



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

January 29, 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: 841290
AT&T Site ID: CT2130
363 Riversville Road, Greenwich, CT 06831
Latitude: 41° 3' 58.6" / Longitude: -73° 40' 17.4"

Dear Ms. Bachman:

AT&T currently maintains nine (9) antennas at the 149-foot level of the existing 160-foot monopole at 363 Riversville Road in Greenwich, CT. The tower is owned by Crown Castle. The property is owned by the Greenwich Council Boy Scouts of America. AT&T now intends to replace three (3) antennas with three (3) new 700 MHz antennas. These antennas would be installed at the 149-foot level of the tower. AT&T also intends to install three (3) RRU12s and three (3) A2s.

In communications with the Town of Greenwich, the original Zoning Approval for this tower is unavailable.

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. Peter J. Tesei, First Selectman for the Town of Greenwich, as well as the property owner, and Crown Castle is the tower owner.

1. The proposed modifications will not result in an increase in the height of the existing tower.
2. The proposed modifications will not require the extension of the site boundary.
3. The proposed modification will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.

Melanie A. Bachman

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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. Peter J. Tesei
Town of Greenwich
101 Field Point Road
Greenwich, CT 06830

Greenwich Council Boy Scouts of America
63 Mason Street
Greenwich, CT 06830

Terry, Dashanna

From: Patrick LaRow <Patrick.LaRow@greenwichct.org>
Sent: Thursday, January 21, 2016 12:08 PM
To: Terry, Dashanna
Cc: Barbadora, Jeff
Subject: Re: Zoning Documents - Tower at 363 Riversville Road

The Planning and Zoning office does not have any documents related to a telecommunications facility at this address.

Patrick LaRow, AICP
Deputy Director / Assistant Town Planner

Town of Greenwich
Planning and Zoning
101 Field Point Road
Greenwich, CT 06830

Phone: (203) 622-7894 Fax: (203) 622-3795
Patrick.LaRow@greenwichct.org

From: "Terry, Dashanna" <Dashanna.Terry@crowncastle.com>
To: "patrick.larow@greenwichct.org" <patrick.larow@greenwichct.org>
Cc: "Barbadora, Jeff" <Jeff.Barbadora@crowncastle.com>
Date: 01/21/2016 10:29 AM
Subject: Zoning Documents - Tower at 363 Riversville Road

Hello Patrick,

Thank you for speaking with me this morning regarding zoning documents for the tower at 363 Riversville Road. Could you please confirm here that you do not have original zoning documents for this tower?

Best,
Dashanna

DASHANNA TERRY
Real Estate Project Coordinator
T: (781) 970-0067 | M: (571) 241-0984

<cid:image001.png@01CF9124.0525FEA0>
12 Gill Street, Suite 5800, Woburn, MA 01801 Crowncastle.com

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PROJECT INFORMATION

- SCOPE OF WORK: LTE 2C
- REMOVE (1) ANTENNA PER SECTOR (TOTAL OF 3 ANTENNAS)
 - INSTALL (1) ANTENNA PER SECTOR (TOTAL OF 3 NEW ANTENNAS)
 - ADD (1) RRH PER SECTOR (TOTAL OF 3 NEW RRHS)
 - ADD (1) A-2 MODULE PER SECTOR (TOTAL OF 3 NEW A-2 MODULES)

SITE ADDRESS: 363 RIVERSVILLE ROAD
GREENWICH, CT 06831

LATITUDE: 41.0665481 41° 03' 59.37"N
LONGITUDE: -73.6714161 73° 40' 17.09"W

USID: 26225

TOWER OWNER: TBD

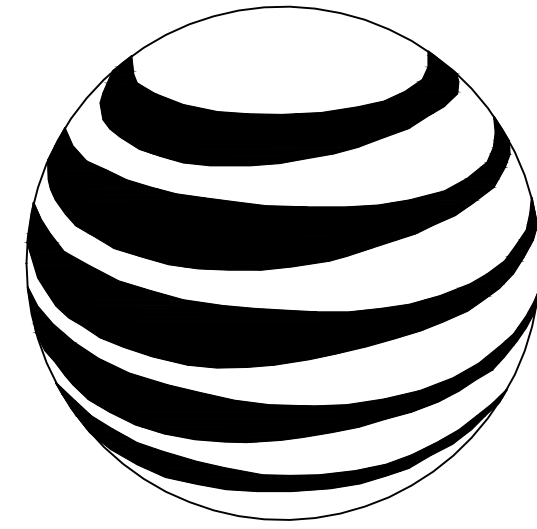
TYPE OF SITE: MONOPOLE/INDOOR EQUIPMENT

TOWER HEIGHT: 160-0"±

RAD CENTER: 149'-0"±

CURRENT USE: UNMANNED WIRELESS TELECOMMUNICATIONS FACILITY

PROPOSED USE: UNMANNED WIRELESS TELECOMMUNICATIONS FACILITY



at&t
MOBILITY

FA CODE: 10034990
SITE NUMBER: CT2130
SITE NAME: GREENWICH NORTH

PROJECT TEAM

CLIENT REPRESENTATIVE

COMPANY: EMPIRE TELECOM
ADDRESS: 16 ESQUIRE ROAD
BILLERICA, MA 01821
CONTACT: DAVID COOPER
PHONE: 617-639-4908
EMAIL: dcooper@empiretelecomm.com

SITE ACQUISITION:

COMPANY: EMPIRE TELECOM
ADDRESS: 16 ESQUIRE ROAD
BILLERICA, MA 01821
CONTACT: DAVID COOPER
PHONE: 617-639-4908
EMAIL: dcooper@empiretelecomm.com

ZONING:

COMPANY: EMPIRE TELECOM
ADDRESS: 16 ESQUIRE ROAD
BILLERICA, MA 01821
CONTACT: DAVID COOPER
PHONE: 617-639-4908
EMAIL: dcooper@empiretelecomm.com

ENGINEERING:

COMPANY: COM-EX CONSULTANTS, LLC
ADDRESS: 115 ROUTE 46
SUITE E39
MOUNTAIN LAKES, NJ 07046
CONTACT: NICHOLAS D. BARILE, P.E.
PHONE: 862-209-4300
EMAIL: nbarile@comexconsultants.com

RF ENGINEER:

COMPANY: AT&T MOBILITY – NEW ENGLAND
ADDRESS: 550 COCHITUATE ROAD
SUITE 550 13 & 14
FRAMINGHAM, MA 01701
CONTACT: CAMERON SYME
PHONE: 508-596-7146
EMAIL: cs6970@att.com

CONSTRUCTION MANAGEMENT:

COMPANY: EMPIRE TELECOM
ADDRESS: 16 ESQUIRE ROAD
BILLERICA, MA 01821
CONTACT: GRZEGORZ "GREG" DORMAN
PHONE: 484-683-1750
EMAIL: gdorman@empiretelecomm.com

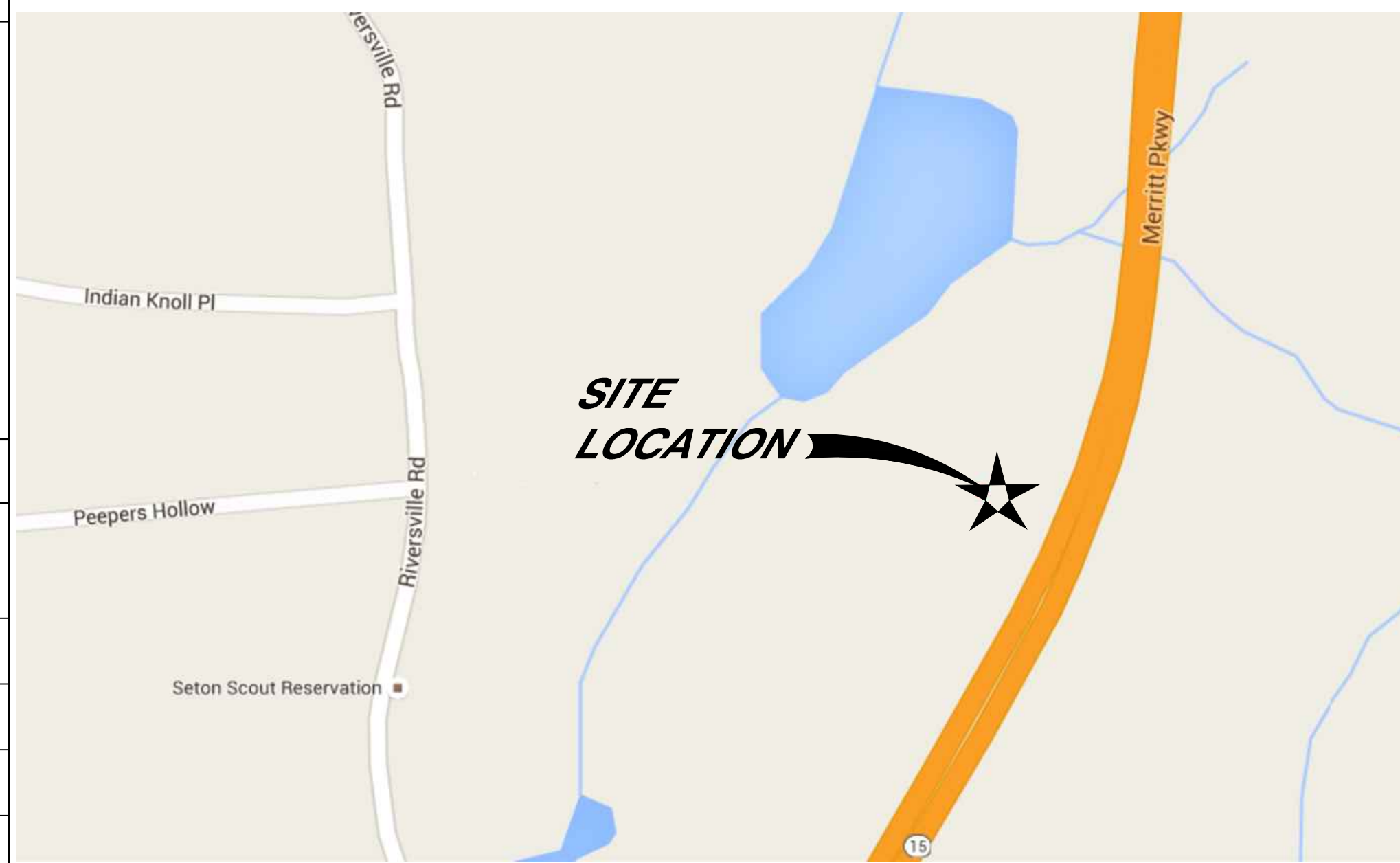
DRAWING INDEX

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G-1	GROUNDING DETAILS	0

VICINITY MAP

FROM ROCKY HILL, HEAD SOUTHWEST ON CONCRIB LN. TURN LEFT ONTO SOLO DR. TURN RIGHT ONTO GILBERT AVE. TURN RIGHT ONTO STATE HWY 411. TURN LEFT TO MERGE ONTO I-91 S. MERGE ONTO I-91 S. TAKE EXIT 17 TO MERGE ONTO CT-15 S. TAKE EXIT 28 FOR ROUND HILL RD. TURN RIGHT ONTO ROUND HILL RD. TURN LEFT ONTO PORCHUCK RD. TURN LEFT TO STAY ON PORCHUCK RD. TURN LEFT ONTO RIVERSVILLE RD. SITE WILL BE ON LEFT.



GENERAL NOTES

1. THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY, AND COPYRIGHTED WORK OF AT&T. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. DUPLICATION AND USE BY GOVERNMENT AGENCIES FOR THE PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.
2. THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
3. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE AT&T REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

APPROVALS

THE FOLLOWING PARTIES HEREBY APPROVE AND ACCEPT THESE DOCUMENTS AND AUTHORIZE THE SUBCONTRACTOR TO PROCEED WITH THE CONSTRUCTION DESCRIBED HEREIN, ALL DOCUMENTS ARE SUBJECT TO REVIEW BY THE LOCAL BUILDING DEPARTMENT AND MAY IMPOSE CHANGES OR SITE MODIFICATIONS.

DISCIPLINE:	NAME:	DATE:
SITE ACQUISITION:		
CONSTRUCTION MANAGER:		
AT&T PROJECT MANAGER:		



CONNECTICUT LAW REQUIRES TWO WORKING DAYS NOTICE PRIOR TO ANY EARTH MOVING ACTIVITIES BY CALLING 800-922-4455 OR DIAL 811



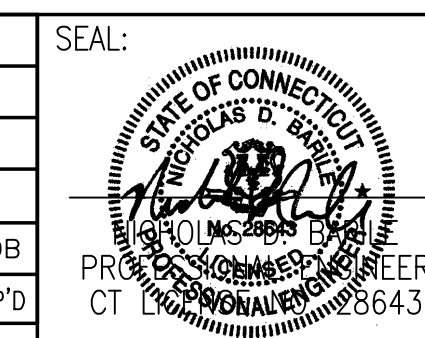
SITE NUMBER: CT2130
SITE NAME: GREENWICH NORTH

363 RIVERSVILLE ROAD
GREENWICH, CT 06831
FAIRFIELD COUNTY



550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

0	1/25/16	ISSUED AS FINAL	JW	NDB	NDB
NO.	DATE	REVISIONS	BY	CHK	APP'D
SCALE: AS SHOWN		DESIGNED BY: JW	DRAWN BY: JW		



AT&T		
DRAWING TITLE: TITLE SHEET		
JOB NUMBER 15128-EMP	DRAWING NUMBER T-1	REV 0

GROUNDING NOTES:

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.
2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS. TESTS SHALL BE PERFORMED IN ACCORDANCE WITH 25471-000-3PS-EG00-0001, DESIGN & TESTING OF FACILITY GROUNDING FOR CELL SITES.
4. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.
5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS; 2 AWG STRANDED COPPER FOR OUTDOOR BTS.
6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
7. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED WITH STAINLESS STEEL HARDWARE TO THE BRIDGE AND THE TOWER GROUND BAR.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
11. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
12. GROUND CONDUCTORS USED IN THE FACILITY GROUND AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC PLASTIC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (E.G., NON-METALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.
13. ALL TOWER GROUNDING SYSTEMS SHALL COMPLY WITH THE REQUIREMENTS OF ANSI/TIA 222. FOR TOWERS BEING BUILT TO REV-G OF THE STANDARD, THE WIRE SIZE OF THE BURIED GROUND RING AND CONNECTIONS BETWEEN THE TOWER AND THE BURIED GROUND RING SHALL BE CHANGED FROM 2 AWG TO 2/0 AWG. IN ADDITION, THE MINIMUM LENGTH OF THE GROUND RODS SHALL BE INCREASED FROM EIGHT FEET (8') TO TEN FEET (10').
14. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE 1/2" OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID TINNED COPPER GROUND WIRE, PER NEC 250.50.

GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
 CONTRACTOR – EMPIRE TELECOM
 SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
 OWNER – AT&T MOBILITY
 OEM – ORIGINAL EQUIPMENT MANUFACTURER
2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.
3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.
5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
6. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
7. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.
8. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR. ROUTING OF TRENCHING SHALL BE APPROVED BY CONTRACTOR
9. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
10. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OFF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
11. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
12. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.
13. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS UNLESS OTHERWISE SPECIFIED. ALL CONCRETING WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.
14. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy=36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCH UP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.
15. CONSTRUCTION SHALL COMPLY WITH SPECIFICATION 25741-000-3APS-A00Z-00002, "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T MOBILITY SITES."
16. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
17. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK MAY NEED TO BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
18. SINCE THE CELL SITE MAY BE ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE REQUIRED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

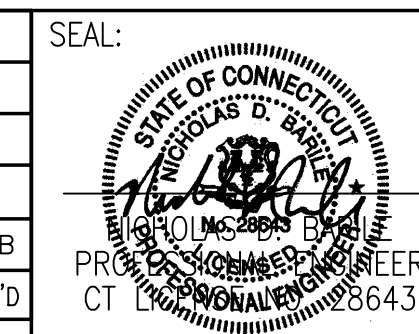
19. SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.
 - INTERNATIONAL BUILDING CODE: IBC 2009 WITH LOCAL & COUNTY AMENDMENTS
 - NATIONAL ELECTRICAL CODE: NEC 2011 WITH LOCAL & COUNTY AMENDMENTS
 - FIRE/LIFE SAFETY CODE: NFPA-101 2009 WITH LOCAL & COUNTY AMENDMENTS
20. SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:
 - AMERICAN CONCRETE INSTITUTE (ACI) 318, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE
 - AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), MANUAL OF STEEL CONSTRUCTION, THIRTEENTH EDITION
 - AMERICAN SOCIETY OF TESTING OF MATERIALS, ASTM
 - TELECOMMUNICATIONS INDUSTRY ASSOCIATION (ANSI/TIA-222-G-1), STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES:
 - TIA 607, COMMERCIAL BUILDING GROUNDING AND BONDING REQUIREMENTS FOR TELECOMMUNICATIONS
 - OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION, OSHA
 - INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE) 81, GUIDE FOR MEASURING EARTH RESISTIVELY, GROUND IMPEDANCE, AND EARTH SURFACE POTENTIALS OF A GROUND SYSTEM IEEE 1100 (1999) RECOMMENDED PRACTICE FOR POWERING AND GROUNDING OF ELECTRONIC EQUIPMENT
 - TELCORDIA GR-1503, COAXIAL CABLE CONNECTIONS
21. FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.
23. INFORMATION SHOWN ON THIS SET OF PLANS TAKEN FROM DRAWINGS PREPARED BY HUDSON DESIGN GROUP FOR A RECENT UPGRADE DATED 03/31/2011. CONTRACTOR TO NOTIFY DESIGN ENGINEER OF ANY DISCREPANCIES PRIOR TO COMMENCEMENT OF CONSTRUCTION.



