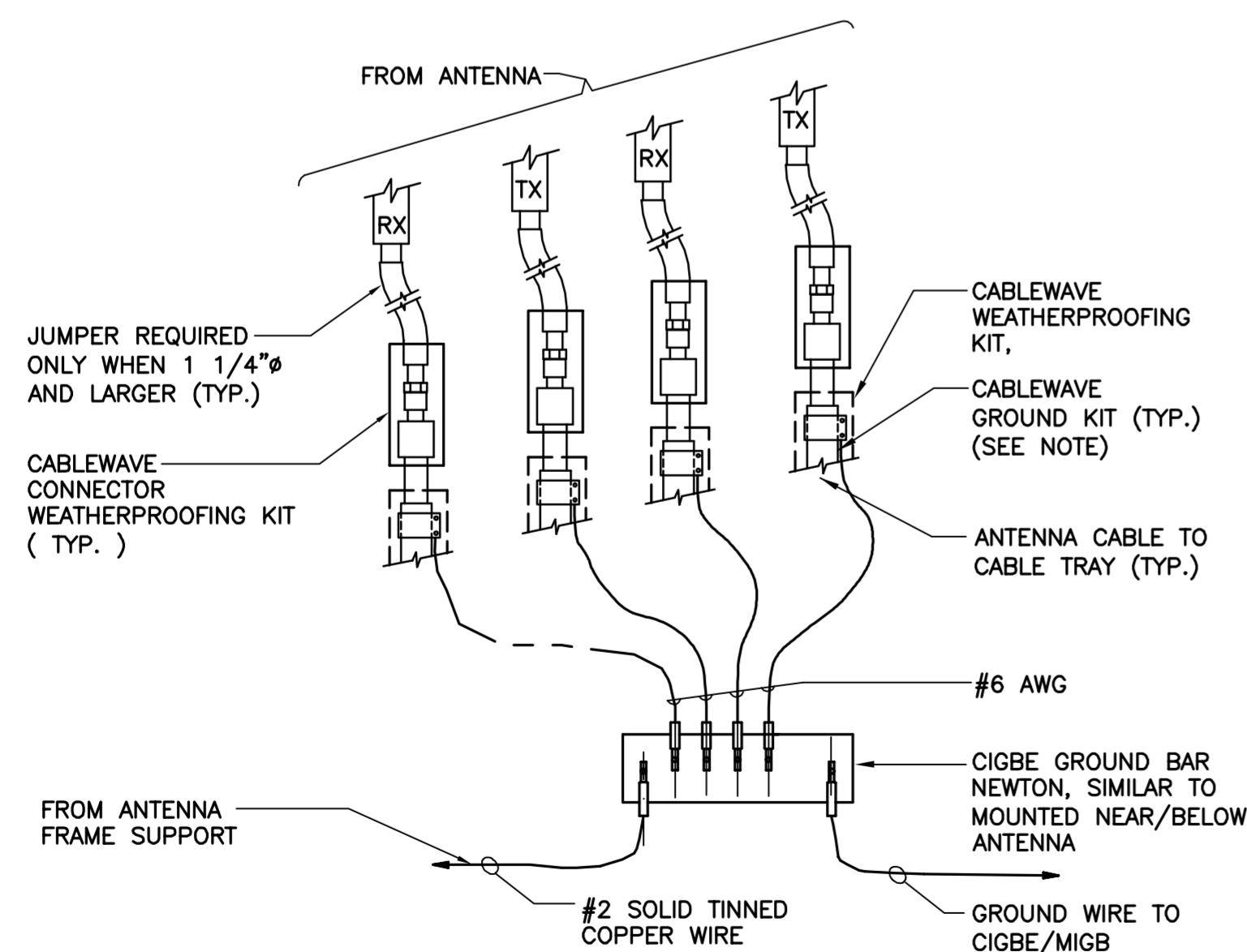
DATE: 04/08/16
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 JOB NO. 16002.15
 LTE BWE EQUIPMENT DETAILS AND ELEVATIONS
C-2
 Sheet No. 4 of 5



NOTES:

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

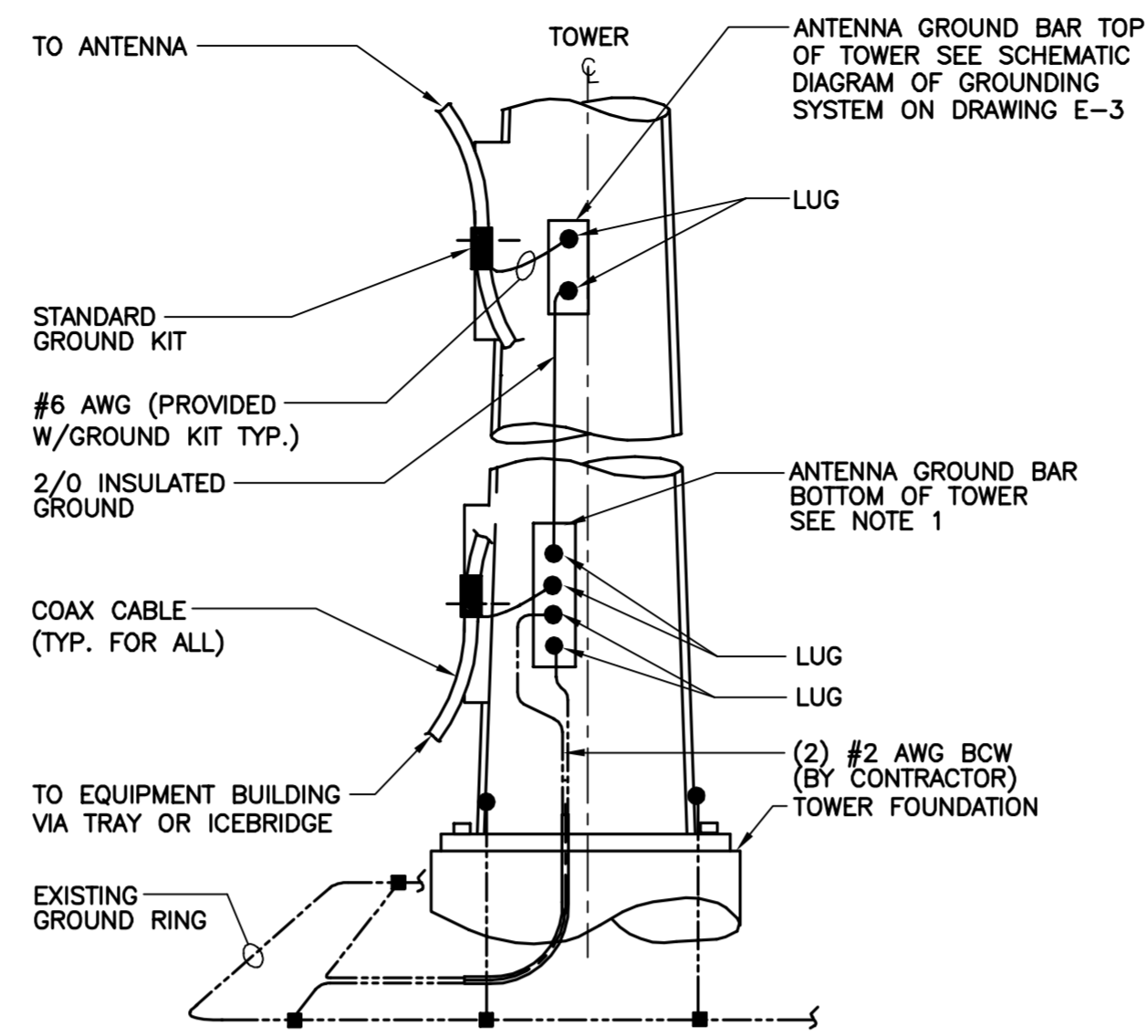
2 TYPICAL ANTENNA GROUNDING DETAIL
E-1 NOT TO SCALE



NOTE:

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

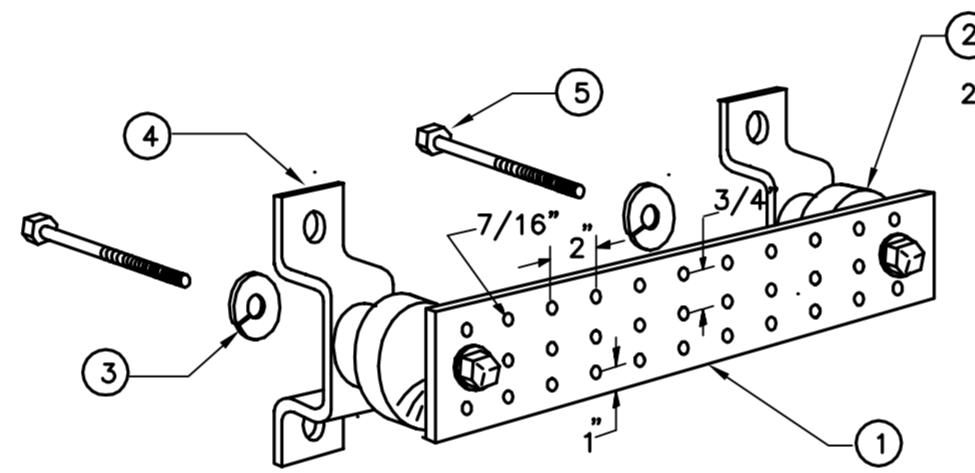
5 CONNECTION OF GROUND WIRES TO GROUND BAR
E-1 NOT TO SCALE



NOTES:

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

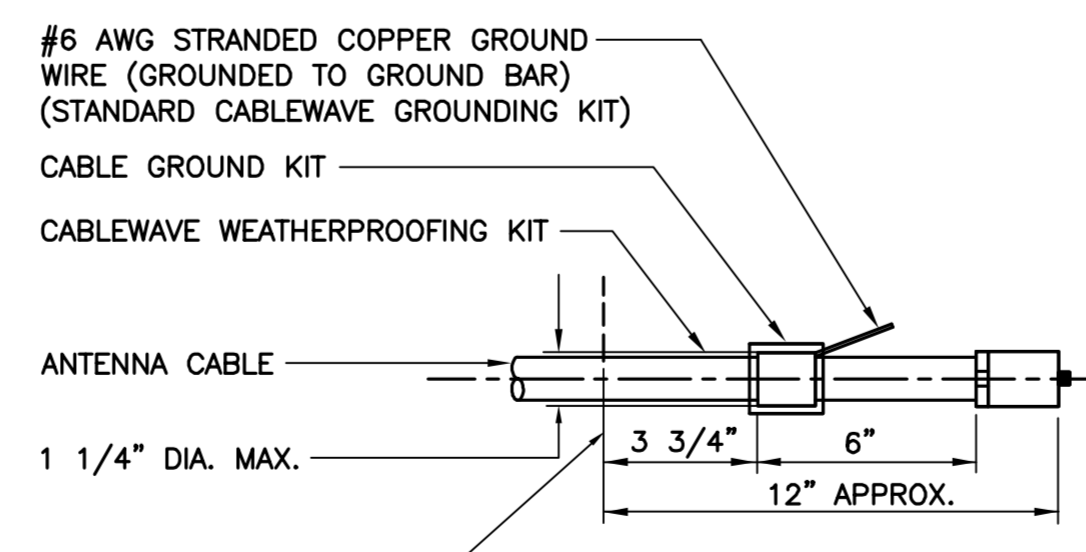
1 ANTENNA CABLE GROUNDING - MONOPOLE
E-1 NOT TO SCALE



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

3 GROUND BAR DETAIL
E-1 NOT TO SCALE



NOTE:

