



20 Commercial St
Branford, CT 06405
Phone: (203) 208-0806
Fax: (203) 488-4820

April 6, 2015

Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051
Attn: Ms. Melanie Bachman, Executive Director

Re: Notice of Exempt Modification Application
1925 East Main Street
Torrington, CT 06790

Dear Ms. Bachman,

On behalf of New Cingular Wireless PCS, LLC ("AT&T"), enclosed for filing are an original and two (2) copies of AT&T's Notice of Exempt Modification for Proposed Modifications to an Existing Telecommunications Facility located at the above-referenced site.

I also enclose herewith a check in the amount of \$625.00 representing the fee for the Notice of Exempt Modification.

If you have any questions, please feel free to contact me.

Thank you,

By: _____

Name: Paul Sagristano
Vertical Development LLC
Phone- 917-841-0247
Fax- 401-633-6202
psagristano@verticaldevelopmentllc.com

cc:

Hon. Elinor Carbone 140 Main Street Torrington, CT 06790 860-489-2228		Gregory A Demichiel 15 Northington Drive Avon, CT 06001
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siting.council@ct.gov (electronic copy)

Notice of Exempt Modification
1925-1931 East Main Street
Torrington, CT 06790

New Cingular Wireless PCS, LLC ("AT&T") submits this Notice of Exempt Modification to the Connecticut Siting Council ("Council") pursuant to Sections 16-50j-73 and 16-50j-72(b) of the Regulations of Connecticut State Agencies ("Regulations") in connection with AT&T's planned modification of antennas and associated equipment on an existing 153' monopole located at 1925 East Main Street, in the City of Torrington, Connecticut. More particularly, AT&T plans to upgrade this site by adding LTE technology to its facilities. The proposed modifications will not increase the tower height, cause a significant adverse change or alteration in the physical or environmental characteristics of the site, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six (6) decibels, add radio frequency sending or receiving capability which increases the total radio frequency electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the Federal Communications Commission pursuant to Section 704 of the Telecommunications Act of 1996, as amended, and the State Department of Energy and Environmental Protection, pursuant to Section 22a-162 of the Connecticut General Statutes, or impair the structural integrity of the facility, as determined in a certification provided by a professional engineer licensed in Connecticut.

To better meet the growing voice and data demands of its wireless customers, AT&T is upgrading their network nationwide to include LTE technology, which will provide faster service and better overall performance. Pursuant to the LTE technology upgrade at this site, AT&T will add panel antennas, install RRHs, and install related equipment to its equipment area within the fenced tower compound.

The monopole tower located at 1925 East Main Street, in the Town of Torrington, Connecticut (lat. 41.823273°, long. -73.076674°) is owned and operated by SBA Towers, LLC, a Florida limited liability company (“Landlord”). AT&T’s existing facility is located within the Landlord’s existing fenced compound. AT&T currently has Twelve (12) panel antennas (four (4) per sector) with a centerline of 95’ installed on the tower. AT&T’s base station equipment is located adjacent to the base of the tower within the fenced compound. A site plan depicting this is attached.

AT&T plans to remove all existing equipment and install a new Commscope MTC3615 platform mount. AT&T will relocate to the new platform the following existing antennas and equipment with a proposed centerline of 95’ installed on the tower: three (3) existing Powerwave 7777.00 panel antennas (one (1) per sector), Six (6) Powerwave TMAs, three (3) Ericsson RRUS-11 (one (1) per sector) which will be connected and located behind the Powerwave 7777.00 panel antennas, and one (1) DC-6 Surge Suppressor.

AT&T plans to add to the new platform Three (3) CCI OPA-65R-LCUU-H6 panel antennas, Four (4) CCI HPA-65R-BUU H6 antennas, Two (2) Andrew SBNH 1D65A, three (3) RRUS-12 (1 per sector), three (3) Ericsson A2 modules (1 per sector (attached behind each respective RRU-12), three (3) RRUS-32 (1 per sector), and three (3) RRUS-E2 (1 per sector) and will add two (2) new Raycap DC-6 Surge Suppressors. The height of the tower will not be increased and all antennas, surge suppressors, and RRHs will be installed at the existing 95’ centerline.

Within the existing equipment shelter AT&T also plans to install a new power plant and a new Ericsson RBS 6601 and DC-DC Converter in an existing LTE Rack. Finally, AT&T will be adding one (1) fiber trunks and four (2) DC trunks from the ground equipment to the AT&T Rad Center outside the monopole following (2) existing DC Trunks and (1) existing Fiber Trunk. The compound’s boundaries will not need to be extended. The proposed modifications will not cause a significant adverse change or alteration in the physical or environmental characteristics of the site, since it is already a

telecommunications installation and the modifications will be compatible with this. Other than brief, construction-related noise, these modifications will not increase noise levels at the tower site boundary by six (6) decibels.

The proposed modifications will not add radio frequency sending or receiving capability which increases the total radio frequency electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the Federal Communications Commission pursuant to Section 704 of the Telecommunications Act of 1996, as amended, and the State Department of Energy and Environmental Protection, pursuant to Section 22a-162 of the Connecticut General Statutes. A radio frequency emissions analysis prepared by EBI Consulting concludes that the proposed final configuration (including other carriers on the tower) will emit 75.28% of the allowable FCC established general public limits sampled at the ground level (see page 1 and the 6th page of Radio Frequency Emissions Analysis Report Evaluation of Human Exposure Potential to Non-Ionizing Emissions (the "MPE" Assessment) dated December 2, 2014). Emissions values for additional carriers were based upon values listed in Connecticut Siting Council active database (see the 2nd and 6 page of the MPE Assessment dated December 2, 2014). The information used in the 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 (see the 2nd page of the MPE Assessment).

The proposed modifications will not impair the structural integrity of the facility. SBA Towers performed a structural analysis of the tower on January 13, 2015 to verify that it can support the proposed loading. The structure was initially found to fail to meet the specified ANSI/TIA/222-G requirements and deemed inadequate to support the proposed loading with a tower component assessment of 123%. SBA Towers thereafter designed modification drawings ("Modification Drawings") dated March 10, 2015, which depict a flat plate reinforcement to the Monopole from 24.3' through 44.3' so that the monopole will comply with the specified ANSI-TIA-222-G requirements and adequately structurally support the proposed loading. The Modification Drawings

specifically state that the modifications presented on these drawings are based on the Structural Analysis Report dated January 13, 2015 and that satisfactory completion of the work indicated on the Modification Drawings will result in the structure meeting the requirements of the specifications under which the structural was completed (see page 9 of the construction drawings (page 1 of the Modification Drawings)).

In conclusion, AT&T's proposed modifications do not constitute a modification subject to the Council's review because AT&T will not change the height of the tower, will not extend the boundaries of the compound, will not cause a significant adverse change or alteration in the physical or environmental characteristics of the site, will not increase the noise levels at the site, will not increase the total radio frequency electromagnetic radiation power density at the site to levels above applicable standards, and will not impair the structural integrity of the facility. Therefore, AT&T respectfully requests that the Council acknowledge that this Notice of Exempt Modification meets the Council's exemption criteria.

PROJECT INFORMATION

SCOPE OF WORK:

- REMOVE ALL TOWER TOP EQUIPMENT & REPLACE SECTOR FRAMES.
- AT&T ANTENNAS: (3) NEW LTE ANTENNAS PER SECTOR WITH (3) SECTORS, FOR A TOTAL OF (9) NEW LTE ANTENNAS; (3) EXISTING UMTS ANTENNAS & TMAs TO BE RE-USED (1 PER SECTOR)
- AT&T RRUs: (4) NEW RRUs PER SECTOR WITH (3) SECTORS, FOR A TOTAL OF (12) NEW RRUs; (1) EXISTING RRU PER SECTOR TO BE REUSED, FOR A TOTAL OF (3) EXISTING RRUs.
- (2) NEW A2 MODULE PER SECTOR WITH (3) SECTORS, FOR A TOTAL OF (6) A2 MODULES.
- (2) NEW AT&T DC6 SURGE SUPPRESSORS; (1) EXISTING DC6 TO BE REUSED.
- NEW LTE RBS-6601 INSTALLED IN EXISTING LTE RACK.
- NEW LTE GPS ANTENNA MOUNTED TO EXISTING EQUIPMENT SHELTER.
- (3) NEW FIBER TRUNKS & (6) NEW DC TRUNKS.
- INSTALL NEW 3-PORT CABLE HATCH PLATE IN EXISTING AT&T EQUIPMENT SHELTER.
- REMOVE (12) EXISTING DIPLEXERS AND REPLACE WITH (6) NEW DIPLEXERS.

SITE ADDRESS: 1925 EAST MAIN STREET
TORRINGTON, CT 06790

LATITUDE: 41.823273 41° 49' 23.78"N
LONGITUDE: -73.076674 73° 4' 36.03"W

USID: 71300

TOWER OWNER: SBA

TYPE OF SITE: MONOPOLE/INDOOR EQUIPMENT

MONOPOLE HEIGHT: 153'-0"±

RAD CENTER: 95'-0"±

CURRENT USE: UNMANNED WIRELESS TELECOMMUNICATIONS FACILITY

PROPOSED USE: UNMANNED WIRELESS TELECOMMUNICATIONS FACILITY



**at&t
MOBILITY**

FA CODE: 10042345
SITE NUMBER: CT1118
SITE NAME: TORRINGTON EAST MAIN ST

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: VERTICAL DEVELOPMENT, LLC
ADDRESS: 7 SYCAMORE WAY
BRANFORD, CT 06405
CONTACT: DAVID BASS
PHONE: 203-826-5857
EMAIL: dbass@verticaldevelopmentllc.com

ZONING:

COMPANY: VERTICAL DEVELOPMENT, LLC
ADDRESS: 7 SYCAMORE WAY
BRANFORD, CT 06405
CONTACT: DAVID BASS
PHONE: 203-826-5857
EMAIL: dbass@verticaldevelopmentllc.com

ENGINEERING:

COMPANY: COM-EX CONSULTANTS, LLC
ADDRESS: 4 SECOND AVENUE
SUITE 204
DENVER, NJ 07834
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 01801
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

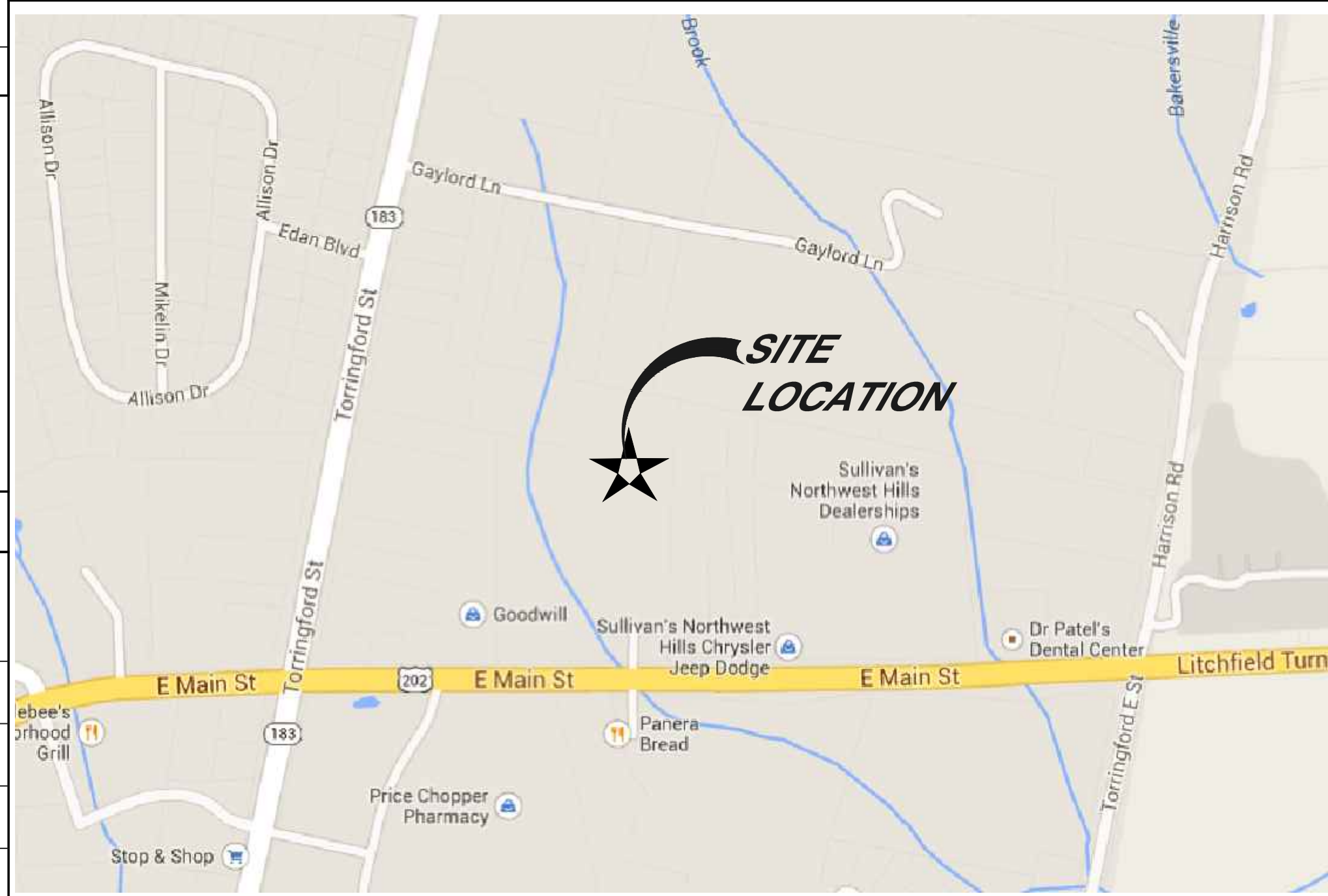
DRAWING INDEX

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VICINITY MAP

1. HEAD WEST ON COCHITUATE RD TOWARD BURR ST (0.3 MI). 2. TURN LEFT ONTO SHOPPERS WORLD DR (230 FT). 3. MAKE A U-TURN AT RING RD 138 FT). 4. TAKE THE 1ST RIGHT ONTO COCHITUATE RD (0.3 MI). 5. TAKE THE RAMP TO I-90 E/MASSPIKE W/SPRINGFIELD/BOSTON (0.6 MI). 6. KEEP LEFT AT THE FORK, FOLLOW SIGNS FOR INTERSTATE 90 W/MASSACHUSETTS TURNPIKE AND MERGE ONTO I-90 W/MASSACHUSETTS TURNPIKE (38.3 MI). 7. TAKE EXIT 9 TO MERGE ONTO I-84 TOWARD US-20/HARTFORD (43.6 MI). 8. TAKE EXIT 50 TO MERGE ONTO US-44 W/MORGAN ST TOWARD I-91 S/MAIN ST (0.3 MI). 9. SLIGHT RIGHT ONTO MAIN ST (0.3 MI). 10. CONTINUE ONTO US-44 W/ALBANY AVE, CONTINUE TO FOLLOW US-44 W (14.1 MI). 11. SLIGHT LEFT ONTO US-202 W (8.9 MI). 12. MAKE RIGHT INTO PARKING LOT AND FOLLOW TO SITE.



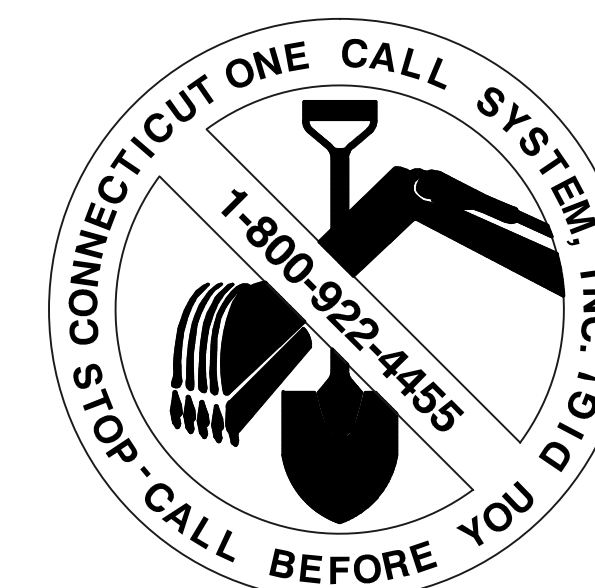
GENERAL NOTES

- 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.
- 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.
- 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:		



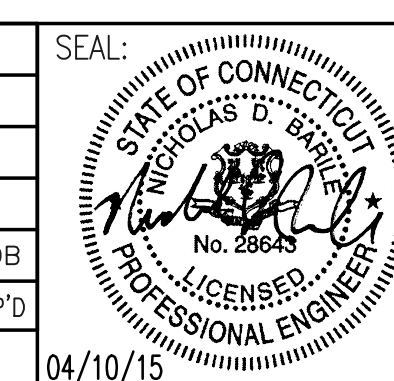
CONNECTICUT LAW REQUIRES TWO WORKING DAYS NOTICE PRIOR TO ANY EARTH MOVING ACTIVITIES BY CALLING 800-922-4455 OR DIAL 811



SITE NUMBER: CT1118
SITE NAME: TORRINGTON EAST MAIN ST
1925 EAST MAIN STREET
TORRINGTON, CT 06790
LITCHFIELD COUNTY



0	04/10/15	FINAL SUBMISSION	CJT	NDB	NDB
NO.	DATE	REVISIONS	BY	CHK	APP'D
SCALE: AS SHOWN		DESIGNED BY: JW	DRAWN BY: JW		04/10/15



AT&T		
DRAWING TITLE: TITLE SHEET		
JOB NUMBER 14021-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.

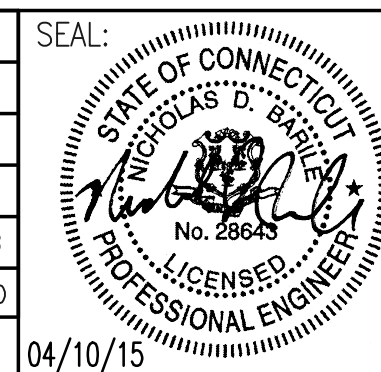
19. SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.
 - INTERNATIONAL 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.