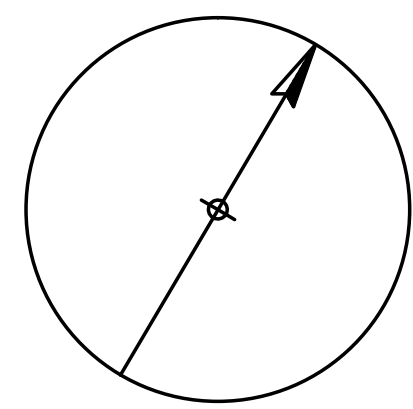
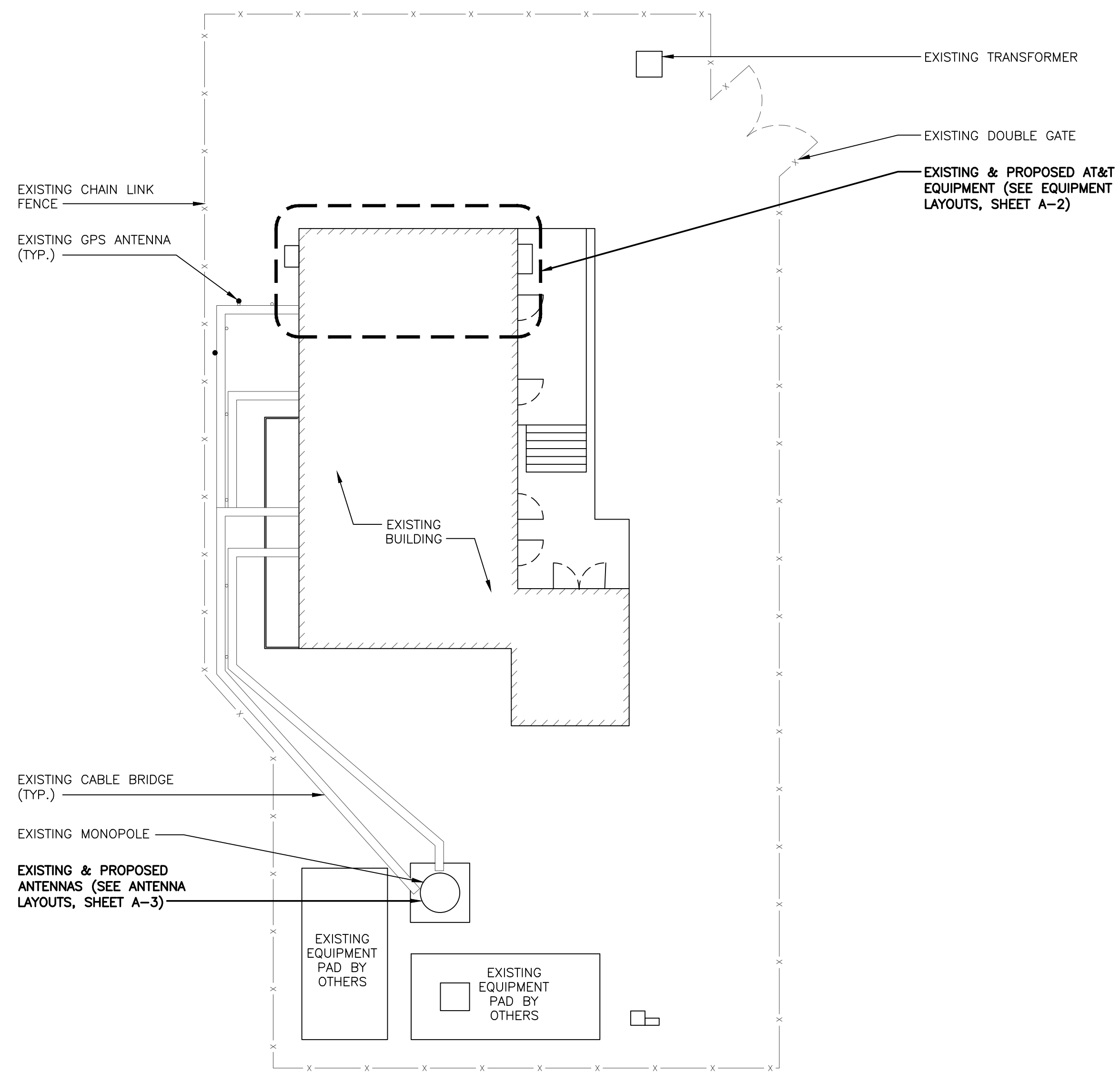
SITE NUMBER: CT2130
SITE NAME: GREENWICH NORTH
 363 RIVERSVILLE ROAD
 GREENWICH, CT 06831
 FAIRFIELD COUNTY



0	1/25/16	ISSUED AS FINAL	JW	NDB	NDB
NO.	DATE	REVISIONS	BY	CHK	APP'D
SCALE: AS SHOWN			DESIGNED BY: JW		DRAWN BY: JW



AT&T		
DRAWING TITLE: GROUNDING NOTES & GENERAL NOTES		
JOB NUMBER 15128-EMP	DRAWING NUMBER GN-1	REV 0



NORTH

COMPOUND LAYOUT
SCALE: 1/8" = 1'-0"

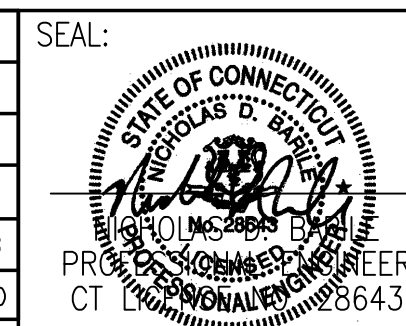
COM-EX
Consultants
115 ROUTE 46
SUITE E39
MOUNTAIN LAKES, NJ 07046
PHONE: 862.209.4300
FAX: 862.209.4301

EMPIRE
telecom
16 ESQUIRE ROAD
BILLERICA, MA 01821

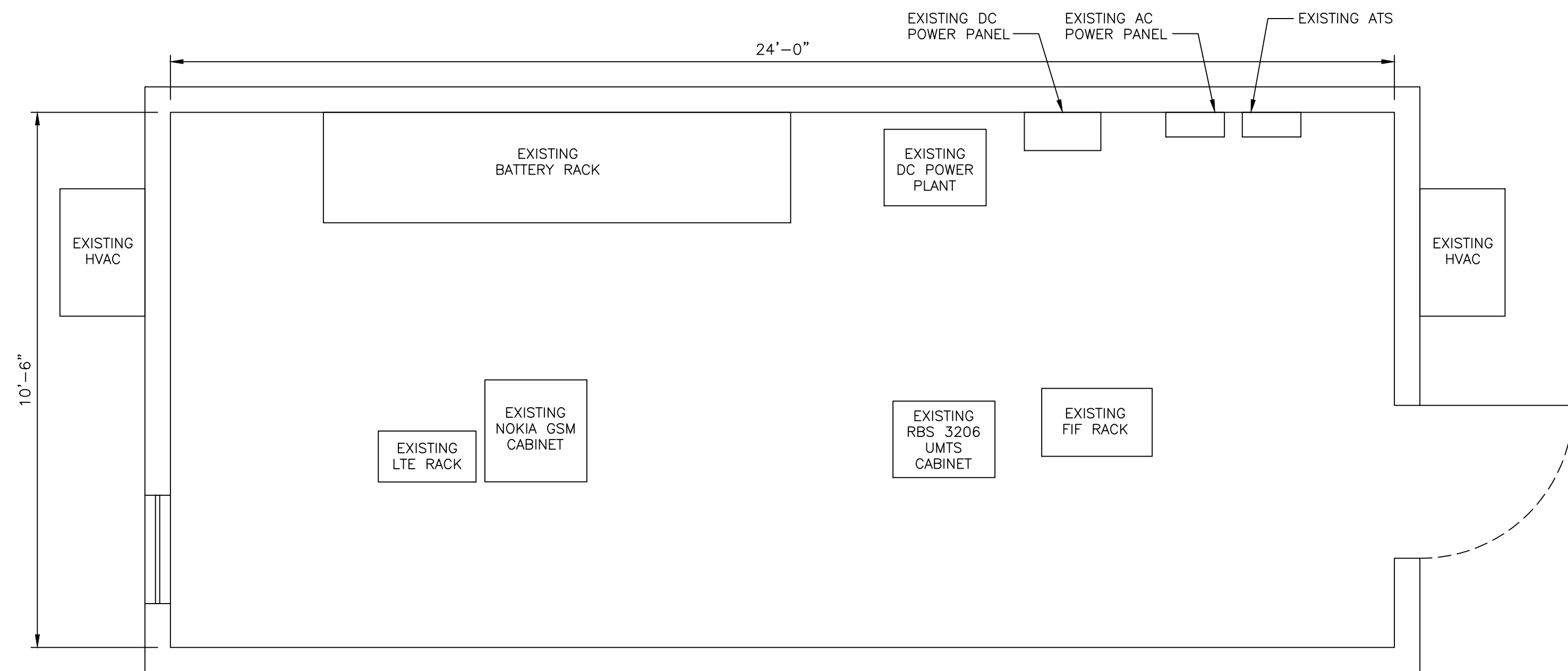
SITE NUMBER: CT2130
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363 RIVERSVILLE ROAD
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 **at&t**
MOBILITY
550 COCHITUATE ROAD
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SCALE: AS SHOWN			DESIGNED BY: JW		DRAWN BY: JW

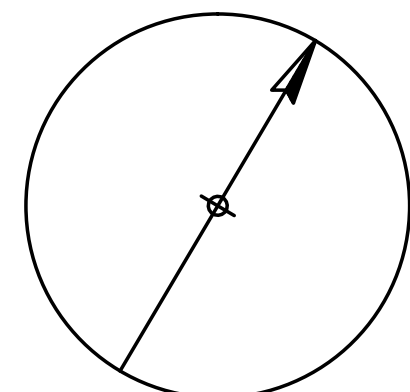


AT&T		
DRAWING TITLE: COMPOUND LAYOUT		
JOB NUMBER 15128-EMP	DRAWING NUMBER A-1	REV 0

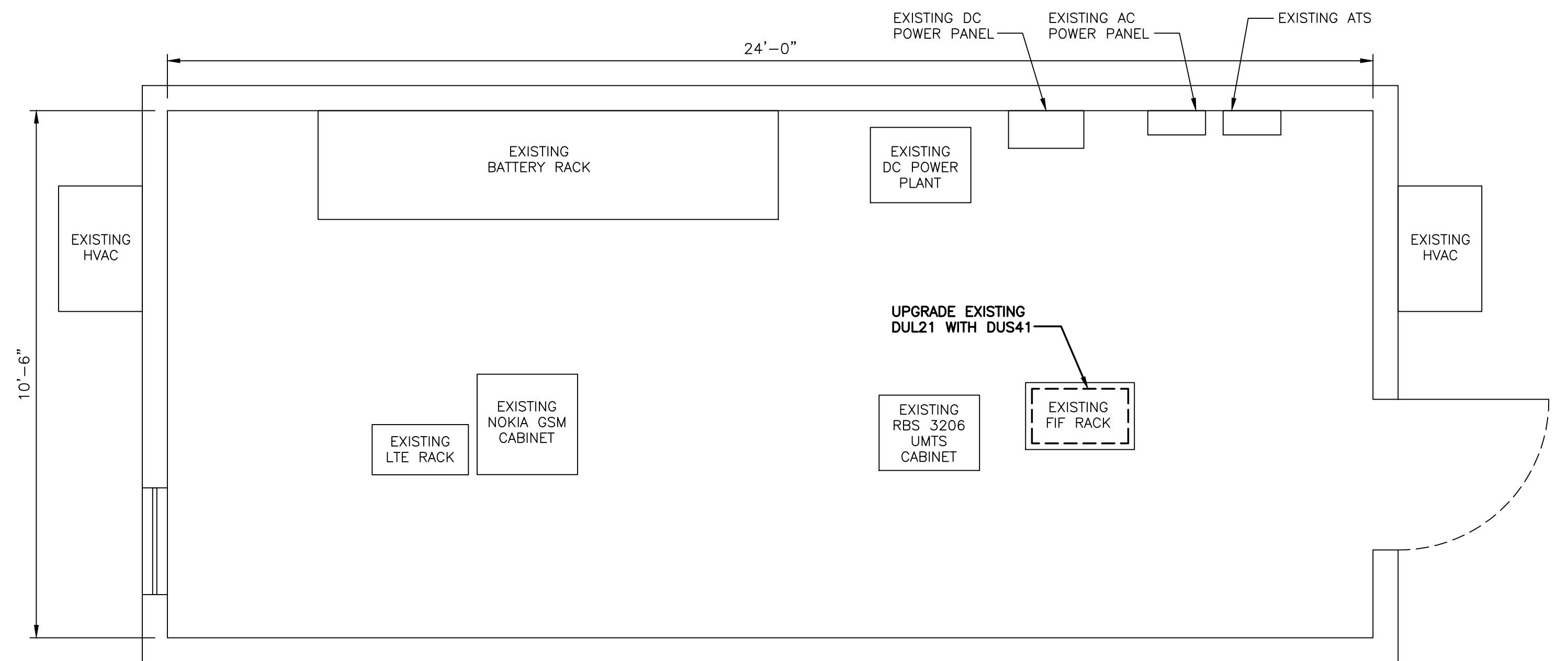


EXISTING EQUIPMENT LAYOUT

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

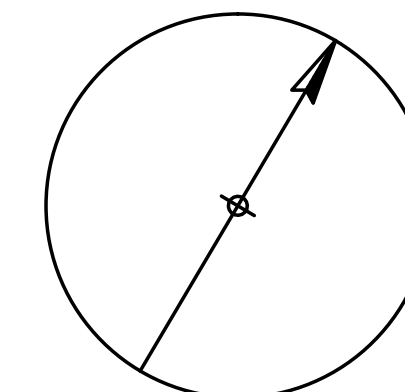


NORTH



PROPOSED EQUIPMENT LAYOUT

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



NORTH

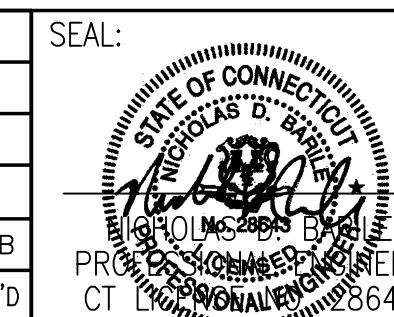
COM-EX
 Consultants
 115 ROUTE 46
 SUITE E39
 MOUNTAIN LAKES, NJ 07046
 PHONE: 862.209.4300
 FAX: 862.209.4301

EMPIRE
 telecom
 16 ESQUIRE ROAD
 BILLERICA, MA 01821

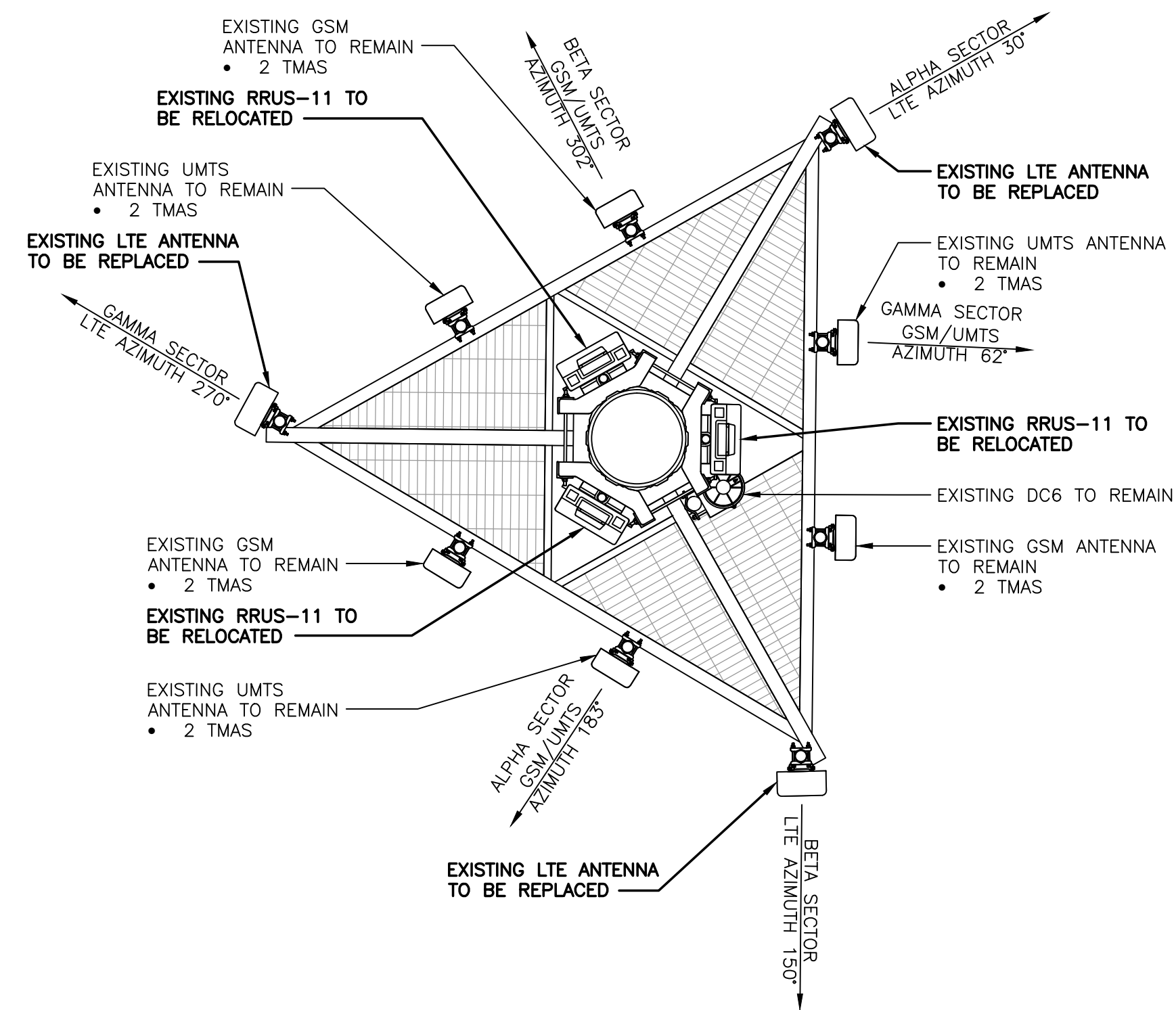
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SITE NAME: GREENWICH NORTH
 363 RIVERSVILLE ROAD
 GREENWICH, CT 06831
 FAIRFIELD COUNTY