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

4 ANTENNA CABLE GROUNDING DETAIL
E-1 NOT TO SCALE

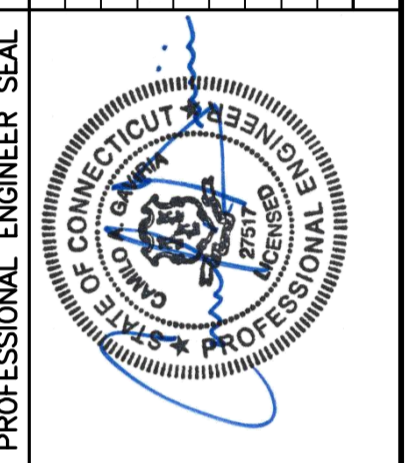
ELECTRICAL NOTES

1. PRIOR TO START OF CONSTRUCTION CONTRACTOR SHALL COORDINATE WITH OWNER FOR ALL CONSTRUCTION STANDARDS AND SPECIFICATIONS, AND ALL MANUFACTURER DOCUMENTATION FOR ALL EQUIPMENT TO BE INSTALLED.
2. INSTALL ALL EQUIPMENT IN ACCORDANCE WITH LOCAL BUILDING CODE, NATIONAL ELECTRIC CODE, OWNER AND MANUFACTURER'S SPECIFICATIONS.
3. CONNECT ALL NEW EQUIPMENT TO EXISTING TELCO AS REQUIRED BY MANUFACTURER.
4. MAINTAIN ALL CLEARANCES REQUIRED BY NEC AND EQUIPMENT MANUFACTURER.
5. PRIOR TO INSTALLATION CONTRACTOR SHALL MEASURE EXISTING ELECTRICAL LOAD AND VERIFY EXISTING AVAILABLE CAPACITY FOR PROPOSED INSTALLATION. IF INADEQUATE CAPACITY IS AVAILABLE, CONTRACTOR SHALL COORDINATE WITH LOCAL ELECTRIC UTILITY COMPANY TO UPGRADE EXISTING ELECTRIC SERVICE.
6. CONTRACTOR SHALL INSPECT EXISTING GROUNDING AND LIGHTNING PROTECTION SYSTEM AND ENSURE THAT IT IS IN COMPLIANCE WITH NEC, AND SITE OWNER'S SPECIFICATIONS. THE RESULTS OF THIS INSPECTION SHALL BE PRESENTED TO OWNERS REPRESENTATIVE, AND ANY DEFICIENCIES SHALL BE CORRECTED.
7. ALL TRANSMISSION TOWER SITES CONTAIN AN EXTENSIVE BURIED GROUNDING SYSTEM. ALL GROUNDING WORK MUST BE COORDINATED WITH, AND APPROVED BY, THE TOWER OWNER'S SITE REPRESENTATIVE. ALL OF THE TOWER OWNER'S SPECIFICATIONS MUST BE STRICTLY FOLLOWED.
8. PROVIDE AND INSTALL GROUND KITS FOR ALL NEW COAXIAL CABLES AND BOND TO EXISTING OWNERS GROUNDING SYSTEM PER OWNERS SPECIFICATIONS AND NEC.
9. ALL CONDUCTORS SHALL BE TYPE THWN (INT. APPLICATION) AND XHHW (EXT. APPLICATION), 75 DEGREE C, 600 VOLT INSULATION, SOFT ANNEALED STRANDED COPPER. #10 AWG AND SMALLER SHALL BE SPLICED USING ACCEPTABLE SOLDERLESS PRESSURE CONNECTORS. #8 AWG AND LARGER SHALL BE SPLICED USING COMPRESSION SPLIT-BOLT TYPE CONNECTORS, #12 AWG SHALL BE THE MINIMUM SIZE CONDUCTOR FOR LINE VOLTAGE BRANCH CIRCUITS. REFER TO PANEL SCHEDULE FOR BRANCH CIRCUIT CONDUCTOR SIZE(S). CONDUCTORS SHALL BE COLOR CODED FOR CONSISTENT PHASE IDENTIFICATION.
10. MINIMUM BENDING RADIUS FOR CONDUCTORS SHALL BE 12 TIMES THE LARGEST DIAMETER OF BRANCH CIRCUIT CONDUCTOR.
11. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE MADE IN STRICT ACCORDANCE WITH ALL LOCAL, STATE AND NATIONAL CODES AND REGULATIONS WHICH MAY APPLY AND NOTHING IN THE DRAWINGS OR SPECIFICATIONS SHALL BE INTERPRETED AS AN INFRINGEMENT OF SUCH CODES OR REGULATIONS.
12. THE ELECTRICAL CONTRACTOR IS TO BE RESPONSIBLE FOR THE COMPLETE INSTALLATION AND COORDINATION OF THE ENTIRE ELECTRICAL SERVICE. ALL ACTIVITIES TO BE COORDINATED THROUGH OWNER'S REPRESENTATIVE, DESIGN ENGINEER AND OTHER AUTHORITIES HAVING JURISDICTION OF TRADES.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND PAY ALL FEES AS MAY BE REQUIRED FOR THE ELECTRICAL WORK AND FOR SCHEDULING OF ALL INSPECTIONS AS MAY BE REQUIRED BY THE LOCAL AUTHORITY.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH THE SITE AND/OR BUILDING OWNER FOR NEW AND/OR DEMOLITION WORK INVOLVED.
15. THE CONTRACTOR SHALL GUARANTEE ALL NEW WORK FOR A PERIOD OF ONE YEAR FROM THE ACCEPTANCE DATE BY THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING WARRANTIES FROM ALL EQUIPMENT MANUFACTURERS FOR SUBMISSION TO THE OWNER.
16. DRAWINGS INDICATE GENERAL ARRANGEMENT OF WORK INCLUDED IN CONTRACT. CONTRACTOR SHALL WITHOUT EXTRA CHARGE, MAKE MODIFICATIONS TO THE LAYOUT OF THE WORK TO PREVENT CONFLICT WITH WORK OF OTHER TRADES AND FOR THE PROPER INSTALLATION OF WORK. CHECK ALL DRAWINGS AND VISIT JOB SITE TO VERIFY SPACE AND TYPE OF EXISTING CONDITIONS IN WHICH WORK WILL BE DONE, PRIOR TO SUBMITTAL OF BID.
17. ALL NON-CURRENT CARRYING PARTS OF THE ELECTRICAL AND TELEPHONE CONDUIT SYSTEMS SHALL BE MECHANICALLY AND ELECTRICALLY CONNECTED TO PROVIDE AN INDEPENDENT RETURN PATH TO THE EQUIPMENT GROUNDING SOURCES.
18. GROUNDING SYSTEM WILL BE IN ACCORDANCE WITH THE LATEST ACCEPTABLE EDITION OF THE NATIONAL ELECTRICAL CODE AND REQUIREMENTS PER LOCAL INSPECTOR HAVING JURISDICTION.
19. EACH EQUIPMENT GROUND CONDUCTOR SHALL BE SIZED IN ACCORDANCE WITH THE N.E.C. ARTICLE 250-122. (MIN. #12 AWG).
20. CONTRACTOR SHALL PROVIDE A CELLULAR GROUNDING SYSTEM WITH THE MAXIMUM AC RESISTANCE TO GROUND OF 5 OHM BETWEEN ANY POINT ON THE GROUNDING SYSTEM AS MEASURED BY 3-POINT GROUNDING TEST. (REFER TO SECTION 16960).

TESTS BY INDEPENDENT ELECTRICAL TESTING FIRM

- A. CONTRACTOR SHALL RETAIN THE SERVICES OF A LOCAL INDEPENDENT ELECTRICAL TESTING FIRM (WITH MINIMUM 5 YEARS COMMERCIAL EXPERIENCE IN THE ELECTRICAL TESTING INDUSTRY) AS SPECIFIED BY OWNER TO PERFORM:
 - TEST 1: RESISTANCE TO GROUND TEST ON THE CELLULAR GROUNDING SYSTEM. THE TESTING FIRM SHALL INCLUDE THE FOLLOWING INFORMATION WITH THE REPORT:
 1. TESTING PROCEDURE INCLUDING THE MAKE AND MODEL OF TEST EQUIPMENT.
 2. CERTIFICATION OF TESTING EQUIPMENT CALIBRATION WITHIN SIX (6) MONTHS OF DATE OF TESTING. INCLUDE CERTIFICATION LAB ADDRESS AND TELEPHONE NUMBER.
 3. GRAPHICAL DESCRIPTION OF TESTING METHOD ACTUALLY IMPLEMENTED.
- B. TESTING SHALL BE PERFORMED IN THE PRESENCE AND TO THE SATISFACTION OF OWNERS CONSTRUCTION REPRESENTATIVE. TESTING DATA SHALL BE INITIALED AND DATED BY THE CONSTRUCTION AND INCLUDED WITH THE WRITTEN REPORT/ANALYSIS.
- C. THE CONTRACTOR SHALL FORWARD SIX (6) COPIES OF THE INDEPENDENT ELECTRICAL TESTING FIRM REPORT/ANALYSIS TO ENGINEER A MINIMUM OF TEN (10) WORKING DAYS PRIOR TO THE JOB TURNOVER.
- D. CONTRACTOR TO PROVIDE A MINIMUM OF ONE (1) WEEK NOTICE TO OWNER AND ENGINEER FOR ALL TESTS REQUIRING WITNESSING.

REV	0	05/12/16	KAW	CAG	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION
DATE					
REV					



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(203) 498-3887 Fax
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AT&T MOBILITY
WIRELESS COMMUNICATIONS FACILITY
NORTH HAVEN SOUTH
SITE NUMBER: CT5107
120 UNIVERSAL DRIVE
NORTH HAVEN, CT 06473

DATE: 04/08/16
SCALE: AS NOTED
JOB NO. 16002.15

TYPICAL ELECTRICAL DETAILS & NOTES
E-1
Sheet No. 5 of 5

Date: May 20, 2016

Rebecca Klein
Crown Castle
525 Alderman Lane
Fort Mill, SC 29715



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

Subject: Structural Analysis Report

Carrier Designation: AT&T Mobility Co-Locate
Carrier Site Number: CTL05107
Carrier Site Name: North Haven South

Crown Castle Designation: Crown Castle BU Number: 881536
Crown Castle Site Name: NORTH HAVEN TOWER
Crown Castle JDE Job Number: 378291
Crown Castle Work Order Number: 1239285
Crown Castle Application Number: 345011 Rev. 1

Engineering Firm Designation: Crown Castle Project Number: 1239285

Site Data: 120 Universal Drive, North Haven, New Haven County, CT
Latitude 41° 20' 40.01", Longitude -72° 52' 14.92"
120 Foot - Monopole Tower

Dear Rebecca Klein,

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 1239285, in accordance with application 345011, revision 1.

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

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

This analysis has been performed in accordance with the TIA/EIA-222-F standard and 2005 CT State Building Code with 2009 amendment based upon a wind speed of 90 mph fastest mile.

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: Brittany Mihalko, EIT / MAA

Respectfully submitted by:

Maham Barimani, P.E.
Sr. Project Engineer

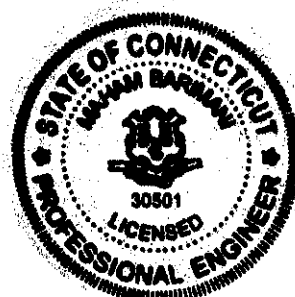


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1) INTRODUCTION

This tower is a 120 ft Monopole tower designed by ENGINEERED ENDEAVORS, INC. in February of 2001. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 90 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
118.0	121.0	3	cci antennas	OPA-65R-LCUU-H6 w/ Mount Pipe	1 2	3/8 3/4	-
		6	cci antennas	TPX-070821			
		6	ericsson	RRUS 32			
		6	powerwave technologies	LGP21401			
		3	quintel technology	QS66512-2 w/ Mount Pipe			
		2	raycap	DC6-48-60-18-8F			
116.0	117.0	3	ericsson	TME-RRUS-12	-	-	-

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	121.0	3	powerwave technologies	7770.00 w/ Mount Pipe	12	1-5/8	1			
					2	3/4				
					1	3/8				
	120.0	3	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe	-	-	3			
								3	powerwave technologies	7770.00 w/ Mount Pipe
118.0	118.0	12	powerwave technologies	LGP2140X	-	-	1			
								1	tower mounts	Platform Mount [LP 712-1]
116.0	117.0	3	ericsson	TME-RRUS-11	-	-	3			
								3	ericsson	TME-RRUS-11
								1	raycap	DC6-48-60-18-8F
	116.0	1	tower mounts	Side Arm Mount [SO 102-3]	-	-	1			
108.0	110.0	12	decibel	844G65VTZASX w/ Mount Pipe	12	1-1/4	4			
	108.0	1	tower mounts	Platform Mount [LP 303-1]						

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note	
100.0	100.0	3	alcatel lucent	TME-1900MHz RRH (65MHz) w/Mount pipe	-	-	1	
		1	tower mounts	Side Arm Mount [SO 102-3]				
	99.0	3	alcatel lucent	TME-800MHZ RRH				
97.0	98.0	3	alcatel lucent	TD-RRH8x20-25	1 3	1-5/8 1-1/4	1	
		2	powerwave technologies	P40-16-XLPP-RR-A w/ Mount Pipe				
		1	rfs celwave	APXVSP18-C-A20 w/ Mount Pipe				
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe				
	97.0	97.0	3	alcatel lucent				800 EXTERNAL NOTCH FILTER
			9	rfs celwave				ACU-A20-N
			1	tower mounts				Platform Mount [LP 601-1]
83.0	84.0	3	ericsson	AIR -32 B2A/B66AA w/ Mount Pipe	1 11 1	1-1/4 1-5/8 1-1/4	2 1	
		3	commscope	LNx-6515DS-A1M w/ Mount Pipe				
		3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe				
		3	ericsson	RRUS 11 B12				
	83.0	83.0	3	rfs celwave				ATMAA1412D-1A20
			1	tower mounts				Platform Mount [LP 303-1]
51.0	51.0	1	lucent	KS24019-L112A	1	1/2	1	
		1	tower mounts	Side Arm Mount [SO 701-1]				