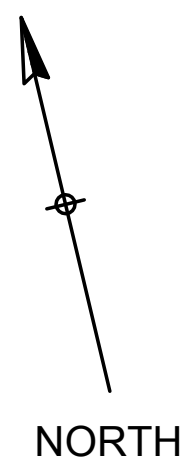
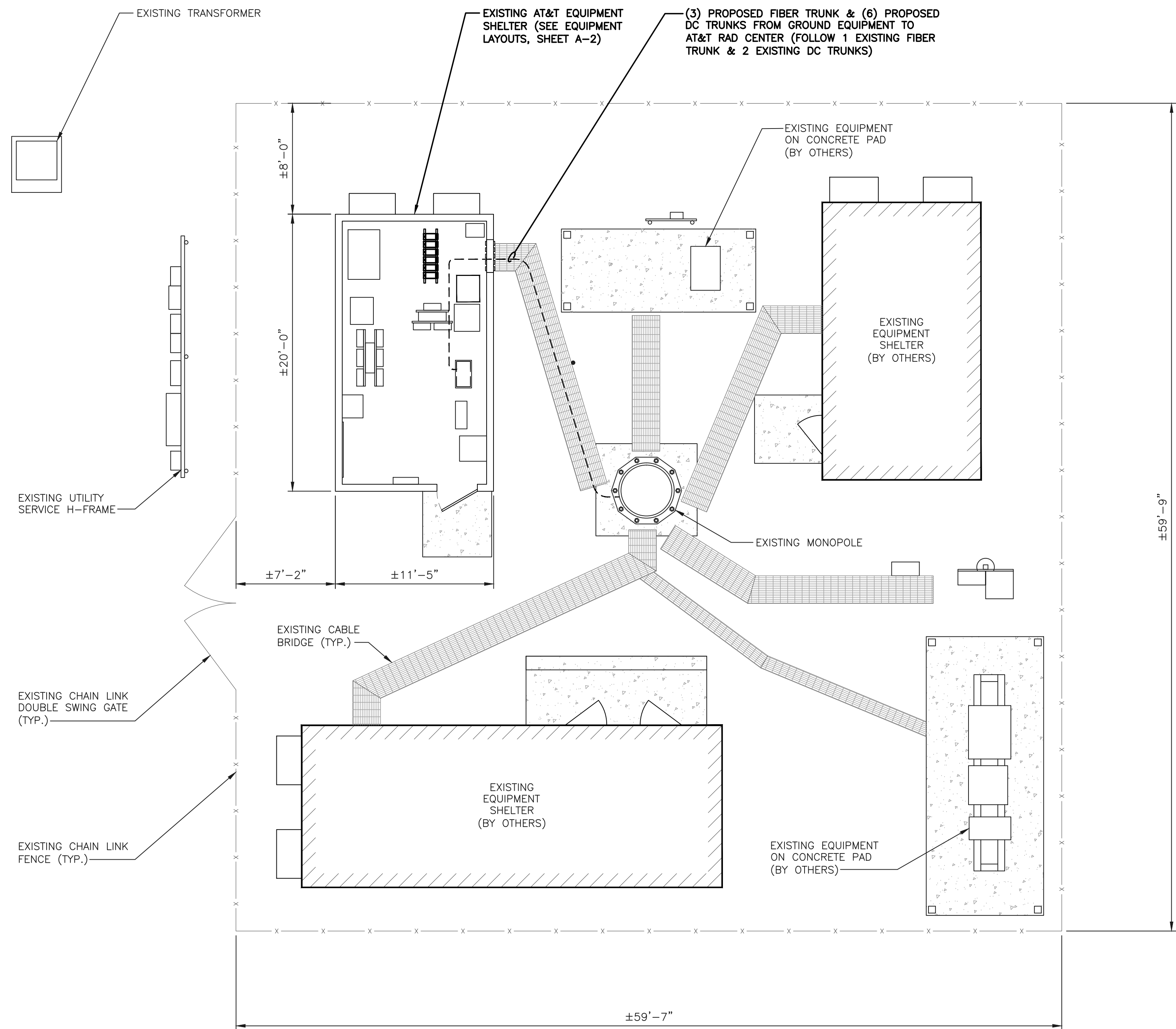
SITE NUMBER: CT1118
SITE NAME: TORRINGTON EAST MAIN ST
 1925 EAST MAIN STREET
 TORRINGTON, CT 06790
 LITCHFIELD COUNTY



0	04/10/15	FINAL SUBMISSION	CJT	NDB	NDB
NO.	DATE	REVISIONS	BY	CHK	APP'D
SCALE: AS SHOWN		DESIGNED BY: JW	DRAWN BY: JW		04/10/15



AT&T		
DRAWING TITLE: GROUNDING NOTES & GENERAL NOTES		
JOB NUMBER 14021-EMP	DRAWING NUMBER GN-1	REV 0

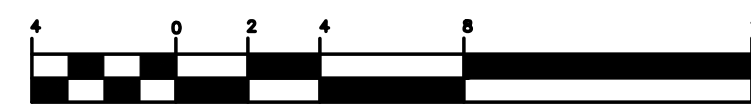


NORTH

COMPOUND LAYOUT

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

GRAPHIC SCALE



(IN FEET)
3/16" = 1 Foot

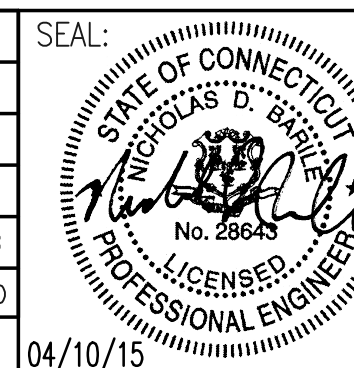
COM-EX
Consultants
4 SECOND AVENUE
SUITE 204
DENVER, NJ 07834
PHONE: 862.209.4300
FAX: 862.209.4301

EMPIRE
telecom
16 ESQUIRE ROAD
BILLERICA, MA 01821

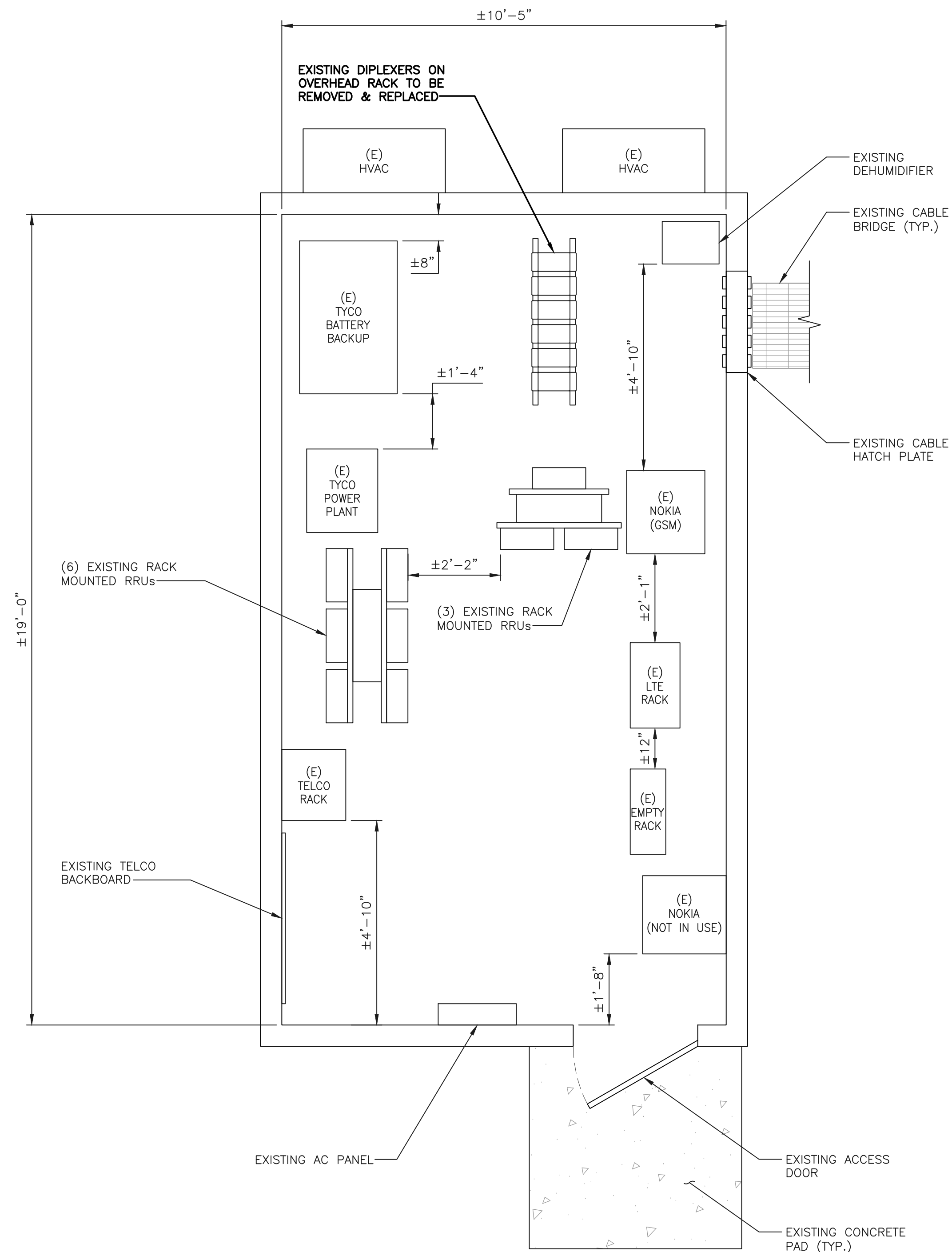
SITE NUMBER: CT1118
SITE NAME: TORRINGTON EAST MAIN ST
1925 EAST MAIN STREET
TORRINGTON, CT 06790
LITCHFIELD COUNTY

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MOBILITY
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

0	04/10/15	FINAL SUBMISSION	CJT	NDB	NDB
NO.	DATE	REVISIONS	BY	CHK	APP'D
SCALE: AS SHOWN			DESIGNED BY: JW	DRAWN BY: JW	



AT&T		
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JOB NUMBER 14021-EMP	DRAWING NUMBER A-1	REV 0

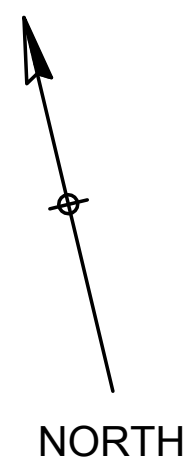


EXISTING EQUIPMENT LAYOUT

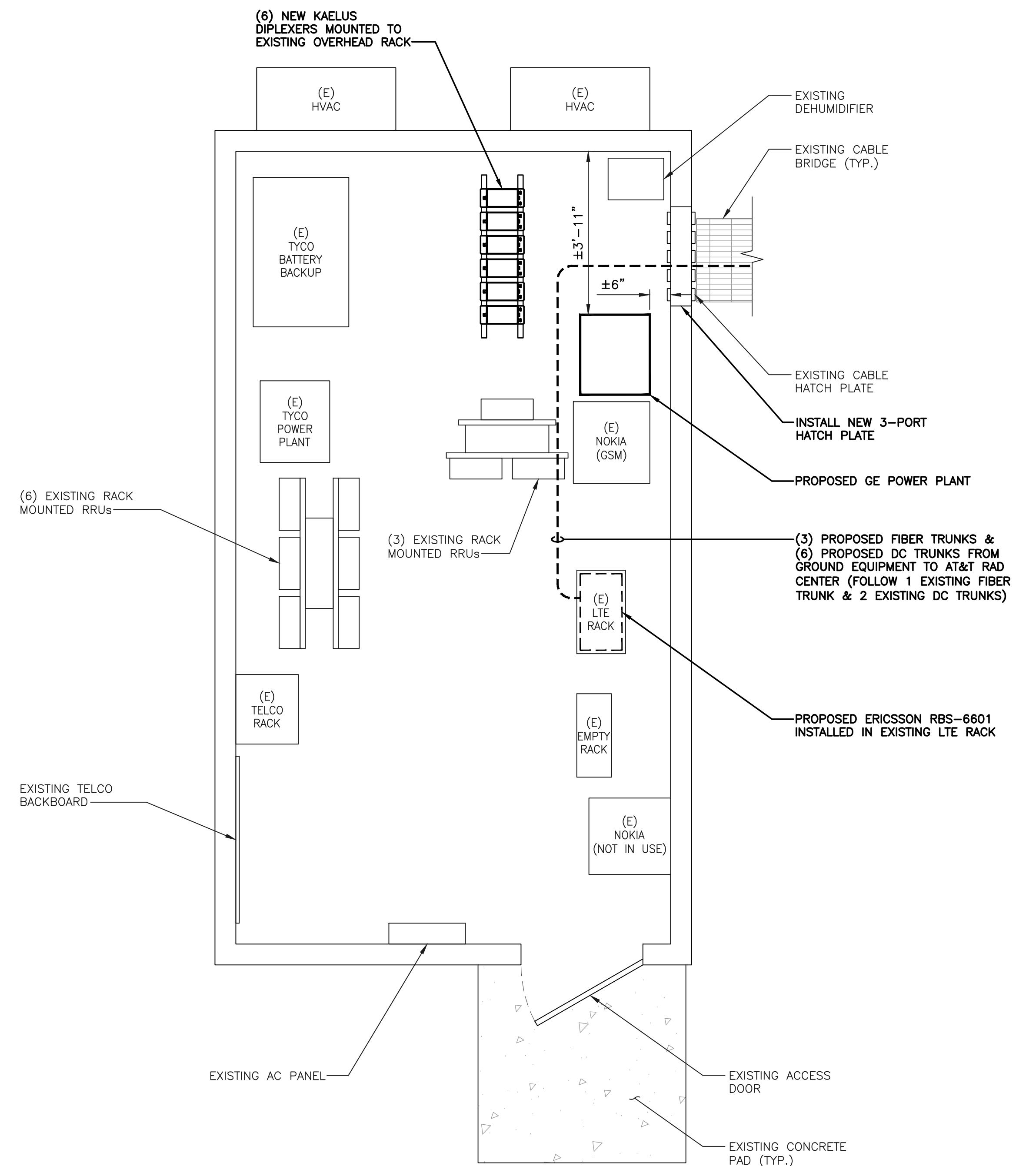
SCALE: 1/2" = 1'-0"



(IN FEET)
1/2 Inch = 1 Foot

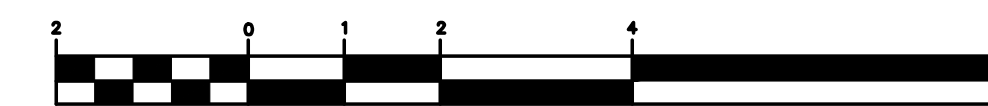


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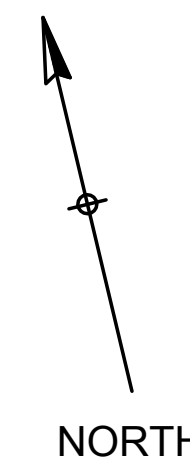


PROPOSED EQUIPMENT LAYOUT

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

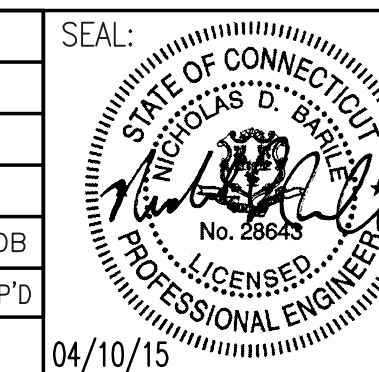


(IN FEET)
1/2 Inch = 1 Foot

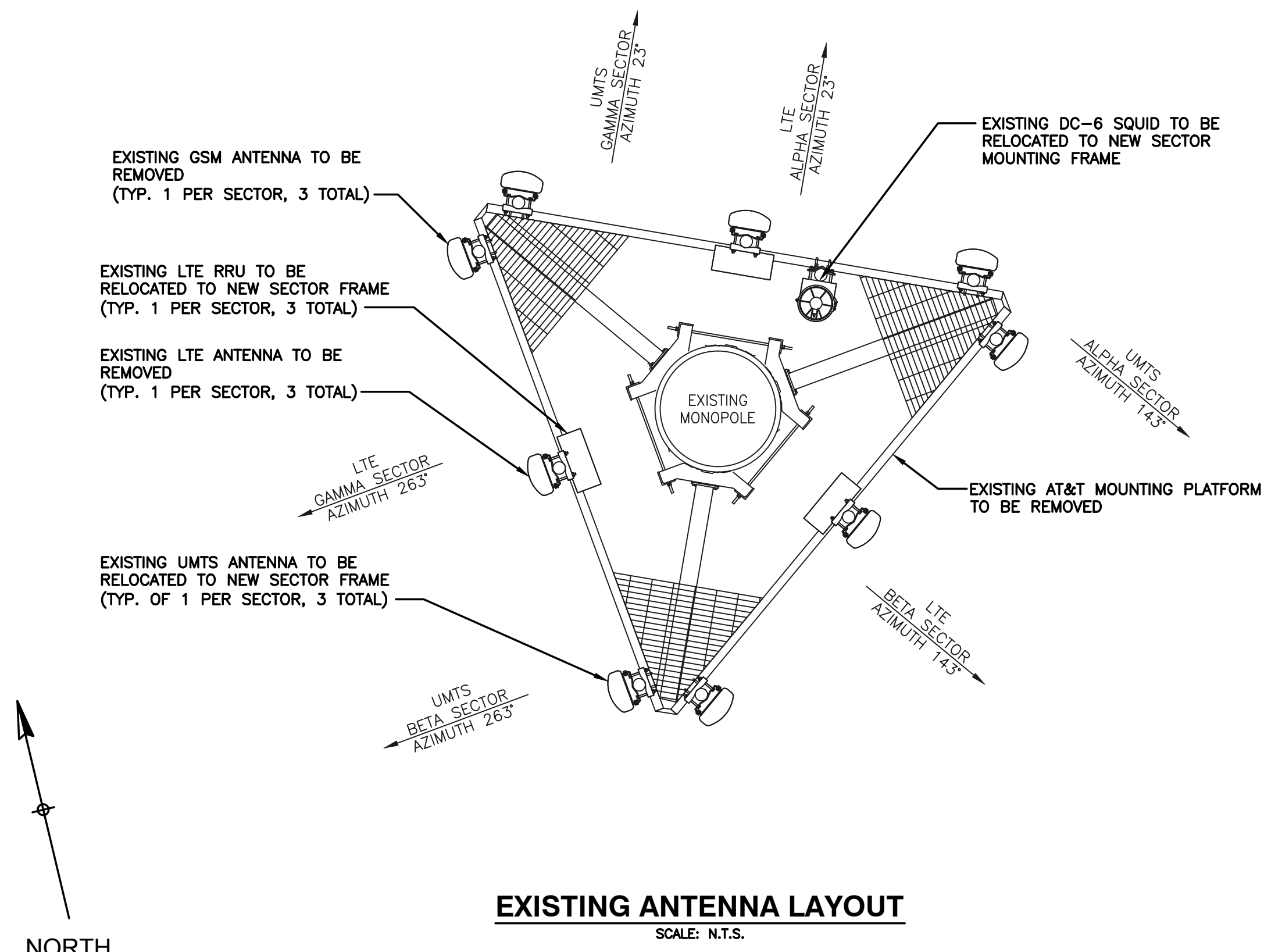


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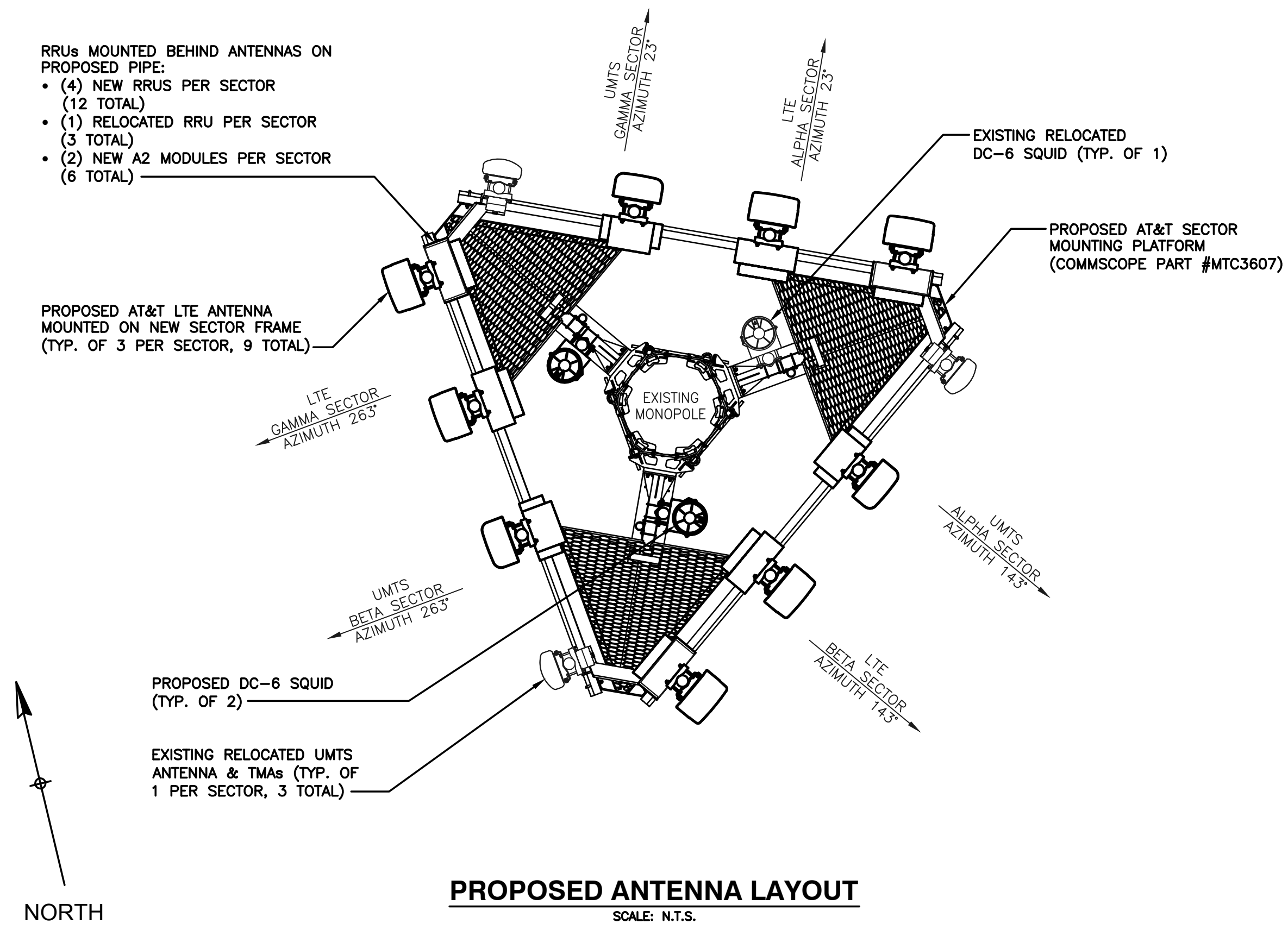
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SCALE: AS SHOWN		DESIGNED BY: JW	DRAWN BY: JW		04/10/15