 **at&t**
 MOBILITY
 550 COCHITUATE ROAD
 FRAMINGHAM, MA 01701

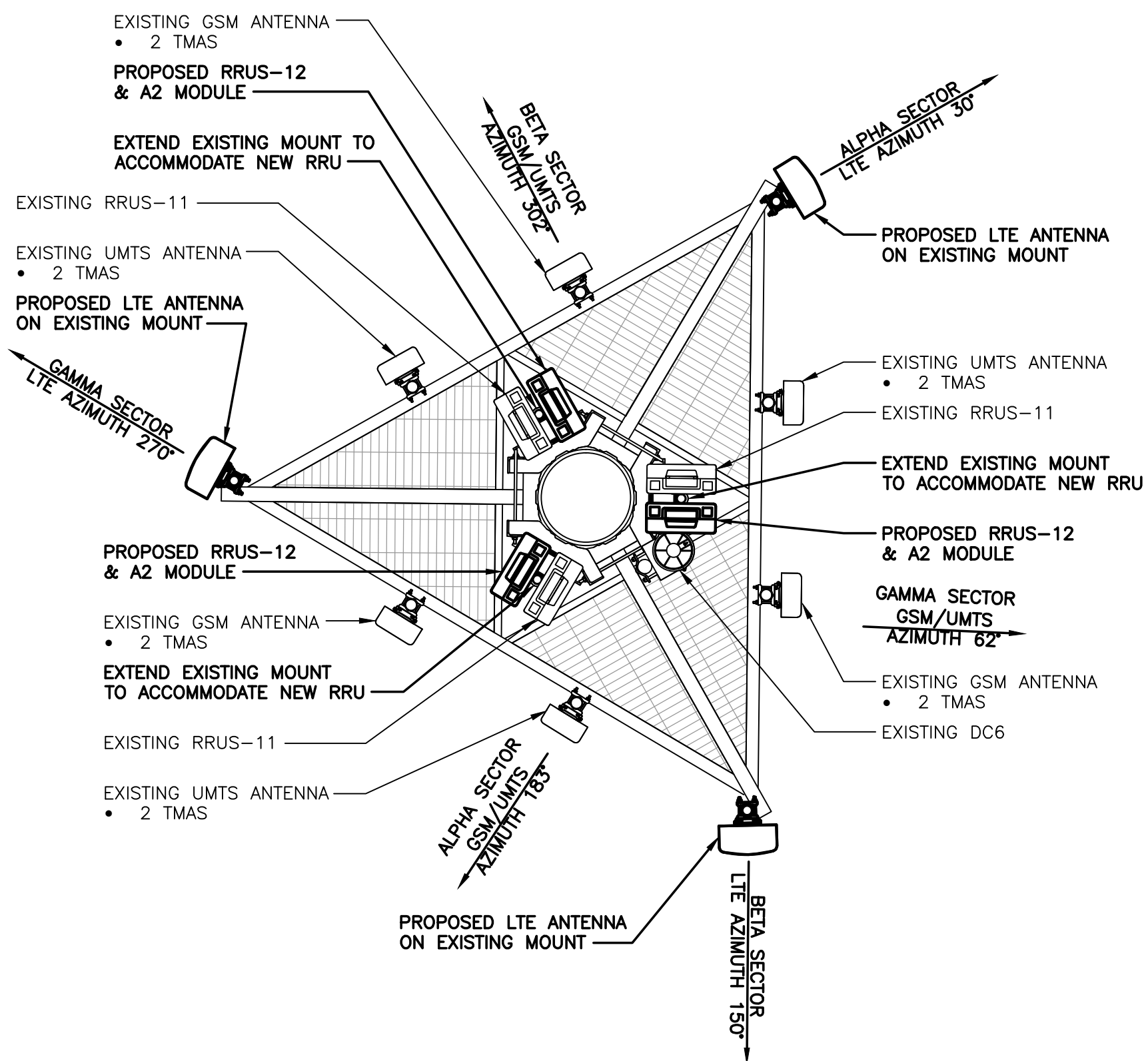
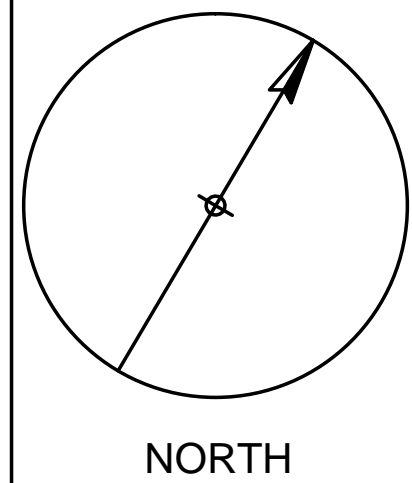
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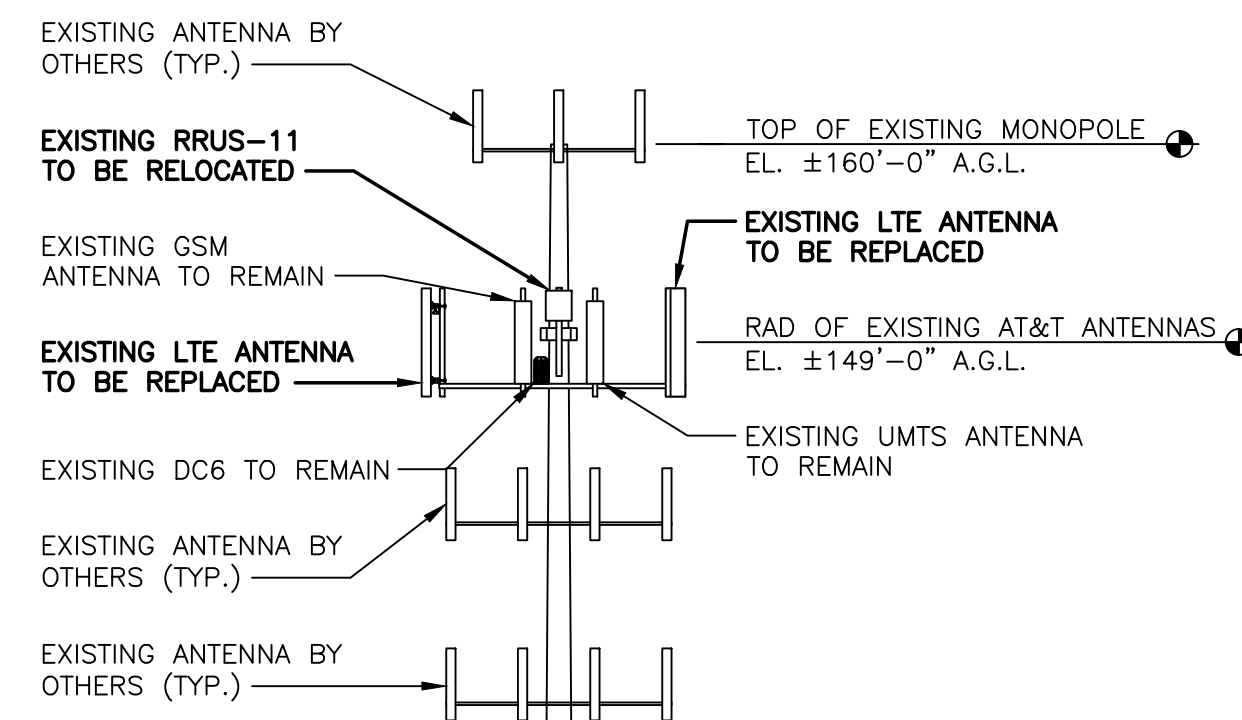
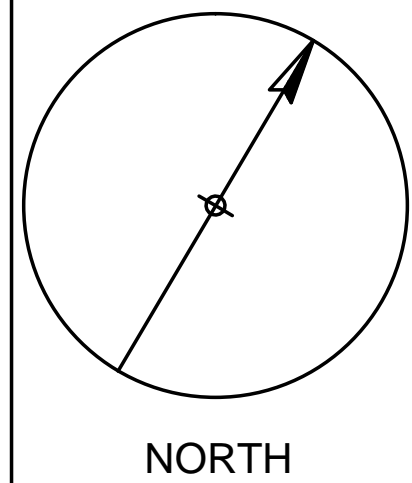
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DRAWING TITLE: EQUIPMENT LAYOUTS		
JOB NUMBER 15128-EMP	DRAWING NUMBER A-2	REV 0



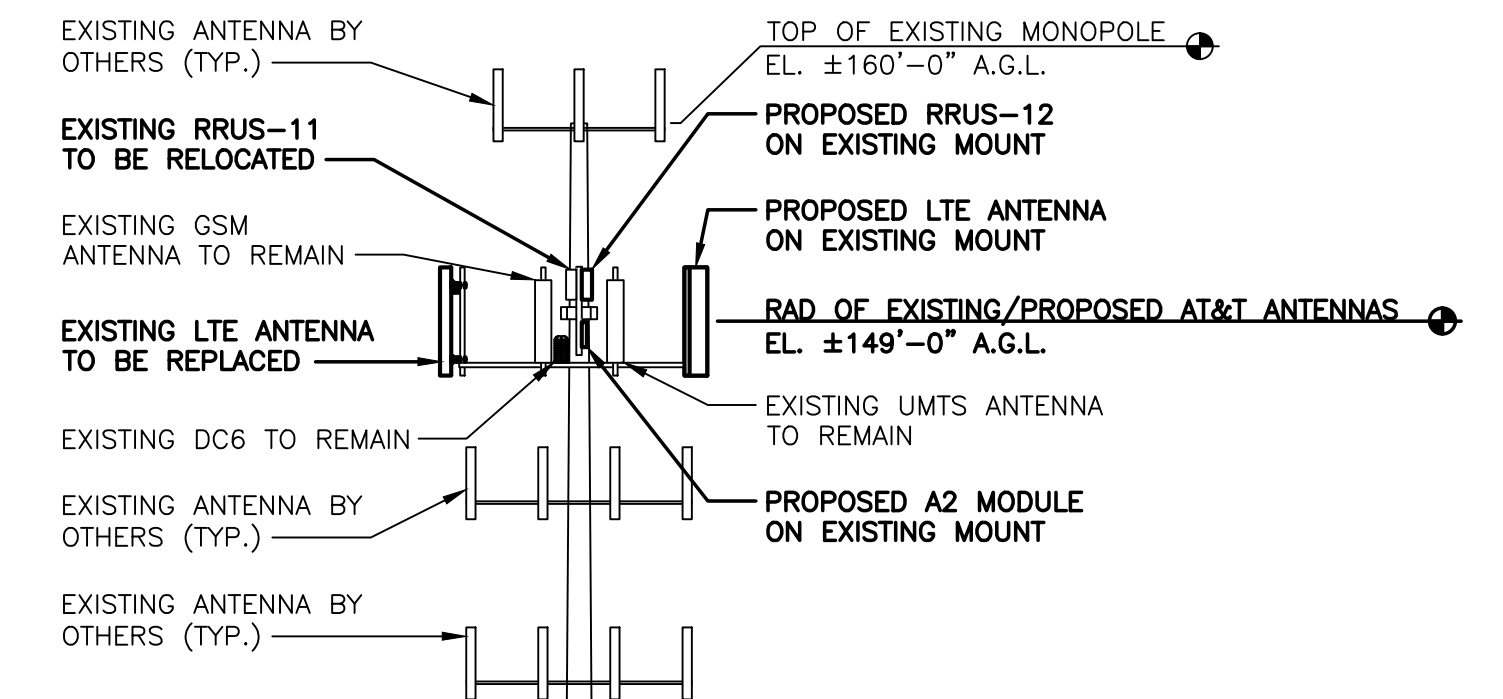
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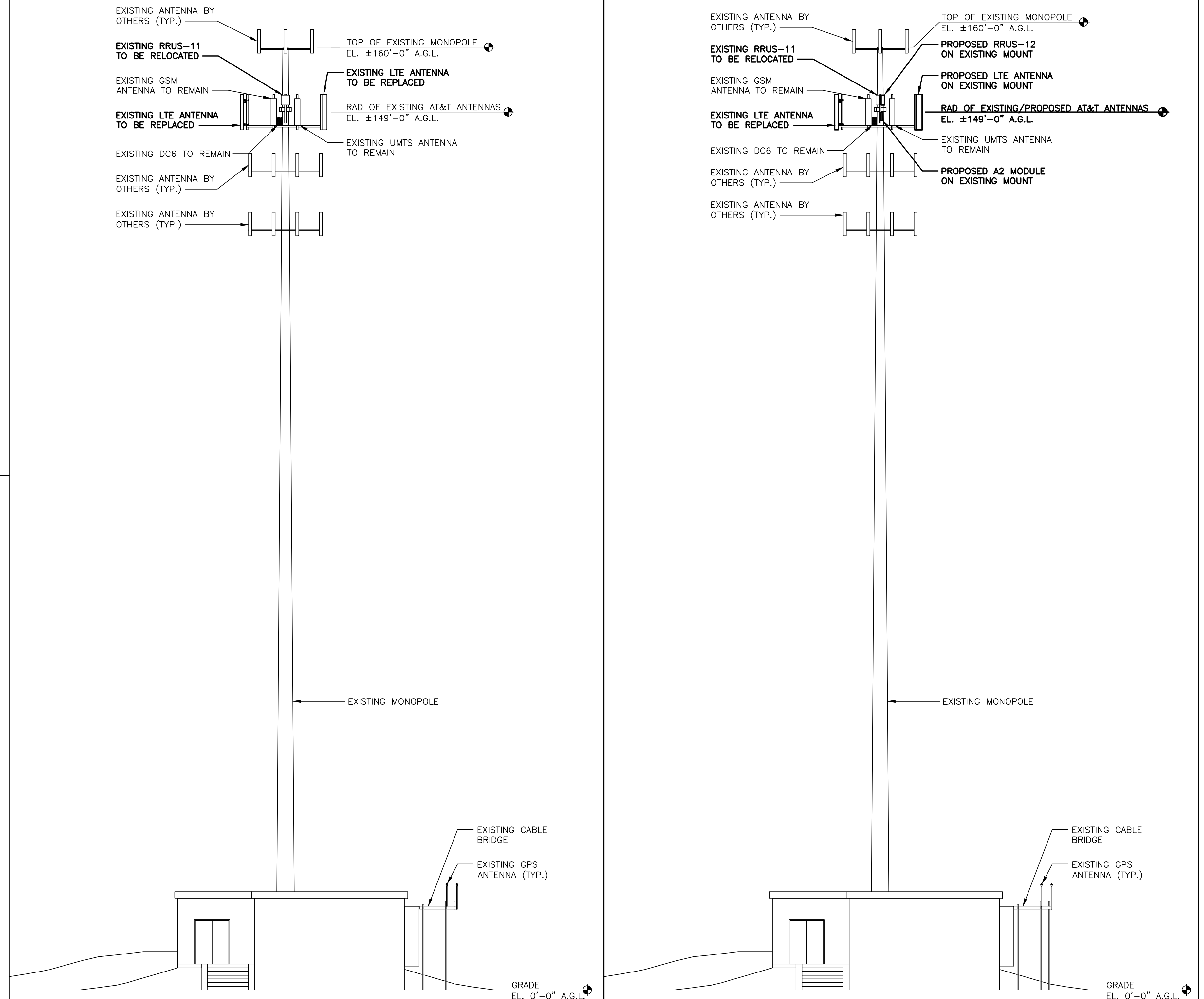
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SCALE: N.T.S.



EXISTING TOWER ELEVATION
SCALE: 3/32" = 1'-0"
GRAPHIC SCALE: 3/32" = 1'-0"



PROPOSED TOWER ELEVATION
SCALE: 3/32" = 1'-0"
GRAPHIC SCALE: 3/32" = 1'-0"



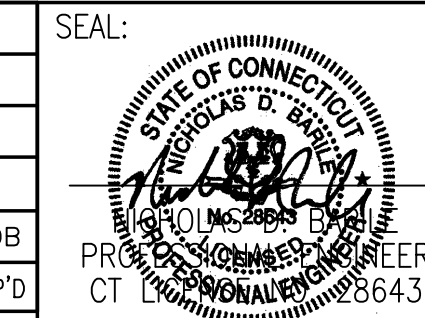
COM-EX
Consultants
115 ROUTE 46
SUITE E39
MOUNTAIN LAKES, NJ 07046
PHONE: 862.209.4300
FAX: 862.209.4301

EMPIRE
telecom
16 ESQUIRE ROAD
BILLERICA, MA 01821

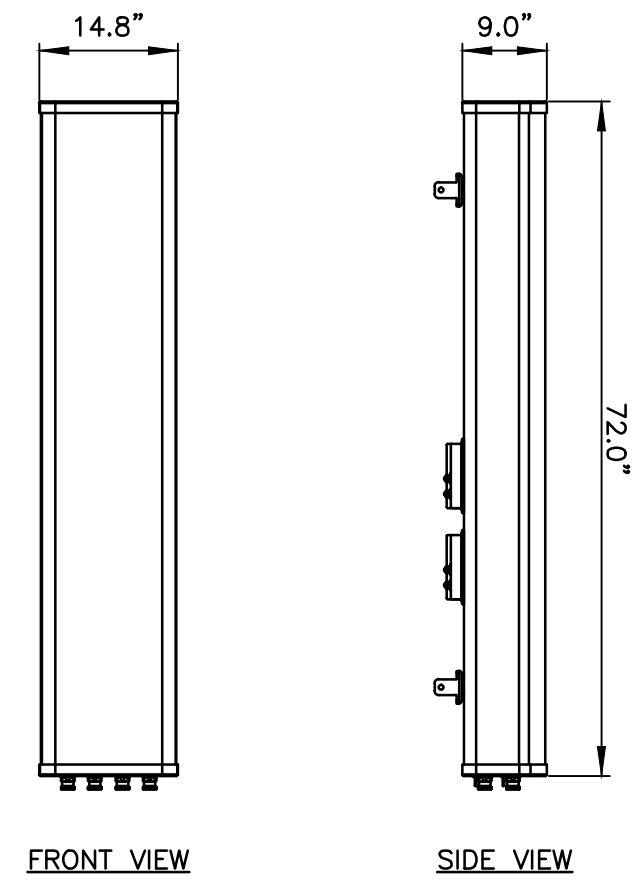
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SITE NAME: GREENWICH NORTH
363 RIVERSVILLE ROAD
GREENWICH, CT 06831
FAIRFIELD COUNTY

at&t
MOBILITY
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

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NO.	DATE	REVISIONS	BY	CHK	APP'D
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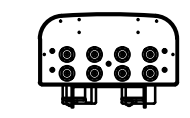


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JOB NUMBER 15128-EMP	DRAWING NUMBER A-3	REV 0



FRONT VIEW

SIDE VIEW

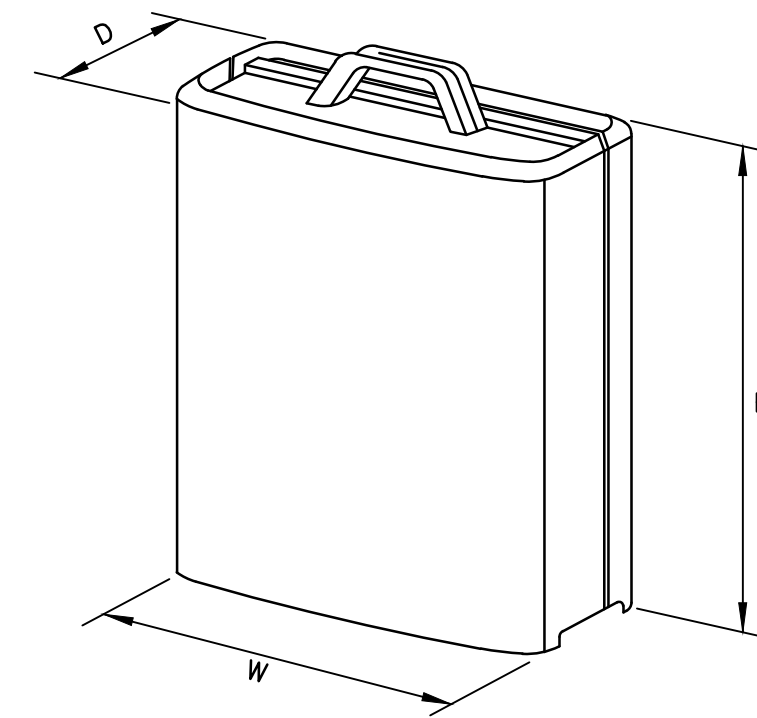


BOTTOM VIEW

MANUFACTURER	CCI
MODEL	HPA-65R-BUU-H6
WEIGHT	42.9 LBS

LTE ANTENNA DETAIL

SCALE: N.T.S.