Notes:

- 1) Existing Equipment
- 2) Reserved Equipment
- 3) Equipment to be Removed; Not Considered in Analysis
- 4) Abandoned Equipment; Considered in 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)
118.0	118.0	12	allgon	7120.16	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Dr. Clarence Welti, P.E., P.C.	1405753	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Engineering Endeavors, Inc.	1405795	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Engineering Endeavors, Inc.	1405788	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) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by TIA/EIA-222-F.
- 5) 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 - 84.7161	Pole	TP32.5458x24.09x0.375	1	-10.64	1922.92	33.6	Pass
L2	84.7161 - 41.6224	Pole	TP42.0347x30.7011x0.4375	2	-22.57	2904.13	62.8	Pass
L3	41.6224 - 0	Pole	TP51x39.7912x0.5	3	-37.73	4166.42	68.2	Pass
							Summary	
						Pole (L3)	68.2	Pass
						Rating =	68.2	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	46.7	Pass
1	Base Plate	0	56.6	Pass
1	Base Foundation Structure	0	60.7	Pass
1	Base Foundation Soil Interaction	0	22.0	Pass

Structure Rating (max from all components) =	68.2%
---	--------------

Notes:

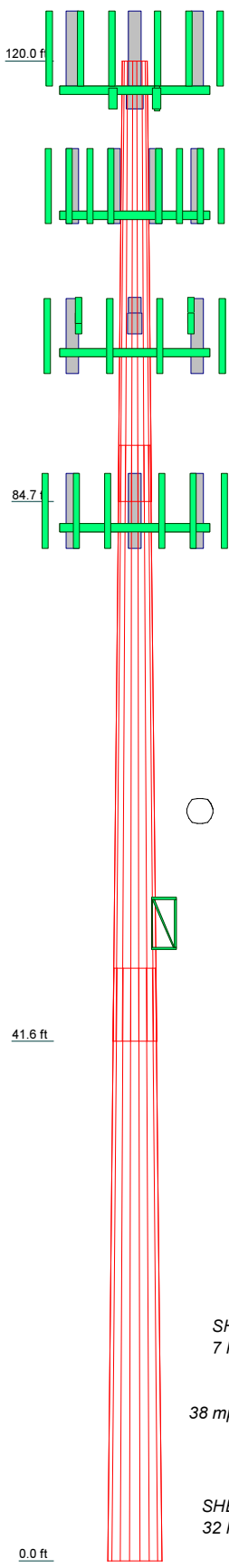
- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

4.1) Recommendations

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

APPENDIX A
TNXTOWER OUTPUT

Section	1	2	3
Length (ft)	35.28	47.66	47.38
Number of Sides	18	18	18
Thickness (in)	0.3750	0.4375	0.5000
Socket Length (ft)	4.57	5.76	39.7912
Top Dia (in)	24.0900	30.7011	51.0000
Bot Dia (in)	32.5458	42.0347	111.5
Grade		A572-65	
Weight (K)	4.0	8.1	23.6



DESIGNED APPURTENANCE LOADING

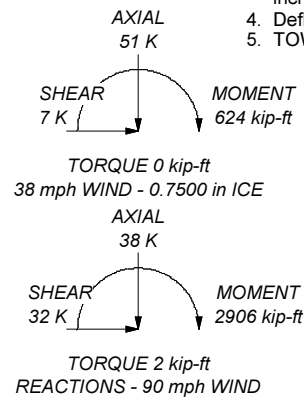
TYPE	ELEVATION	TYPE	ELEVATION
7770.00 w/ Mount Pipe	118	Side Arm Mount [SO 102-3]	100
7770.00 w/ Mount Pipe	118	P40-16-XLPP-RR-A w/ Mount Pipe	97
7770.00 w/ Mount Pipe	118	P40-16-XLPP-RR-A w/ Mount Pipe	97
OPA-65R-LCUU-H6 w/ Mount Pipe	118	APXVSP18-C-A20 w/ Mount Pipe	97
OPA-65R-LCUU-H6 w/ Mount Pipe	118	APXVTM14-C-120 w/ Mount Pipe	97
OPA-65R-LCUU-H6 w/ Mount Pipe	118	APXVTM14-C-120 w/ Mount Pipe	97
QA66512-2 w/ Mount Pipe	118	APXVTM14-C-120 w/ Mount Pipe	97
QA66512-2 w/ Mount Pipe	118	800 EXTERNAL NOTCH FILTER	97
QA66512-2 w/ Mount Pipe	118	800 EXTERNAL NOTCH FILTER	97
(2) TPX-070821	118	800 EXTERNAL NOTCH FILTER	97
(2) TPX-070821	118	TD-RRH8x20-25	97
(2) RRUS 32	118	TD-RRH8x20-25	97
(2) RRUS 32	118	(3) ACU-A20-N	97
(2) RRUS 32	118	(3) ACU-A20-N	97
(2) LGP21401	118	(3) ACU-A20-N	97
(2) LGP21401	118	Platform Mount [LP 601-1]	97
(2) LGP21401	118	6' x 2" Mount Pipe	97
(2) DC6-48-60-18-8F	118	6' x 2" Mount Pipe	97
Platform Mount [LP 712-1]	118	8'x2" Antenna Mount Pipe	97
8'x2" Antenna Mount Pipe	118	8'x2" Antenna Mount Pipe	118
8'x2" Antenna Mount Pipe	118	8'x2" Antenna Mount Pipe	118
Transition Ladder	118	Transition Ladder	118
TME-RRUS-11	116	LNx-6515DS-A1M w/ Mount Pipe	83
TME-RRUS-11	116	LNx-6515DS-A1M w/ Mount Pipe	83
DC6-48-60-18-8F	116	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	83
TME-RRUS-12	116	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	83
TME-RRUS-12	116	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	83
TME-RRUS-12	116	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	83
Side Arm Mount [SO 102-3]	116	RRUS 11 B12	83
4' x 2" Pipe Mount	116	RRUS 11 B12	83
4' x 2" Pipe Mount	116	RRUS 11 B12	83
4' x 2" Pipe Mount	116	ATMAA1412D-1A20	83
(4) 844G65VTZASX w/ Mount Pipe	108	ATMAA1412D-1A20	83
(4) 844G65VTZASX w/ Mount Pipe	108	ATMAA1412D-1A20	83
(4) 844G65VTZASX w/ Mount Pipe	108	AIR -32 B2A/B66AA w/ Mount Pipe	83
Platform Mount [LP 303-1]	108	AIR -32 B2A/B66AA w/ Mount Pipe	83
TME-800MHZ RRH	100	Platform Mount [LP 303-1]	83
TME-800MHZ RRH	100	8'x2" Antenna Mount Pipe	83
TME-800MHZ RRH	100	8'x2" Antenna Mount Pipe	83
1900MHz RRH (65MHz) w/Mount pipe	100	8'x2" Antenna Mount Pipe	83
1900MHz RRH (65MHz) w/Mount pipe	100	KS24019-L112A	51
1900MHz RRH (65MHz) w/Mount pipe	100	Side Arm Mount [SO 701-1]	51

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for a 90 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 68.2%



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

Job: BU# 881536	Project:	
Client: Crown Castle	Drawn by: MATiles	App'd:
Code: TIA/EIA-222-F	Date: 05/20/16	Scale: NTS
Path:	Dwg No. E-1	

X:\ENG Work Area\B\B\h\k\ WIP\881536.WG 1239285.QA - MAA\881536.WG 1239285.er

Tower Input Data

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

- 5) Tower is located in New Haven County, Connecticut.
- 6) Basic wind speed of 90 mph.
- 7) Nominal ice thickness of 0.7500 in.
- 8) Ice thickness is considered to increase with height.
- 9) Ice density of 56 pcf.
- 10) A wind speed of 38 mph is used in combination with ice.
- 11) Temperature drop of 50 °F.
- 12) Deflections calculated using a wind speed of 50 mph.
- 13) A non-linear (P-delta) analysis was used.
- 14) Pressures are calculated at each section.
- 15) Stress ratio used in pole design is 1.333.
- 16) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification ✓ Use Code Stress Ratios ✓ Use Code Safety Factors - Guys ✓ Escalate Ice Always Use Max Kz Use Special Wind Profile Include Bolts In Member Capacity Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) SR Members Have Cut Ends SR Members Are Concentric	Distribute Leg Loads As Uniform Assume Legs Pinned ✓ Assume Rigid Index Plate ✓ Use Clear Spans For Wind Area Use Clear Spans For KL/r Retension Guys To Initial Tension ✓ Bypass Mast Stability Checks ✓ Use Azimuth Dish Coefficients ✓ Project Wind Area of Appurt. Autocalc Torque Arm Areas Add IBC .6D+W Combination ✓ Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Treat Feed Line Bundles As Cylinder	Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation ✓ Consider Feed Line Torque Include Angle Block Shear Check Use TIA-222-G Bracing Resist. Exemption Use TIA-222-G Tension Splice Exemption <div style="text-align: center; background-color: #e0e0e0; padding: 2px;">Poles</div> ✓ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets
--	--	---

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	120.00-84.72	35.28	4.57	18	24.0900	32.5458	0.3750	1.5000	A572-65 (65 ksi)
L2	84.72-41.62	47.66	5.76	18	30.7011	42.0347	0.4375	1.7500	A572-65 (65 ksi)
L3	41.62-0.00	47.38		18	39.7912	51.0000	0.5000	2.0000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	It/Q in ²	w in	w/t
---------	----------------	-------------------------	----------------------	---------	---------	------------------------	----------------------	-------------------------	---------	-----

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	I/Q in ²	w in	w/t
L1	24.4616	28.2268	2005.6033	8.4188	12.2377	163.8870	4013.8455	14.1161	3.5798	9.546
	33.0479	38.2913	5006.8113	11.4206	16.5333	302.8326	10020.210	19.1493	5.0681	13.515
L2	32.2777	42.0249	4862.7972	10.7436	15.5962	311.7941	9731.9930	21.0164	4.6334	10.591
	42.6832	57.7629	12627.422	14.7670	21.3536	591.3479	25271.461	28.8869	6.6281	15.15
L3	41.7876	62.3551	12161.823	13.9484	20.2139	601.6563	24339.649	31.1835	6.1232	12.246
	51.7868	80.1435	25821.918	17.9275	25.9080	996.6774	51677.814	40.0794	8.0960	16.192

Tower Elevation ft	Gusset Area (per face) ft ²	Gusset Thickness in	Gusset Grade	Adjust. Factor A _r	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 120.00-84.72				1	1	1			
L2 84.72-41.62				1	1	1			
L3 41.62-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

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

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C _{AA}	Weight plf
LDF7-50A(1-5/8")	C	No	Inside Pole	118.00 - 0.00	12	No Ice	0.82
						1/2" Ice	0.82
						1" Ice	0.82
						2" Ice	0.82
						4" Ice	0.82
FB-L98B-002-75000(3/8")	C	No	Inside Pole	118.00 - 0.00	1	No Ice	0.06
						1/2" Ice	0.06
						1" Ice	0.06
						2" Ice	0.06
						4" Ice	0.06
WR-VG86ST-BRD(3/4")	C	No	Inside Pole	118.00 - 0.00	2	No Ice	0.58
						1/2" Ice	0.58
						1" Ice	0.58
						2" Ice	0.58
						4" Ice	0.58
FB-L98B-002-75000(3/8")	C	No	Inside Pole	118.00 - 0.00	1	No Ice	0.06
						1/2" Ice	0.06
						1" Ice	0.06
						2" Ice	0.06
						4" Ice	0.06
WR-VG86ST-BRD(3/4")	C	No	Inside Pole	118.00 - 0.00	2	No Ice	0.58
						1/2" Ice	0.58
						1" Ice	0.58
						2" Ice	0.58
						4" Ice	0.58
2" Rigid Conduit	C	No	Inside Pole	118.00 - 0.00	1	No Ice	2.80
						1/2" Ice	2.80
						1" Ice	2.80

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C _A A _A ft ² /ft	Weight plf
						2" Ice	0.00	2.80
						4" Ice	0.00	2.80