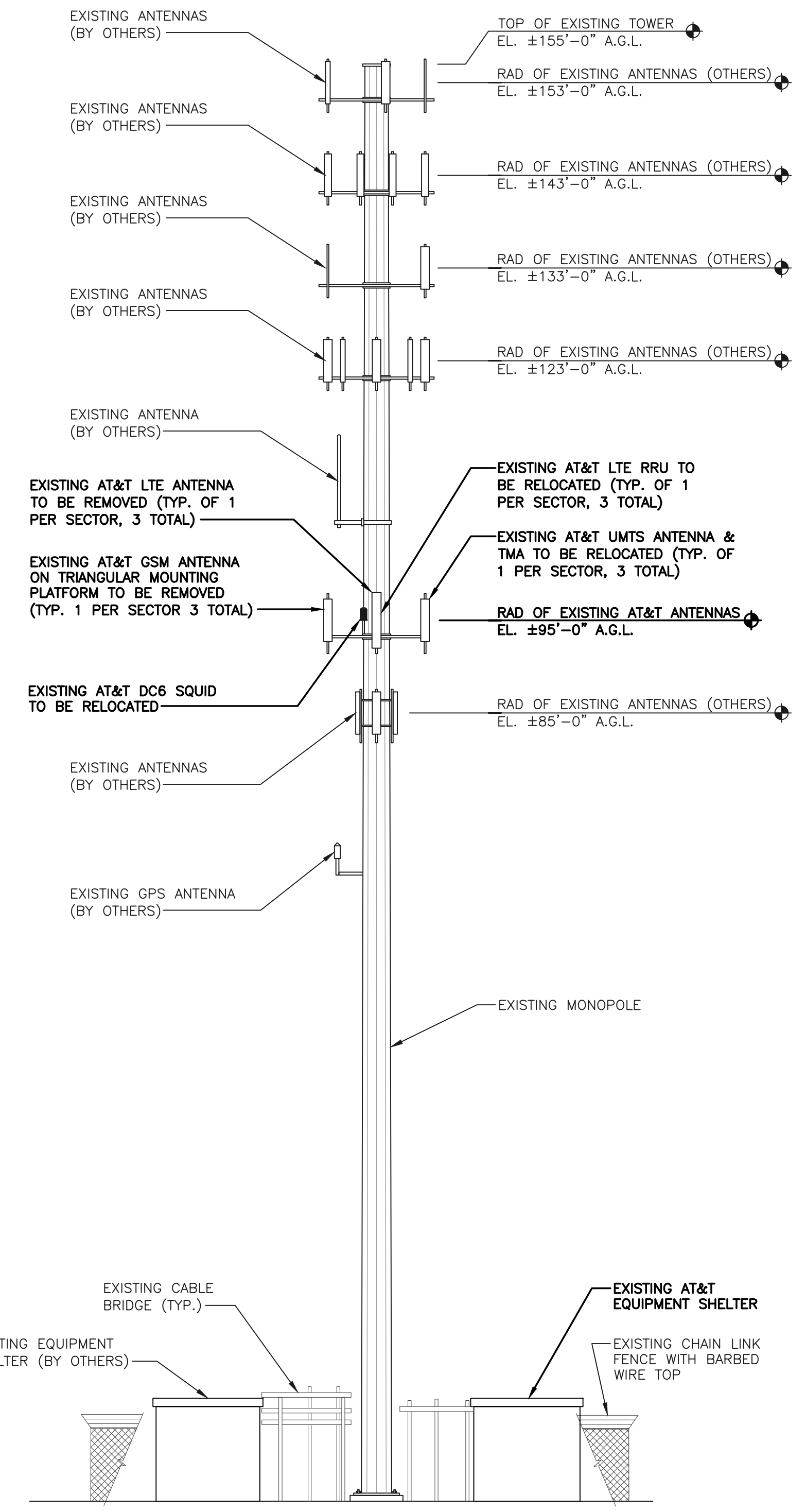
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JOB NUMBER 14021-EMP	DRAWING NUMBER A-2	REV 0



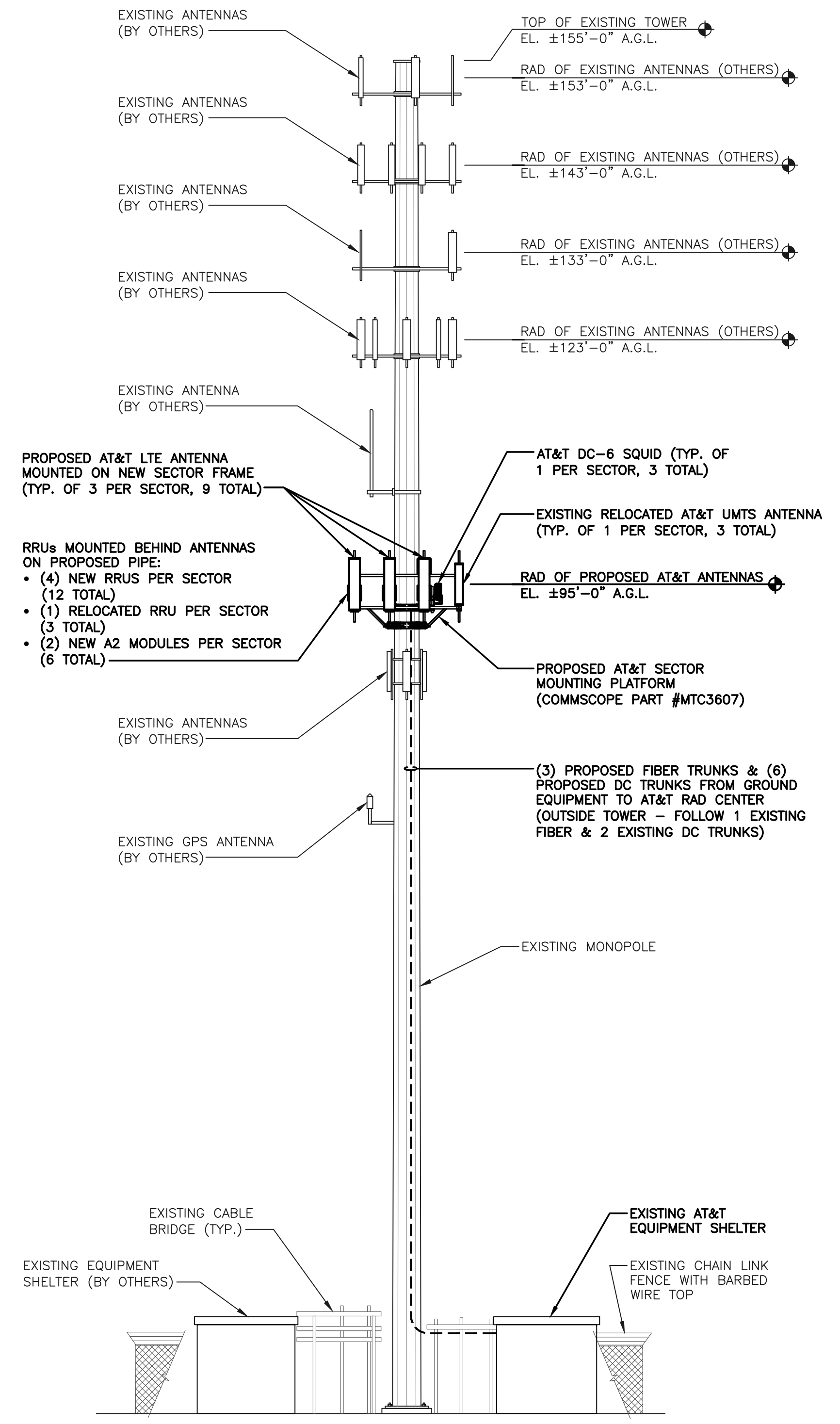
EXISTING ANTENNA LAYOUT
SCALE: N.T.S.



PROPOSED ANTENNA LAYOUT
SCALE: N.T.S.



EXISTING TOWER ELEVATION
SCALE: N.T.S.



PROPOSED TOWER ELEVATION
SCALE: N.T.S.

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.

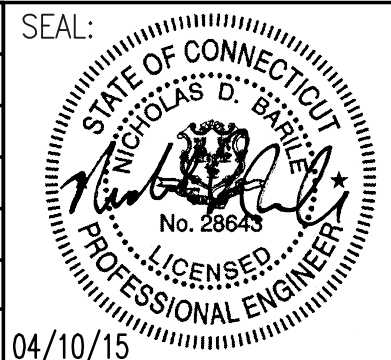
COM-EX
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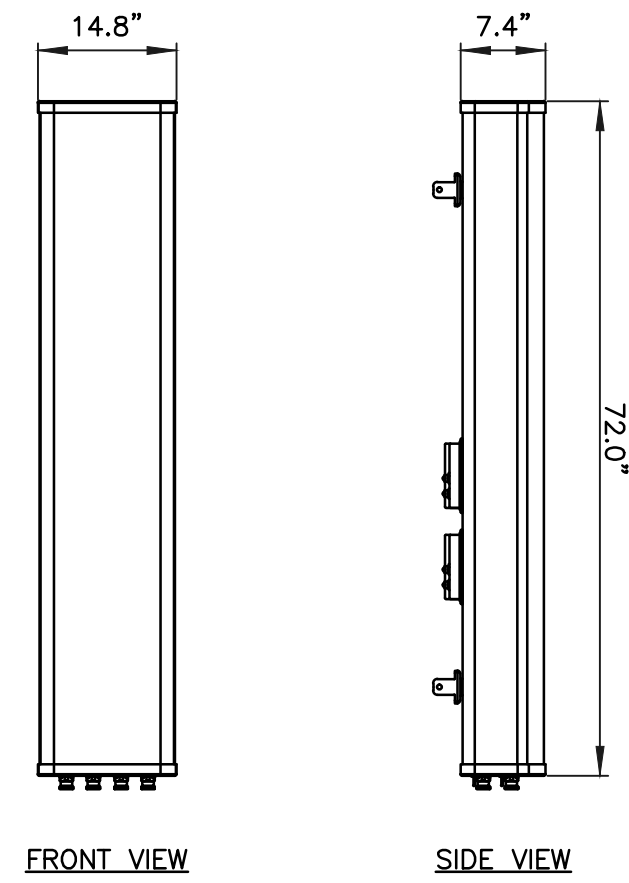
SITE NUMBER: CT1118
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0	04/10/15	FINAL SUBMISSION	CJT	NDB	NDB
NO.	DATE	REVISIONS	BY	CHK	APP'D
SCALE: AS SHOWN		DESIGNED BY: JW	DRAWN BY: JW		04/10/15

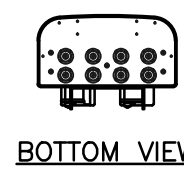


AT&T
DRAWING TITLE:
ANTENNA LAYOUTS & ELEVATIONS
JOB NUMBER: 14021-EMP
DRAWING NUMBER: A-3
REV: 0



FRONT VIEW

SIDE VIEW

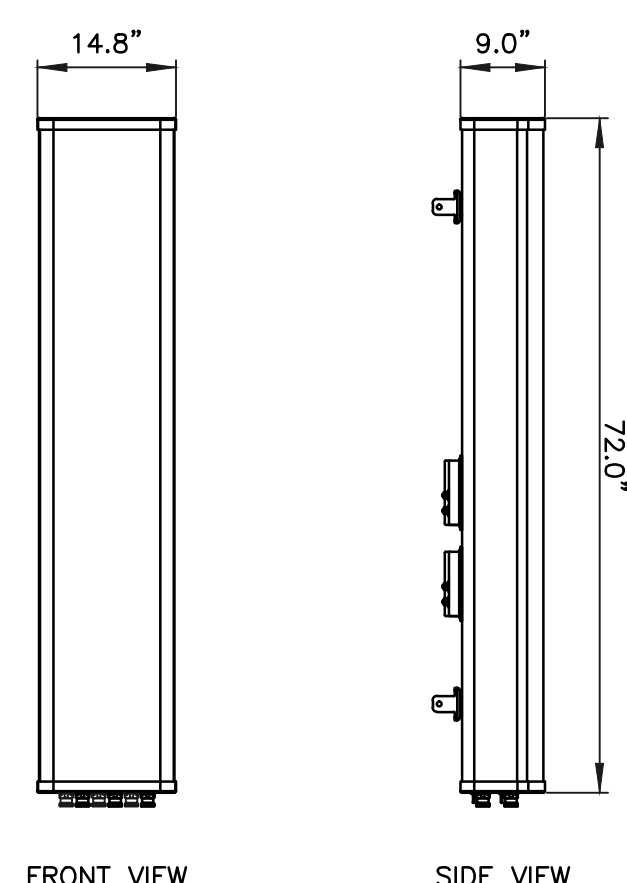


BOTTOM VIEW

MANUFACTURER	CCI
MODEL	OPA-65R-LCUU-H4
WEIGHT	73.0 LBS

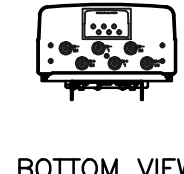
LTE OCTO-PORT ANTENNA DETAIL

SCALE: N.T.S.



FRONT VIEW

SIDE VIEW

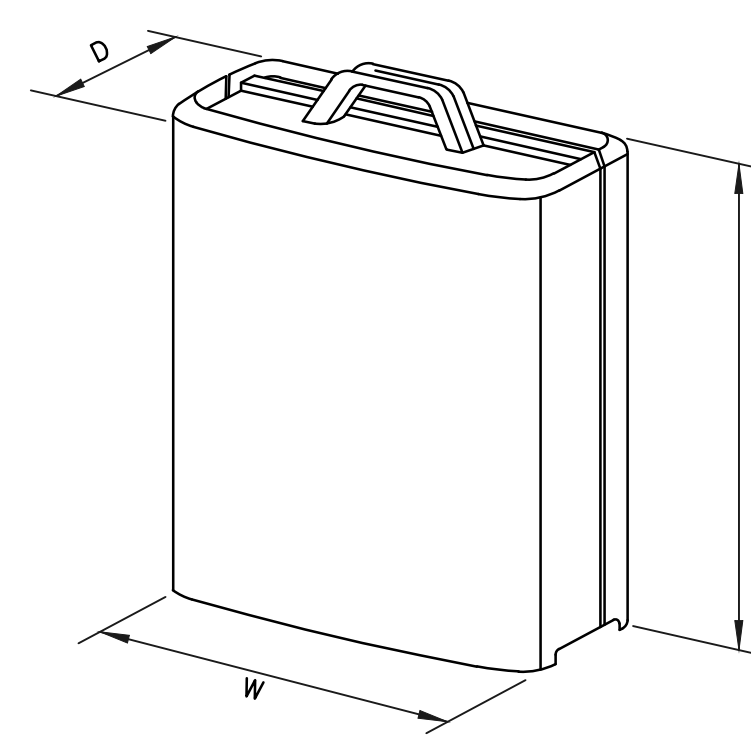


BOTTOM VIEW

MANUFACTURER	CCI
MODEL	HPA-65R-BUU-H6
WEIGHT	51.0 LBS

LTE HEX-PORT ANTENNA DETAIL

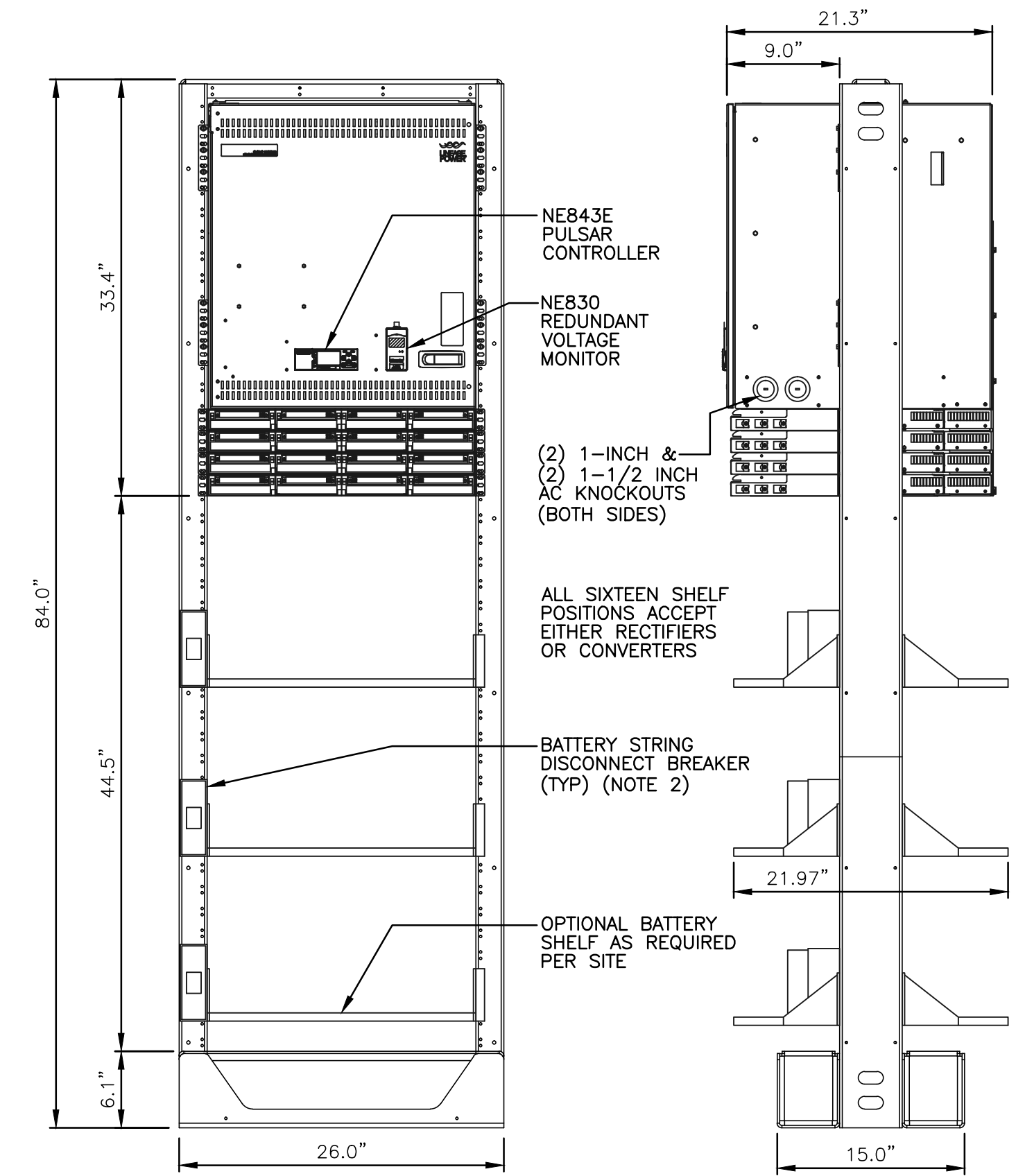
SCALE: N.T.S.



MODEL	L x W x H	WEIGHT
RRUS-11	19.69" x 16.97" x 7.17"	50.7 LBS
RRUS-12	20.4" x 18.5" x 7.5"	58 LBS
RRUS-32	29.9" x 13.3" x 9.5"	77 LBS
RRUS-E2	20.4" x 18.5" x 7.5"	58 LBS
A2 MODULE	16.4" x 15.2" x 3.4"	22 LBS

RRUS DETAIL

SCALE: N.T.S.