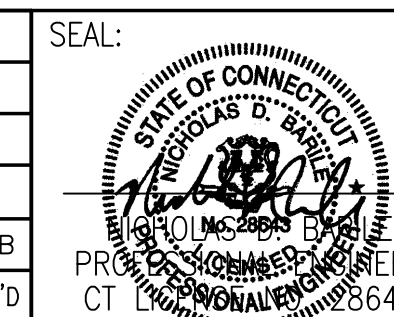
MODEL	L x W x H	WEIGHT
* RRUS-11	19.69" x 16.97" x 7.17"	50.7 LBS
RRUS-12	19.69" x 16.97" x 7.17"	50.7 LBS

* DENOTES EXISTING

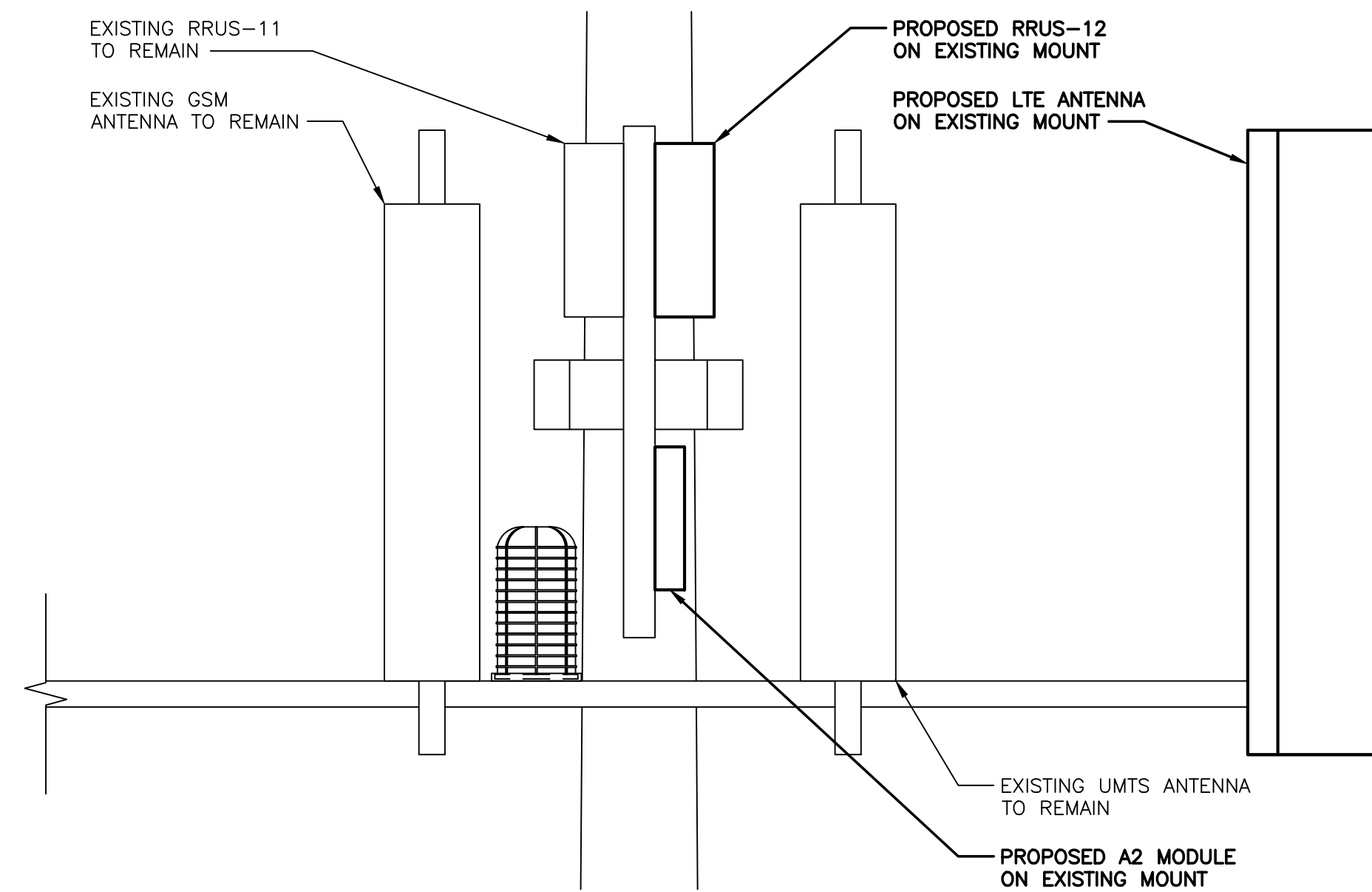
RRUS DETAIL

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0	1/25/16	ISSUED AS FINAL	JW	NDB	NDB
NO.	DATE	REVISIONS	BY	CHK	APP'D
SCALE: AS SHOWN			DESIGNED BY: JW		DRAWN BY: JW

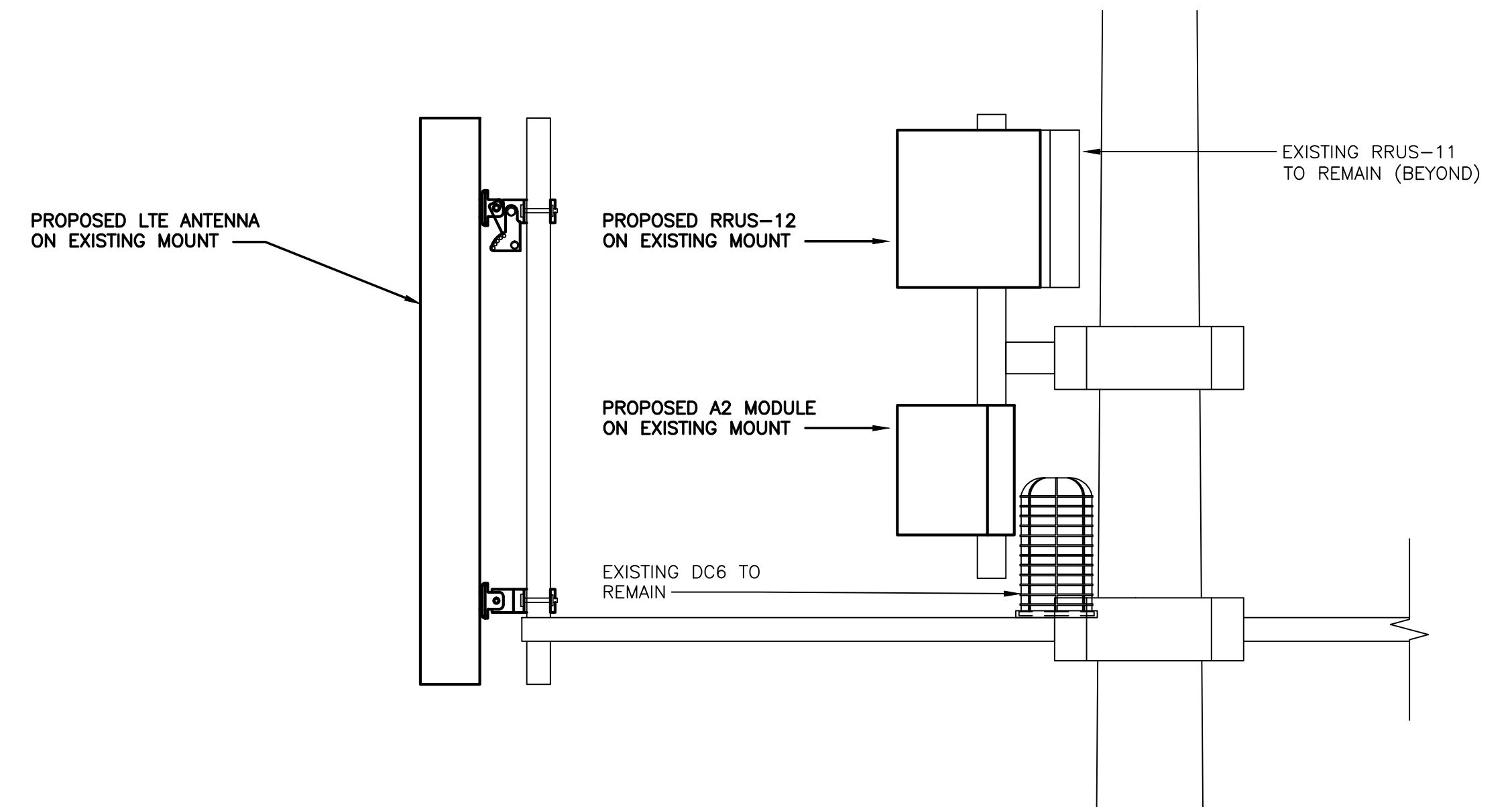


AT&T		
DRAWING TITLE:		
DETAILS		
JOB NUMBER	DRAWING NUMBER	REV
15128-EMP	A-4	0



PROPOSED ANTENNA MOUNTING DETAIL (FRONT VIEW)

SCALE: N.T.S.



PROPOSED ANTENNA MOUNTING DETAIL (SIDE VIEW)

SCALE: N.T.S.

EXISTING ANTENNA SCHEDULE

SECTOR	POSITION	MAKE	MODEL	SIZE (INCHES)
ALPHA	A1	POWERWAVE	P65-16-XLH-RR	72"x12"x6"
	A2	POWERWAVE	7770	55"x11"x5"
	A3	POWERWAVE	7770	55"x11"x5"
BETA	B1	POWERWAVE	P65-16-XLH-RR	72"x12"x6"
	B2	POWERWAVE	7770	55"x11"x5"
	B3	POWERWAVE	7770	55"x11"x5"
GAMMA	C1	POWERWAVE	P65-16-XLH-RR	72"x12"x6"
	C2	POWERWAVE	7770	55"x11"x5"
	C3	POWERWAVE	7770	55"x11"x5"

FINAL ANTENNA SCHEDULE

SECTOR	POSITION	MAKE	MODEL	SIZE (INCHES)
ALPHA	A1	CCI	HPA-65R-BUU-H6	72"x14.8"x9"
	A2	POWERWAVE	7770	55"x11"x5"
	A3	POWERWAVE	7770	55"x11"x5"
BETA	B1	CCI	HPA-65R-BUU-H6	72"x14.8"x9"
	B2	POWERWAVE	7770	55"x11"x5"
	B3	POWERWAVE	7770	55"x11"x5"
GAMMA	C1	CCI	HPA-65R-BUU-H6	72"x14.8"x9"
	C2	POWERWAVE	7770	55"x11"x5"
	C3	POWERWAVE	7770	55"x11"x5"

PROPOSED RRU SCHEDULE

SECTOR	MAKE	MODEL	SIZE (INCHES)	ADDITIONAL COMPONENT	SIZE (INCHES)
ALPHA	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"		
	ERICSSON	RRUS-12	19.7"x16.9"x7.2"	ERICSSON A2 MODULE	16.4"x15.2"x3.4"
BETA	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"		
	ERICSSON	RRUS-12	19.7"x16.9"x7.2"	ERICSSON A2 MODULE	16.4"x15.2"x3.4"
GAMMA	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"		
	ERICSSON	RRUS-12	19.7"x16.9"x7.2"	ERICSSON A2 MODULE	16.4"x15.2"x3.4"

PROJECT OWNER IS RESPONSIBLE FOR PROVIDING A STRUCTURAL STABILITY ANALYSIS TO DETERMINE THE CAPACITY AND SUITABILITY OF THE EXISTING ANTENNA SUPPORT STRUCTURE TO SAFELY CARRY ALL ADDITIONAL LOADS IMPOSED BY THE PROPOSED EQUIPMENT AS SHOWN HEREIN. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR INCORPORATING ANY REQUIRED STRUCTURAL MODIFICATIONS INTO THEIR SCOPE OF WORK.

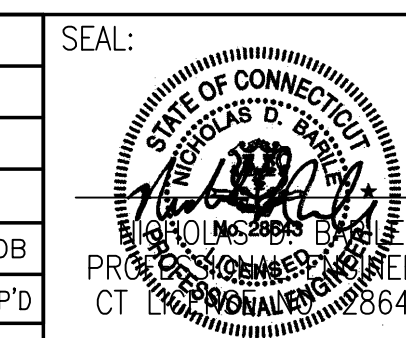
COM-EX
Consultants
115 ROUTE 46
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MOUNTAIN LAKES, NJ 07046
PHONE: 862.209.4300
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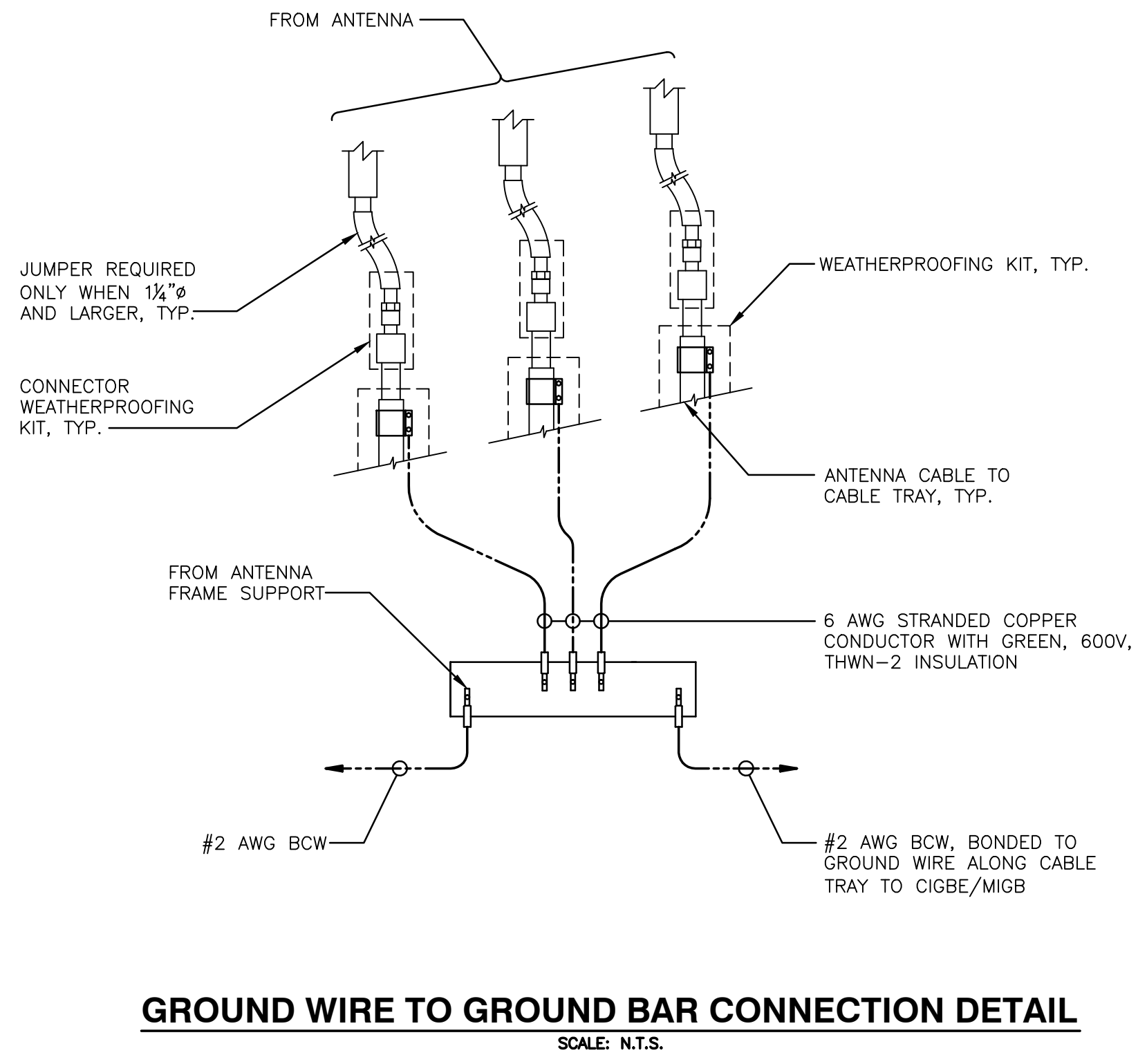
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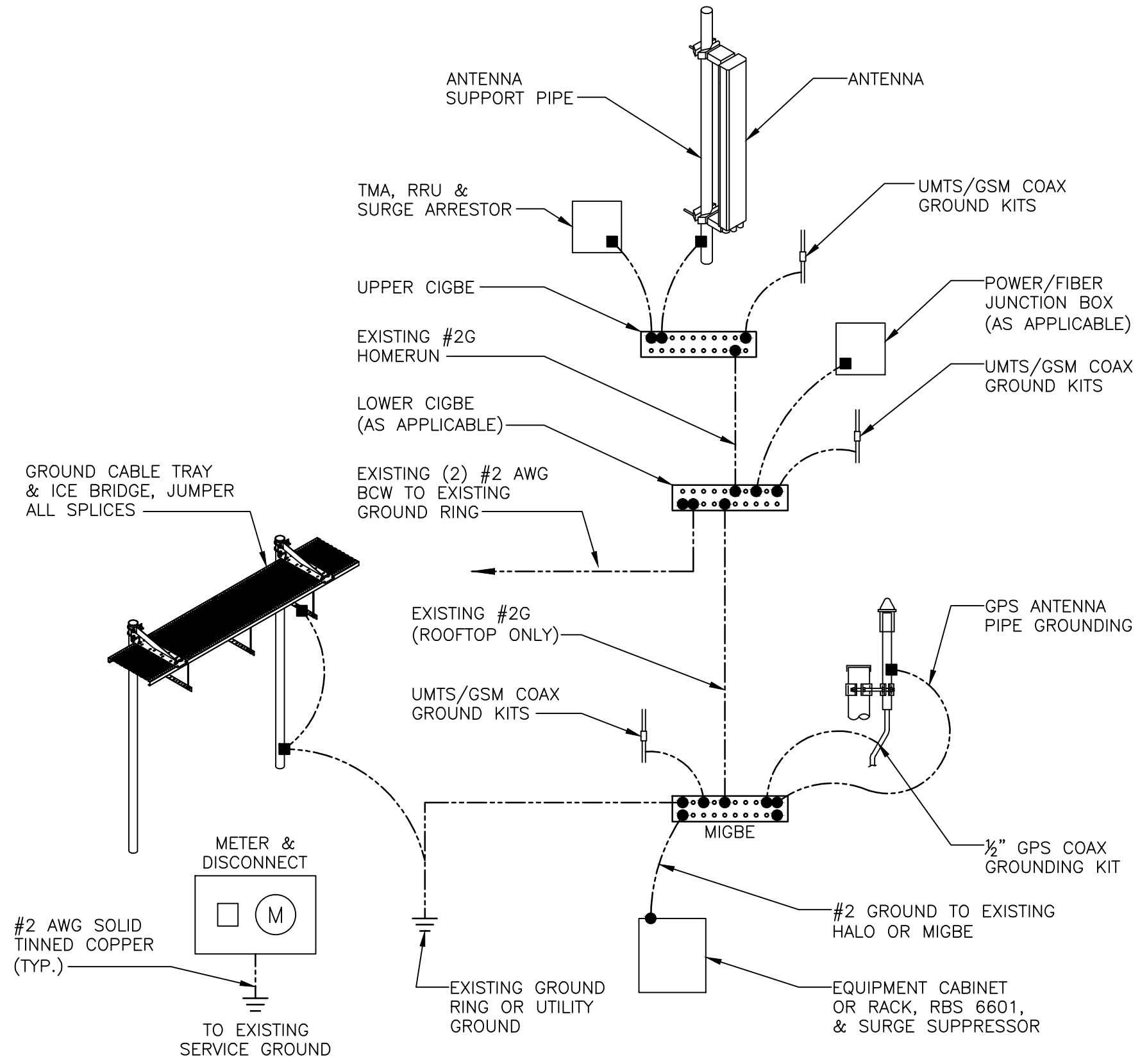
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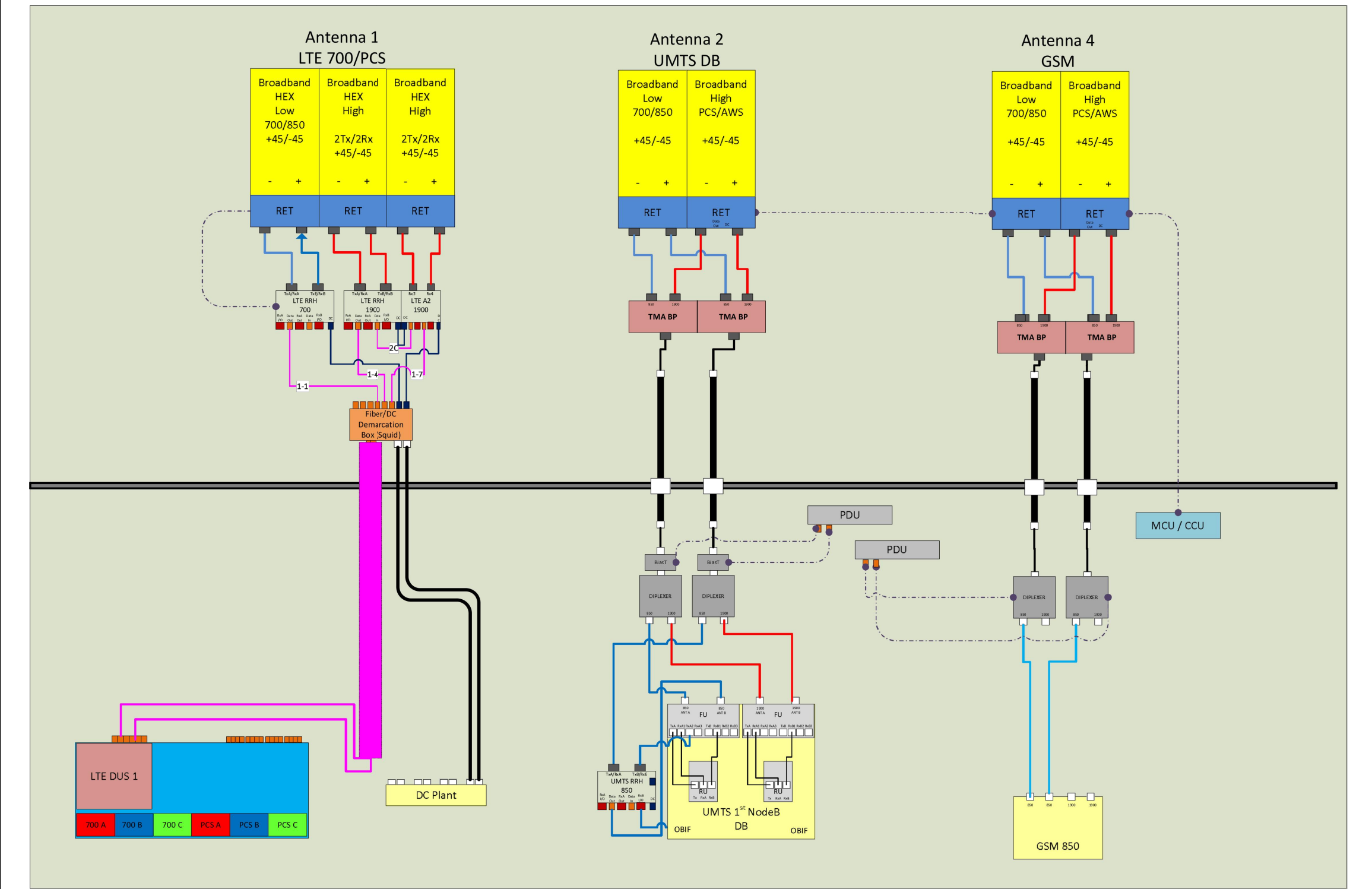
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ANTENNA MOUNTING DETAILS		
JOB NUMBER	DRAWING NUMBER	REV
15128-EMP	A-5	0