LDF6-50A(1-1/4")	B	No	Inside Pole	108.00 - 0.00	12	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
						1" Ice	0.00	0.66
						2" Ice	0.00	0.66
						4" Ice	0.00	0.66

HB114-1-0813U4-M5F(1-1/4")	A	No	Inside Pole	97.00 - 0.00	3	No Ice	0.00	1.20
						1/2" Ice	0.00	1.20
						1" Ice	0.00	1.20
						2" Ice	0.00	1.20
						4" Ice	0.00	1.20
HB158-1-08U8-S8F18(1-5/8")	A	No	Inside Pole	97.00 - 0.00	1	No Ice	0.00	1.70
						1/2" Ice	0.00	1.70
						1" Ice	0.00	1.70
						2" Ice	0.00	1.70
						4" Ice	0.00	1.70

MLE Hybrid 3Power/6Fiber RL 2 10AWG(1-1/4")	A	No	Inside Pole	83.00 - 0.00	1	No Ice	0.00	0.46
						1/2" Ice	0.00	0.46
						1" Ice	0.00	0.46
						2" Ice	0.00	0.46
						4" Ice	0.00	0.46
HCC 158-50J(1-5/8")	A	No	Inside Pole	83.00 - 0.00	11	No Ice	0.00	0.86
						1/2" Ice	0.00	0.86
						1" Ice	0.00	0.86
						2" Ice	0.00	0.86
						4" Ice	0.00	0.86
MLE Hybrid 3Power/6Fiber RL 2 10AWG(1-1/4")	A	No	Inside Pole	83.00 - 0.00	1	No Ice	0.00	0.46
						1/2" Ice	0.00	0.46
						1" Ice	0.00	0.46
						2" Ice	0.00	0.46
						4" Ice	0.00	0.46

LDF4-50A(1/2")	A	No	CaAa (Out Of Face)	51.00 - 0.00	1	No Ice	0.06	0.15
						1/2" Ice	0.16	0.84
						1" Ice	0.26	2.14
						2" Ice	0.46	6.58
						4" Ice	0.86	22.78

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation	Face	A _R	A _F	C _A A _A In Face	C _A A _A Out Face	Weight
n	ft		ft ²	ft ²	ft ²	ft ²	K
L1	120.00-84.72	A	0.000	0.000	0.000	0.000	0.07
		B	0.000	0.000	0.000	0.000	0.18
		C	0.000	0.000	0.000	0.000	0.50
L2	84.72-41.62	A	0.000	0.000	0.000	0.591	0.66
		B	0.000	0.000	0.000	0.000	0.34
		C	0.000	0.000	0.000	0.000	0.65
L3	41.62-0.00	A	0.000	0.000	0.000	2.622	0.66
		B	0.000	0.000	0.000	0.000	0.33
		C	0.000	0.000	0.000	0.000	0.63

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation	Face or Leg	Ice Thickness	A _R	A _F	C _A A _A In Face	C _A A _A Out Face	Weight
n	ft		in	ft ²	ft ²	ft ²	ft ²	K

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	120.00-84.72	A	0.858	0.000	0.000	0.000	0.000	0.07
		B		0.000	0.000	0.000	0.000	0.18
		C		0.000	0.000	0.000	0.000	0.50
L2	84.72-41.62	A	0.810	0.000	0.000	0.000	2.201	0.67
		B		0.000	0.000	0.000	0.000	0.34
		C		0.000	0.000	0.000	0.000	0.65
L3	41.62-0.00	A	0.750	0.000	0.000	0.000	9.366	0.72
		B		0.000	0.000	0.000	0.000	0.33
		C		0.000	0.000	0.000	0.000	0.63

Feed Line Center of Pressure

Section	Elevation ft	CP _x in	CP _z in	CP _x Ice in	CP _z Ice in
L1	120.00-84.72	0.0000	0.0000	0.0000	0.0000
L2	84.72-41.62	0.0000	-0.0227	0.0000	-0.0799
L3	41.62-0.00	0.0000	-0.0930	0.0000	-0.3086

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
7770.00 w/ Mount Pipe	A	From Leg	4.00 0.00 3.00	0.0000	118.00	No Ice	6.12	4.25	0.06
						1/2" Ice	6.63	5.01	0.10
						1" Ice	7.13	5.71	0.16
						2" Ice	8.16	7.16	0.29
						4" Ice	10.36	10.41	0.66
7770.00 w/ Mount Pipe	B	From Leg	4.00 0.00 3.00	0.0000	118.00	No Ice	6.12	4.25	0.06
						1/2" Ice	6.63	5.01	0.10
						1" Ice	7.13	5.71	0.16
						2" Ice	8.16	7.16	0.29
						4" Ice	10.36	10.41	0.66
7770.00 w/ Mount Pipe	C	From Leg	4.00 0.00 3.00	0.0000	118.00	No Ice	6.12	4.25	0.06
						1/2" Ice	6.63	5.01	0.10
						1" Ice	7.13	5.71	0.16
						2" Ice	8.16	7.16	0.29
						4" Ice	10.36	10.41	0.66
OPA-65R-LCUU-H6 w/ Mount Pipe	A	From Leg	4.00 0.00 3.00	0.0000	118.00	No Ice	10.60	7.18	0.10
						1/2" Ice	11.27	8.36	0.18
						1" Ice	11.91	9.26	0.26
						2" Ice	13.21	11.09	0.46
						4" Ice	15.93	15.15	1.00
OPA-65R-LCUU-H6 w/ Mount Pipe	B	From Leg	4.00 0.00 3.00	0.0000	118.00	No Ice	10.60	7.18	0.10
						1/2" Ice	11.27	8.36	0.18
						1" Ice	11.91	9.26	0.26
						2" Ice	13.21	11.09	0.46
						4" Ice	15.93	15.15	1.00
OPA-65R-LCUU-H6 w/ Mount Pipe	C	From Leg	4.00 0.00 3.00	0.0000	118.00	No Ice	10.60	7.18	0.10
						1/2" Ice	11.27	8.36	0.18
						1" Ice	11.91	9.26	0.26
						2" Ice	13.21	11.09	0.46
						4" Ice	15.93	15.15	1.00

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C _{AA} _{Front}	C _{AA} _{Side}	Weight	
			Horz	Lateral	Vert						ft
			ft	ft	ft	°	ft	ft ²	ft ²	K	
QS66512-2 w/ Mount Pipe	A	From Leg	4.00	0.00	3.00	0.0000	118.00	1" Ice	13.21	11.09	0.46
								2" Ice	15.93	15.15	1.00
								4" Ice			
								No Ice	8.64	8.46	0.14
								1/2" Ice	9.29	9.66	0.21
								1" Ice	9.91	10.62	0.30
								2" Ice	11.18	12.61	0.49
QS66512-2 w/ Mount Pipe	B	From Leg	4.00	0.00	3.00	0.0000	118.00	2" Ice	13.83	16.81	1.03
								4" Ice			
								No Ice	8.64	8.46	0.14
								1/2" Ice	9.29	9.66	0.21
								1" Ice	9.91	10.62	0.30
								1" Ice	11.18	12.61	0.49
								2" Ice	13.83	16.81	1.03
QS66512-2 w/ Mount Pipe	C	From Leg	4.00	0.00	3.00	0.0000	118.00	4" Ice			
								No Ice	8.64	8.46	0.14
								1/2" Ice	9.29	9.66	0.21
								1" Ice	9.91	10.62	0.30
								1" Ice	11.18	12.61	0.49
								2" Ice	13.83	16.81	1.03
								(2) TPX-070821	A	From Leg	4.00
								No Ice	0.55	0.12	0.01
								1/2" Ice	0.65	0.17	0.01
								1" Ice	0.76	0.24	0.02
								1" Ice	1.02	0.39	0.03
								2" Ice	1.63	0.80	0.08
(2) TPX-070821	B	From Leg	4.00	0.00	3.00	0.0000	118.00	4" Ice			
								No Ice	0.55	0.12	0.01
								1/2" Ice	0.65	0.17	0.01
								1" Ice	0.76	0.24	0.02
								1" Ice	1.02	0.39	0.03
								2" Ice	1.63	0.80	0.08
(2) TPX-070821	C	From Leg	4.00	0.00	3.00	0.0000	118.00	4" Ice			
								No Ice	0.55	0.12	0.01
								1/2" Ice	0.65	0.17	0.01
								1" Ice	0.76	0.24	0.02
								1" Ice	1.02	0.39	0.03
								2" Ice	1.63	0.80	0.08
(2) RRUS 32	A	From Leg	4.00	0.00	3.00	0.0000	118.00	4" Ice			
								No Ice	3.33	1.98	0.06
								1/2" Ice	3.60	2.21	0.08
								1" Ice	3.87	2.45	0.10
								1" Ice	4.44	2.96	0.16
								2" Ice	5.68	4.07	0.34
(2) RRUS 32	B	From Leg	4.00	0.00	3.00	0.0000	118.00	4" Ice			
								No Ice	3.33	1.98	0.06
								1/2" Ice	3.60	2.21	0.08
								1" Ice	3.87	2.45	0.10
								1" Ice	4.44	2.96	0.16
								2" Ice	5.68	4.07	0.34
(2) RRUS 32	C	From Leg	4.00	0.00	3.00	0.0000	118.00	4" Ice			
								No Ice	3.33	1.98	0.06
								1/2" Ice	3.60	2.21	0.08
								1" Ice	3.87	2.45	0.10
								1" Ice	4.44	2.96	0.16
								2" Ice	5.68	4.07	0.34
(2) LGP21401	A	From Leg	4.00	0.00	3.00	0.0000	118.00	4" Ice			
								No Ice	1.29	0.23	0.01
								1/2" Ice	1.45	0.31	0.02
								1" Ice	1.61	0.40	0.03
								1" Ice	1.97	0.61	0.05
								2" Ice	2.79	1.12	0.14
(2) LGP21401	B	From Leg	4.00	0.00		0.0000	118.00	4" Ice			
								No Ice	1.29	0.23	0.01
								1/2" Ice	1.45	0.31	0.02

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Lateral					
				3.00					
(2) LGP21401	C	From Leg	4.00	0.0000	118.00	Ice	1.61	0.40	0.03
			0.00			1" Ice	1.97	0.61	0.05
			3.00			2" Ice	2.79	1.12	0.14
						4" Ice			
						No Ice	1.29	0.23	0.01
						1/2"	1.45	0.31	0.02
						Ice	1.61	0.40	0.03
						1" Ice	1.97	0.61	0.05
						2" Ice	2.79	1.12	0.14
						4" Ice			
(2) DC6-48-60-18-8F	A	From Leg	4.00	0.0000	118.00	No Ice	1.27	1.27	0.02
			0.00			1/2"	1.46	1.46	0.04
			3.00			Ice	1.66	1.66	0.05
						1" Ice	2.09	2.09	0.10
						2" Ice	3.10	3.10	0.21
						4" Ice			
Platform Mount [LP 712-1]	C	None		0.0000	118.00	No Ice	24.53	24.53	1.34
						1/2"	29.94	29.94	1.65
						Ice	35.35	35.35	1.96
						1" Ice	46.17	46.17	2.58
						2" Ice	67.81	67.81	3.82
						4" Ice			
8'x2" Antenna Mount Pipe	A	From Leg	4.00	0.0000	118.00	No Ice	1.90	1.90	0.03
			0.00			1/2"	2.73	2.73	0.04
			0.00			Ice	3.40	3.40	0.06
						1" Ice	4.40	4.40	0.12
						2" Ice	6.50	6.50	0.30
						4" Ice			
8'x2" Antenna Mount Pipe	B	From Leg	4.00	0.0000	118.00	No Ice	1.90	1.90	0.03
			0.00			1/2"	2.73	2.73	0.04
			0.00			Ice	3.40	3.40	0.06
						1" Ice	4.40	4.40	0.12
						2" Ice	6.50	6.50	0.30
						4" Ice			
8'x2" Antenna Mount Pipe	C	From Leg	4.00	0.0000	118.00	No Ice	1.90	1.90	0.03
			0.00			1/2"	2.73	2.73	0.04
			0.00			Ice	3.40	3.40	0.06
						1" Ice	4.40	4.40	0.12
						2" Ice	6.50	6.50	0.30
						4" Ice			
Transition Ladder	B	From Leg	2.00	0.0000	118.00	No Ice	6.00	6.00	0.16
			0.00			1/2"	8.00	8.00	0.24
			-6.00			Ice	10.00	10.00	0.32
						1" Ice	14.00	14.00	0.48
						2" Ice	22.00	22.00	0.80
						4" Ice			