FRONT VIEW

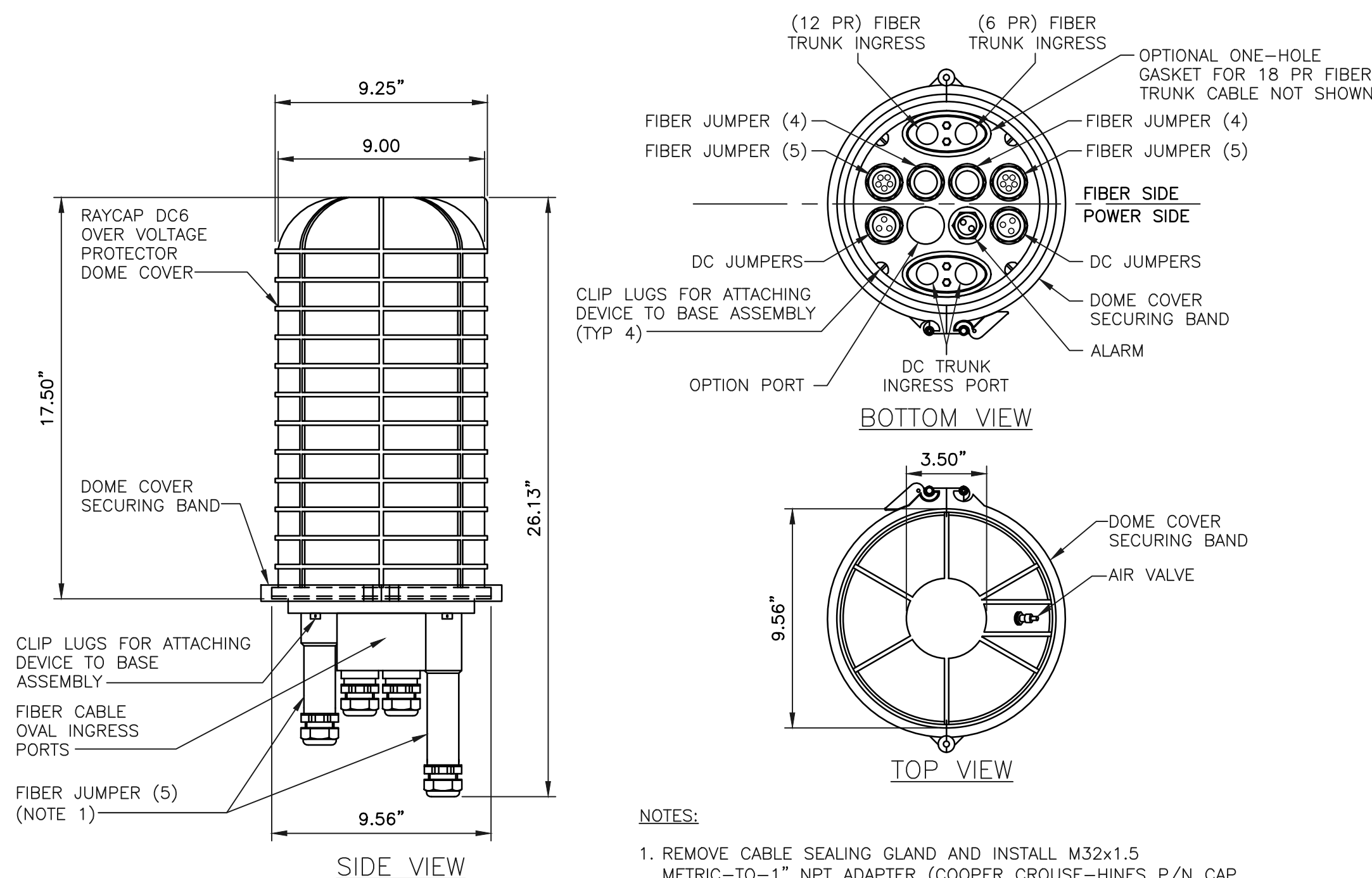
SIDE VIEW

WEIGHT:
 FRAME W/DC POWER SYSTEM AND W/O BATTERIES = 435lbs
 BATTERY SHELF (W/(4) 155AH BATTERIES = APPROXIMATELY 500lbs PER SHELF
CLEARANCE:
 FRONT = 36"
 REAR = 6"
 SIDES = 2"

- NOTES:**
- GE/LINEAGE FLOOR ANCHOR KIT (847135688) MAY BE USED UNLESS LOCAL REQUIREMENTS GOVERN.
 - DISCONNECT MAY BE MOUNTED TO EITHER SIDE OF TRAY OR DIRECTLY TO FRAMEWORK
 - PER MANUFACTURER, FRAME IS SEISMIC COMPLIANT UP TO 3 BATTERY SHELVES.

POWER PLANT DETAIL

SCALE: N.T.S.



SIDE VIEW

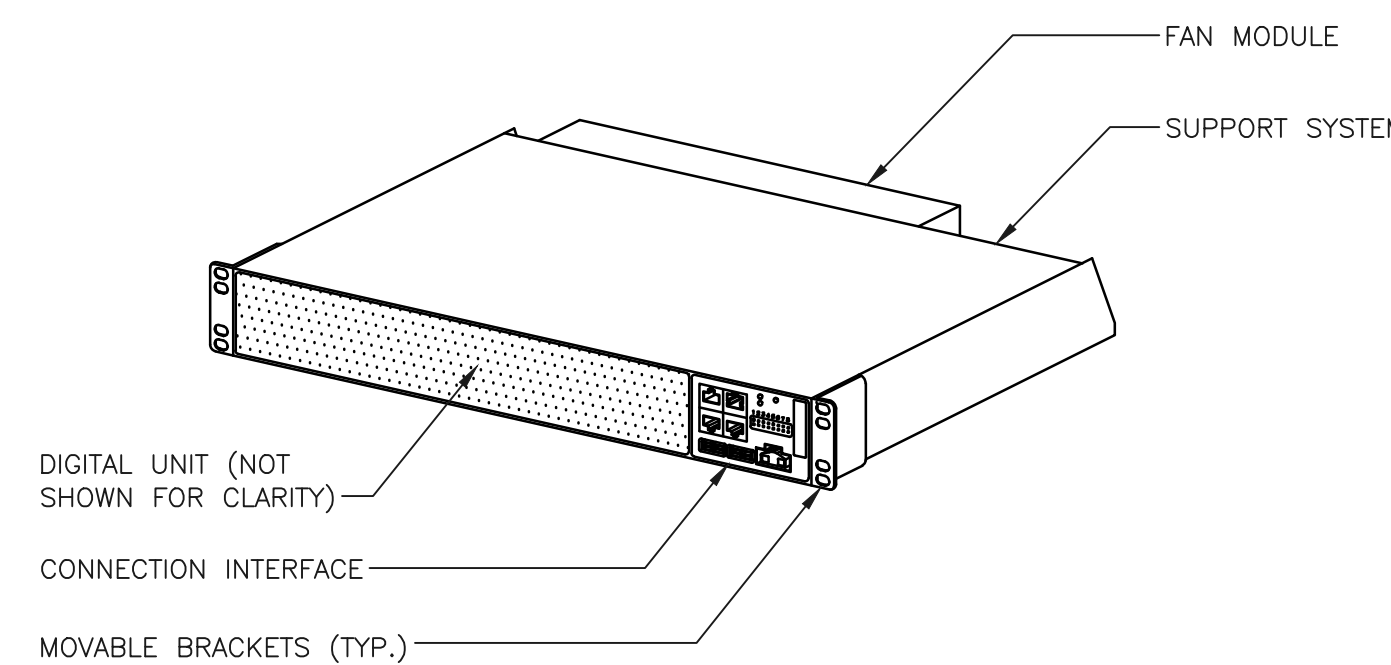
BOTTOM VIEW

TOP VIEW

- NOTES:**
- REMOVE CABLE SEALING GLAND AND INSTALL M32x1.5 METRIC-TO-1" NPT ADAPTER (COOPER CROUSE-HINES P/N CAP 740 994 OR EQUIVALENT MFR) WHEN CONNECTING CONDUIT TO OVP.

DC-6 SURGE SUPPRESSOR DETAIL

SCALE: N.T.S.

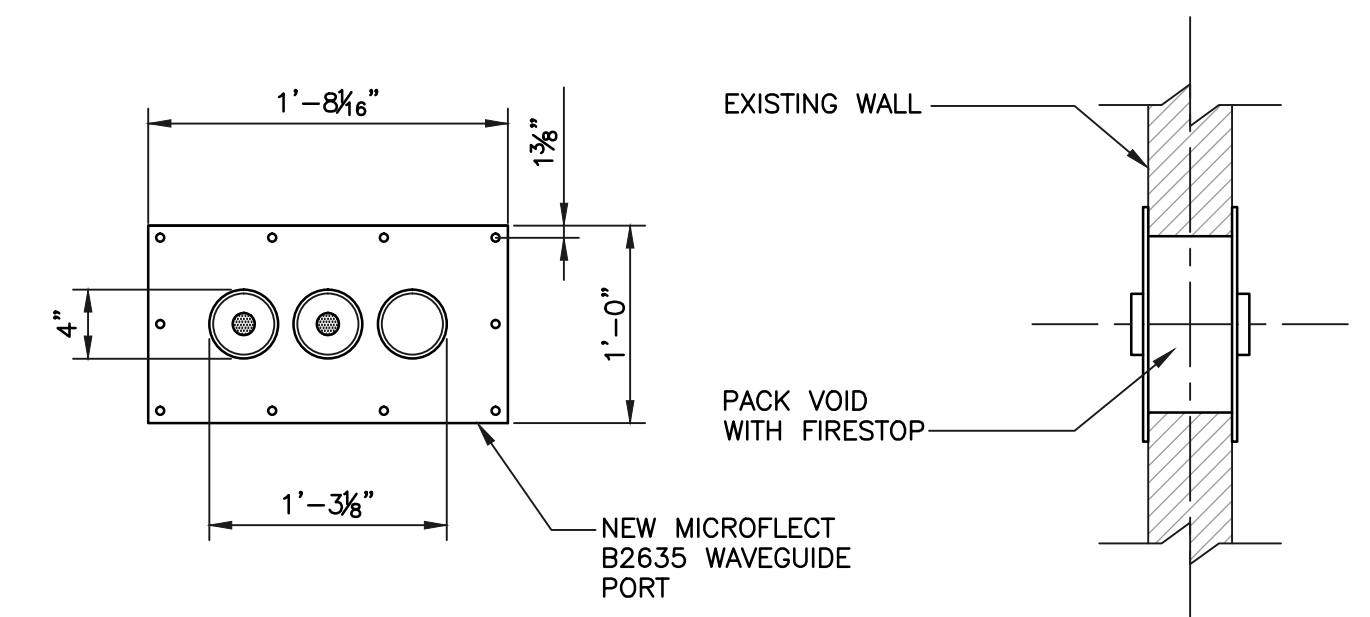


PHYSICAL CHARACTERISTICS	
HEIGHT	2.59" (1.5 U)
WIDTH	19"
DEPTH	13.77"
WEIGHT (FULLY EQUIPPED)	<22 LBS.
COLOR	WHITE

DC POWER SUPPLY	
NOMINAL VOLTAGE	-48VDC
OPERATING VOLTAGE RANGE	-40.0 TO -57.6 VDC
NON-DESTRUCTIVE VOLTAGE RANGE	0 TO -60 VDC

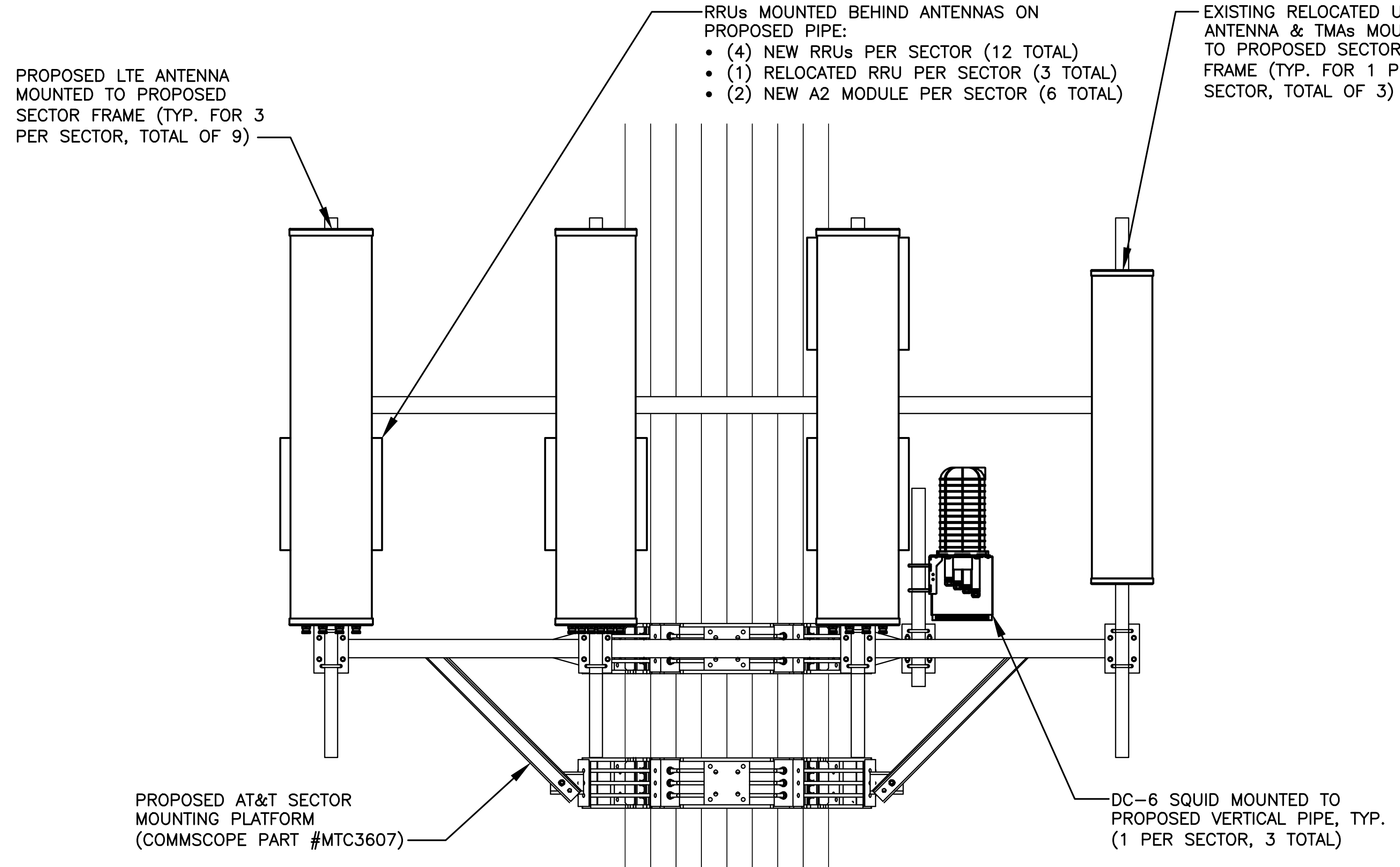
RBS 6601 DETAIL

SCALE: N.T.S.

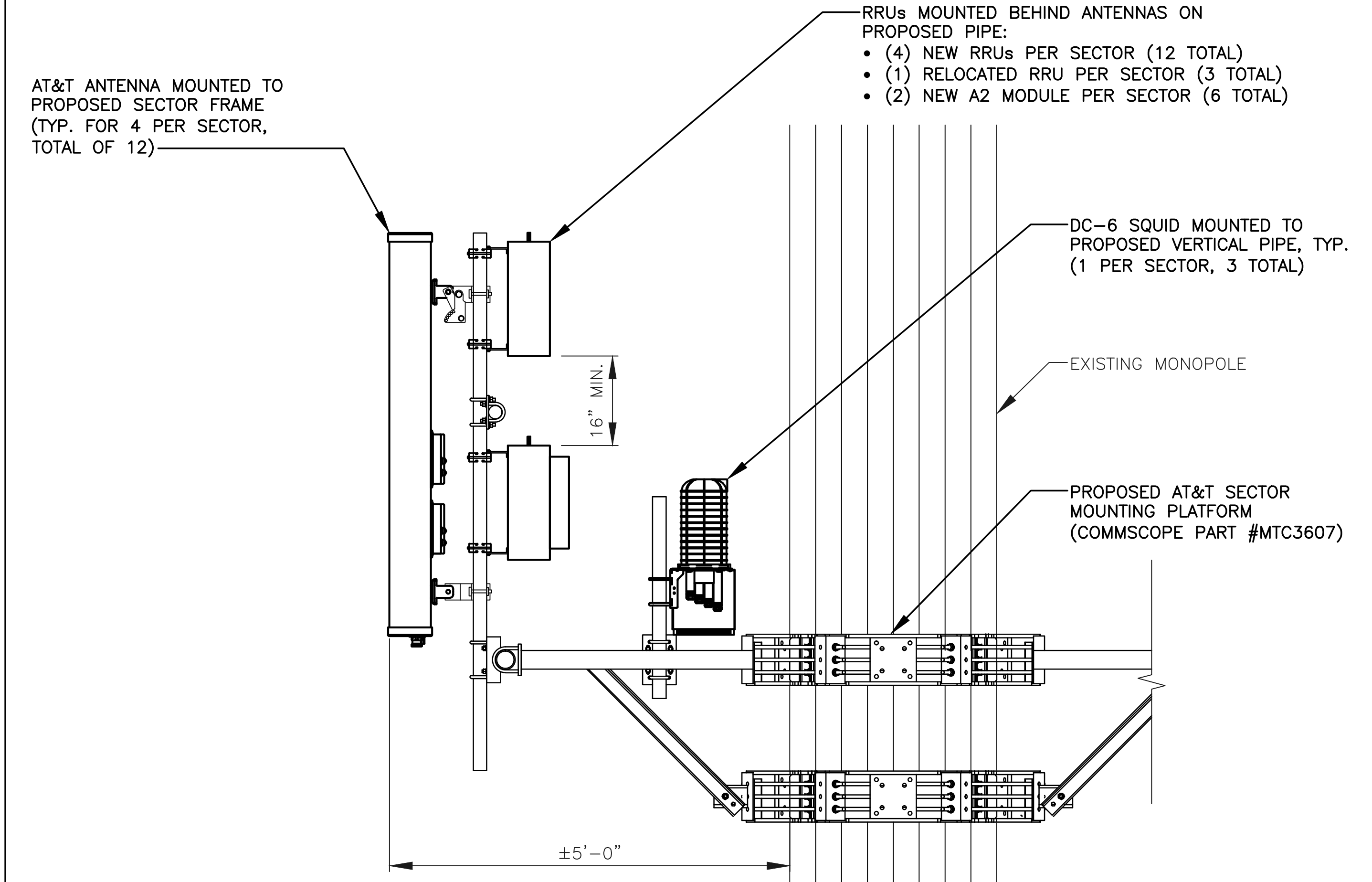


HATCH PLATE DETAIL

SCALE: N.T.S.