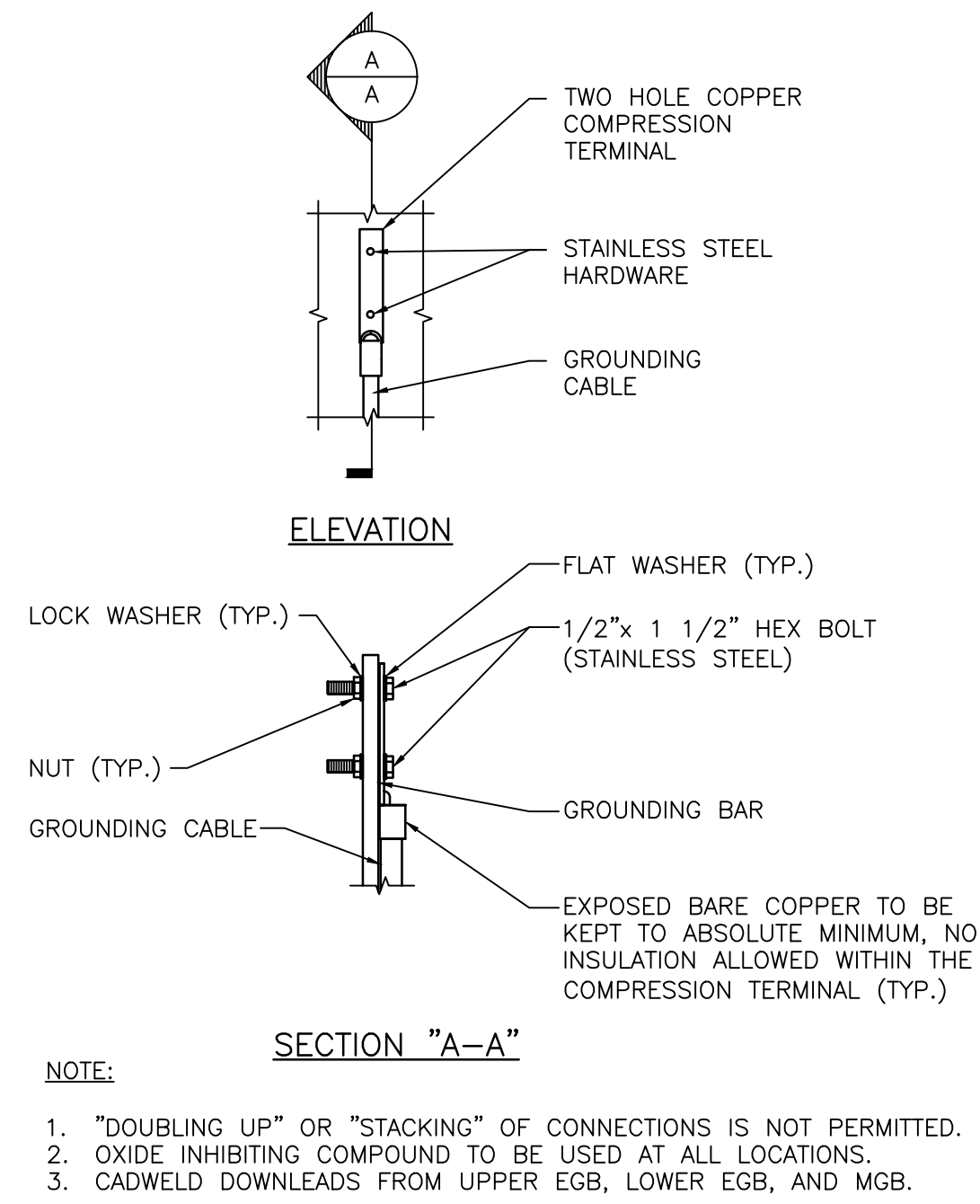
GROUND WIRE TO GROUND BAR CONNECTION DETAIL
SCALE: N.T.S.



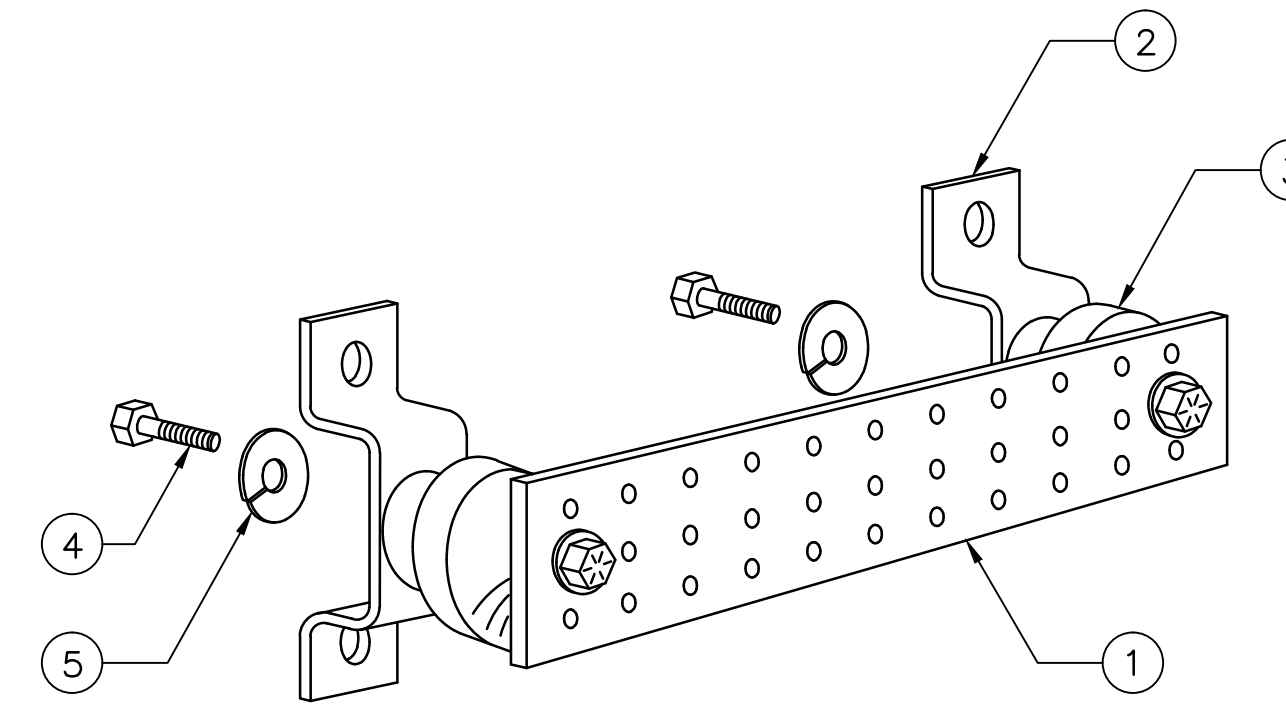
GROUNDING RISER DIAGRAM
SCALE: N.T.S.



TYPICAL PLUMBING DIAGRAM (PER SECTOR)
SCALE: N.T.S.



TYPICAL GROUND BAR CONNECTION DETAIL
SCALE: N.T.S.



ITEM NO.	QTY.	DESCRIPTION
1	1	SOLID GROUND BAR (20"x 4"x 1/4")
2	2	WALL MOUNTING BRACKET
3	2	INSULATORS
4	4	5/8"-11x1" H.H.C.S.
5	4	5/8" LOCK WASHER

- NOTES:
- EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION
- SECTION "P" - SURGE PRODUCERS**
- CABLE ENTRY PORTS (HATCH PLATES) (#2)
 - GENERATOR FRAMEWORK (IF AVAILABLE) (#2)
 - TELCO GROUND BAR
 - COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (#2)
 - +24V POWER SUPPLY RETURN BAR (#2)
 - -48V POWER SUPPLY RETURN BAR (#2)
 - RECTIFIER FRAMES
- SECTION "A" - SURGE ABSORBERS**
- INTERIOR GROUND RING (#2)
 - EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2)
 - METALLIC COLD WATER PIPE (IF AVAILABLE) (#2)
 - BUILDING STEEL (IF AVAILABLE) (#2)

GROUND BAR DETAIL
SCALE: N.T.S.



Date: December 07, 2015

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

Paul J Ford and Company
250 E. Broad St Suite 600
Columbus, OH 43215
614-221-6679

Subject: Structural Analysis Report

Carrier Designation: **AT&T Mobility Co-Locate**
Carrier Site Number: CT2130
Carrier Site Name: Greenwich North

Crown Castle Designation: **Crown Castle BU Number:** 841290
Crown Castle Site Name: GREENWICH NORTH
Crown Castle JDE Job Number: 355202
Crown Castle Work Order Number: 1152189
Crown Castle Application Number: 319000 Rev. 2

Engineering Firm Designation: **Paul J Ford and Company Project Number:** 37515-3249.001.7805

Site Data: **363 RIVERSVILLE ROAD, GREENWICH, Fairfield County, CT**
Latitude 41° 3' 58.6", Longitude -73° 40' 17.4"
160 Foot - Monopole Tower

Dear Rebecca Klein,

Paul J Ford and Company is pleased to submit this "Structural Analysis Report" to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 845383, in accordance with application 319000, revision 2.

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

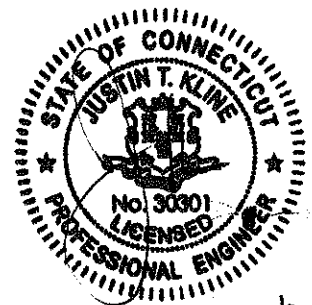
LC7: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

The analysis has been performed in accordance with the TIA/EIA-222-F standard and the 2005 Connecticut (CT) State Building Code with 2009 amendment based upon a wind speed of 85 mph fastest mile.

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

Respectfully submitted by:


Christina Hedges, PE
Project Engineer **NKR/B**



12-0-15

Date: **December 07, 2015**

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

Paul J Ford and Company
250 E. Broad St Suite 600
Columbus, OH 43215
614-221-6679

Subject: Structural Analysis Report

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1) INTRODUCTION

This tower is a 160 ft Monopole tower designed by ENGINEERED ENDEAVORS, INC. in April of 2003. 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 85 mph with no ice, 38 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
149.0	149.0	3	cci antennas	HPA-65R-BUU-H6 w/ Mount Pipe	1	3/8	
		3	ericsson	RRUS 11			
		3	ericsson	RRUS 12 B2/RRUS A2	2	7/8	
		1	raycap	DC6-48-60-18-8F			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
160.0	163.0	3	commscope	LNx-6515DS-VTM w/ Mount Pipe	13	1 5/8	2
		3	ericsson	RRUS 11 B12			
		3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe			
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe			
	1	rfs celwave	ATMAA1412D-1A20	1			
160.0	1	tower mounts	Platform Mount [LP 1201-1]				
153.0	153.0	3	ericsson	TME-RRUS-11	2	3/8*	1
		1	raycap	TME-DC6-48-60-18-8F			
		1	tower mounts	Side Arm Mount [SO 102-3]			
149.0	151.0	6	powerwave tech	7770.00 w/ Mount Pipe	12	3/8* 1 5/8	1
		12	powerwave tech	LGP21401			
	149.0	1	tower mounts	Platform Mount [LP 1201-1]	3		3
		3	powerwave tech	P65-16-XLH-RR w/ mount pipe			
140.0	142.0	3	alcatel lucent	RRH2X40-AWS	2	1 5/8	2
		6	amphenol	WWX063X19G00 w/ Mount Pipe			
		1	antel	BXA-70063/8CFx2 w/ Mount Pipe			
		2	decibel	DB844H80E-XY w/ Mount Pipe			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
	140.0	2	powerwave technologies	P65-16-XL-M w/ Mount Pipe	18	1 5/8	1
		4	rfs celwave	APL868013-42T0 w/ Mount Pipe			
		1	rfs celwave	DB-T1-6Z-8AB-0Z			2
		3	alcatel lucent	TME-RRH2X60-PCS			
		1	tower mounts	Platform Mount [LP 1201-1]			1
122.0	122.0	1	tower mounts	Miscellaneous [NA 510-1]			1
120.0	122.0	3	alcatel lucent	1900MHz RRH	2 3	1/2 1 1/4	1
		3	alcatel lucent	800MHZ RRH			
		3	rfs celwave	APXVSP18-C-A20 w/ Mount Pipe			
		9	tower mounts	6' x 2" Mount Pipe			
	120.0	1	tower mounts	Platform Mount [LP 1201-1]			
119.0	119.0	3	alcatel lucent	TME-1900MHz RRH w/ 4' x 2" Mount Pipe			1
		3	alcatel lucent	TME-800MHZ RRH			
		1	tower mounts	Side Arm Mount [SO 102-3]			
72.0	73.0	2	gps	GPS_A	1	1/2	1
	72.0	1	tower mounts	Side Arm Mount [SO 701-1]			

*Installed inside (2) 2" conduits

Notes:

- 1) Existing equipment
- 2) Reserved Equipment
- 3) Equipment to be removed

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
Tower Drawings / Specifications	EEl Project #: 5590, 04/10/2003	5121537	CCIsites
Foundation Drawings / Specifications	EEl Project #: 5590, 04/10/2003	5121536	CCIsites
Foundation Exploration Report	WEI Project #: 2009-895, 09/04/2009	4468638	CCIsites
Geotechnical Report	WEI Project #: 2009-895, 09/04/2009	5121535	CCIsites

3.1) Analysis Method

tnxTower (version 6.1.4.1), 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 foundation pad dimensions were taken from the field mapping. We also used the rebar type determined from the mapping. Based on this information we assumed that the orientation of the rebar within the pier was square.

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	160 - 152	Pole	TP30.62x29x0.1875	1	-3.54	908.48	10.9	Pass
L2	152 - 111.29	Pole	TP38.86x30.62x0.25	2	-16.69	1547.47	62.2	Pass
L3	111.29 - 77.42	Pole	TP45.09x37.263x0.3125	3	-23.58	2245.56	84.9	Pass
L4	77.42 - 36.46	Pole	TP52.62x43.2359x0.4375	4	-35.78	3665.31	79.0	Pass
L5	36.46 - 0	Pole	TP59x50.3353x0.5	5	-52.59	4826.45	79.4	Pass
							Summary	
						Pole (L3)	84.9	Pass
						Rating =	84.9	Pass

Table 5 - Tower Component Stresses vs. Capacity – LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	68.4	Pass
1	Base Plate	0	86.2	Pass
1	Base Foundation	0	81.9	Pass
1	Base Foundation Soil Interaction	0	67.9	Pass
1	Flange Bolts	152	14.1	Pass
1	Flange Plate	152	12.9	Pass

Structure Rating (max from all components) =	86.2%
---	--------------

Notes:

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

APPENDIX A

TNXTOWER OUTPUT

Tower Input Data

There is a pole section.

This tower is designed using the TIA/EIA-222-F standard.