TME-RRUS-11	A	From Leg	1.00	0.0000	116.00	No Ice	3.42	1.85	0.06
			0.00			1/2"	3.72	2.19	0.08
			1.00			Ice	4.04	2.55	0.12
						1" Ice	4.72	3.38	0.19
						2" Ice	6.25	5.29	0.43
						4" Ice			
TME-RRUS-11	B	From Leg	1.00	0.0000	116.00	No Ice	3.42	1.85	0.06
			0.00			1/2"	3.72	2.19	0.08
			1.00			Ice	4.04	2.55	0.12
						1" Ice	4.72	3.38	0.19
						2" Ice	6.25	5.29	0.43
						4" Ice			
TME-RRUS-11	C	From Leg	1.00	0.0000	116.00	No Ice	3.42	1.85	0.06
			0.00			1/2"	3.72	2.19	0.08
			1.00			Ice	4.04	2.55	0.12
						1" Ice	4.72	3.38	0.19
						2" Ice	6.25	5.29	0.43
						4" Ice			

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
DC6-48-60-18-8F	B	From Leg	1.00	0.0000	116.00	No Ice	1.27	1.27	0.02
			0.00			1/2"	1.46	1.46	0.04
			1.00			Ice	1.66	1.66	0.05
						1" Ice	2.09	2.09	0.10
						2" Ice	3.10	3.10	0.21
						4" Ice			
TME-RRUS-12	A	From Leg	1.00	0.0000	116.00	No Ice	3.67	1.49	0.05
			0.00			1/2"	3.93	1.67	0.07
			1.00			Ice	4.19	1.87	0.10
						1" Ice	4.75	2.28	0.16
						2" Ice	5.96	3.21	0.34
						4" Ice			
TME-RRUS-12	B	From Leg	1.00	0.0000	116.00	No Ice	3.67	1.49	0.05
			0.00			1/2"	3.93	1.67	0.07
			1.00			Ice	4.19	1.87	0.10
						1" Ice	4.75	2.28	0.16
						2" Ice	5.96	3.21	0.34
						4" Ice			
TME-RRUS-12	C	From Leg	1.00	0.0000	116.00	No Ice	3.67	1.49	0.05
			0.00			1/2"	3.93	1.67	0.07
			1.00			Ice	4.19	1.87	0.10
						1" Ice	4.75	2.28	0.16
						2" Ice	5.96	3.21	0.34
						4" Ice			
Side Arm Mount [SO 102-3]	C	None		0.0000	116.00	No Ice	3.00	3.00	0.08
						1/2"	3.48	3.48	0.11
						Ice	3.96	3.96	0.14
						1" Ice	4.92	4.92	0.20
						2" Ice	6.84	6.84	0.32
						4" Ice			
4' x 2" Pipe Mount	A	From Leg	1.00	0.0000	116.00	No Ice	0.79	0.79	0.03
			0.00			1/2"	1.03	1.03	0.04
			0.00			Ice	1.28	1.28	0.04
						1" Ice	1.81	1.81	0.07
						2" Ice	3.11	3.11	0.17
						4" Ice			
4' x 2" Pipe Mount	B	From Leg	1.00	0.0000	116.00	No Ice	0.79	0.79	0.03
			0.00			1/2"	1.03	1.03	0.04
			0.00			Ice	1.28	1.28	0.04
						1" Ice	1.81	1.81	0.07
						2" Ice	3.11	3.11	0.17
						4" Ice			
4' x 2" Pipe Mount	C	From Leg	1.00	0.0000	116.00	No Ice	0.79	0.79	0.03
			0.00			1/2"	1.03	1.03	0.04
			0.00			Ice	1.28	1.28	0.04
						1" Ice	1.81	1.81	0.07
						2" Ice	3.11	3.11	0.17
						4" Ice			

(4) 844G65VTZASX w/ Mount Pipe	A	From Leg	4.00	0.0000	108.00	No Ice	6.13	5.21	0.03
			0.00			1/2"	6.59	5.89	0.09
			2.00			Ice	7.06	6.59	0.14
						1" Ice	8.04	8.04	0.28
						2" Ice	10.12	11.19	0.67
						4" Ice			
(4) 844G65VTZASX w/ Mount Pipe	B	From Leg	4.00	0.0000	108.00	No Ice	6.13	5.21	0.03
			0.00			1/2"	6.59	5.89	0.09
			2.00			Ice	7.06	6.59	0.14
						1" Ice	8.04	8.04	0.28
						2" Ice	10.12	11.19	0.67
						4" Ice			
(4) 844G65VTZASX w/ Mount Pipe	C	From Leg	4.00	0.0000	108.00	No Ice	6.13	5.21	0.03
			0.00			1/2"	6.59	5.89	0.09
			2.00			Ice	7.06	6.59	0.14
						1" Ice	8.04	8.04	0.28

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C _{AA} _{Front}	C _{AA} _{Side}	Weight
			Horz	Lateral	Vert					
			ft	ft	ft	°	ft	ft ²	ft ²	K
							2" Ice	10.12	11.19	0.67
							4" Ice			
Platform Mount [LP 303-1]	C	None				0.0000	No Ice	14.66	14.66	1.25
							1/2" Ice	18.87	18.87	1.48
							1" Ice	23.08	23.08	1.71
							2" Ice	31.50	31.50	2.18
							4" Ice	48.34	48.34	3.10

TME-800MHZ RRH	A	From Leg	4.00			0.0000	No Ice	2.49	2.07	0.05
			0.00				1/2"	2.71	2.27	0.07
			-1.00				Ice	2.93	2.48	0.10
							1" Ice	3.41	2.93	0.16
							2" Ice	4.46	3.93	0.32
							4" Ice			
TME-800MHZ RRH	B	From Leg	4.00			0.0000	No Ice	2.49	2.07	0.05
			0.00				1/2"	2.71	2.27	0.07
			-1.00				Ice	2.93	2.48	0.10
							1" Ice	3.41	2.93	0.16
							2" Ice	4.46	3.93	0.32
							4" Ice			
TME-800MHZ RRH	C	From Leg	4.00			0.0000	No Ice	2.49	2.07	0.05
			0.00				1/2"	2.71	2.27	0.07
			-1.00				Ice	2.93	2.48	0.10
							1" Ice	3.41	2.93	0.16
							2" Ice	4.46	3.93	0.32
							4" Ice			
1900MHz RRH (65MHz) w/Mount pipe	A	From Leg	4.00			0.0000	No Ice	2.70	2.93	0.06
			0.00				1/2"	2.94	3.25	0.09
			0.00				Ice	3.18	3.60	0.12
							1" Ice	3.70	4.35	0.20
							2" Ice	4.85	6.09	0.41
							4" Ice			
1900MHz RRH (65MHz) w/Mount pipe	B	From Leg	4.00			0.0000	No Ice	2.70	2.93	0.06
			0.00				1/2"	2.94	3.25	0.09
			0.00				Ice	3.18	3.60	0.12
							1" Ice	3.70	4.35	0.20
							2" Ice	4.85	6.09	0.41
							4" Ice			
1900MHz RRH (65MHz) w/Mount pipe	C	From Leg	4.00			0.0000	No Ice	2.70	2.93	0.06
			0.00				1/2"	2.94	3.25	0.09
			0.00				Ice	3.18	3.60	0.12
							1" Ice	3.70	4.35	0.20
							2" Ice	4.85	6.09	0.41
							4" Ice			
Side Arm Mount [SO 102-3]	C	None				0.0000	No Ice	3.00	3.00	0.08
							1/2"	3.48	3.48	0.11
							Ice	3.96	3.96	0.14
							1" Ice	4.92	4.92	0.20
							2" Ice	6.84	6.84	0.32
							4" Ice			

P40-16-XLPP-RR-A w/ Mount Pipe	A	From Leg	4.00			0.0000	No Ice	10.74	4.83	0.07
			0.00				1/2"	11.29	5.57	0.14
			1.00				Ice	11.85	6.27	0.22
							1" Ice	12.99	7.80	0.39
							2" Ice	15.39	11.11	0.86
							4" Ice			
P40-16-XLPP-RR-A w/ Mount Pipe	C	From Leg	4.00			0.0000	No Ice	10.74	4.83	0.07
			0.00				1/2"	11.29	5.57	0.14
			1.00				Ice	11.85	6.27	0.22
							1" Ice	12.99	7.80	0.39
							2" Ice	15.39	11.11	0.86
							4" Ice			
APXVSP18-C-A20 w/	B	From Leg	4.00			0.0000	No Ice	8.50	6.95	0.08

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
Mount Pipe			0.00 1.00			1/2" Ice 1" Ice 2" Ice 4" Ice	9.15 8.13 9.77 9.02 11.03 10.84 13.68 14.85	0.15 0.23 0.41 0.91
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.13 4.96 7.66 5.75 8.18 6.47 9.26 8.01 11.53 11.41	0.07 0.13 0.19 0.34 0.75
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.13 4.96 7.66 5.75 8.18 6.47 9.26 8.01 11.53 11.41	0.07 0.13 0.19 0.34 0.75
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.13 4.96 7.66 5.75 8.18 6.47 9.26 8.01 11.53 11.41	0.07 0.13 0.19 0.34 0.75
800 EXTERNAL NOTCH FILTER	A	From Leg	4.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.77 0.37 0.89 0.46 1.02 0.56 1.30 0.79 1.97 1.34	0.01 0.02 0.02 0.04 0.11
800 EXTERNAL NOTCH FILTER	B	From Leg	4.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.77 0.37 0.89 0.46 1.02 0.56 1.30 0.79 1.97 1.34	0.01 0.02 0.02 0.04 0.11
800 EXTERNAL NOTCH FILTER	C	From Leg	4.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.77 0.37 0.89 0.46 1.02 0.56 1.30 0.79 1.97 1.34	0.01 0.02 0.02 0.04 0.11
TD-RRH8x20-25	A	From Leg	4.00 0.00 1.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.72 1.70 5.01 1.92 5.32 2.15 5.95 2.62 7.31 3.68	0.07 0.10 0.13 0.20 0.40
TD-RRH8x20-25	B	From Leg	4.00 0.00 1.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.72 1.70 5.01 1.92 5.32 2.15 5.95 2.62 7.31 3.68	0.07 0.10 0.13 0.20 0.40
TD-RRH8x20-25	C	From Leg	4.00 0.00 1.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.72 1.70 5.01 1.92 5.32 2.15 5.95 2.62 7.31 3.68	0.07 0.10 0.13 0.20 0.40
(3) ACU-A20-N	A	From Leg	4.00 0.00 0.00	0.0000	97.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.08 0.14 0.12 0.19 0.17 0.25 0.30 0.40 0.67 0.80	0.00 0.00 0.00 0.01 0.04

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} _{Front}	C _{AA} _{Side}	Weight	
			Horz	Lateral						Vert
			ft	ft	°	ft	ft ²	ft ²	K	
(3) ACU-A20-N	B	From Leg	4.00		0.0000	97.00	No Ice	0.08	0.14	0.00
			0.00				1/2"	0.12	0.19	0.00
			0.00				Ice	0.17	0.25	0.00
							1" Ice	0.30	0.40	0.01
							2" Ice	0.67	0.80	0.04
							4" Ice			
(3) ACU-A20-N	C	From Leg	4.00		0.0000	97.00	No Ice	0.08	0.14	0.00
			0.00				1/2"	0.12	0.19	0.00
			0.00				Ice	0.17	0.25	0.00
							1" Ice	0.30	0.40	0.01
							2" Ice	0.67	0.80	0.04
							4" Ice			
Platform Mount [LP 601-1]	C	None			0.0000	97.00	No Ice	28.47	28.47	1.12
							1/2"	33.59	33.59	1.51
							Ice	38.71	38.71	1.91
							1" Ice	48.95	48.95	2.69
							2" Ice	69.43	69.43	4.26
							4" Ice			
6' x 2" Mount Pipe	A	From Leg	4.00		0.0000	97.00	No Ice	1.43	1.43	0.02
			0.00				1/2"	1.92	1.92	0.03
			0.00				Ice	2.29	2.29	0.05
							1" Ice	3.06	3.06	0.09
							2" Ice	4.70	4.70	0.23
							4" Ice			
6' x 2" Mount Pipe	B	From Leg	4.00		0.0000	97.00	No Ice	1.43	1.43	0.02
			0.00				1/2"	1.92	1.92	0.03
			0.00				Ice	2.29	2.29	0.05
							1" Ice	3.06	3.06	0.09
							2" Ice	4.70	4.70	0.23
							4" Ice			
6' x 2" Mount Pipe	C	From Leg	4.00		0.0000	97.00	No Ice	1.43	1.43	0.02
			0.00				1/2"	1.92	1.92	0.03
			0.00				Ice	2.29	2.29	0.05
							1" Ice	3.06	3.06	0.09
							2" Ice	4.70	4.70	0.23
							4" Ice			
Transition Ladder	A	From Leg	2.00		0.0000	97.00	No Ice	6.00	6.00	0.16
			0.00				1/2"	8.00	8.00	0.24
			-6.00				Ice	10.00	10.00	0.32
							1" Ice	14.00	14.00	0.48
							2" Ice	22.00	22.00	0.80
							4" Ice			
*** LNX-6515DS-A1M w/ Mount Pipe	A	From Leg	4.00		0.0000	83.00	No Ice	11.68	9.84	0.08
			0.00				1/2"	12.40	11.37	0.17
			1.00				Ice	13.14	12.91	0.27
							1" Ice	14.60	15.27	0.51
							2" Ice	17.87	20.14	1.15
							4" Ice			
LNX-6515DS-A1M w/ Mount Pipe	B	From Leg	4.00		0.0000	83.00	No Ice	11.68	9.84	0.08
			0.00				1/2"	12.40	11.37	0.17
			1.00				Ice	13.14	12.91	0.27
							1" Ice	14.60	15.27	0.51
							2" Ice	17.87	20.14	1.15
							4" Ice			
LNX-6515DS-A1M w/ Mount Pipe	C	From Leg	4.00		0.0000	83.00	No Ice	11.68	9.84	0.08
			0.00				1/2"	12.40	11.37	0.17
			1.00				Ice	13.14	12.91	0.27
							1" Ice	14.60	15.27	0.51
							2" Ice	17.87	20.14	1.15
							4" Ice			
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.00		0.0000	83.00	No Ice	6.83	5.64	0.11
			0.00				1/2"	7.35	6.48	0.17
			1.00				Ice	7.86	7.26	0.23
							1" Ice	8.93	8.86	0.38