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	7770	55"x11"x5"
	A2	-	-	-
	A3	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	A4	POWERWAVE	7770	55"x11"x5"
BETA	B1	POWERWAVE	7770	55"x11"x5"
	B2	-	-	-
	B3	KATHREIN	800-10764	55.2"x11.8"x6.0"
	B4	POWERWAVE	7770	55"x11"x5"
GAMMA	G1	POWERWAVE	7770	55"x11"x5"
	G2	-	-	-
	G3	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	G4	POWERWAVE	7770	55"x11"x5"

PROPOSED ANTENNA SCHEDULE				
SECTOR	POSITION	MAKE	MODEL	SIZE (INCHES)
ALPHA	A1	POWERWAVE	7770	55"x11"x5"
	A2	CCI	OPA-65R-LCUU-H6	72"x14.8"x7.4"
	A3	CCI	HPA-65R-BUU-H6	72"x14.8"x9.0"
	A4	CCI	HPA-65R-BUU-H6	72"x14.8"x9.0"
BETA	B1	POWERWAVE	7770	55"x11"x5"
	B2	CCI	OPA-65R-LCUU-H6	72"x14.8"x7.4"
	B3	CCI	HPA-65R-BUU-H6	72"x14.8"x9.0"
	B4	CCI	HPA-65R-BUU-H6	72"x14.8"x9.0"
GAMMA	G1	POWERWAVE	7770	55"x11"x5"
	G2	CCI	OPA-65R-LCUU-H6	72"x14.8"x7.4"
	G3	CCI	HPA-65R-BUU-H6	72"x14.8"x9.0"
	G4	CCI	HPA-65R-BUU-H6	72"x14.8"x9.0"

PROPOSED RRH SCHEDULE					
SECTOR	MAKE	MODEL	SIZE (INCHES)	ADDITIONAL COMPONENT	SIZE (INCHES)
ALPHA	ERICSSON	RRUS-12	20.4"x18.5"x7.5"	ERICSSON A2 MODULE	16.4"x15.2"x3.4"
	ERICSSON	RRUS-12	20.4"x18.5"x7.5"	ERICSSON A2 MODULE	16.4"x15.2"x3.4"
	ERICSSON	RRUS-11 (RELOCATED)	19.7"x16.9"x7.2"		
	ERICSSON	RRUS-32	29.9"x13.3"x9.5"		
	ERICSSON	RRUS-E2	20.4"x18.5"x7.5"		
BETA	ERICSSON	RRUS-12	20.4"x18.5"x7.5"	ERICSSON A2 MODULE	16.4"x15.2"x3.4"
	ERICSSON	RRUS-12	20.4"x18.5"x7.5"	ERICSSON A2 MODULE	16.4"x15.2"x3.4"
	ERICSSON	RRUS-11 (RELOCATED)	19.7"x16.9"x7.2"		
	ERICSSON	RRUS-32	29.9"x13.3"x9.5"		
	ERICSSON	RRUS-E2	20.4"x18.5"x7.5"		
GAMMA	ERICSSON	RRUS-12	20.4"x18.5"x7.5"	ERICSSON A2 MODULE	16.4"x15.2"x3.4"
	ERICSSON	RRUS-12	20.4"x18.5"x7.5"	ERICSSON A2 MODULE	16.4"x15.2"x3.4"
	ERICSSON	RRUS-11 (RELOCATED)	19.7"x16.9"x7.2"		
	ERICSSON	RRUS-32	29.9"x13.3"x9.5"		
	ERICSSON	RRUS-E2	20.4"x18.5"x7.5"		

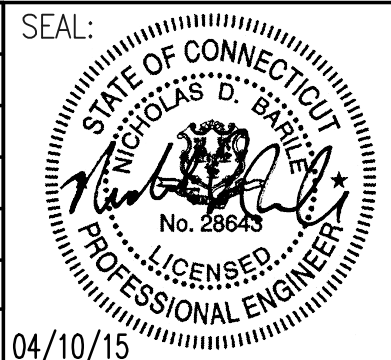
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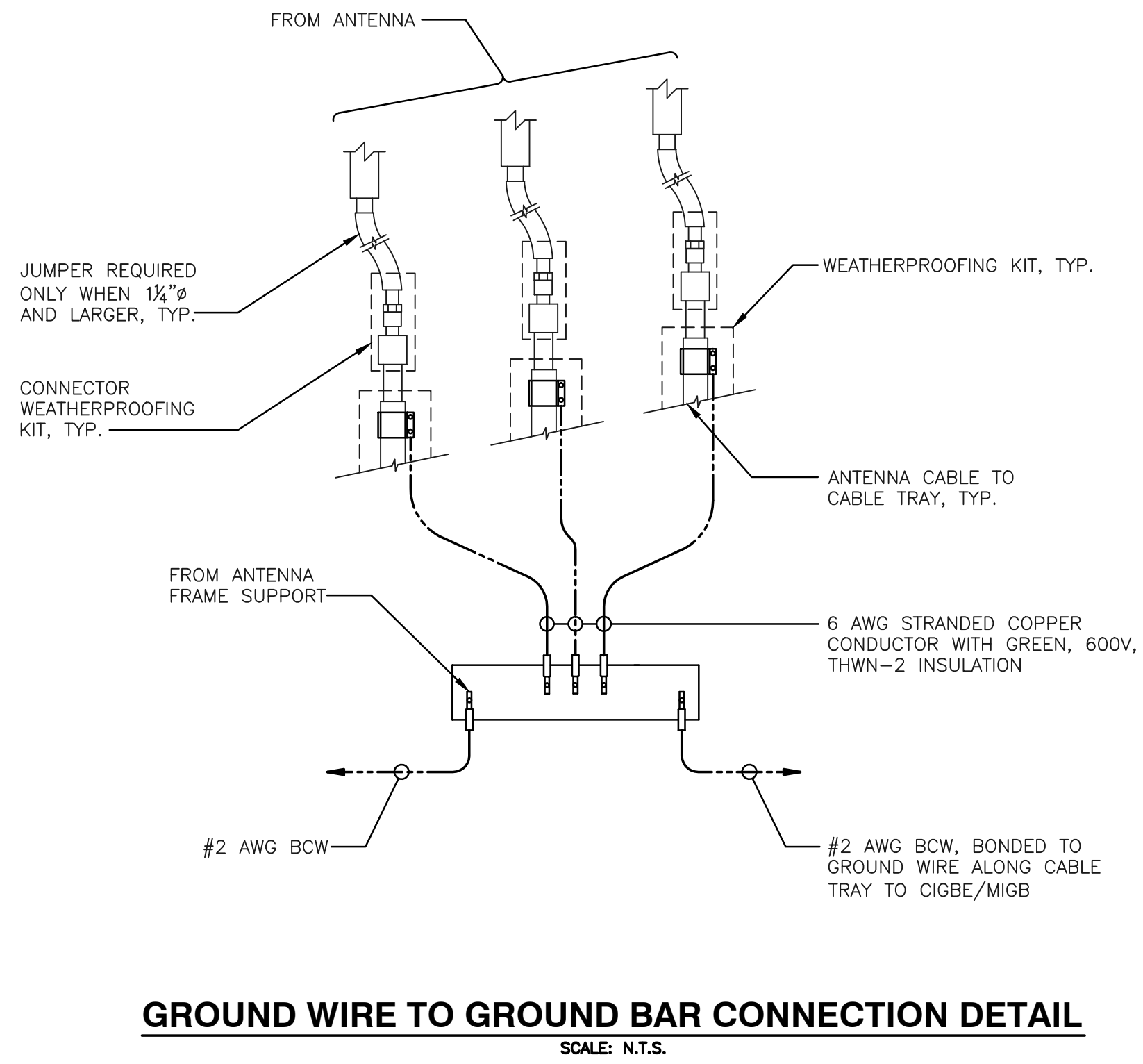
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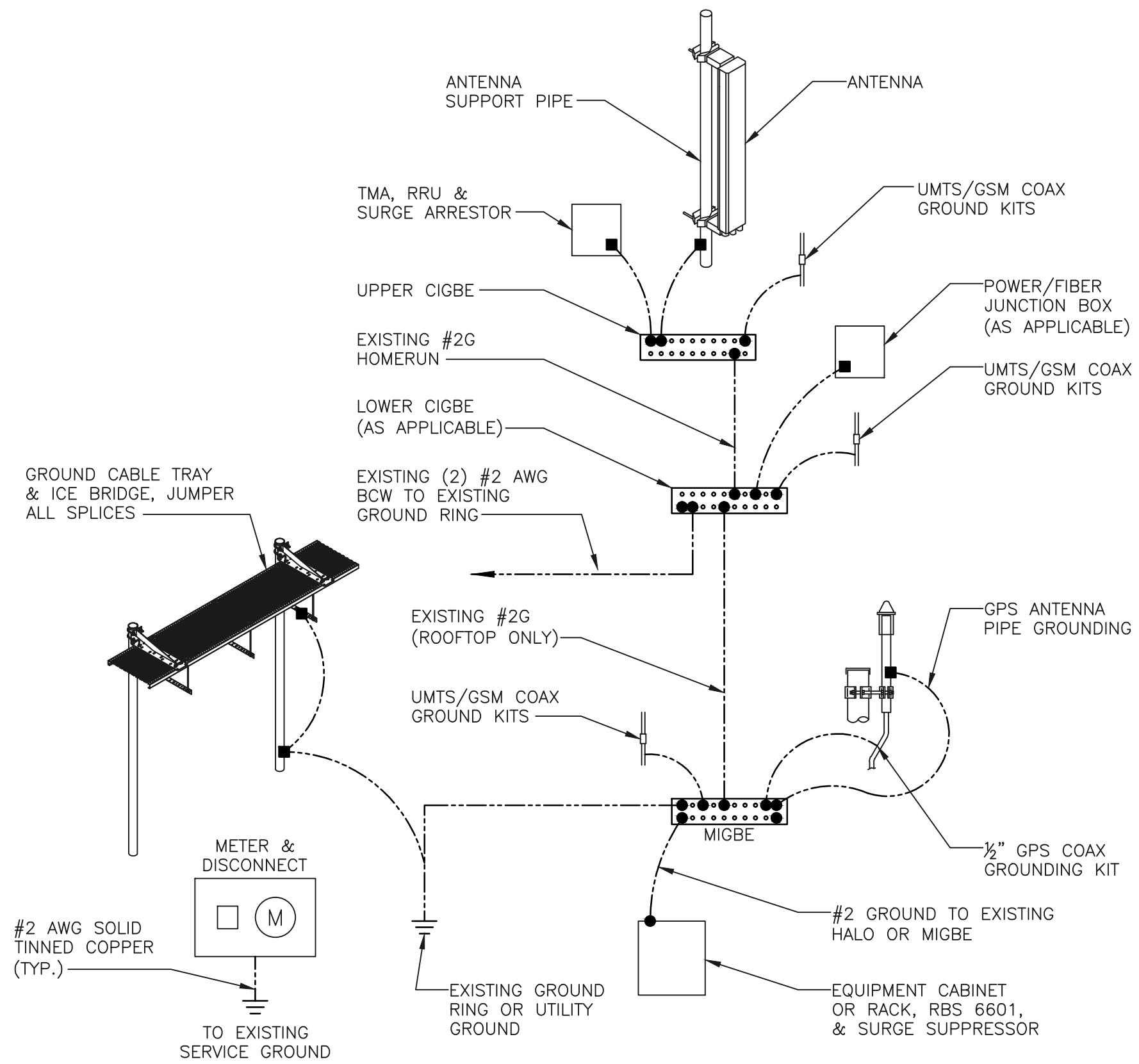
0	04/10/15	FINAL SUBMISSION	CJT	NDB	NDB
NO.	DATE	REVISIONS	BY	CHK	APP'D
SCALE: AS SHOWN		DESIGNED BY: JW	DRAWN BY: JW		04/10/15



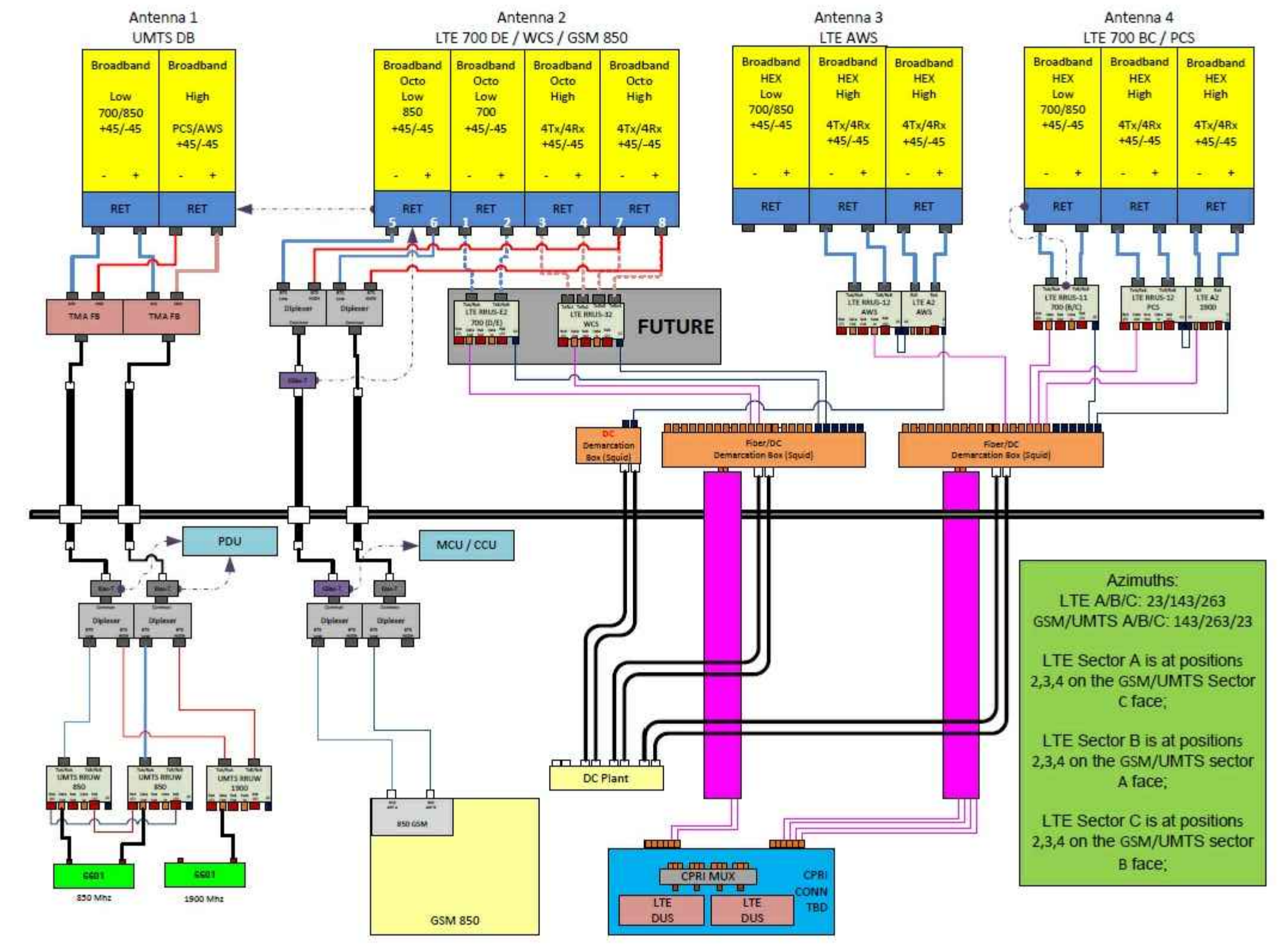
AT&T		
DRAWING TITLE: ANTENNA MOUNTING DETAILS		
JOB NUMBER 14021-EMP	DRAWING NUMBER A-5	REV 0



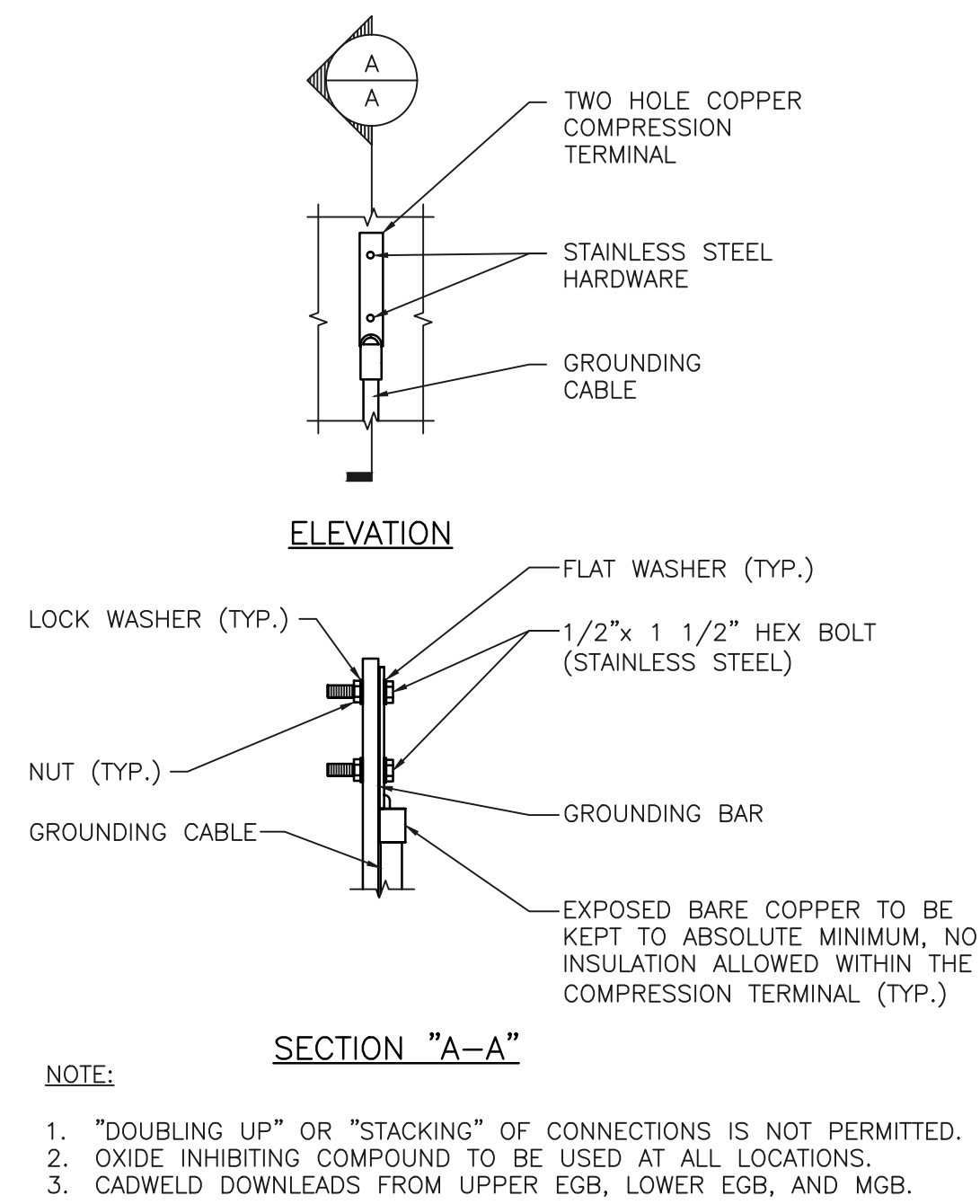
GROUND WIRE TO GROUND BAR CONNECTION DETAIL
SCALE: N.T.S.



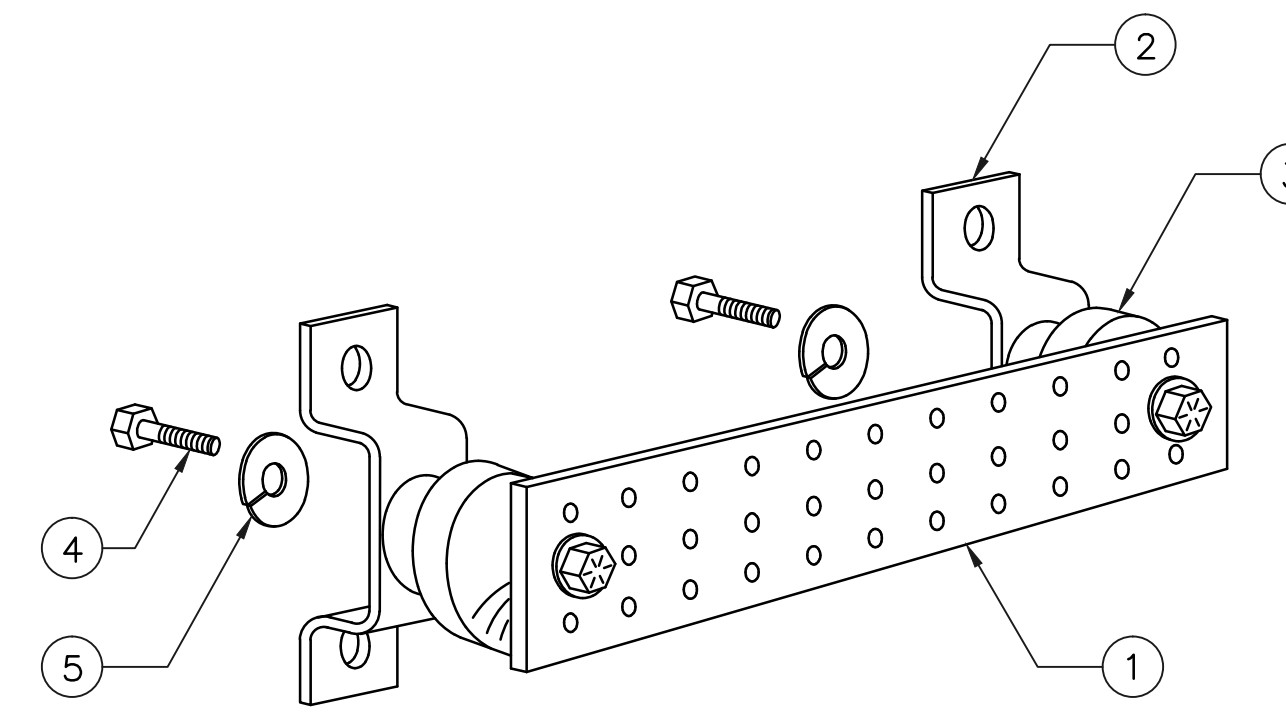
GROUNDING RISER DIAGRAM
SCALE: N.T.S.