The following design criteria apply:

- 1) Tower is located in Fairfield County, Connecticut.
- 2) Basic wind speed of 85 mph.
- 3) Nominal ice thickness of 0.7500 in.
- 4) Ice thickness is considered to increase with height.
- 5) Ice density of 56 pcf.
- 6) A wind speed of 38 mph is used in combination with ice.
- 7) Temperature drop of 50 °F.
- 8) Deflections calculated using a wind speed of 50 mph.
- 9) A non-linear (P-delta) analysis was used.
- 10) Pressures are calculated at each section.
- 11) Stress ratio used in pole design is 1.333.
- 12) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

- | | | |
|--|--|---|
| <ul style="list-style-type: none"> 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) Add IBC .6D+W Combination | <ul style="list-style-type: none"> 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 SR Members Have Cut Ends Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Use TIA-222-G Tension Splice Capacity Exemption | <ul style="list-style-type: none"> Treat Feedline 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 Feedline Torque Include Angle Block Shear Check <li style="text-align: center;">Poles √ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets |
|--|--|---|

Tapered Pole Section Geometry

Section	Elevation <i>ft</i>	Section Length <i>ft</i>	Splice Length <i>ft</i>	Number of Sides	Top Diameter <i>in</i>	Bottom Diameter <i>in</i>	Wall Thickness <i>in</i>	Bend Radius <i>in</i>	Pole Grade
L1	160.00-152.00	8.00	0.00	18	29.0000	30.6200	0.1875	0.7500	A572-65 (65 ksi)
L2	152.00-111.29	40.71	5.42	18	30.6200	38.8600	0.2500	1.0000	A572-65 (65 ksi)
L3	111.29-77.42	39.29	6.17	18	37.2630	45.0900	0.3125	1.2500	A572-65 (65 ksi)
L4	77.42-36.46	47.13	7.08	18	43.2359	52.6200	0.4375	1.7500	A572-65 (65 ksi)
L5	36.46-0.00	43.54		18	50.3353	59.0000	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
L1	29.4474	17.1470	1798.4090	10.2284	14.7320	122.0750	3599.1844	8.5751	4.7740	25.461
	31.0924	18.1111	2119.1346	10.8035	15.5550	136.2353	4241.0576	9.0573	5.0591	26.982
L2	31.0924	24.0986	2808.1400	10.7814	15.5550	180.5302	5619.9750	12.0516	4.9491	19.796
	39.4595	30.6370	5770.1059	13.7066	19.7409	292.2922	11547.8043	15.3214	6.3994	25.597
L3	38.9342	36.6502	6321.9884	13.1174	18.9296	333.9740	12652.2955	18.3286	6.0083	19.226
	45.7856	44.4137	11250.5543	15.8960	22.9057	491.1679	22515.9125	22.2111	7.3858	23.635
L4	45.1503	59.4309	13753.2027	15.1934	21.9638	626.1754	27524.5022	29.7211	6.8395	15.633
	53.4317	72.4619	24928.5533	18.5248	26.7310	932.5723	49889.9082	36.2378	8.4911	19.408
L5	52.5425	79.0886	24815.6294	17.6915	25.5703	970.4854	49663.9118	39.5518	7.9790	15.958
	59.9102	92.8395	40140.4258	20.7675	29.9720	1339.2642	80333.6694	46.4286	9.5040	19.008

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C _A A _A		Weight plf
						ft ² /ft		
Safety Line 3/8	B	No	CaAa (Out Of Face)	160.00 - 8.00	1	No Ice	0.04	0.22
						1/2" Ice	0.14	0.75
						1" Ice	0.24	1.28
						2" Ice	0.44	2.34
						4" Ice	0.84	4.46
LDF7-50A(1-5/8")	A	No	Inside Pole	160.00 - 8.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	A	No	Inside Pole	160.00 - 8.00	1	No Ice	0.00	1.07
						1/2" Ice	0.00	1.07
						1" Ice	0.00	1.07
						2" Ice	0.00	1.07
						4" Ice	0.00	1.07
LDF2-50(3/8")	A	No	Inside Pole	153.00 - 8.00	2	No Ice	0.00	0.08
						1/2" Ice	0.00	0.08
						1" Ice	0.00	0.08
						2" Ice	0.00	0.08
						4" Ice	0.00	0.08
2" Flex Conduit	A	No	Inside Pole	153.00 - 8.00	1	No Ice	0.00	0.32
						1/2" Ice	0.00	0.32
						1" Ice	0.00	0.32
						2" Ice	0.00	0.32
						4" Ice	0.00	0.32
LDF2-50(3/8")	A	No	Inside Pole	149.00 - 8.00	2	No Ice	0.00	0.08
						1/2" Ice	0.00	0.08
						1" Ice	0.00	0.08
						2" Ice	0.00	0.08
						4" Ice	0.00	0.08
LDF7-50A(1-5/8")	A	No	Inside Pole	149.00 - 8.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
FB-L98B-034-XXX(3/8)	C	No	Inside Pole	149.00 - 0.00	1	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C _A A _A		Weight plf
						ft ² /ft		
WR-VG86ST-BRDA(7/8")	C	No	Inside Pole	149.00 - 0.00	2	1" Ice	0.00	0.06
						2" Ice	0.00	0.06
						4" Ice	0.00	0.06
						No Ice	0.00	0.68
						1/2" Ice	0.00	0.68
						1" Ice	0.00	0.68
						2" Ice	0.00	0.68
LDF7-50A(1-5/8")	A	No	Inside Pole	140.00 - 8.00	18	4" Ice	0.00	0.68
						No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
						No Ice	0.00	1.30
HB158-1-08U8-S8J18(1-5/8)	A	No	Inside Pole	140.00 - 8.00	2	1/2" Ice	0.00	1.30
						1" Ice	0.00	1.30
						2" Ice	0.00	1.30
						4" Ice	0.00	1.30
						No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
LDF4-50A(1/2")	C	No	Inside Pole	120.00 - 8.00	2	2" Ice	0.00	0.15
						4" Ice	0.00	0.15
						No Ice	0.00	0.90
						1/2" Ice	0.00	0.90
						1" Ice	0.00	0.90
						2" Ice	0.00	0.90
						4" Ice	0.00	0.90
HB114-1-05U3-S3J(1 1/4)	C	No	Inside Pole	120.00 - 8.00	3	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
						2" Ice	0.00	0.15
						4" Ice	0.00	0.15
						No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
LDF4-50A(1/2")	C	No	Inside Pole	72.00 - 8.00	1	1" Ice	0.00	0.15
						2" Ice	0.00	0.15
						4" Ice	0.00	0.15
						No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
						2" Ice	0.00	0.15
**								

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment °	Placement ft	C _A A _A		Weight K	
			Horz Lateral ft	Vert ft			Front ft ²	Side ft ²		
Platform Mount [LP 1201-1]	C	None			0.0000	160.00	No Ice	23.10	23.10	2.10
							1/2" Ice	26.80	26.80	2.50
							Ice	30.50	30.50	2.90
							1" Ice	37.90	37.90	3.70
							2" Ice	52.70	52.70	5.30
Pipe Mount 6'x2.375"	A	From Leg	4.00	0.00	0.0000	160.00	4" Ice	1.43	1.43	0.03
							No Ice	1.92	1.92	0.04
							1/2" Ice	2.29	2.29	0.05
							Ice	3.06	3.06	0.09
							1" Ice	4.70	4.70	0.23
Pipe Mount 6'x2.375"	B	From Leg	4.00	0.00	0.0000	160.00	4" Ice	1.43	1.43	0.03
							No Ice	1.92	1.92	0.04
							1/2" Ice	2.29	2.29	0.05
							Ice	3.06	3.06	0.09
							1" Ice	4.70	4.70	0.23
Pipe Mount 6'x2.375"	C	From Leg	4.00	0.00	0.0000	160.00	4" Ice	1.43	1.43	0.03
							No Ice	1.92	1.92	0.04
							1/2" Ice	2.29	2.29	0.05
							Ice	3.06	3.06	0.09
							1" Ice	4.70	4.70	0.23

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A _A Front	C _A A _A Side	Weight
			Horz	Vert					
			ft	ft	°	ft	ft ²	ft ²	K
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.00	0.0000	160.00	2" Ice	4.70	4.70	0.23
						4" Ice			
						No Ice	6.83	5.64	0.11
						1/2" Ice	7.35	6.48	0.17
						Ice	7.86	7.26	0.23
						1" Ice	8.93	8.86	0.38
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.00	0.0000	160.00	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
						Ice	7.86	7.26	0.23
						1" Ice	8.93	8.86	0.38
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.00	0.0000	160.00	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
						Ice	7.86	7.26	0.23
						1" Ice	8.93	8.86	0.38
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	4.00	0.0000	160.00	2" Ice	11.17	12.28	0.81
						4" Ice			
						No Ice	6.82	5.63	0.11
						1/2" Ice	7.34	6.47	0.17
						Ice	7.85	7.25	0.23
						1" Ice	8.92	8.85	0.38
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Leg	4.00	0.0000	160.00	2" Ice	11.17	12.28	0.81
						4" Ice			
						No Ice	6.82	5.63	0.11
						1/2" Ice	7.34	6.47	0.17
						Ice	7.85	7.25	0.23
						1" Ice	8.92	8.85	0.38
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Leg	4.00	0.0000	160.00	2" Ice	11.17	12.28	0.81
						4" Ice			
						No Ice	6.82	5.63	0.11
						1/2" Ice	7.34	6.47	0.17
						Ice	7.85	7.25	0.23
						1" Ice	8.92	8.85	0.38
ATMAA1412D-1A20	A	From Leg	4.00	0.0000	160.00	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
						1" Ice	0.95	1.81	0.06
ATMAA1412D-1A20	B	From Leg	4.00	0.0000	160.00	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
						1" Ice	0.95	1.81	0.06
ATMAA1412D-1A20	C	From Leg	4.00	0.0000	160.00	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
						1" Ice	0.95	1.81	0.06
LNX-6515DS-VTM w/ Mount Pipe	A	From Leg	4.00	0.0000	160.00	2" Ice	17.87	20.14	1.15
						4" Ice			
						No Ice	11.68	9.84	0.08
						1/2" Ice	12.40	11.37	0.17
						Ice	13.14	12.91	0.27
						1" Ice	14.60	15.27	0.51
LNX-6515DS-VTM w/ Mount Pipe	B	From Leg	4.00	0.0000	160.00	2" Ice	17.87	20.14	1.15
						4" Ice			
						No Ice	11.68	9.84	0.08
						1/2" Ice	12.40	11.37	0.17
						Ice	13.14	12.91	0.27
						1" Ice	14.60	15.27	0.51

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A _A Front	C _A A _A Side	Weight
			Horz Lateral	Vert					
			ft	ft	°	ft	ft ²	ft ²	K
LNX-6515DS-VTM w/ Mount Pipe	C	From Leg	4.00 0.00 3.00	0.0000	160.00	1" Ice	14.60	15.27	0.51
						2" Ice	17.87	20.14	1.15
						4" Ice			
						No Ice	11.68	9.84	0.08
						1/2" Ice	12.40	11.37	0.17
						1" Ice	13.14	12.91	0.27
						2" Ice	14.60	15.27	0.51
RRUS 11 B12	A	From Leg	4.00 0.00 3.00	0.0000	160.00	1" Ice	17.87	20.14	1.15
						2" Ice			
						4" Ice			
						No Ice	3.31	1.36	0.05
						1/2" Ice	3.55	1.54	0.07
						1" Ice	3.80	1.73	0.10
						2" Ice	4.33	2.13	0.15
RRUS 11 B12	B	From Leg	4.00 0.00 3.00	0.0000	160.00	2" Ice	5.50	3.04	0.31
						4" Ice			
						No Ice	3.31	1.36	0.05
						1/2" Ice	3.55	1.54	0.07
						1" Ice	3.80	1.73	0.10
						2" Ice	4.33	2.13	0.15
						4" Ice	5.50	3.04	0.31
RRUS 11 B12	C	From Leg	4.00 0.00 3.00	0.0000	160.00	1" Ice	5.50	3.04	0.31
						2" Ice			
						4" Ice			
						No Ice	3.31	1.36	0.05
						1/2" Ice	3.55	1.54	0.07
						1" Ice	3.80	1.73	0.10
						2" Ice	4.33	2.13	0.15
*** Side Arm Mount [SO 102-3]	C	None		0.0000	153.00	4" Ice	5.50	3.04	0.31
						2" Ice	6.84	6.84	0.32
						1" Ice	4.92	4.92	0.20
						Ice	3.96	3.96	0.14
						1/2" Ice	3.48	3.48	0.11
						No Ice	3.00	3.00	0.08
						TME-RRUS-11	A	From Leg	1.50 0.00 0.00
2" Ice	5.43	3.04	0.31						
1" Ice	4.27	2.14	0.15						
Ice	3.74	1.74	0.09						
1/2" Ice	3.49	1.55	0.07						
No Ice	3.25	1.37	0.05						
TME-RRUS-11	B	From Leg	1.50 0.00 0.00	0.0000	153.00				
						2" Ice	5.43	3.04	0.31
						1" Ice	4.27	2.14	0.15
						Ice	3.74	1.74	0.09
						1/2" Ice	3.49	1.55	0.07
						No Ice	3.25	1.37	0.05
						TME-RRUS-11	C	From Leg	1.50 0.00 0.00
2" Ice	5.43	3.04	0.31						
1" Ice	4.27	2.14	0.15						
Ice	3.74	1.74	0.09						
1/2" Ice	3.49	1.55	0.07						
No Ice	3.25	1.37	0.05						
TME-DC6-48-60-18-8F	A	From Leg	1.50 0.00 0.00	0.0000	153.00				
						2" Ice	3.38	3.38	0.24
						1" Ice	2.33	2.33	0.11
						Ice	1.88	1.88	0.06
						1/2" Ice	1.67	1.67	0.04
						No Ice	1.47	1.47	0.02
						*** Platform Mount [LP 1201-1]	C	None	
2" Ice	52.70	52.70	5.30						
1" Ice	37.90	37.90	3.70						
Ice	30.50	30.50	2.90						
1/2" Ice	26.80	26.80	2.50						
No Ice	23.10	23.10	2.10						

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A _A Front	C _A A _A Side	Weight
			Horz	Lateral					
(2) 7770.00 w/ Mount Pipe	A	From Leg	4.00	0.0000	149.00	No Ice	6.22	4.82	0.09
			0.00			1/2"	6.71	5.51	0.14
			2.00			Ice	7.22	6.21	0.21
						1" Ice	8.26	7.67	0.36
						2" Ice	10.48	11.06	0.76
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.00	0.0000	149.00	No Ice	6.22	4.82	0.09
			0.00			1/2"	6.71	5.51	0.14
			2.00			Ice	7.22	6.21	0.21
						1" Ice	8.26	7.67	0.36
						2" Ice	10.48	11.06	0.76
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.00	0.0000	149.00	No Ice	6.22	4.82	0.09
			0.00			1/2"	6.71	5.51	0.14
			2.00			Ice	7.22	6.21	0.21
						1" Ice	8.26	7.67	0.36
						2" Ice	10.48	11.06	0.76
(4) LGP21401	A	From Leg	4.00	0.0000	149.00	No Ice	1.29	0.36	0.01
			0.00			1/2"	1.45	0.48	0.02
			2.00			Ice	1.61	0.60	0.03
						1" Ice	1.97	0.87	0.05
						2" Ice	2.79	1.52	0.14
(4) LGP21401	B	From Leg	4.00	0.0000	149.00	No Ice	1.29	0.36	0.01
			0.00			1/2"	1.45	0.48	0.02
			2.00			Ice	1.61	0.60	0.03
						1" Ice	1.97	0.87	0.05
						2" Ice	2.79	1.52	0.14
(4) LGP21401	C	From Leg	4.00	0.0000	149.00	No Ice	1.29	0.36	0.01
			0.00			1/2"	1.45	0.48	0.02
			2.00			Ice	1.61	0.60	0.03
						1" Ice	1.97	0.87	0.05
						2" Ice	2.79	1.52	0.14
HPA-65R-BUU-H6 w/ Mount Pipe	A	From Leg	4.00	0.0000	149.00	No Ice	10.60	8.11	0.08
			0.00			1/2"	11.27	9.30	0.16
			0.00			Ice	11.91	10.21	0.25
						1" Ice	13.21	12.17	0.46
						2" Ice	15.93	16.35	1.02
RRUS 11	A	From Leg	4.00	0.0000	149.00	No Ice	3.26	1.38	0.05
			0.00			1/2"	3.50	1.56	0.07
			0.00			Ice	3.75	1.74	0.10
						1" Ice	4.28	2.15	0.15
						2" Ice	5.44	3.05	0.31
RRUS 12 B2/RRUS A2	A	From Leg	4.00	0.0000	149.00	No Ice	3.67	2.16	0.07
			0.00			1/2"	3.93	2.36	0.10
			0.00			Ice	4.19	2.58	0.13
						1" Ice	4.75	3.04	0.20
						2" Ice	5.96	4.06	0.40
DC6-48-60-18-8F	A	From Leg	4.00	0.0000	149.00	No Ice	1.47	1.47	0.02
			0.00			1/2"	1.67	1.67	0.04
			0.00			Ice	1.88	1.88	0.06
						1" Ice	2.33	2.33	0.11
						2" Ice	3.38	3.38	0.24
HPA-65R-BUU-H6 w/ Mount Pipe	B	From Leg	4.00	0.0000	149.00	No Ice	10.60	8.11	0.08
			0.00			1/2"	11.27	9.30	0.16
			0.00			Ice	11.91	10.21	0.25
						1" Ice	13.21	12.17	0.46
						2" Ice	15.93	16.35	1.02

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement		C_{AA}	C_{AA}	Weight
			Horz	Lateral				Front	Side	
			ft	ft	°	ft	ft ²	ft ²	K	
RRUS 11	B	From Leg	4.00	0.0000	149.00	4" Ice				0.05
			0.00			No Ice	3.26	1.38	0.07	
			0.00			1/2" Ice	3.50	1.56	0.10	
						1" Ice	3.75	1.74	0.15	
						2" Ice	4.28	2.15	0.31	
RRUS 12 B2/RRUS A2	B	From Leg	4.00	0.0000	149.00	4" Ice				0.07
			0.00			No Ice	3.67	2.16	0.10	
			0.00			1/2" Ice	3.93	2.36	0.13	
						1" Ice	4.19	2.58	0.20	
						2" Ice	4.75	3.04	0.40	
HPA-65R-BUU-H6 w/ Mount Pipe	C	From Leg	4.00	0.0000	149.00	4" Ice				0.08
			0.00			No Ice	10.60	8.11	0.16	
			0.00			1/2" Ice	11.27	9.30	0.25	
						1" Ice	11.91	10.21	0.46	
						2" Ice	13.21	12.17	1.02	
RRUS 11	C	From Leg	4.00	0.0000	149.00	4" Ice				0.05
			0.00			No Ice	3.26	1.38	0.07	
			0.00			1/2" Ice	3.50	1.56	0.10	
						1" Ice	3.75	1.74	0.15	
						2" Ice	4.28	2.15	0.31	
RRUS 12 B2/RRUS A2	C	From Leg	4.00	0.0000	149.00	4" Ice				0.07
			0.00			No Ice	3.67	2.16	0.10	
			0.00			1/2" Ice	3.93	2.36	0.13	
						1" Ice	4.19	2.58	0.20	
						2" Ice	4.75	3.04	0.40	
*** Platform Mount [LP 1201-1]	C	None		0.0000	140.00	4" Ice				2.10
						No Ice	23.10	23.10	2.50	
						1/2" Ice	26.80	26.80	2.90	
						1" Ice	30.50	30.50	3.70	
						2" Ice	37.90	37.90	5.30	
P65-16-XL-M w/ Mount Pipe	A	From Leg	4.00	0.0000	140.00	4" Ice				0.08
			0.00			No Ice	8.54	6.57	0.15	
			2.00			1/2" Ice	9.13	7.48	0.23	
						1" Ice	9.72	8.33	0.40	
						2" Ice	10.92	10.09	0.89	
P65-16-XL-M w/ Mount Pipe	C	From Leg	4.00	0.0000	140.00	4" Ice				0.08
			0.00			No Ice	8.54	6.57	0.15	
			2.00			1/2" Ice	9.13	7.48	0.23	
						1" Ice	9.72	8.33	0.40	
						2" Ice	10.92	10.09	0.89	
(2) APL868013-42T0 w/ Mount Pipe	A	From Leg	4.00	0.0000	140.00	4" Ice				0.02
			0.00			No Ice	2.87	3.73	0.05	
			2.00			1/2" Ice	3.18	4.10	0.07	
						1" Ice	3.52	4.48	0.15	
						2" Ice	4.27	5.25	0.35	
(2) APL868013-42T0 w/ Mount Pipe	B	From Leg	4.00	0.0000	140.00	4" Ice				0.02
			0.00			No Ice	2.87	3.73	0.05	
			2.00			1/2" Ice	3.18	4.10	0.07	
						1" Ice	3.52	4.48	0.15	
						2" Ice	4.27	5.25	0.35	
RRH2X40-AWS	A	From Leg	4.00	0.0000	140.00	4" Ice				0.04
			0.00			No Ice	2.52	1.59	0.06	
			2.00			1/2" Ice	2.75	1.80	0.08	
					Ice	2.99	2.01			