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} _{Front}	C _{AA} _{Side}	Weight	
			Horz	Lateral						Vert
			ft	ft	°	ft	ft ²	ft ²	K	
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.00	0.00	0.0000	83.00	2" Ice	11.18	12.29	0.81
							4" Ice			
							No Ice	6.83	5.64	0.11
							1/2" Ice	7.35	6.48	0.17
							1" Ice	7.86	7.26	0.23
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.00	0.00	0.0000	83.00	2" Ice	11.18	12.29	0.81
							4" Ice			
							No Ice	6.83	5.64	0.11
							1/2" Ice	7.35	6.48	0.17
							1" Ice	7.86	7.26	0.23
RRUS 11 B12	A	From Leg	4.00	0.00	0.0000	83.00	1" Ice	8.93	8.86	0.38
							2" Ice	11.18	12.29	0.81
							4" Ice			
							No Ice	3.31	1.36	0.05
							1/2" Ice	3.55	1.54	0.07
RRUS 11 B12	B	From Leg	4.00	0.00	0.0000	83.00	Ice	3.80	1.73	0.10
							1" Ice	4.33	2.13	0.15
							2" Ice	5.50	3.04	0.31
							4" Ice			
							No Ice	3.31	1.36	0.05
RRUS 11 B12	C	From Leg	4.00	0.00	0.0000	83.00	1/2" Ice	3.55	1.54	0.07
							Ice	3.80	1.73	0.10
							1" Ice	4.33	2.13	0.15
							2" Ice	5.50	3.04	0.31
							4" Ice			
ATMAA1412D-1A20	A	From Leg	4.00	0.00	0.0000	83.00	No Ice	0.47	1.17	0.01
							1/2" Ice	0.57	1.31	0.02
							Ice	0.69	1.47	0.03
							1" Ice	0.95	1.81	0.06
							2" Ice	1.57	2.58	0.14
ATMAA1412D-1A20	B	From Leg	4.00	0.00	0.0000	83.00	4" Ice			
							No Ice	0.47	1.17	0.01
							1/2" Ice	0.57	1.31	0.02
							Ice	0.69	1.47	0.03
							1" Ice	0.95	1.81	0.06
ATMAA1412D-1A20	C	From Leg	4.00	0.00	0.0000	83.00	2" Ice	1.57	2.58	0.14
							4" Ice			
							No Ice	0.47	1.17	0.01
							1/2" Ice	0.57	1.31	0.02
							Ice	0.69	1.47	0.03
AIR -32 B2A/B66AA w/ Mount Pipe	A	From Leg	4.00	0.00	0.0000	83.00	1" Ice	0.95	1.81	0.06
							2" Ice	1.57	2.58	0.14
							4" Ice			
							No Ice	7.34	6.15	0.15
							1/2" Ice	7.87	7.01	0.21
AIR -32 B2A/B66AA w/ Mount Pipe	B	From Leg	4.00	0.00	0.0000	83.00	Ice	8.39	7.80	0.28
							1" Ice	9.47	9.43	0.44
							2" Ice	11.76	12.91	0.89
							4" Ice			
							No Ice	7.34	6.15	0.15
AIR -32 B2A/B66AA w/ Mount Pipe	C	From Leg	4.00	0.00	0.0000	83.00	1/2" Ice	7.87	7.01	0.21
							Ice	8.39	7.80	0.28
							1" Ice	9.47	9.43	0.44
							2" Ice	11.76	12.91	0.89
							4" Ice			
AIR -32 B2A/B66AA w/ Mount Pipe	C	From Leg	4.00	0.00	0.0000	83.00	No Ice	7.34	6.15	0.15
							1/2" Ice	7.87	7.01	0.21
							Ice	8.39	7.80	0.28

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
Platform Mount [LP 303-1]	C	None		0.0000	83.00	1" Ice	9.47	9.43	0.44
						2" Ice	11.76	12.91	0.89
						4" Ice			
						No Ice	14.66	14.66	1.25
						1/2" Ice	18.87	18.87	1.48
						Ice	23.08	23.08	1.71
						1" Ice	31.50	31.50	2.18
8'x2" Antenna Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	83.00	2" Ice	48.34	48.34	3.10
						4" Ice			
						No Ice	1.90	1.90	0.03
						1/2" Ice	2.73	2.73	0.04
						Ice	3.40	3.40	0.06
						1" Ice	4.40	4.40	0.12
						2" Ice	6.50	6.50	0.30
8'x2" Antenna Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	83.00	4" Ice			
						No Ice	1.90	1.90	0.03
						1/2" Ice	2.73	2.73	0.04
						Ice	3.40	3.40	0.06
						1" Ice	4.40	4.40	0.12
						2" Ice	6.50	6.50	0.30
						4" Ice			
8'x2" Antenna Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	83.00	No Ice	1.90	1.90	0.03
						1/2" Ice	2.73	2.73	0.04
						Ice	3.40	3.40	0.06
						1" Ice	4.40	4.40	0.12
						2" Ice	6.50	6.50	0.30
						4" Ice			
						No Ice	1.90	1.90	0.03
*** KS24019-L112A	B	From Leg	2.00 0.00 0.00	0.0000	51.00	No Ice	0.10	0.10	0.01
						1/2" Ice	0.18	0.18	0.01
						Ice	0.26	0.26	0.01
						1" Ice	0.42	0.42	0.01
						2" Ice	0.74	0.74	0.02
						4" Ice			
						No Ice	0.85	1.67	0.07
Side Arm Mount [SO 701-1]	B	From Leg	1.00 0.00 0.00	0.0000	51.00	1/2" Ice	1.14	2.34	0.08
						Ice	1.43	3.01	0.09
						1" Ice	2.01	4.35	0.12
						2" Ice	3.17	7.03	0.18
						4" Ice			
						No Ice	0.85	1.67	0.07
						1/2" Ice	1.14	2.34	0.08

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 60 deg - No Ice
5	Dead+Wind 90 deg - No Ice
6	Dead+Wind 120 deg - No Ice
7	Dead+Wind 150 deg - No Ice
8	Dead+Wind 180 deg - No Ice
9	Dead+Wind 210 deg - No Ice
10	Dead+Wind 240 deg - No Ice
11	Dead+Wind 270 deg - No Ice
12	Dead+Wind 300 deg - No Ice
13	Dead+Wind 330 deg - No Ice

Comb. No.	Description
14	Dead+Ice+Temp
15	Dead+Wind 0 deg+Ice+Temp
16	Dead+Wind 30 deg+Ice+Temp
17	Dead+Wind 60 deg+Ice+Temp
18	Dead+Wind 90 deg+Ice+Temp
19	Dead+Wind 120 deg+Ice+Temp
20	Dead+Wind 150 deg+Ice+Temp
21	Dead+Wind 180 deg+Ice+Temp
22	Dead+Wind 210 deg+Ice+Temp
23	Dead+Wind 240 deg+Ice+Temp
24	Dead+Wind 270 deg+Ice+Temp
25	Dead+Wind 300 deg+Ice+Temp
26	Dead+Wind 330 deg+Ice+Temp
27	Dead+Wind 0 deg - Service
28	Dead+Wind 30 deg - Service
29	Dead+Wind 60 deg - Service
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	120 - 84.7161	Pole	Max Tension	15	0.00	0.00	-0.00
			Max. Compression	14	-18.90	-0.92	0.91
			Max. Mx	5	-10.66	-401.83	1.23
			Max. My	2	-10.65	-1.29	402.70
			Max. Vy	5	19.77	-401.83	1.23
			Max. Vx	2	-19.88	-1.29	402.70
			Max. Torque	13			-1.55
L2	84.7161 - 41.6224	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-34.12	-1.14	0.81
			Max. Mx	5	-22.58	-1475.96	5.09
			Max. My	2	-22.57	-5.42	1481.10
			Max. Vy	5	28.00	-1475.96	5.09
			Max. Vx	2	-28.12	-5.42	1481.10
			Max. Torque	7			1.65
L3	41.6224 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-50.89	-1.14	0.94
			Max. Mx	5	-37.74	-2889.14	10.11
			Max. My	2	-37.74	-10.44	2900.06
			Max. Vy	5	31.65	-2889.14	10.11
			Max. Vx	2	-31.77	-10.44	2900.06
			Max. Torque	7			1.66

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	16	50.89	-3.32	5.75
	Max. H _x	11	37.75	31.63	-0.10
	Max. H _z	2	37.75	-0.10	31.75

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Max. M _x	2	2900.06	-0.10	31.75
	Max. M _z	5	2889.14	-31.63	0.10
	Max. Torsion	7	1.66	-15.72	-27.44
	Min. Vert	1	37.75	0.00	0.00
	Min. H _x	5	37.75	-31.63	0.10
	Min. H _z	8	37.75	0.10	-31.75
	Min. M _x	8	-2899.34	0.10	-31.75
	Min. M _z	11	-2887.77	31.63	-0.10
	Min. Torsion	13	-1.66	15.72	27.44