PLUMBING DIAGRAM
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	1/8"-11x1" H.H.C.S.
5	4	3/8" LOCK WASHER

GROUND BAR DETAIL
SCALE: N.T.S.

- 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)

MI CHECKLIST

CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED	REPORT ITEM
PRE-CONSTRUCTION	
X	MI CHECKLIST DRAWING
N/A	EOR APPROVED SHOP DRAWINGS
X	FABRICATION INSPECTION
N/A	FABRICATOR CERTIFIED WELD INSPECTION
X	MATERIAL TEST REPORT (MTR)
N/A	FABRICATOR NDE INSPECTION
N/A	NDE REPORT OF MONOPOLE BASE PLATE (AS REQUIRED)
X	PACKING SLIPS
ADDITIONAL TESTING AND INSPECTIONS:	
CONSTRUCTION	
X	CONSTRUCTION INSPECTIONS
N/A	FOUNDATION INSPECTIONS
N/A	CONCRETE COMP. STRENGTH AND SLUMP TESTS
N/A	POST INSTALLED ANCHOR ROD VERIFICATION
N/A	BASE PLATE GROUT VERIFICATION
N/A	CONTRACTOR'S CERTIFIED WELD INSPECTION
N/A	EARTHWORK: LIFT AND DENSITY
X	ON SITE COLD GALVANIZING VERIFICATION
N/A	GUY WIRE TENSION REPORT
X	GC AS-BUILT DOCUMENTS
ADDITIONAL TESTING AND INSPECTIONS:	
POST-CONSTRUCTION	
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)
N/A	POST INSTALLED ANCHOR ROD PULL-OUT TESTING
X	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

NOTE: X DENOTES A DOCUMENT NEEDED FOR THE MI REPORT
 N/A DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE MI REPORT

MODIFICATION INSPECTION NOTES:

GENERAL

1. THE POST CONSTRUCTION INSPECTION (MI) IS A VISUAL INSPECTION OF TOWER MODIFICATIONS AND A REVIEW OF CONSTRUCTION INSPECTIONS AND OTHER REPORTS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS, AS DESIGNED BY THE ENGINEER OF RECORD (EOR).
2. THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, NOR DOES THE MI INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY RESIDES WITH THE EOR AT ALL TIMES.
3. ALL MI'S SHALL BE CONDUCTED BY A MI INSPECTOR THAT IS APPROVED TO PERFORM ELEVATED WORK FOR FDH ENGINEERING, INC.
4. TO ENSURE THAT THE REQUIREMENTS OF THE MI ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MI INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PO IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY. IF CONTACT INFORMATION IS NOT KNOWN, CONTACT YOUR FDH POINT OF CONTACT (POC).
5. REFER TO CCR-01 : CONTRACTOR CLOSEOUT REQUIREMENTS FOR FURTHER DETAILS AND REQUIREMENTS.

MI INSPECTOR

1. THE MI INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PO FOR THE MI TO, AT A MINIMUM:
 - REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
 - WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS
2. THE MI INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL GENERAL CONTRACTOR (GC) INSPECTION AND TEST REPORTS, REVIEWING THE DOCUMENTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING THE IN-FIELD INSPECTIONS, AND SUBMITTING THE MI REPORT TO FDH.

CORRECTION OF FAILING MI'S

1. IF THE MODIFICATION INSTALLATION WOULD FAIL THE MI ("FAILED MI"), THE GC SHALL WORK WITH FDH TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:
 - CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MI.
 - OR, WITH FDH'S APPROVAL, THE GC MAY WORK WITH THE EOR TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION.

REQUIRED PHOTOS

1. BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT:
 - PRE-CONSTRUCTION GENERAL SITE CONDITION
 - PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION
 - RAW MATERIALS
 - PHOTOS OF ALL CRITICAL DETAILS
 - FOUNDATION MODIFICATIONS
 - WELD PREPARATION
 - BOLT INSTALLATION AND TORQUE
 - FINAL INSTALLED CONDITION
 - SURFACE COATING REPAIR
 - POST CONSTRUCTION PHOTOGRAPHS
 - FINAL INFIELD CONDITION
2. PHOTOS OF ELEVATED MODIFICATIONS TAKEN FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.

PREPARED BY:



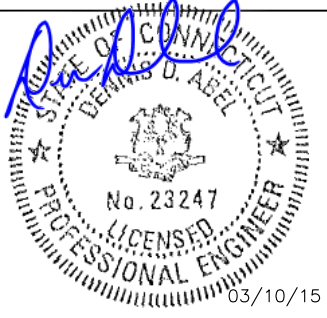
6521 MERIDIEN DRIVE
 RALEIGH, NC 27616
 PHONE: 919-755-1012
 FAX: 919-755-1031

ENGINEERING INNOVATION

PREPARED FOR:



5900 BROKEN SOUND PARKWAY, NW
 BOCA RATON, FL 33487
 (800) 487-SITE



DENNIS D. ABEL, P.E.
 CONNECTICUT LIC. NO. 23247

DRAWN BY: JK
 CHECKED BY: MSG
 ENG APPVD: DDA
 PROJECT NO: 15BFJD1400

SUBMITTALS		
DATE	DESCRIPTION	REV
03/10/15	CONSTRUCTION	0

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SITE NAME:
TORRINGTON

SITE NUMBER:
CT01499-S-00

SITE ADDRESS:
 1925-1931 EAST MAIN STREET
 TORRINGTON, CT 06790

SHEET TITLE
**MODIFICATION
 INSPECTION NOTES**

SHEET NUMBER
N-1

GENERAL NOTES:

- ALL WORK SHALL BE DONE IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL CODES AND ORDINANCES. IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN ALL PERMITS NECESSARY TO COMPLETE THE PROJECT AND ABIDE BY ALL CONDITIONS AND REQUIREMENTS OF THE PERMITS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF ALL DIMENSIONS, ELEVATIONS AND EXISTING CONDITIONS AT THE SITE BEFORE ORDERING ANY MATERIALS OR DOING ANY WORK. NO EXTRA CHARGE OR COMPENSATION SHALL BE ALLOWED DUE TO DIFFERENCE BETWEEN ACTUAL DIMENSIONS AND DIMENSIONS INDICATED ON THE CONSTRUCTION DRAWINGS. ANY SUCH DISCREPANCY IN DIMENSION WHICH MAY BE FOUND SHALL BE SUBMITTED TO FDH ENGINEERING FOR CONSIDERATION BEFORE THE CONTRACTOR PROCEEDS WITH THE WORK IN THE AFFECTED AREAS.
- INCORRECTLY FABRICATED, DAMAGED, OTHERWISE MISFITTING, OR NON-CONFORMING MATERIALS AND CONDITIONS SHALL BE REPORTED TO FDH ENGINEERING PRIOR TO ANY REMEDIAL OR CORRECTIVE ACTION. ALL ACTIONS SHALL REQUIRE FDH ENGINEERING APPROVAL.
- IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE TO ENSURE THE SAFETY OF THE STRUCTURE AND ITS COMPONENT PARTS DURING ERECTION AND/OR FIELD MODIFICATIONS. THIS INCLUDES, BUT IS NOT LIMITED TO, THE ADDITION OF TEMPORARY BRACING, GUYS OR TIE DOWNS THAT MAY BE NECESSARY. SUCH MATERIAL SHALL BE REMOVED AFTER THE COMPLETION OF THE PROJECT.
- CONTRACTOR SHALL PROMPTLY REMOVE ANY & ALL DEBRIS FROM SITE AND RESTORE AS BEST AS POSSIBLE TO PRECONSTRUCTION CONDITION.
- THE CLIMBING FACILITIES, SAFETY CLIMB AND ALL PARTS THEREOF SHALL NOT BE IMPEDED, MODIFIED OR ALTERED WITHOUT THE EXPRESS APPROVAL OF THE CROWN ENGINEERING GROUP (OR ENGINEER OF RECORD)

CONTRACTOR QUALIFICATION NOTES:

- ALL REPAIRS SHALL BE PERFORMED BY A TOWER CONTRACTOR WITH A MINIMUM 5 YEARS EXPERIENCE IN TOWER ERECTION AND RETROFIT AND WITH WORKING KNOWLEDGE OF THE TIA/EIA 222-F "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES".
- CONTRACTOR IS RESPONSIBLE FOR ALL CONSTRUCTION MEANS AND METHODS. SHOULD THE CONTRACTOR REQUIRE DIRECT CONSULTATION, FDH ENGINEERING, INC. IS WILLING TO OFFER SERVICES BASED UPON AN AGREED FEE FOR THE WORK REQUIRED.
- ALL SUBMITTAL INFORMATION MUST BE SENT TO FDH ENGINEERING, INC. 6521 MERIDIEN DRIVE, RALEIGH NC, 27616, TEL. (919) 755-1012, FAX. (919) 755-1031, E-MAIL INFO@FDH-INC.COM. ANY VARIATION OF THESE SPECIFICATIONS OR DRAWINGS WITHOUT CONSENT FROM FDH ENGINEERING, INC. WILL VOID ANY RESPONSIBILITY OR LIABILITY FOR DAMAGE (MATERIAL OR PHYSICAL) TOWARDS FDH ENGINEERING, INC.
- ALL CONSTRUCTION TO BE IN ACCORDANCE WITH THE TIA-1019-A STANDARD.

JOB SITE SAFETY & NOTES:

- NEITHER THE PROFESSIONAL ACTIVITIES OF FDH ENGINEERING, INC. NOR THE PRESENCE OF FDH ENGINEERING, INC. OR EMPLOYEES AND SUB-CONSULTANTS AT THE CONSTRUCTION SITE, SHALL RELIEVE THE GENERAL CONTRACTOR AND OR SUBCONTRACTORS AND ANY OTHER ENTITY OF THEIR OBLIGATIONS, DUTIES AND RESPONSIBILITIES INCLUDING, BUT NOT LIMITED TO, CONSTRUCTION MEANS, METHODS, SEQUENCE, TECHNIQUES OR PROCEDURES NECESSARY FOR PERFORMING, SUPERINTENDING OR COORDINATING ALL PORTIONS OF THE WORK OF CONSTRUCTION IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND ANY HEALTH OR SAFETY PRECAUTIONS REQUIRED BY ANY REGULATORY AGENCIES. THE GENERAL CONTRACTOR AND OR SUBCONTRACTOR IS SOLELY RESPONSIBLE FOR JOB SAFETY, AND WARRANTS THAT THIS INTENT IS EVIDENT BY ACCEPTING THIS WORK.

STEEL:

- ALL STRUCTURAL STEEL SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST AISC CODE AND ASTM SPECIFICATIONS.

*ALL STEEL PLATES SHALL BE ASTM A572-65 (Fy=65KSI) UNLESS OTHERWISE SPECIFIED.
- ALL CONNECTIONS OF STRUCTURAL STEEL MEMBERS SHALL BE MADE USING SPECIFIED WELDS WITH WELDING ELECTRODES E-80XX OR SPECIFIED HIGH STRENGTH BOLTS TO BE ASTM A325N, THREAD INCLUDED WITH SHEAR PLANE (UNLESS OTHERWISE NOTED).
- ALL BOLTED CONNECTIONS TO BE INSTALLED TO A SNUG-TIGHTENED CONDITION IN ACCORDANCE WITH AISC 13 PART 16.2, "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS", SECTION 8.1, UNLESS OTHERWISE SPECIFIED. WHEN "X" TYPE BOLTS ARE USED, CONTRACTOR MAY BE REQUIRED TO STACK ADDITIONAL WASHERS TO OBTAIN PROPER SNUG TIGHT INSTALLATION. ALL NUTS SHALL BE HEAVY HEX UNLESS OTHERWISE NOTED.
- ALL STEEL, AFTER FABRICATION, SHALL BE HOT DIPPED GALVANIZED PER ASTM A-123. ALL DAMAGED SURFACES, WELDED AREAS AND AUTHORIZED NON-GALVANIZED MEMBERS OR PARTS (EXISTING OR NEW) SHALL BE PAINTED WITH MULTIPLE COATS OF ZRC COLD GALVANIZING COMPOUND ACHIEVING A MINIMUM OF 4 MILS DRY FILM PER ASTM A 780.
- ALL SHOP AND FIELD WELDING SHALL BE DONE BY WELDERS QUALIFIED AS DESCRIBED IN THE "AMERICAN WELDING SOCIETY'S STANDARD QUALIFICATION PROCEDURE" TO PERFORM THE TYPE OF WORK REQUIRED. CONTRACTOR IS REQUIRED TO PROVIDE FDH ENGINEERING, INC. WITH A PASSING CERTIFIED WELDING INSPECTION FOR ALL WELDS.
- STRUCTURAL STEEL MAY NOT BE TORCH CUT FOR FABRICATION. ALL STEEL FABRICATION MUST FOLLOW AISC STANDARDS.

MISC. NOTES:

- ALL MODIFICATIONS ARE ASSUMED TO BE MADE ON AN EMPTY TOWER. CONTRACTOR IS RESPONSIBLE TO MAKE PROVISIONS TO SUPPORT OR WORK AROUND EXISTING ANTENNAS AND TRANSMISSION LINES. MODIFICATIONS MUST BE CONTINUOUS THROUGH ALL AREAS SHOWN.
- CONTRACTOR FIELD VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION.

FABRICATION NOTES:

- ALL DIMENSIONS ARE PRELIMINARY UNTIL FIELD VERIFIED BY CONTRACTOR. ANY CHANGES MUST BE APPROVED BY ENGINEER OF RECORD IN WRITING PRIOR TO FABRICATION AND INSTALLATION.
- NEW STEEL MEMBERS MUST HAVE SINGLE DRILLED HOLES. SLOTTED AND DOUBLE DRILLED HOLES ARE NOT ACCEPTABLE MEANS OF FABRICATION.

SUBSTITUTES AND/OR EQUALS:

- IF CONTRACTOR WISHES TO FURNISH OR USE A SUBSTITUTE ITEM OF MATERIAL OR EQUIPMENT, CONTRACTOR SHALL FIRST MAKE WRITTEN APPLICATION TO ENGINEER OF RECORD FOR ACCEPTANCE THEREOF, CERTIFYING THAT THE PROPOSED SUBSTITUTE WILL PERFORM ADEQUATELY THE FUNCTIONS AND ACHIEVE THE RESULTS CALLED FOR BY THE GENERAL DESIGN, BE SIMILAR IN SUBSTANCE TO THAT SPECIFIED AND SUITED TO THE SAME USE AS THAT SPECIFIED. ALL VARIATIONS OF THE PROPOSED SUBSTITUTE FROM THAT SPECIFIED WILL BE IDENTIFIED IN THE APPLICATION AND AVAILABLE MAINTENANCE, REPAIR AND REPLACEMENT SERVICE WILL BE INDICATED. THE APPLICATION WILL ALSO CONTAIN AN ITEMIZED ESTIMATE OF ALL COSTS OR CREDITS THAT WILL RESULT DIRECTLY OR INDIRECTLY FROM ACCEPTANCE OF SUCH SUBSTITUTE INCLUDING COSTS OF REDESIGN AND CLAIMS OF OTHER CONTRACTORS AFFECTED BY THE RESULTING CHANGE, ALL OF WHICH WILL BE CONSIDERED BY ENGINEER OF RECORD IN EVALUATION OF THE PROPOSED SUBSTITUTE. ENGINEER OF RECORD MAY REQUIRE CONTRACTOR TO FURNISH ADDITIONAL DATA ABOUT THE PROPOSED SUBSTITUTE.

NEW FLAT PLATE REINFORCEMENT NOTES:

- CONTRACTOR TO FIELD VERIFY PROPOSED LOCATION OF FLAT PLATE TO ENSURE THAT PROPER SPACING CAN BE MET.
- CONTRACTOR TO REPLACE AND/OR RELOCATE ANY CLIMBING PEGS THAT INTERFERE WITH THE INSTALLATION OF FLAT PLATE.
- ALL AJAX CONNECTIONS TO USE HIGH TENSILE SLEEVE PROVIDED BY MANUFACTURER. AJAX BOLT ASSEMBLY TO BE INSTALLED PER MANUFACTURER SPECIFICATIONS. SEE AJAX BOLT ASSEMBLY DETAIL.
- ALL SHEAR SLEEVES TO BE HOT DIPPED GALVANIZED PRIOR TO INSTALLATION.
- PRIOR TO FLAT PLATE INSTALLATION, SLIP JOINTS MUST BE TIGHTENED WITH A MINIMUM JACKING FORCE OF 6000 LBS.
- NEW FLAT PLATES TO BE INSTALLED ON THE CENTER OF PROPOSED SIDE UNLESS OTHERWISE NOTED.
- EXISTING COAX BANDS TO BE REPLACED AFTER FLAT PLATE INSTALLATION. NEW FLAT PLATE TO BE INSTALLED BENEATH EXISTING COAX BANDS.

CONSTRUCTION NOTES:

- CONTRACTOR TO FIELD VERIFY PROPOSED FLAT PLATE LAYOUT PRIOR TO CONSTRUCTION. IF ISSUES ARE PRESENT IN THE FIT OF THE FLAT PLATE, CONTRACTOR TO CONTACT ENGINEER OF RECORD OR FDH ENGINEERING PROJECT MANAGER PRIOR TO PROCEEDING WITH PROPOSED MODIFICATION OR FABRICATION.

PRETENSION BOLTS:

- ALL DIRECT TENSION INDICATOR (DTI) WASHERS SHALL BE THE "SQUIRTER@STYLE" AS MANUFACTURED BY:

APPLIED BOLTING TECHNOLOGY PRODUCTS, INC.
1413 ROCKINGHAM ROAD
BELLOWS FALLS, VERMONT 05101, USA
PHONE: 1-800-552-1999
WEBSITE: WWW.APPLIEDBOLTING.COM

- USE DIRECT TENSION INDICATOR (DTI) WASHERS COMPATIBLE WITH 3/4" NOMINAL A325 BOLTS FOR THE AJAX M20 BOLTS. DTI'S SHALL NOT BE HOT-DIP GALVANIZED. DTI'S SHALL BE MECHANICALLY GALVANIZED (MG) BY THE COLD MECHANICAL PROCESS ONLY AS PROVIDED BY THE DTI MANUFACTURER.
- USE HARDENED WASHER FOR A 3/4" NOMINAL BOLT BETWEEN THE TOP OF DIRECT TENSION INDICATOR (DTI) WASHER AND THE NUT OF THE AJAX M20 BOLT. HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A MINIMUM HARDNESS OF RE 38 OR HIGHER. THE HARDENED WASHERS SHALL BE MECHANICALLY GALVANIZED BY COLD MECHANICAL PROCESS. ALTERNATIVELY, CORRECTLY MADE HOT DIP GALVANIZED HARDENED FLAT WASHERS HAVING A MINIMUM HARDNESS OF RC 38 CAN BE USED; CONTRACTOR SHALL PROVIDE DOCUMENTATION OF WASHER SPECIFICATION AND HARDNESS.
- CONTRACTOR SHALL FOLLOW DTI MANUFACTURER'S INSTRUCTION FOR INSTALLATION, LUBRICATION, TIGHTENING AND INSPECTION.