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K	
TME-RRH2X60-PCS	A	From Leg	4.00 0.00 0.00	0.0000	140.00	1" Ice	3.50	2.46	0.13
						2" Ice	4.61	3.48	0.28
						4" Ice			
						No Ice	2.57	2.01	0.06
						1/2" Ice	2.79	2.22	0.08
(2) WWX063X19G00 w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	140.00	Ice	3.02	2.43	0.10
						1" Ice	3.52	2.89	0.16
						2" Ice	4.61	3.92	0.31
						4" Ice			
						No Ice	9.06	7.28	0.06
RRH2X40-AWS	B	From Leg	4.00 0.00 2.00	0.0000	140.00	1/2" Ice	9.73	8.50	0.13
						Ice	10.38	9.47	0.21
						1" Ice	11.68	11.35	0.40
						2" Ice	14.42	15.44	0.92
						4" Ice			
TME-RRH2X60-PCS	B	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice	2.52	1.59	0.04
						1/2" Ice	2.75	1.80	0.06
						Ice	2.99	2.01	0.08
						1" Ice	3.50	2.46	0.13
						2" Ice	4.61	3.48	0.28
(2) WWX063X19G00 w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	140.00	4" Ice			
						No Ice	2.57	2.01	0.06
						1/2" Ice	2.79	2.22	0.08
						Ice	3.02	2.43	0.10
						1" Ice	3.52	2.89	0.16
RRH2X40-AWS	C	From Leg	4.00 0.00 2.00	0.0000	140.00	2" Ice	4.61	3.92	0.31
						4" Ice			
						No Ice	2.52	1.59	0.04
						1/2" Ice	2.75	1.80	0.06
						Ice	2.99	2.01	0.08
TME-RRH2X60-PCS	C	From Leg	4.00 0.00 0.00	0.0000	140.00	1" Ice	3.50	2.46	0.13
						2" Ice	4.61	3.48	0.28
						4" Ice			
						No Ice	2.57	2.01	0.06
						1/2" Ice	2.79	2.22	0.08
(2) WWX063X19G00 w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	140.00	Ice	3.02	2.43	0.10
						1" Ice	3.52	2.89	0.16
						2" Ice	4.61	3.92	0.31
						4" Ice			
						No Ice	9.06	7.28	0.06
DB-T1-6Z-8AB-0Z	A	From Leg	4.00 0.00 2.00	0.0000	140.00	1/2" Ice	9.73	8.50	0.13
						Ice	10.38	9.47	0.21
						1" Ice	11.68	11.35	0.40
						2" Ice	14.42	15.44	0.92
						4" Ice			
BXA-70063/8CFx2 w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	140.00	No Ice	5.60	2.33	0.04
						1/2" Ice	5.92	2.56	0.08
						Ice	6.24	2.79	0.12
						1" Ice	6.91	3.28	0.21
						2" Ice	8.37	4.37	0.45
(2) DB844H80E-XY w/ Mount Pipe	C	From Leg	4.00 0.00	0.0000	140.00	4" Ice			
						No Ice	10.90	8.18	0.06
						1/2" Ice	11.61	9.66	0.14
						Ice	12.33	11.16	0.22
						1" Ice	13.70	13.44	0.44

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K	
			2.00			Ice	4.12	6.28	0.12
						1" Ice	5.01	7.71	0.23
						2" Ice	6.92	10.83	0.56
						4" Ice			

Miscellaneous [NA 510-1]	C	None		0.0000	122.00	No Ice	6.00	6.00	0.26
						1/2"	8.50	8.50	0.34
						Ice	11.00	11.00	0.42
						1" Ice	16.00	16.00	0.59
						2" Ice	26.00	26.00	0.93
						4" Ice			
Platform Mount [LP 1201-1]	C	None		0.0000	120.00	No Ice	23.10	23.10	2.10
						1/2"	26.80	26.80	2.50
						Ice	30.50	30.50	2.90
						1" Ice	37.90	37.90	3.70
						2" Ice	52.70	52.70	5.30
						4" Ice			
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	120.00	No Ice	8.50	6.95	0.08
						1/2"	9.15	8.13	0.15
						Ice	9.77	9.02	0.23
						1" Ice	11.03	10.84	0.41
						2" Ice	13.68	14.85	0.91
						4" Ice			
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	120.00	No Ice	8.50	6.95	0.08
						1/2"	9.15	8.13	0.15
						Ice	9.77	9.02	0.23
						1" Ice	11.03	10.84	0.41
						2" Ice	13.68	14.85	0.91
						4" Ice			
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	120.00	No Ice	8.50	6.95	0.08
						1/2"	9.15	8.13	0.15
						Ice	9.77	9.02	0.23
						1" Ice	11.03	10.84	0.41
						2" Ice	13.68	14.85	0.91
						4" Ice			
1900MHz RRH	A	From Leg	4.00 0.00 2.00	0.0000	120.00	No Ice	2.91	3.80	0.04
						1/2"	3.14	4.06	0.08
						Ice	3.39	4.34	0.11
						1" Ice	3.91	4.91	0.19
						2" Ice	5.05	6.15	0.41
						4" Ice			
1900MHz RRH	B	From Leg	4.00 0.00 2.00	0.0000	120.00	No Ice	2.91	3.80	0.04
						1/2"	3.14	4.06	0.08
						Ice	3.39	4.34	0.11
						1" Ice	3.91	4.91	0.19
						2" Ice	5.05	6.15	0.41
						4" Ice			
1900MHz RRH	C	From Leg	4.00 0.00 2.00	0.0000	120.00	No Ice	2.91	3.80	0.04
						1/2"	3.14	4.06	0.08
						Ice	3.39	4.34	0.11
						1" Ice	3.91	4.91	0.19
						2" Ice	5.05	6.15	0.41
						4" Ice			
800MHZ RRH	A	From Leg	4.00 0.00 2.00	0.0000	120.00	No Ice	2.49	2.07	0.05
						1/2"	2.71	2.27	0.07
						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			
800MHZ RRH	B	From Leg	4.00 0.00 2.00	0.0000	120.00	No Ice	2.49	2.07	0.05
						1/2"	2.71	2.27	0.07
						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			

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A _A Front	C _A A _A Side	Weight
			Horz Lateral	Vert					
800MHZ RRH	C	From Leg	4.00	0.0000	120.00	No Ice	2.49	2.07	0.05
			0.00			1/2"	2.71	2.27	0.07
			2.00			Ice	2.93	2.48	0.10
						1" Ice	3.41	2.93	0.16
						2" Ice	4.46	3.93	0.32
(3) 6' x 2" Mount Pipe	A	From Leg	4.00	0.0000	120.00	No Ice	1.43	1.43	0.02
			0.00			1/2"	1.92	1.92	0.03
			2.00			Ice	2.29	2.29	0.05
						1" Ice	3.06	3.06	0.09
						2" Ice	4.70	4.70	0.23
(3) 6' x 2" Mount Pipe	B	From Leg	4.00	0.0000	120.00	No Ice	1.43	1.43	0.02
			0.00			1/2"	1.92	1.92	0.03
			2.00			Ice	2.29	2.29	0.05
						1" Ice	3.06	3.06	0.09
						2" Ice	4.70	4.70	0.23
(3) 6' x 2" Mount Pipe	C	From Leg	4.00	0.0000	120.00	No Ice	1.43	1.43	0.02
			0.00			1/2"	1.92	1.92	0.03
			2.00			Ice	2.29	2.29	0.05
						1" Ice	3.06	3.06	0.09
						2" Ice	4.70	4.70	0.23
** Side Arm Mount [SO 102-3]	C	None		0.0000	119.00	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
TME-1900MHz RRH w/ 4' x 2" Mount Pipe	A	From Leg	1.50	0.0000	119.00	No Ice	3.36	4.67	0.06
			0.00			1/2"	3.72	5.18	0.10
			0.00			Ice	4.10	5.70	0.15
						1" Ice	4.90	6.81	0.26
						2" Ice	6.73	9.38	0.57
TME-1900MHz RRH w/ 4' x 2" Mount Pipe	B	From Leg	1.50	0.0000	119.00	No Ice	3.36	4.67	0.06
			0.00			1/2"	3.72	5.18	0.10
			0.00			Ice	4.10	5.70	0.15
						1" Ice	4.90	6.81	0.26
						2" Ice	6.73	9.38	0.57
TME-1900MHz RRH w/ 4' x 2" Mount Pipe	C	From Leg	1.50	0.0000	119.00	No Ice	3.36	4.67	0.06
			0.00			1/2"	3.72	5.18	0.10
			0.00			Ice	4.10	5.70	0.15
						1" Ice	4.90	6.81	0.26
						2" Ice	6.73	9.38	0.57
TME-800MHZ RRH	A	From Leg	1.50	0.0000	119.00	No Ice	2.49	2.07	0.05
			0.00			1/2"	2.71	2.27	0.07
			0.00			Ice	2.93	2.48	0.10
						1" Ice	3.41	2.93	0.16
						2" Ice	4.46	3.93	0.32
TME-800MHZ RRH	B	From Leg	1.50	0.0000	119.00	No Ice	2.49	2.07	0.05
			0.00			1/2"	2.71	2.27	0.07
			0.00			Ice	2.93	2.48	0.10
						1" Ice	3.41	2.93	0.16
						2" Ice	4.46	3.93	0.32
TME-800MHZ RRH	C	From Leg	1.50	0.0000	119.00	No Ice	2.49	2.07	0.05
			0.00			1/2"	2.71	2.27	0.07
			0.00			Ice	2.93	2.48	0.10
						1" Ice	3.41	2.93	0.16
						2" Ice	4.46	3.93	0.32

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K	
						2" Ice 4" Ice	4.46 3.93	0.32	
** Side Arm Mount [SO 701-1]	B	From Leg	1.50 0.00 0.00	0.0000	72.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.85 1.14 1.43 2.01 3.17 7.03	1.67 2.34 3.01 4.35 7.03	0.07 0.08 0.09 0.12 0.18
(2) GPS_A	B	From Leg	3.00 0.00 1.00	0.0000	72.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.30 0.37 0.46 0.65 1.15	0.30 0.37 0.46 0.65 1.15	0.00 0.00 0.01 0.02 0.08

Load Combinations

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

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	15	70.35	0.00	8.83
	Max. H _x	11	52.61	37.21	0.03
	Max. H _z	2	52.61	0.03	37.40
	Max. M _x	2	4543.06	0.03	37.40
	Max. M _z	5	4516.39	-37.21	-0.03
	Max. Torsion	6	0.49	-32.24	-18.73
	Min. Vert	1	52.61	0.00	0.00
	Min. H _x	5	52.61	-37.21	-0.03
	Min. H _z	8	52.61	-0.03	-37.40
	Min. M _x	8	-4542.57	-0.03	-37.40
	Min. M _z	11	-4516.27	37.21	0.03
	Min. Torsion	12	-0.47	32.24	18.73

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	160 - 152	30.722	27	1.6727	0.0012
L2	152 - 111.29	27.929	27	1.6588	0.0012
L3	116.71 - 77.42	16.446	27	1.3776	0.0005
L4	83.59 - 36.46	8.246	27	0.9366	0.0002
L5	43.54 - 0	2.242	27	0.4630	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
160.00	Platform Mount [LP 1201-1]	27	30.722	1.6727	0.0012	33749
153.00	Side Arm Mount [SO 102-3]	27	28.277	1.6613	0.0012	24330
149.00	Platform Mount [LP 1201-1]	27	26.889	1.6490	0.0011	16121
140.00	Platform Mount [LP 1201-1]	27	23.816	1.6016	0.0010	9446
122.00	Miscellaneous [NA 510-1]	27	18.021	1.4388	0.0006	5169
120.00	Platform Mount [LP 1201-1]	27	17.417	1.4163	0.0006	4925
119.00	Side Arm Mount [SO 102-3]	27	17.119	1.4047	0.0006	4821
72.00	Side Arm Mount [SO 701-1]	27	6.057	0.7894	0.0002	4449

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	160 - 152	88.559	2	4.8224	0.0033
L2	152 - 111.29	80.515	2	4.7822	0.0033
L3	116.71 - 77.42	47.434	2	3.9732	0.0014
L4	83.59 - 36.46	23.794	2	2.7023	0.0006
L5	43.54 - 0	6.471	2	1.3365	0.0002

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
160.00	Platform Mount [LP 1201-1]	2	88.559	4.8224	0.0034	11884
153.00	Side Arm Mount [SO 102-3]	2	81.517	4.7895	0.0034	8568
149.00	Platform Mount [LP 1201-1]	2	77.520	4.7541	0.0033	5679
140.00	Platform Mount [LP 1201-1]	2	68.668	4.6176	0.0029	3321
122.00	Miscellaneous [NA 510-1]	2	51.973	4.1494	0.0018	1812
120.00	Platform Mount [LP 1201-1]	2	50.234	4.0845	0.0017	1726
119.00	Side Arm Mount [SO 102-3]	2	49.375	4.0512	0.0016	1690
72.00	Side Arm Mount [SO 701-1]	2	17.478	2.2779	0.0005	1548

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	160 - 152 (1)	TP30.62x29x0.1875	8.00	0.00	0.0	37.630	18.1111	-3.54	681.53	0.005
L2	152 - 111.29 (2)	TP38.86x30.62x0.25	40.71	0.00	0.0	39.000	29.7665	-16.69	1160.89	0.014
L3	111.29 - 77.42 (3)	TP45.09x37.263x0.3125	39.29	0.00	0.0	39.000	43.1945	-23.58	1684.59	0.014
L4	77.42 - 36.46 (4)	TP52.62x43.2359x0.4375	47.13	0.00	0.0	39.000	70.5044	-35.78	2749.67	0.013
L5	36.46 - 0 (5)	TP59x50.3353x0.5	43.54	0.00	0.0	39.000	92.8395	-52.59	3620.74	0.015

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	160 - 152 (1)	TP30.62x29x0.1875	59.51	5.242	37.630	0.139	0.00	0.000	37.630	0.000
L2	152 - 111.29 (2)	TP38.86x30.62x0.25	729.10	31.715	39.000	0.813	0.00	0.000	39.000	0.000
L3	111.29 - 77.42 (3)	TP45.09x37.263x0.3125	1686.9 7	43.583	39.000	1.118	0.00	0.000	39.000	0.000
L4	77.42 - 36.46 (4)	TP52.62x43.2359x0.4375	2983.1 8	40.557	39.000	1.040	0.00	0.000	39.000	0.000
L5	36.46 - 0 (5)	TP59x50.3353x0.5	4543.0 7	40.706	39.000	1.044	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	160 - 152 (1)	TP30.62x29x0.1875	6.76	0.373	26.000	0.029	0.00	0.000	26.000	0.000
L2	152 - 111.29 (2)	TP38.86x30.62x0.25	27.34	0.918	26.000	0.071	0.14	0.003	26.000	0.000
L3	111.29 - 77.42 (3)	TP45.09x37.263x0.3125	30.44	0.705	26.000	0.054	0.13	0.002	26.000	0.000
L4	77.42 - 36.46 (4)	TP52.62x43.2359x0.4375	34.12	0.484	26.000	0.037	0.18	0.001	26.000	0.000
L5	36.46 - 0 (5)	TP59x50.3353x0.5	37.42	0.403	26.000	0.031	0.19	0.001	26.000	0.000

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 $\frac{f_{vt}}{F_{vt}}$
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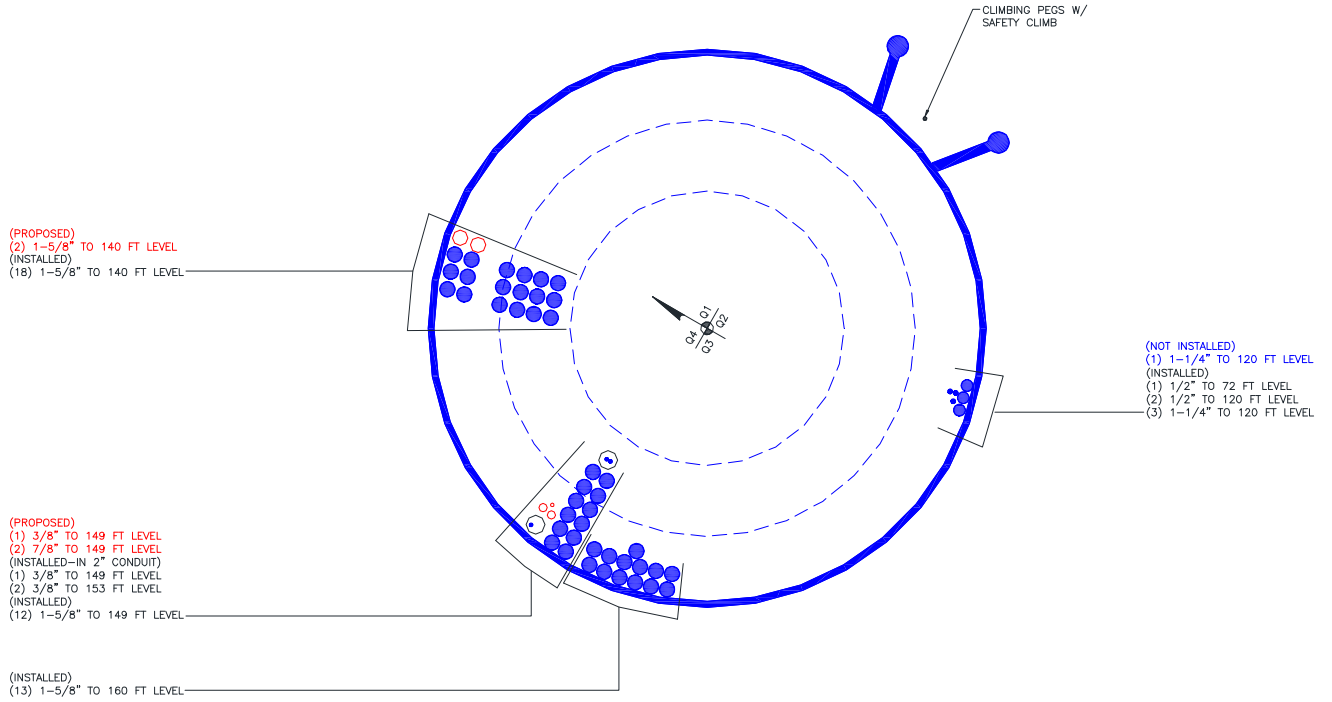
Pole Interaction Design Data

Section No.	Elevation ft	Ratio P	Ratio f_{bx}	Ratio f_{by}	Ratio f_v	Ratio f_{vt}	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	160 - 152 (1)	0.005	0.139	0.000	0.029	0.000	0.145	1.333	H1-3+VT ✓
L2	152 - 111.29 (2)	0.014	0.813	0.000	0.071	0.000	0.829	1.333	H1-3+VT ✓
L3	111.29 - 77.42 (3)	0.014	1.118	0.000	0.054	0.000	1.132	1.333	H1-3+VT ✓
L4	77.42 - 36.46 (4)	0.013	1.040	0.000	0.037	0.000	1.053	1.333	H1-3+VT ✓
L5	36.46 - 0 (5)	0.015	1.044	0.000	0.031	0.000	1.059	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	160 - 152	Pole	TP30.62x29x0.1875	1	-3.54	908.48	10.9	Pass	
L2	152 - 111.29	Pole	TP38.86x30.62x0.25	2	-16.69	1547.47	62.2	Pass	
L3	111.29 - 77.42	Pole	TP45.09x37.263x0.3125	3	-23.58	2245.56	84.9	Pass	
L4	77.42 - 36.46	Pole	TP52.62x43.2359x0.4375	4	-35.78	3665.31	79.0	Pass	
L5	36.46 - 0	Pole	TP59x50.3353x0.5	5	-52.59	4826.45	79.4	Pass	
							Summary		
							Pole (L3)	84.9	Pass
							RATING =	84.9	Pass