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturing Moment, M _x kip-ft	Overturing Moment, M _z kip-ft	Torque kip-ft
Dead Only	37.75	0.00	0.00	-0.35	-0.67	0.00
Dead+Wind 0 deg - No Ice	37.75	0.10	-31.75	-2900.06	-10.44	1.51
Dead+Wind 30 deg - No Ice	37.75	15.90	-27.55	-2516.45	-1453.35	0.95
Dead+Wind 60 deg - No Ice	37.75	27.44	-15.96	-1458.66	-2507.02	0.14
Dead+Wind 90 deg - No Ice	37.75	31.63	-0.10	-10.11	-2889.14	-0.71
Dead+Wind 120 deg - No Ice	37.75	27.34	15.78	1441.05	-2497.28	-1.37
Dead+Wind 150 deg - No Ice	37.75	15.72	27.44	2505.99	-1436.46	-1.66
Dead+Wind 180 deg - No Ice	37.75	-0.10	31.75	2899.34	9.07	-1.51
Dead+Wind 210 deg - No Ice	37.75	-15.90	27.55	2515.73	1451.98	-0.95
Dead+Wind 240 deg - No Ice	37.75	-27.44	15.96	1457.94	2505.65	-0.14
Dead+Wind 270 deg - No Ice	37.75	-31.63	0.10	9.39	2887.77	0.71
Dead+Wind 300 deg - No Ice	37.75	-27.34	-15.78	-1441.77	2495.92	1.37
Dead+Wind 330 deg - No Ice	37.75	-15.72	-27.44	-2506.71	1435.09	1.66
Dead+Ice+Temp	50.89	0.00	0.00	-0.94	-1.14	0.00
Dead+Wind 0 deg+Ice+Temp	50.89	0.02	-6.63	-622.39	-3.18	0.39
Dead+Wind 30 deg+Ice+Temp	50.89	3.32	-5.75	-540.12	-312.47	0.24
Dead+Wind 60 deg+Ice+Temp	50.89	5.73	-3.33	-313.40	-538.36	0.03
Dead+Wind 90 deg+Ice+Temp	50.89	6.60	-0.02	-2.97	-620.32	-0.19
Dead+Wind 120 deg+Ice+Temp	50.89	5.71	3.30	307.99	-536.39	-0.36
Dead+Wind 150 deg+Ice+Temp	50.89	3.28	5.73	536.16	-309.05	-0.43
Dead+Wind 180 deg+Ice+Temp	50.89	-0.02	6.63	620.40	0.77	-0.39
Dead+Wind 210 deg+Ice+Temp	50.89	-3.32	5.75	538.14	310.06	-0.24
Dead+Wind 240 deg+Ice+Temp	50.89	-5.73	3.33	311.41	535.95	-0.03
Dead+Wind 270 deg+Ice+Temp	50.89	-6.60	0.02	0.98	617.91	0.19
Dead+Wind 300 deg+Ice+Temp	50.89	-5.71	-3.30	-309.98	533.98	0.36
Dead+Wind 330 deg+Ice+Temp	50.89	-3.28	-5.73	-538.15	306.64	0.43
Dead+Wind 0 deg - Service	37.75	0.03	-9.80	-895.77	-3.70	0.47
Dead+Wind 30 deg - Service	37.75	4.91	-8.50	-777.32	-449.26	0.29
Dead+Wind 60 deg - Service	37.75	8.47	-4.93	-450.68	-774.63	0.04
Dead+Wind 90 deg - Service	37.75	9.76	-0.03	-3.37	-892.62	-0.22
Dead+Wind 120 deg - Service	37.75	8.44	4.87	444.74	-771.62	-0.42
Dead+Wind 150 deg - Service	37.75	4.85	8.47	773.58	-444.05	-0.51
Dead+Wind 180 deg - Service	37.75	-0.03	9.80	895.05	2.32	-0.47
Dead+Wind 210 deg - Service	37.75	-4.91	8.50	776.59	447.89	-0.29

Load Combination	Vertical	Shear _x	Shear _z	Overturning Moment, M _x	Overturning Moment, M _z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 240 deg - Service	37.75	-8.47	4.93	449.95	773.26	-0.04
Dead+Wind 270 deg - Service	37.75	-9.76	0.03	2.65	891.25	0.22
Dead+Wind 300 deg - Service	37.75	-8.44	-4.87	-445.46	770.24	0.42
Dead+Wind 330 deg - Service	37.75	-4.85	-8.47	-774.31	442.67	0.51

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-37.75	0.00	0.00	37.75	0.00	0.000%
2	0.10	-37.75	-31.75	-0.10	37.75	31.75	0.000%
3	15.90	-37.75	-27.55	-15.90	37.75	27.55	0.000%
4	27.44	-37.75	-15.96	-27.44	37.75	15.96	0.000%
5	31.63	-37.75	-0.10	-31.63	37.75	0.10	0.000%
6	27.34	-37.75	15.78	-27.34	37.75	-15.78	0.000%
7	15.72	-37.75	27.44	-15.72	37.75	-27.44	0.000%
8	-0.10	-37.75	31.75	0.10	37.75	-31.75	0.000%
9	-15.90	-37.75	27.55	15.90	37.75	-27.55	0.000%
10	-27.44	-37.75	15.96	27.44	37.75	-15.96	0.000%
11	-31.63	-37.75	0.10	31.63	37.75	-0.10	0.000%
12	-27.34	-37.75	-15.78	27.34	37.75	15.78	0.000%
13	-15.72	-37.75	-27.44	15.72	37.75	27.44	0.000%
14	0.00	-50.89	0.00	0.00	50.89	0.00	0.000%
15	0.02	-50.89	-6.63	-0.02	50.89	6.63	0.000%
16	3.32	-50.89	-5.75	-3.32	50.89	5.75	0.000%
17	5.73	-50.89	-3.33	-5.73	50.89	3.33	0.000%
18	6.60	-50.89	-0.02	-6.60	50.89	0.02	0.000%
19	5.71	-50.89	3.30	-5.71	50.89	-3.30	0.000%
20	3.28	-50.89	5.73	-3.28	50.89	-5.73	0.000%
21	-0.02	-50.89	6.63	0.02	50.89	-6.63	0.000%
22	-3.32	-50.89	5.75	3.32	50.89	-5.75	0.000%
23	-5.73	-50.89	3.33	5.73	50.89	-3.33	0.000%
24	-6.60	-50.89	0.02	6.60	50.89	-0.02	0.000%
25	-5.71	-50.89	-3.30	5.71	50.89	3.30	0.000%
26	-3.28	-50.89	-5.73	3.28	50.89	5.73	0.000%
27	0.03	-37.75	-9.80	-0.03	37.75	9.80	0.000%
28	4.91	-37.75	-8.50	-4.91	37.75	8.50	0.000%
29	8.47	-37.75	-4.93	-8.47	37.75	4.93	0.000%
30	9.76	-37.75	-0.03	-9.76	37.75	0.03	0.000%
31	8.44	-37.75	4.87	-8.44	37.75	-4.87	0.000%
32	4.85	-37.75	8.47	-4.85	37.75	-8.47	0.000%
33	-0.03	-37.75	9.80	0.03	37.75	-9.80	0.000%
34	-4.91	-37.75	8.50	4.91	37.75	-8.50	0.000%
35	-8.47	-37.75	4.93	8.47	37.75	-4.93	0.000%
36	-9.76	-37.75	0.03	9.76	37.75	-0.03	0.000%
37	-8.44	-37.75	-4.87	8.44	37.75	4.87	0.000%
38	-4.85	-37.75	-8.47	4.85	37.75	8.47	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	0.00018964
3	Yes	5	0.00000001	0.00005085
4	Yes	5	0.00000001	0.00004931
5	Yes	4	0.00000001	0.00010315

6	Yes	5	0.0000001	0.00004689
7	Yes	5	0.0000001	0.00005131
8	Yes	4	0.0000001	0.00015619
9	Yes	5	0.0000001	0.00004807
10	Yes	5	0.0000001	0.00004948
11	Yes	4	0.0000001	0.00007045
12	Yes	5	0.0000001	0.00005080
13	Yes	5	0.0000001	0.00004650
14	Yes	4	0.0000001	0.00000001
15	Yes	4	0.0000001	0.00047158
16	Yes	4	0.0000001	0.00052066
17	Yes	4	0.0000001	0.00051878
18	Yes	4	0.0000001	0.00046982
19	Yes	4	0.0000001	0.00051248
20	Yes	4	0.0000001	0.00051561
21	Yes	4	0.0000001	0.00046879
22	Yes	4	0.0000001	0.00051319
23	Yes	4	0.0000001	0.00051319
24	Yes	4	0.0000001	0.00046644
25	Yes	4	0.0000001	0.00051379
26	Yes	4	0.0000001	0.00051253
27	Yes	4	0.0000001	0.00002730
28	Yes	4	0.0000001	0.00011449
29	Yes	4	0.0000001	0.00010556
30	Yes	4	0.0000001	0.00001606
31	Yes	4	0.0000001	0.00009543
32	Yes	4	0.0000001	0.00011942
33	Yes	4	0.0000001	0.00002585
34	Yes	4	0.0000001	0.00009914
35	Yes	4	0.0000001	0.00010612
36	Yes	4	0.0000001	0.00001484
37	Yes	4	0.0000001	0.00011604
38	Yes	4	0.0000001	0.00009398

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	120 - 84.7161	14.590	28	0.9935	0.0024
L2	89.2839 - 41.6224	8.463	28	0.8705	0.0014
L3	47.3776 - 0	2.407	28	0.4658	0.0005

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
118.00	7770.00 w/ Mount Pipe	28	14.176	0.9881	0.0023	50446
116.00	TME-RRUS-11	28	13.763	0.9825	0.0023	50446
108.00	(4) 844G65VTZASX w/ Mount Pipe	28	12.120	0.9584	0.0020	21019
100.00	TME-800MHZ RRH	28	10.514	0.9281	0.0017	12611
97.00	P40-16-XLPP-RR-A w/ Mount Pipe	28	9.926	0.9142	0.0016	10966
83.00	LNx-6515DS-A1M w/ Mount Pipe	28	7.333	0.8247	0.0012	7217
51.00	KS24019-L112A	28	2.769	0.5047	0.0005	4465

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	120 - 84.7161	47.162	3	3.2114	0.0079
L2	89.2839 - 41.6224	27.367	3	2.8148	0.0045
L3	47.3776 - 0	7.787	3	1.5070	0.0015

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
118.00	7770.00 w/ Mount Pipe	3	45.825	3.1938	0.0076	15750
116.00	TME-RRUS-11	3	44.490	3.1759	0.0074	15750
108.00	(4) 844G65VTZASX w/ Mount Pipe	3	39.184	3.0983	0.0065	6562
100.00	TME-800MHZ RRH	3	33.996	3.0006	0.0056	3936
97.00	P40-16-XLPP-RR-A w/ Mount Pipe	3	32.097	2.9560	0.0053	3422
83.00	LNx-6515DS-A1M w/ Mount Pipe	3	23.717	2.6670	0.0039	2247
51.00	KS24019-L112A	3	8.960	1.6328	0.0017	1382

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio $\frac{P}{P_a}$
L1	120 - 84.7161 (1)	TP32.5458x24.09x0.375	35.28	0.00	0.0	39.000	36.9884	-10.64	1442.55	0.007
L2	84.7161 - 41.6224 (2)	TP42.0347x30.7011x0.4375	47.66	0.00	0.0	39.000	55.8625	-22.57	2178.64	0.010
L3	41.6224 - 0 (3)	TP51x39.7912x0.5	47.38	0.00	0.0	39.000	80.1435	-37.73	3125.60	0.012

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M _x kip-ft	Actual f _{bx} ksi	Allow. F _{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M _y kip-ft	Actual f _{by} ksi	Allow. F _{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	120 - 84.7161 (1)	TP32.5458x24.09x0.375	403.37	17.137	39.000	0.439	0.00	0.000	39.000	0.000
L2	84.7161 - 41.6224 (2)	TP42.0347x30.7011x0.4375	1484.13	32.212	39.000	0.826	0.00	0.000	39.000	0.000
L3	41.6224 - 0 (3)	TP51x39.7912x0.5	2905.98	34.988	39.000	0.897	0.00	0.000	39.000	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	120 - 84.7161 (1)	TP32.5458x24.09x0.375	19.93	0.539	26.000	0.041	0.78	0.016	26.000	0.001
L2	84.7161 - 41.6224 (2)	TP42.0347x30.7011x0.4375	28.18	0.504	26.000	0.039	0.97	0.010	26.000	0.000
L3	41.6224 - 0 (3)	TP51x39.7912x0.5	31.83	0.397	26.000	0.031	0.95	0.006	26.000	0.000