INSPECTION REQUIRED: ALL AJAX BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC "SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS", DEC. 31, 2009, BY A QUALIFIED BOLT INSPECTOR. DURING INSTALLATION, THE BOLT INSPECTOR SHALL VERIFY AND DOCUMENT THE SHOP-DRILL AND FIELD-DRILLED HOLE SIZES; THE INSTALLATION OF THE AJAX BOLT ASSEMBLY, INCLUDING THE SHEAR SLEEVE PLACEMENT AND NUT LUBRICATION AND CONTRACTOR'S TENSIONING PROCEDURE. IN ADDITION, ALL AJAX BOLTS AND DTI'S SHALL BE VISUALLY INSPECTED ACCORDING TO THE DTI MANUFACTURER'S INSTRUCTIONS. THE BOLT INSPECTOR SHALL PROVIDE PHOTO DOCUMENT OF ALL BOLTS AFTER TIGHTENING CLEARLY SHOWING THE CONDITION OF THE DTI'S.

COLD GALVANIZATION/SURFACE PREPARATION NOTES:

- CONTRACTOR TO USE ZINGA OR ZRC COLD GALVANIZATION COMPOUNDS OR APPROVED EQUIVALENT.
- PREPARE RUSTED/CORRODED SURFACE FOR TREATMENT ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
- CONTRACTOR TO APPLY (2) COATS OF COLD GALVANIZATION COMPOUND PER MANUFACTURER'S RECOMMENDATION. DRYING AND CURING TIMES MUST BE UTILIZED PER MANUFACTURER'S RECOMMENDATION.
- APPLY ALL COATINGS BY BRUSH IN CALM WIND CONDITIONS. THE USE OF AEROSOL IS NOT PERMITTED.
- IF THE TOWER IS PAINTED, BRUSH PAINT ALL TREATED AREAS TO MATCH TOWER AFTER COLD GALVANIZATION COMPOUND IS ALLOWED TO CURE.


PREPARED BY:



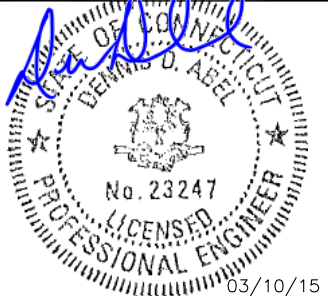
6521 MERIDIEN DRIVE
RALEIGH, NC 27616
PHONE: 919-755-1012
FAX: 919-755-1031

ENGINEERING INNOVATION

PREPARED FOR:



5900 BROKEN SOUND PARKWAY, NW
BOCA RATON, FL 33487
(800) 487-SITE



DENNIS D. ABEL, P.E.
CONNECTICUT LIC. NO. 23247

DRAWN BY:	JK
CHECKED BY:	MSG
ENG APPVD:	DDA
PROJECT NO:	15BFJD1400

SUBMITTALS		
DATE	DESCRIPTION	REV
03/10/15	CONSTRUCTION	0

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TORRINGTON

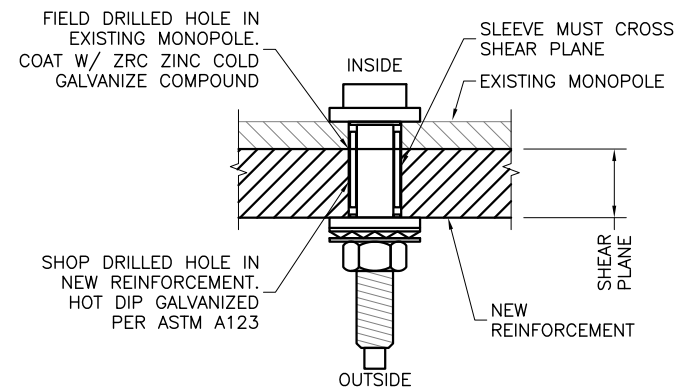
SITE NUMBER:
CT01499-S-00

SITE ADDRESS:
1925-1931 EAST MAIN STREET
TORRINGTON, CT 06790

SHEET TITLE

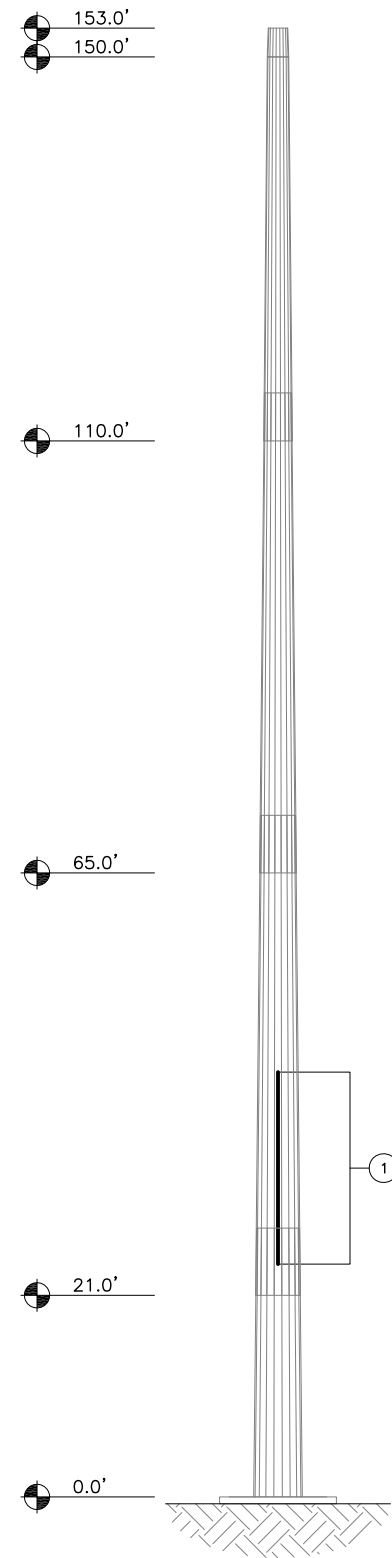
GENERAL NOTES

SHEET NUMBER



AJAX BOLT ASSEMBLY
SCALE: NTS

LENGTH (FT)	28.00	50.00	50.00	50.00	40.00
# OF SIDES		18			
THICKNESS (IN)	0.3750	0.3125	0.3125	0.3125	0.2500
SOCKET LENGTH (FT)	N/A	7.00	6.00	6.00	5.00
TOP DIAMETER (IN)	52.9791	43.3400	33.6250	26.2500	26.2500
BOT. DIAMETER (IN)	60.0000	55.2750	45.3750	35.2500	35.2500



TOWER ELEVATION
SCALE: NTS

MEMBER KEY SIZE	
MARK	SIZE
A	3.00
B	0.2500
C	N/A
D	24.0000
E	26.2500

- APPURTENANCES MAY INTERFERE WITH PROPOSED MODIFICATIONS.
- ALL MODIFICATIONS TO BE INSTALLED CONTINUOUSLY THROUGH EXISTING EQUIPMENT (UNLESS NOTED OTHERWISE). ALL EXISTING EQUIPMENT NOT TO BE DAMAGED OR TAKEN OFF AIR DURING INSTALLATION.
- ANTENNA GRAPHICS NOT SHOWN FOR CLARITY. SEE STRUCTURAL ANALYSIS REPORT FOR EXISTING ANTENNA LOADING.
- COAX GRAPHICS NOT SHOWN FOR CLARITY. SEE STRUCTURAL ANALYSIS REPORT FOR EXISTING COAX CONFIGURATION.

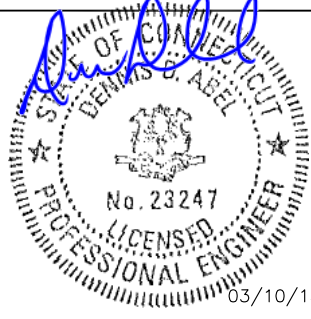
TOWER MODIFICATION SCHEDULE			
NO.	TYPE OF MODIFICATION	BOTTOM ELEV. (FT)	TOP ELEV. (FT)
1	INSTALLATION OF NEW FLAT PLATE REINFORCEMENT. SEE SHEET S-2 FOR DETAILS.	24.3±	44.3±
TOWER FINISH: GALVANIZED			

PREPARED BY:

FDH
 ENGINEERING INNOVATION
 6521 MERIDIEN DRIVE
 RALEIGH, NC 27616
 PHONE: 919-755-1012
 FAX: 919-755-1031

PREPARED FOR:

SBA
 5900 BROKEN SOUND PARKWAY, NW
 BOCA RATON, FL 33487
 (800) 487-SITE


 DENNIS D. ABEL, P.E.
 CONNECTICUT LIC. NO. 23247

DRAWN BY: JK
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 SITE ADDRESS:
 1925-1931 EAST MAIN STREET
 TORRINGTON, CT 06790

SHEET TITLE
 MODIFICATION SCHEDULE

SHEET NUMBER
S-1

FLAT PLATE INSTALLATION SCHEDULE

PART #	QTY.	DESCRIPTION	ELEVATION	FLATS
MK-1	3	FLAT PLATE REINFORCEMENT	24'-3"± TO 44'-3"±	1 - 7 - 13
-	108	20MM AJAX BOLTS	VARIES	-

PREPARED BY:
FDH
 6521 MERIDIEN DRIVE
 RALEIGH, NC 27616
 PHONE: 919-755-1012
 FAX: 919-755-1031
ENGINEERING INNOVATION

PREPARED FOR:
SBA
 5900 BROKEN SOUND PARKWAY, NW
 BOCA RATON, FL 33487
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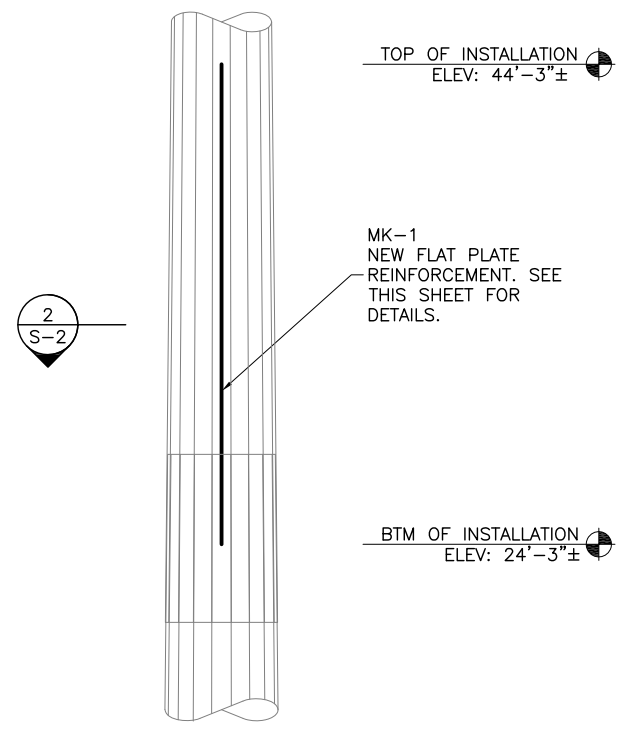
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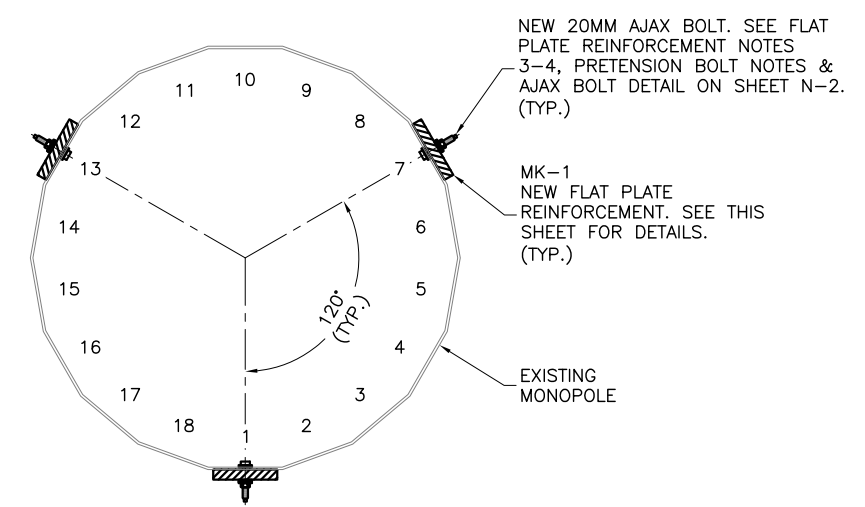
SHEET TITLE
FLAT PLATE INSTALLATION DETAILS

SHEET NUMBER
S-2



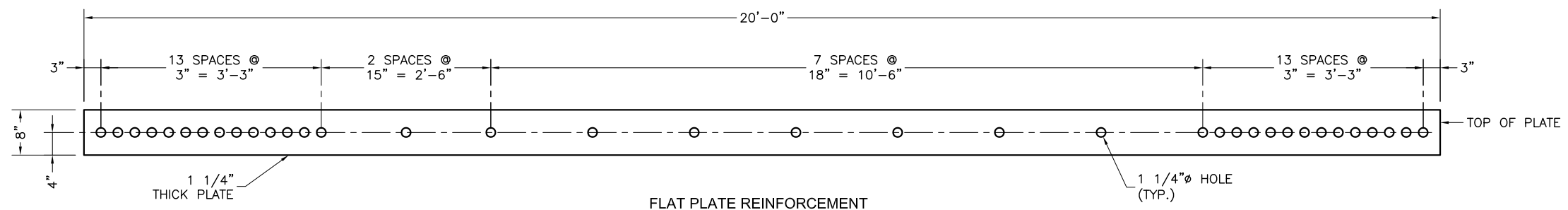
FLAT PLATE REINFORCEMENT LAYOUT
ELEVATION VIEW

1 **ELEVATION**
S-2 SCALE: NTS



FLAT PLATE REINFORCEMENT LAYOUT
PLAN VIEW

2 **SECTION**
S-2 SCALE: NTS



FLAT PLATE REINFORCEMENT
FRONT VIEW

MK-1 **DETAIL**
S-2 SCALE: 1/2" = 1'-0"



FDH Engineering, Inc., 6521 Meriden Drive Raleigh, NC 27616, Ph. 919.755.1012

**Structural Analysis for
SBA Network Services, Inc.**

153' Monopole

**SBA Site Name: Torrington
SBA Site ID: CT01499-S
AT&T Site ID: CT1118**

FDH Project Number 15BAJS1400

Analysis Results

Tower Components	123.0%	Insufficient
Foundation	59.2%	Sufficient

Prepared By:

Anjali Guli, EI
Project Engineer

Reviewed By:

J. Darrin Holt, PhD, PE
Principal
CT PE License No. 22988

FDH Engineering, Inc.
6521 Meriden Drive
Raleigh, NC 27616
(919) 755-1012
info@fdh-inc.com



January 13, 2015

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EXECUTIVE SUMMARY

At the request of SBA Network Services, Inc., FDH Engineering, Inc. performed a structural analysis of the monopole located in Torrington, CT to determine whether the tower is structurally adequate to support both the existing and proposed loads pursuant to the *Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, TIA/EIA-222-F* and *2005 Connecticut Building Code*. Information pertaining to the existing/proposed antenna loading, current tower geometry, geotechnical data, foundation dimensions, and member sizes was obtained from:

- Fred A. Nudd Corporation (Project No. 7783) original design drawings dated August 18, 2000
- Vertical Structures, Inc. (Job No. 2003-007-015) structural analysis and modification drawings dated September 9, 2003
- SBA Network Services, Inc.

The *basic design wind speed* per the *TIA/EIA-222-F* standards and *2005 Connecticut Building Code* is 80 mph without ice and 28 mph with 1" radial ice. Ice is considered to increase in thickness with height.

Conclusions

With the existing and proposed antennas from AT&T in place at 95 ft, the tower does not meet the requirements of the *TIA/EIA-222-F* standards and *2005 Connecticut Building Code*. However, provided the foundation was designed and constructed per the design drawings (see Fred A. Nudd Project No. 7783) and using the normal soil parameters, the foundation should have the necessary capacity to support the existing and proposed loading. For a more detailed description of the analysis of the tower, see the **Results** section of this report.

Our structural analysis has been performed assuming all information provided to FDH Engineering, Inc. is accurate (i.e., the steel data, tower layout, existing antenna loading, and proposed antenna loading) and that the tower has been properly erected and maintained per the original design drawings.

Recommendations

To ensure the requirements of the *TIA/EIA-222-F* standards and *2005 Connecticut Building Code* are met with the existing and proposed loading in place, we have the following recommendations:

1. The proposed feed lines should be installed inside the pole's shaft.
2. RRU/RRH Stipulation: The proposed equipment may be installed in any configuration as determined by the client.
3. Modifications to the tower's shaft are needed to support the proposed and existing loading. See the **Results** section of the report for overstressed locations.

We would anticipate the construction cost for a turnkey design/build modification project of this nature to range in price from approximately \$45,000 to \$55,000 (which should include the engineering design fees, inspection fees, and construction fees) provided the foundation does not require reinforcement.

APPURTENANCE LISTING

The proposed and existing antennas with their corresponding cables/coax lines are shown in **Table 1**. *If the actual layout determined in the field deviates from the layout, FDH Engineering, Inc. should be contacted to perform a revised analysis.*

Table 1 - Appurtenance Loading

Existing Loading:

Antenna Elevation (ft)	Description	Coax and Lines ¹	Carrier	Mount Elevation (ft)	Mount Type
153	(3) RFS APXV1M14-C-I20 (3) RFS APXVSPP18-C-A20 (3) ALU 1900 MHz RRUs (3) ALU 800 MHz RRUs (3) ALU 800 MHz Filters (4) RFS ACU-A20-N RETs (3) TD-RRH8x20-25 RRHs	(4) 1-1/4"	Sprint	153	(1) Low Profile Platform
143	(12) Decibel DB844H90E-XY	(12) 1-1/4"	Nextel	143	(1) Low Profile Platform
133	(6) EMS RR90-17-02DP	(12) 1-5/8"	T-Mobile	133	(1) Low Profile Platform
123 ²	(3) Antel BXA 70063-6CF (6) Antel LPA-80063-6CF (6) Antel LPA-171063-12CF	(12) 1-5/8"	Verizon	123	(1) Low Profile Platform
110	(1) 10' Omni	(1) 1/2"	Torrington PD	105	(1) Standoff
95 ³	(3) CSS DUO1417-8686-40 (6) Powerwave 7770 (1) Kathrein 800 10764 (2) KMW AM-X-CD-16-65-001-RET (6) Powerwave LGP21401 (6) Powerwave LGP21903 (6) Ericsson RRUS-11 (1) Andrew ABT-DF-DMADBH (1) Raycap DC6-48-60-18-8F	(12) 1-5/8" (1) 7/16" Fiber ⁵ (2) 3/4" DC ⁵	AT&T	95	(1) Low Profile Platform
85 ⁴	(3) RFS APXV18-206517S-C	(6) 1-5/8"	Pocket	85	(3) Pipe Mounts
70	(1) GPS	(1) 1/2"	---	70	(1) Standoff

1. The existing coax are installed inside the pole's shaft, unless otherwise noted
2. Verizon has (6) 1-5/8" coax to 123 ft installed outside the pole's shaft in a single row
3. AT&T's coax to 95 ft are installed outside the pole's shaft double stacked
4. Pocket's coax to 85 ft are installed outside the pole's shaft in a single row
5. AT&T's coax installed inside 3" Flex Conduit.