APPENDIX B
BASE LEVEL DRAWING



APPENDIX C
ADDITIONAL CALCULATIONS

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Platform Mount [LP 1201-1]	160	HPA-65R-BUU-H6 w/ Mount Pipe	149
Pipe Mount 6"x2.375"	160	RRUS 11	149
Pipe Mount 6"x2.375"	160	RRUS 12 B2/RRUS A2	149
Pipe Mount 6"x2.375"	160	Platform Mount [LP 1201-1]	140
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	160	P65-16-XL-M w/ Mount Pipe	140
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	160	P65-16-XL-M w/ Mount Pipe	140
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	160	(2) APL868013-42T0 w/ Mount Pipe	140
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	160	(2) APL868013-42T0 w/ Mount Pipe	140
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	160	RRH2X40-AWS	140
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	160	TME-RRH2X60-PCS	140
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	160	(2) WWX063X19G00 w/ Mount Pipe	140
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	160	RRH2X40-AWS	140
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	160	TME-RRH2X60-PCS	140
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	160	(2) WWX063X19G00 w/ Mount Pipe	140
ATMAA1412D-1A20	160	RRH2X40-AWS	140
ATMAA1412D-1A20	160	TME-RRH2X60-PCS	140
ATMAA1412D-1A20	160	(2) WWX063X19G00 w/ Mount Pipe	140
LNx-6515DS-VTM w/ Mount Pipe	160	DB-T1-6Z-8AB-0Z	140
LNx-6515DS-VTM w/ Mount Pipe	160	BXA-70063/8CFx2 w/ Mount Pipe	140
LNx-6515DS-VTM w/ Mount Pipe	160	(2) DB844H80E-XY w/ Mount Pipe	140
RRUS 11 B12	160	Miscellaneous [NA 510-1]	122
RRUS 11 B12	160	Platform Mount [LP 1201-1]	120
RRUS 11 B12	160	APXVSP18-C-A20 w/ Mount Pipe	120
Side Arm Mount [SO 102-3]	153	APXVSP18-C-A20 w/ Mount Pipe	120
TME-RRUS-11	153	APXVSP18-C-A20 w/ Mount Pipe	120
TME-RRUS-11	153	1900MHz RRH	120
TME-RRUS-11	153	1900MHz RRH	120
TME-RRUS-11	153	1900MHz RRH	120
TME-DC6-48-60-18-8F	153	800MHz RRH	120
Platform Mount [LP 1201-1]	149	800MHz RRH	120
(2) 7770.00 w/ Mount Pipe	149	800MHz RRH	120
(2) 7770.00 w/ Mount Pipe	149	(3) 6' x 2" Mount Pipe	120
(2) 7770.00 w/ Mount Pipe	149	(3) 6' x 2" Mount Pipe	120
(4) LGP21401	149	(3) 6' x 2" Mount Pipe	120
(4) LGP21401	149	Side Arm Mount [SO 102-3]	119
(4) LGP21401	149	TME-1900MHz RRH w/ 4' x 2" Mount Pipe	119
HPA-65R-BUU-H6 w/ Mount Pipe	149	TME-1900MHz RRH w/ 4' x 2" Mount Pipe	119
RRUS 11	149	TME-1900MHz RRH w/ 4' x 2" Mount Pipe	119
RRUS 12 B2/RRUS A2	149	TME-800MHz RRH	119
DC6-48-60-18-8F	149	TME-800MHz RRH	119
HPA-65R-BUU-H6 w/ Mount Pipe	149	TME-800MHz RRH	119
RRUS 11	149	Side Arm Mount [SO 701-1]	72
RRUS 12 B2/RRUS A2	149	(2) GPS_A	72

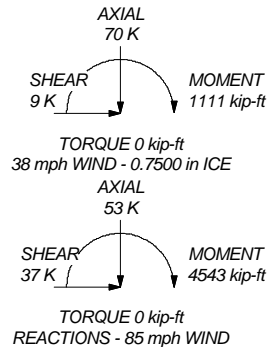
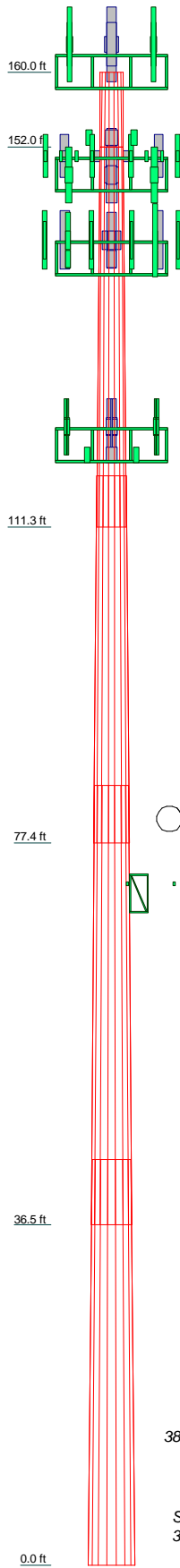
MATERIAL STRENGTH


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

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 84.9%

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	8.00	18	0.1875	29.0000	30.6200			0.5
2	40.71	18	0.2500	30.6200	38.8600			3.8
3	39.29	18	0.3125	37.2630	45.0900	A572-65		5.4
4	47.13	18	0.4375	43.2359	52.6200			10.6
5	43.54	18	0.5000	50.3353	59.0000			12.7



 Paul J Ford and Company 250 E. Broad St Suite 600 Columbus, OH 43215 Phone: 614-221-6679 FAX: 614-448-4105	Job: 160' Monopole Greenwich, CT Project: BU #: 841290 (PJF37515-3249)		
	Client: Crown Castle USA, Inc. Code: TIA/EIA-222-F Path:	Drawn by: chedges Date: 12/07/15	App'd: Scale: NTS Dwg No. E-1

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

Site Data

BU#: _____
 Site Name: _____
 App #: _____

Reactions		
Moment:	59.51	ft-kips
Axial:	3.54	kips
Shear:	6.76	kips
Elevation:	152	feet

Pole Manufacturer:	Other
--------------------	-------

Bolt Data		
Qty:	12	
Diameter (in.):	1	Bolt Fu: 120
Bolt Material:	A325	Bolt Fy: 92
N/A:	75	<-- Disregard
N/A:	55	<-- Disregard
Circle (in.):	35	

Plate Data		
Diam:	38	in
Thick, t:	1	in
Grade (Fy):	60	ksi
Strength, Fu:	75	ksi
Single-Rod B-eff:	8.10	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	Fillet	
Groove Depth:	0.25	<-- Disregard
Groove Angle:	45	<-- Disregard
Fillet H. Weld:	0.25	in
Fillet V. Weld:	0.25	in
Width:	3	in
Height:	8	in
Thick:	0.5	in
Notch:	0.375	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	30.62	in
Thick:	0.1875	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu:	80	ksi
Reinf. Fillet Weld:	0	"0" if None

Stress Increase Factor	
ASIF:	1.333

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

Flange Bolt Results

Bolt Tension Capacity, **B**: 46.07 kips
 Max Bolt directly applied T: 6.51 Kips
 Min. PL "tc" for **B** cap. **w/o Pry**: 0.986 in
 Min PL "treq" for actual **T w/o Pry**: 0.271 in
 Min PL "t1" for actual **T w/o Pry**: 0.370 in
 T allowable w/o Prying: 46.07 kips
 Prying Force, Q: 0.00 kips
 Total Bolt Tension=T+Q: 6.51 kips
 Non-Prying Bolt Stress Ratio, T/B: 14.1% **Pass**

Rigid
Service, ASD
Fty*ASIF

Exterior Flange Plate Results

Flexural Check
 Compression Side Plate Stress: 7.7 ksi
 Allowable Plate Stress: 60.0 ksi
 Compression Plate Stress Ratio: 12.9% **Pass**
No Prying
 Tension Side Stress Ratio, (treq/t)^2: 7.3% **Pass**

Rigid
Service ASD
0.75*Fy*ASIF
Comp. Y.L. Length:
16.95

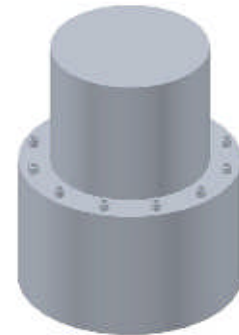
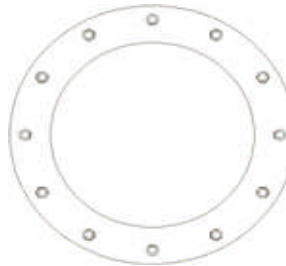
n/a

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

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

TIA Rev F

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

Reactions		
Moment:	4543	ft-kips
Axial:	53	kips
Shear:	37	kips

Anchor Rod Data		
Qty:	24	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	67	in

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

Anchor Rod Results			
Maximum Rod Tension:	133.4 Kips		
Allowable Tension:	195.0 Kips		
Anchor Rod Stress Ratio:	68.4%	Pass	

Rigid
Service, ASD
Fty*ASIF

Plate Data		
Diam:	73	in
Thick:	2.25	in
Grade:	60	ksi
Single-Rod B-eff:	7.80	in

Base Plate Results			
Base Plate Stress:	51.7 ksi	Flexural Check	
Allowable Plate Stress:	60.0 ksi		
Base Plate Stress Ratio:	86.2%	Pass	

Rigid
Service ASD
0.75*Fy*ASIF
Y.L. Length:
31.75

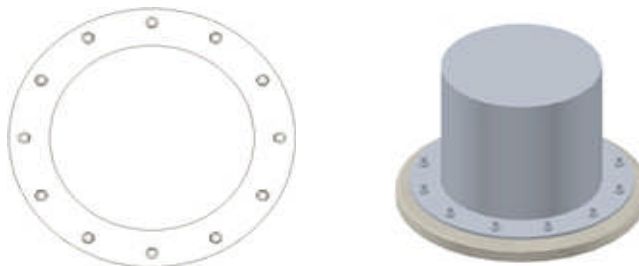
Stiffener Data (Welding at both sides)		
Config:	0	*
Weld Type:	Both	
Groove Depth:	0.25	in **
Groove Angle:	45	degrees
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	5	in
Height:	18	in
Thick:	0.75	in
Notch:	0.5	in
Grade:	50	ksi
Weld str.:	70	ksi

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

Pole Results
 Pole Punching Shear Check: n/a

Pole Data		
Diam:	59	in
Thick:	0.5	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor	
ASIF:	1.333



* 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

Foundation Loads:

Pole weight or tower leg compression = 0 (kips)
 Horizontal load at top of pier = 37 (kips)
 Overturning moment at top of pier = 4543 (ft-kips)

Design criteria:

Safety factor against overturning = 1.5

Soil Properties:

Soil density = 120 (pcf)
 Allowable soil bearing = 10 (ksf)
 Depth to water table = 99 (ft)

Dimensions:

Pier shape (round or square) = S ("R" or "S")
 Pier width = 7 (ft)
 Pier height above grade = 0.5 (ft)
 depth to bottom of footing = 9.5 (ft)
 Footing thickness = 4.5 (ft)
 Footing width = 25 (ft)
 Footing length = 25 (ft)

Concrete:

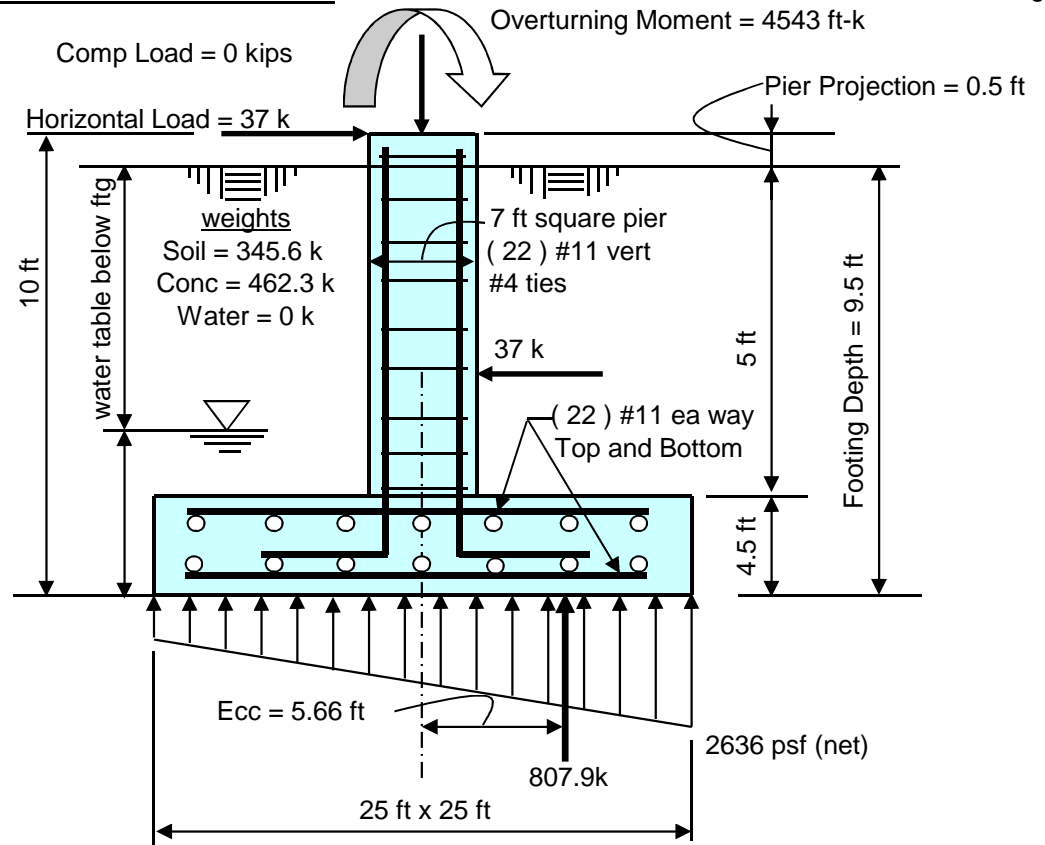
Concrete strength = 3 (ksi)
 Rebar strength = 60 (ksi)
 ultimate load factor = 1.3

Reinforcing Steel:

Pad
 minimum cover over rebar = 3 inches
 size of pad rebar = #11 bar
 quantity of pad rebar = 22 (ea direction)

Reinforcing Steel:

Pier
 size of vert rebar in pier = #11 bar
 vertical rebar quantity = 22
 size of pier ties = #4 bar
 minimum cover over rebar = 3.5 inches
 Total volume of concrete = #### cu yd



Summary of analysis results	
Maximum Net Soil Bearing = 2.636 ksf Allowable Net Soil Bearing = 10 ksf Soil Bearing Stress Ratio = 0.26 Okay	Ult Bending Shear Capacity = 110 psi Ult Bending Shear Stress = 24 psi Bending Shear Stress Ratio = 0.22 Okay
Ftg Overturning Resistance = 10099 ft-kips Overturning Moment = 4573 ft-kips Required Overturning Safety Factor = 1.5 Overturning Safety Factor = 2.208 Ratio = 0.68 Okay	Pad Bending Moment Capacity = 7350 ft-k Pad Bending Moment = 1862 ft-k Bending Moment Stress Ratio = 0.25 OK

General Information:

=====
File Name: T:\375_Crown_Castle\2015\37515-3249_841290_GREENWICH NORTH\37515-3249.col
Project: 37515-3249
Column: Engineer:
Code: ACI 318-08 Units: English

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

Material Properties:

=====
f'c = 3 ksi fy = 60 ksi
Ec = 3122.02 ksi Es = 29000 ksi
Ultimate strain = 0.003 in/in
Beta1 = 0.85

Section:

=====
Rectangular: Width = 84 in Depth = 84 in

Gross section area, Ag = 7056 in^2
Ix = 4.14893e+006 in^4 Iy = 4.14893e+006 in^4
rx = 24.2487 in ry = 24.2487 in
Xo = 0 in Yo = 0 in

Reinforcement:

=====
Bar Set: ASTM A615
Size Diam (in) Area (in^2) Size Diam (in) Area (in^2) Size Diam (in) Area (in^2)

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

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

Layout: Rectangular
Pattern: All Sides Equal (Cover to transverse reinforcement)
Total steel area: As = 43.68 in^2 at rho = 0.62% (Note: rho < 1.0%)
Minimum clear spacing = 9.10 in

28 #11 Cover = 4 in

Factored Loads and Moments with Corresponding Capacities:

=====
No. Pu Mux PhiMnx PhiMn/Mu NA depth Dt depth eps_t Phi
kip k-ft k-ft in in in in in

1 36.39 6170.00 7531.35 1.221 8.41 78.79 0.02512 0.900

*** End of output ***

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

AT&T Existing Facility

Site ID: CT2130

Greenwich North
363 Riversville Road
Greenwich, CT 06831

January 25, 2016

EBI Project Number: 6216000230

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	7.83 %

January 25, 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: **CT2130 – Greenwich North**

EBI Consulting was directed to analyze the proposed AT&T facility located at **363 Riversville Road, Greenwich, 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 **363 Riversville Road, Greenwich, 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 LTE channels (700 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.
- 2) 2 LTE channels (PCS Band – 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.
- 3) 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.
- 4) 2 UMTS channels (PCS Band – 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 5) 2 GSM channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel

- 6) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
- 7) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 8) The antennas used in this modeling are the **CCI HPA-65R-BUU-H6 and the Powerwave 7770.00** for transmission in the 700 MHz, 850 MHz and 1900 MHz (PCS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 9) The antenna mounting height centerline of the proposed antennas is **149 feet** above ground level (AGL).
- 10) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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

AT&T Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	CCI HPA-65R-BUU-H6	Make / Model:	CCI HPA-65R-BUU-H6	Make / Model:	CCI HPA-65R-BUU-H6
Gain:	11.95 / 14.75 dBd	Gain:	11.95 / 14.75 dBd	Gain:	11.95 / 14.75 dBd
Height (AGL):	149 feet	Height (AGL):	149 feet	Height (AGL):	149 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	Total TX Power(W):	240	Total TX Power(W):	240
ERP (W):	5,462.56	ERP (W):	5,462.56	ERP (W):	5,462.56
Antenna A1 MPE%	1.34	Antenna B1 MPE%	1.34	Antenna C1 MPE%	1.34
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	Powerwave 7770.00	Make / Model:	Powerwave 7770.00	Make / Model:	Powerwave 7770.00
Gain:	13.4 / 11.4 dBd	Gain:	13.4 / 11.4 dBd	Gain:	13.4 / 11.4 dBd
Height (AGL):	149 feet	Height (AGL):	149 feet	Height (AGL):	149 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	Total TX Power(W):	120	Total TX Power(W):	120
ERP (W):	2,140.89	ERP (W):	2,140.89	ERP (W):	2,140.89
Antenna A2 MPE%	0.49	Antenna B2 MPE%	0.49	Antenna C2 MPE%	0.49
Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	Powerwave 7770.00	Make / Model:	Powerwave 7770.00	Make / Model:	Powerwave 7770.00
Gain:	11.4 dBd	Gain:	11.4 dBd	Gain:	11.4 dBd
Height (AGL):	149 feet	Height (AGL):	149 feet	Height (AGL):	149 feet
Frequency Bands	850 MHz	Frequency Bands	850 MHz	Frequency Bands	850 MHz
Channel Count	2	Channel Count	2	Channel Count	2
Total TX Power(W):	60	Total TX Power(W):	60	Total TX Power(W):	60
ERP (W):	828.23	ERP (W):	828.23	ERP (W):	828.23
Antenna A3 MPE%	0.26	Antenna B3 MPE%	0.26	Antenna C3 MPE%	0.26

Site Composite MPE%	
Carrier	MPE%
AT&T – Max per sector	2.08 %
T-Mobile	1.63 %
Verizon Wireless	2.83 %
Nextel	0.37 %
Sprint	0.92 %
Site Total MPE %:	7.83 %

AT&T Sector 1 Total:	2.08 %
AT&T Sector 2 Total:	2.08 %
AT&T Sector 3 Total:	2.08 %
Site Total:	7.83 %

AT&T _ 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 700 MHz LTE	2	940.05	149	3.31	700	467	0.71 %
AT&T 1900 MHz (PCS) LTE	2	1791.23	149	6.30	1900	1000	0.63 %
AT&T 850 MHz UMTS	2	414.12	149	1.49	850	567	0.26 %
AT&T 1900 MHz (PCS) UMTS	2	656.33	149	2.31	1900	567	0.23 %
AT&T 850 MHz GSM	2	414.12	149	1.46	850	567	0.26 %
						Total:	7.83 %

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 1:	2.08 %
Sector 2:	2.08 %
Sector 3 :	2.08 %
AT&T Maximum Total (per sector):	2.08 %
Site Total:	7.83 %
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **7.83%** 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.



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