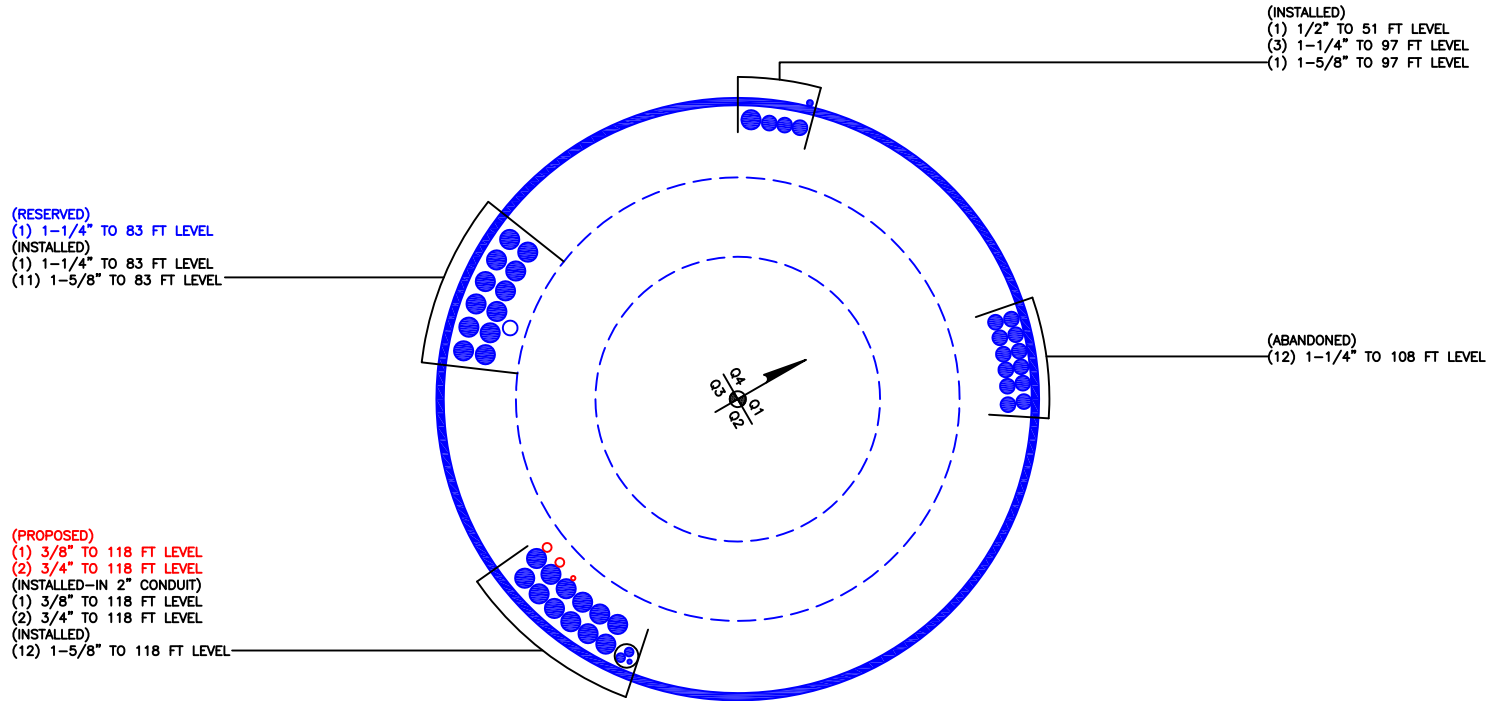
Pole Interaction Design Data

Section No.	Elevation ft	Ratio P $\frac{P}{P_a}$	Ratio f_{bx} $\frac{f_{bx}}{F_{bx}}$	Ratio f_{by} $\frac{f_{by}}{F_{by}}$	Ratio f_v $\frac{f_v}{F_v}$	Ratio f_{vt} $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	120 - 84.7161 (1)	0.007	0.439	0.000	0.041	0.001	0.447	1.333	H1-3+VT ✓
L2	84.7161 - 41.6224 (2)	0.010	0.826	0.000	0.039	0.000	0.837	1.333	H1-3+VT ✓
L3	41.6224 - 0 (3)	0.012	0.897	0.000	0.031	0.000	0.909	1.333	H1-3+VT ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF * P_{allow}$ K	% Capacity	Pass Fail	
L1	120 - 84.7161	Pole	TP32.5458x24.09x0.375	1	-10.64	1922.92	33.6	Pass	
L2	84.7161 - 41.6224	Pole	TP42.0347x30.7011x0.4375	2	-22.57	2904.13	62.8	Pass	
L3	41.6224 - 0	Pole	TP51x39.7912x0.5	3	-37.73	4166.42	68.2	Pass	
							Summary		
							Pole (L3)	68.2	Pass
							RATING =	68.2	Pass

APPENDIX B
BASE LEVEL DRAWING



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#: 881536
Site Name: NORTH HAVEN TOWER
App #: 345011 Rev. 1
Pole Manufacturer: Other

Anchor Rod Data

Qty:	20	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	60	in

Plate Data

Diam:	66	in
Thick:	2.25	in
Grade:	60	ksi
Single-Rod B-eff:	8.09	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:	51	in
Thick:	0.5	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Reactions

Mu:	2906	ft-kips
Axial, Pu:	38	kips
Shear, Vu:	32	kips
Eta Factor, η	0.5	TIA G (Fig. 4-4)

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

Anchor Rod Results

Max Rod (Cu+ Vu/η): 121.3 Kips
 Allowable Axial, $\Phi * Fu * Anet$: 260.0 Kips
 Anchor Rod Stress Ratio: 46.7% **Pass**

Rigid
AISC LRFD
$\phi * Tn$

Base Plate Results

Base Plate Stress: 30.6 ksi
 Allowable Plate Stress: 54.0 ksi
 Base Plate Stress Ratio: 56.6% **Pass**

Flexural Check

Rigid
AISC LRFD
$\phi * Fy$
Y.L. Length:
31.61

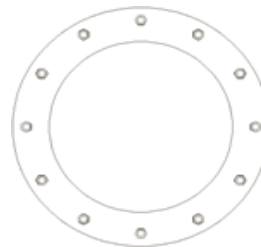
n/a

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

BU:	881536
Site Name:	NORTH HAVEN TOWER
App Number:	345011 Rev. 1
Work Order:	1239285

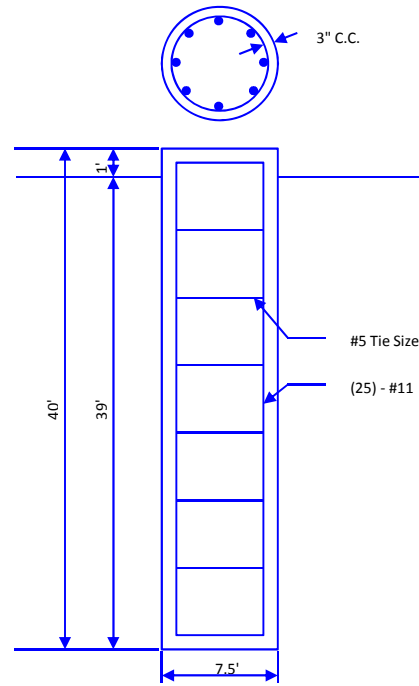


Monopole Drilled Pier

Input

Criteria	
TIA Revision:	F
ACI 318 Revision:	2002
Seismic Category:	B
Forces	
Compression	38 kips
Shear	32 kips
Moment	2906 k-ft
Swelling Force	0 kips
Foundation Dimensions	
Pier Diameter:	7.5 ft
Ext. above grade:	1 ft
Depth below grade:	39 ft
Material Properties	
Number of Rebar:	25
Rebar Size:	11
Tie Size	5
Rebar tensile strength:	60 ksi
Concrete Strength:	4000 psi
Ultimate Concrete Strain	0.003 in/in
Clear Cover to Ties:	3 in

Soil Profile: 1



Layer	Thickness (ft)	From (ft)	To (ft)	Unit Weight (pcf)	Cohesion (psf)	Friction Angle (deg)	Ultimate Uplift Friction (ksf)	Ultimate Comp. Friction (ksf)	Ultimate Bearing Capacity (ksf)	SPT 'N' Counts
1	3.75	0	3.75	120	0	0	0	0	0	
2	1.25	3.75	5	120	0	32	0	0	0	
3	2	5	7	120	0	32	1.4	1.4	0	
4	32	7	39	60	0	32	1.4	1.4	16	

Analysis Results

Soil Lateral Capacity	
Depth to Zero Shear:	9.07 ft
Max Moment, Mu:	3178.00 k-ft
Soil Safety Factor:	9.07
Safety Factor Req'd:	2
RATING:	22.0%

Soil Axial Capacity	
Skin Friction (k):	560.77 kips
End Bearing (k):	353.43 kips
Comp. Capacity (k), φCn:	914.20 kips
Comp. (k), Cu:	49.40 kips
RATING:	5.4%

Concrete/Steel Check	
Mu (from soil analysis)	4131.39 k-ft
φMn	6811.42 k-ft
RATING:	60.7%
rho provided	0.61
rho required	0.33 OK
Rebar Spacing	8.81
Spacing required	22.56 OK
Dev. Length required	29.68
Dev. Length provided	53.51 OK

Overall Foundation Rating: 60.7%



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

AT&T Existing Facility

Site ID: CT5107

North Haven South
120 Universal Drive
North Haven, CT 06473

July 6, 2016

EBI Project Number: 6216003127

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	18.23 %



July 6, 2016

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

Emissions Analysis for Site: **CT5107 – North Haven South**

EBI Consulting was directed to analyze the proposed AT&T facility located at **120 Universal Drive, North Haven, 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 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The number of $\mu\text{W}/\text{cm}^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

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

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

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



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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed AT&T Wireless antenna facility located at **120 Universal Drive, North Haven, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since AT&T is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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

- 1) 2 UMTS channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 2) 2 UMTS channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 3) 2 GSM channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 4) 2 LTE channels (2300 MHz (WCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.
- 5) 2 LTE channels (700 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.
- 6) 2 LTE channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.



- 7) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
- 8) For the following calculations the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 9) The antennas used in this modeling are the **Powerwave 7770, CCI OPA-65R-LCUU-H6 and the Quintel QS66512-2** for transmission in the 700 MHz, 850 MHz, 1900 MHz (PCS) and 2300 MHz (WCS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 10) The antenna mounting height centerlines of the proposed antennas are **121 feet** above ground level (AGL) for **Sector A**, **121 feet** above ground level (AGL) for **Sector B** and **121 feet** above ground level (AGL) for Sector C.
- 11) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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



AT&T Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770
Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd
Height (AGL):	121 feet	Height (AGL):	121 feet	Height (AGL):	121 feet
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	120 Watts	Total TX Power(W):	120 Watts	Total TX Power(W):	120 Watts
ERP (W):	2,140.89	ERP (W):	2,140.89	ERP (W):	2,140.89
Antenna A1 MPE%	0.75 %	Antenna B1 MPE%	0.75 %	Antenna C1 MPE%	0.75 %
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	CCI OPA-65R-LCUU-H6	Make / Model:	CCI OPA-65R-LCUU-H6	Make / Model:	CCI OPA-65R-LCUU-H6
Gain:	12.45 / 15.45 dBd	Gain:	12.45 / 15.45 dBd	Gain:	12.45 / 15.45 dBd
Height (AGL):	121 feet	Height (AGL):	121 feet	Height (AGL):	121 feet
Frequency Bands	850 MHz / 2300 MHz (WCS)	Frequency Bands	850 MHz / 2300 MHz (WCS)	Frequency Bands	850 MHz / 2300 MHz (WCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	180 Watts	Total TX Power(W):	180 Watts	Total TX Power(W):	180 Watts
ERP (W):	5,263.78	ERP (W):	5,263.78	ERP (W):	5,263.78
Antenna A2 MPE%	1.65 %	Antenna B2 MPE%	1.65 %	Antenna C2 MPE%	1.65 %
Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	Quintel QS66512-2	Make / Model:	Quintel QS66512-2	Make / Model:	Quintel QS66512-2
Gain:	10.85 / 13.85 dBd	Gain:	10.85 / 13.85 dBd	Gain:	10.85 / 13.85 dBd
Height (AGL):	121 feet	Height (AGL):	121 feet	Height (AGL):	121 feet
Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	240 Watts	Total TX Power(W):	240 Watts	Total TX Power(W):	240 Watts
ERP (W):	4,371.36	ERP (W):	4,371.36	ERP (W):	4,371.36
Antenna A3 MPE%	1.64 %	Antenna B3 MPE%	1.64 %	Antenna C3 MPE%	1.64 %

Site Composite MPE%	
Carrier	MPE%
AT&T – Max per sector	4.04 %
Sprint	0.90 %
Nextel	0.70 %
T-Mobile	6.60 %
Verizon Wireless (Adjacent Tower)	5.99 %
Site Total MPE %:	18.23 %

AT&T Sector A Total:	4.04 %
AT&T Sector B Total:	4.04 %
AT&T Sector C Total:	4.04 %
Site Total:	18.23 %

AT&T_ Max Values Per Sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu\text{W}/\text{cm}^2$)	Frequency (MHz)	Allowable MPE ($\mu\text{W}/\text{cm}^2$)	Calculated % MPE
AT&T 850 MHz UMTS	2	414.12	121	2.25	850 MHz	567	0.40 %
AT&T 1900 MHz (PCS) UMTS	2	656.33	121	3.57	1900 MHz (PCS)	1000	0.36 %
AT&T 850 MHz GSM	2	527.38	121	2.87	850 MHz	567	0.51 %
AT&T 2300 MHz (WCS) LTE	2	2,104.51	121	11.44	2300 MHz (WCS)	1000	1.14 %
AT&T 700 MHz LTE	2	729.71	121	3.97	700 MHz	467	0.85 %
AT&T 1900 MHz (PCS) LTE	2	1,455.97	121	7.92	1900 MHz (PCS)	1000	0.79 %
Total:						4.04 %	



Summary

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

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

AT&T Sector	Power Density Value (%)
Sector A:	4.04 %
Sector B:	4.04 %
Sector C:	4.04 %
AT&T Maximum Total (per sector):	4.04 %
Site Total:	18.23 %
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **18.23 %** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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