Proposed Carrier Final Loading:

Antenna Elevation (ft)	Description	Coax and Lines	Carrier	Mount Elevation (ft)	Mount Type
95	(4) CCI/HPA-65R-BUU H6 (3) Powerwave 7770 (2) Andrew SBNH-1D65A (3) CCI OPA-65R-LCUU-H6 (6) Powerwave LGP21401 (6) Powerwave LGP21903 (6) Ericsson RRUS-11 (3) Ericsson RRUS-12 (3) Ericsson RRUS-A2 (3) Ericsson RRUS-32 (3) Ericsson RRUS-E2 (3) Polyphaser 1000860 (2) Raycap/Squid	(12) 1-5/8" (2) 1/2" Fiber (4) 3/4" DC	AT&T	95	(3) Sector Frames (Commscope P/N MTC3615)

RESULTS

The following yield strength of steel for individual members was used for analysis:

Table 2 - Material Strength

Member Type	Yield Strength
Tower Shaft Sections	65 ksi
Flange Plate	50 ksi
Flange Bolts	Fu = 120 ksi (assumed)
Base Plate	50 ksi
Anchor Bolts	Fu = 125 ksi

Table 3 displays the summary of the ratio (as a percentage) of force in the member to their capacities. Values greater than 100% indicate locations where the maximum force in the member exceeds its capacity. **Table 4** displays the maximum foundation reactions.

If the assumptions outlined in this report differ from actual field conditions, FDH Engineering, Inc. should be contacted to perform a revised analysis. Furthermore, as no information pertaining to the allowable twist and sway requirements for the existing or proposed appurtenances was provided, deflection and rotation were not taken into consideration when performing this analysis.

See the **Appendix** for detailed modeling information.

Table 3 - Summary of Working Percentage of Structural Components

Section No.	Elevation ft	Component Type	Size	% Capacity*	Pass Fail
L1	153 - 150	Pole	TP26.25x24x0.25	3.2	Pass
	150	Flange Bolts	(18) .5" Ø w/ 27" Ø BC	10.1	Pass
	150	Flange Plate	30" Ø x .5" thk PL	6.5	Pass
L2	150 - 110	Pole	TP35.25x26.25x0.25	48.4	Pass
L3	110 - 65	Pole	TP45.375x33.625x0.3125	87.3	Pass
L4	65 - 21	Pole	TP55.275x43.34x0.3125	123.0	Fail
L5	21 - 0	Pole	TP60x52.9791x0.375	107.7	Fail
		Anchor Bolts	(18) 2" Ø w/ 67" Ø BC	89.6	Pass
		Base Plate	73" Ø x 1.5" thk. PL w/ Stiffeners	70.6	Pass

* Capacities include 1/3 allowable stress increase for wind.

Table 4 - Maximum Base Reactions

Base Reactions	Current Analysis (TIA/EIA-222-F)	Original Design (TIA/EIA-222-F)
Axial	44 k	---
Shear	39 k	31 k
Moment	3,952 k-ft	3,692 k-ft

* Foundation determined to be adequate per independent analysis.

GENERAL COMMENTS

This engineering analysis is based upon the theoretical capacity of the structure. It is not a condition assessment of the tower and its foundation. It is the responsibility of SBA Network Services, Inc. to verify that the tower modeled and analyzed is the correct structure (with accurate antenna loading information) modeled. If there are substantial modifications to be made or the assumptions made in this analysis are not accurate, FDH Engineering, Inc. should be notified immediately to perform a revised analysis.

LIMITATIONS

All opinions and conclusions are considered accurate to a reasonable degree of engineering certainty based upon the evidence available at the time of this report. All opinions and conclusions are subject to revision based upon receipt of new or additional/updated information. All services are provided exercising a level of care and diligence equivalent to the standard and care of our profession. No other warranty or guarantee, expressed or implied, is offered. Our services are confidential in nature and we will not release this report to any other party without the client's consent. The use of this engineering work is limited to the express purpose for which it was commissioned and it may not be reused, copied, or distributed for any other purpose without the written consent of FDH Engineering, Inc.

APPENDIX

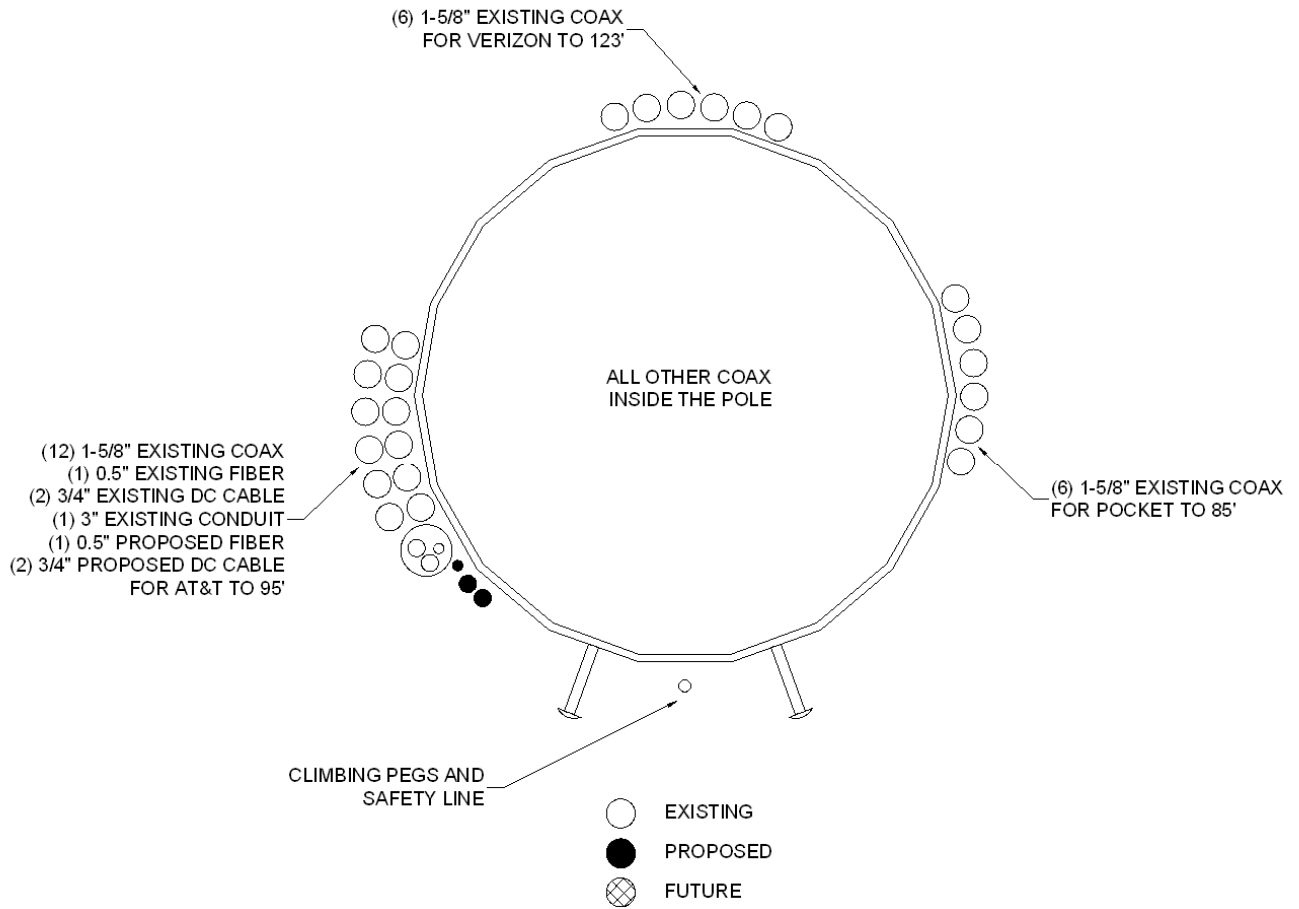
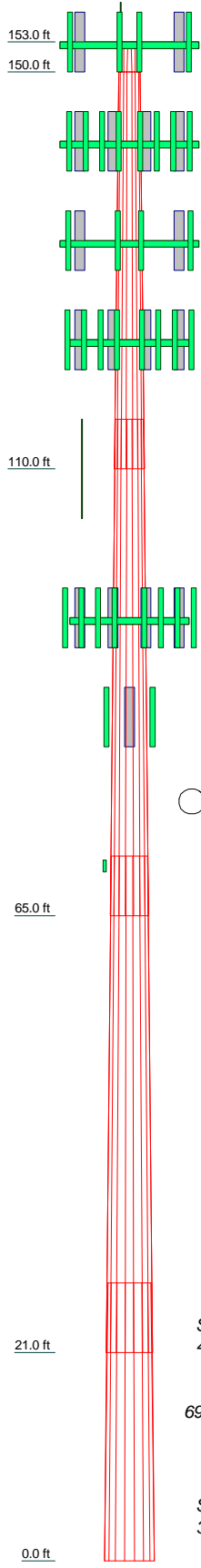


Figure 1 – Assumed Feed line Layout

Section	1	2	3	4	5
Length (ft)	3.00	40.00	50.00	50.00	28.00
Number of Sides	18	18	18	18	18
Thickness (in)	0.2500	0.2500	0.3125	0.3125	0.3750
Socket Length (ft)		5.00	6.00	7.00	
Top Dia (in)	24.0000	26.2500	33.6250	43.3400	52.9791
Bot Dia (in)	26.2500	35.2500	45.3750	55.2750	60.0000
Grade			A572-65		
Weight (K)	0.2	3.3	6.6	8.3	6.4



DESIGNED APPURTENANCE LOADING

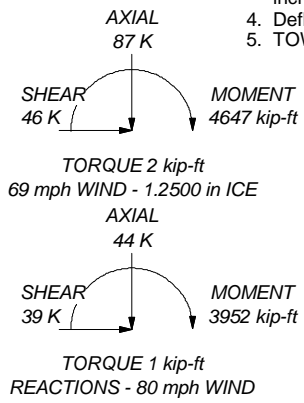
TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod	153	(1) Standoff	105
APXVSP18-C-A20 w/Mount Pipe	153	(2) HPA-65R-BUU-H8 w/ Mount Pipe	95
APXVSP18-C-A20 w/Mount Pipe	153	HPA-65R-BUU-H8 w/ Mount Pipe	95
APXVSP18-C-A20 w/Mount Pipe	153	HPA-65R-BUU-H8 w/ Mount Pipe	95
ALU 1900 RRU	153	OPA-65R-LCUU-H6 w/ Mount Pipe	95
ALU 1900 RRU	153	OPA-65R-LCUU-H6 w/ Mount Pipe	95
ALU 1900 RRU	153	OPA-65R-LCUU-H6 w/ Mount Pipe	95
ALU 800 RRU	153	SBNH-1D65A w/ Mount Pipe	95
ALU 800 RRU	153	SBNH-1D65A w/ Mount Pipe	95
ALU 800 RRU	153	SBNH-1D65A w/ Mount Pipe	95
ALU 800 Filter	153	Powerwave 7770 w/ Mount Pipe	95
ALU 800 Filter	153	Powerwave 7770 w/ Mount Pipe	95
ALU 800 Filter	153	Powerwave 7770 w/ Mount Pipe	95
ACU-A20-N RET	153	(2) LGP21401 TMA	95
(2) ACU-A20-N RET	153	(2) LGP21401 TMA	95
ACU-A20-N RET	153	(2) LGP21401 TMA	95
(1) Low Profile Platform	153	(2) LGP21903 Diplexer	95
Empty Mount Pipe	153	(2) LGP21903 Diplexer	95
Empty Mount Pipe	153	(2) RRUS-11	95
APXVTM14-C-I20 w/ Mount Pipe	153	(2) RRUS-11	95
APXVTM14-C-I20 w/ Mount Pipe	153	(2) RRUS-11	95
APXVTM14-C-I20 w/ Mount Pipe	153	RRUS 12	95
TD-RRH8x20-25	153	RRUS 12	95
TD-RRH8x20-25	153	RRUS A2	95
TD-RRH8x20-25	153	RRUS A2	95
(4) DB844H90E-XY w/Mount Pipe	143	RRUS A2	95
(4) DB844H90E-XY w/Mount Pipe	143	RRUS-32	95
(4) DB844H90E-XY w/Mount Pipe	143	RRUS-32	95
(1) Low Profile Platform	143	RRUS-32	95
(2) RR90-17-02DP w/Mount Pipe	133	RRUS-E2	95
(2) RR90-17-02DP w/Mount Pipe	133	RRUS-E2	95
(2) RR90-17-02DP w/Mount Pipe	133	RRUS-E2	95
(1) Low Profile Platform	133	Polyphaser 1000860	95
(2) LPA-80063/6CF w/ Mount Pipe	123	Polyphaser 1000860	95
(2) LPA-80063/6CF w/ Mount Pipe	123	Polyphaser 1000860	95
(2) LPA-80063/6CF w/ Mount Pipe	123	raycap squid	95
(2) LPA-171063-12CF w/ Mount Pipe	123	raycap squid	95
(2) LPA-171063-12CF w/ Mount Pipe	123	raycap squid	95
(2) LPA-171063-12CF w/ Mount Pipe	123	(3) Commscope MTC3615	95
(2) LPA-171063-12CF w/ Mount Pipe	123	APXV18-206517S-C w/Mount Pipe	85
BXA-70063/6CF w/ Mount Pipe	123	APXV18-206517S-C w/Mount Pipe	85
BXA-70063/6CF w/ Mount Pipe	123	APXV18-206517S-C w/Mount Pipe	85
BXA-70063/6CF w/ Mount Pipe	123	GPS	70
(1) Low Profile Platform	123	Standoff	70
10' Omni	105		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Litchfield County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 69 mph basic wind with 1.25 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 123%



FDH Engineering, Inc.
 6521 Meriden Drive, Suite 107
 Raleigh, North Carolina 27616
 Phone: 9197551012
 FAX: 9197551031

Job: **Torrington, CT01499-S**
 Project: **15BAJS1400**
 Client: SBA Network Services, Inc. Drawn by: AGul App'd:
 Code: TIA/EIA-222-F Date: 01/1 /15 Scale: NTS
 Path: Dwg No. E-1



**Structural Analysis for
SBA Network Services, Inc.**

153' Monopole

**SBA Site Name: Torrington
SBA Site ID: CT01499-S-00
AT&T Site ID: CT1118**

FDH Project Number 15BFJD1400

Analysis Results

Tower Components	95.2%	Sufficient
Foundation	53.0%	Sufficient

Prepared By:

Mark S. Girgis, EI
Project Engineer

Reviewed By:

Dennis D. Abel, PE
Director of Structural Engineering
CT PE License No. 23247

FDH Engineering, Inc.
6521 Meriden Drive
Raleigh, NC 27616
(919) 755-1012
info@fdh-inc.com



03-10-2015

March 10, 2015

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EXECUTIVE SUMMARY

At the request of SBA Network Services, Inc., FDH Engineering, Inc. performed a structural analysis of the monopole located in Torrington, CT to determine whether the tower is structurally adequate to support both the existing and proposed loads pursuant to the *Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, TIA/EIA-222-F* and *2005 Connecticut Building Code*. Information pertaining to the existing/proposed antenna loading, current tower geometry, geotechnical data, foundation dimensions, and member sizes was obtained from:

- Fred A. Nudd Corporation (Project No. 7783) original design drawings dated August 18, 2000
- Vertical Structures, Inc. (Job No. 2003-007-015) structural analysis and modification drawings dated September 9, 2003
- FDH Engineering, Inc. (Project No. 15BFJD1400) Modification Drawings for a 153' Monopole dated March 10, 2015
- SBA Network Services, Inc.

The *basic design wind speed* per the *TIA/EIA-222-F* standards and *2005 Connecticut Building Code* is 80 mph without ice and 28 mph with 1" radial ice. Ice is considered to increase in thickness with height.

Conclusions

With the existing and proposed antennas from AT&T in place at 95 ft, the tower meets the requirements of the *TIA/EIA-222-F* standards and *2005 Connecticut Building Code* provided the **Recommendations** listed below are satisfied. Furthermore, provided the foundation was designed and constructed per the design drawings (see Fred A. Nudd Project No. 7783) and using the normal soil parameters, the foundation should have the necessary capacity to support the existing and proposed loading. For a more detailed description of the analysis of the tower, see the **Results** section of this report.

Our structural analysis has been performed assuming all information provided to FDH Engineering, Inc. is accurate (i.e., the steel data, tower layout, existing antenna loading, and proposed antenna loading) and that the tower has been properly erected and maintained per the original design drawings.

Recommendations

To ensure the requirements of the *TIA/EIA-222-F* standards and *2005 Connecticut Building Code* are met with the existing and proposed loading in place, we have the following recommendations:

1. The proposed feed lines should be installed inside the pole's shaft.
2. RRU/RRH Stipulation: The proposed equipment may be installed in any configuration as determined by the client.
3. The modifications outlined in FDH Engineering, Inc. (Project No. 15BFJD1400) Modification Drawings for a 153' Monopole dated March 10, 2015 must be installed as specified in order for this analysis to be considered valid.

APPURTENANCE LISTING

The proposed and existing antennas with their corresponding cables/coax lines are shown in **Table 1**. *If the actual layout determined in the field deviates from the layout, FDH Engineering, Inc. should be contacted to perform a revised analysis.*

Table 1 - Appurtenance Loading

Existing Loading:

Antenna Elevation (ft)	Description	Feed Lines ¹	Carrier	Mount Elevation (ft)	Mount Type
153	(3) RFS APXVTM14-C-I20 (3) RFS APXVSPP18-C-A20 (3) ALU 1900 MHz RRUs (3) ALU 800 MHz RRUs (3) ALU 800 MHz Filters (4) RFS ACU-A20-N RETs (3) TD-RRH8x20-25 RRHs	(4) 1-1/4"	Sprint	153	(1) Low Profile Platform
143	(12) Decibel DB844H90E-XY	(12) 1-1/4"	Nextel	143	(1) Low Profile Platform
133	(6) EMS RR90-17-02DP	(12) 1-5/8"	T-Mobile	133	(1) Low Profile Platform
123 ²	(3) Antel BXA 70063-6CF (6) Antel LPA-80063-6CF (6) Antel LPA-171063-12CF	(12) 1-5/8"	Verizon	123	(1) Low Profile Platform
110	(1) 10' Omni	(1) 1/2"	Torrington PD	105	(1) Standoff
95 ²	(3) CSS DUO1417-8686-40 (6) Powerwave 7770 (1) Kathrein 800 10764 (2) KMW AM-X-CD-16-65-001-RET (6) Powerwave LGP21401 (6) Powerwave LGP21903 (6) Ericsson RRUS-11 (1) Andrew ABT-DF-DMADBH (1) Raycap DC6-48-60-18-8F	(12) 1-5/8" (1) 7/16" Fiber ² (2) 3/4" DC ²	AT&T	95	(1) Low Profile Platform
85 ²	(3) RFS APXV18-206517S-C	(6) 1-5/8"	Pocket	85	(3) Pipe Mounts
70	(1) GPS	(1) 1/2"	---	70	(1) Standoff

1. Feed lines installed inside the pole's shaft, unless otherwise noted
2. Feed lines installed as shown in **Figure 1**.

Proposed Carrier Final Loading:

Antenna Elevation (ft)	Description	Feed Lines	Carrier	Mount Elevation (ft)	Mount Type
95	(4) CCI/HPA-65R-BUU H6 (3) Powerwave 7770 (2) Andrew SBNH-1D65A (3) CCI OPA-65R-LCUU-H6 (6) Powerwave LGP21401 (6) Powerwave LGP21903 (6) Ericsson RRUS-11 (3) Ericsson RRUS-12 (3) Ericsson RRUS-A2 (3) Ericsson RRUS-32 (3) Ericsson RRUS-E2 (3) Polyphaser 1000860 (2) Raycap/Squid	(12) 1-5/8" (2) 1/2" Fiber (4) 3/4" DC	AT&T	95	(3) Sector Frames (Commscope P/N MTC3615)

RESULTS

The following yield strength of steel for individual members was used for analysis:

Table 2 - Material Strength

Member Type	Yield Strength
Tower Shaft Sections	65 ksi
Flange Plate	50 ksi
Flange Bolts	Fu = 120 ksi (assumed)
Base Plate	50 ksi
Anchor Bolts	Fu = 125 ksi

Table 3 displays the summary of the ratio (as a percentage) of force in the member to their capacities. Values greater than 100% indicate locations where the maximum force in the member exceeds its capacity. **Table 4** displays the maximum foundation reactions.

If the assumptions outlined in this report differ from actual field conditions, FDH Engineering, Inc. should be contacted to perform a revised analysis. Furthermore, as no information pertaining to the allowable twist and sway requirements for the existing or proposed appurtenances was provided, deflection and rotation were not taken into consideration when performing this analysis.

See the **Appendix** for detailed modeling information.

Table 3 - Summary of Working Percentage of Structural Components

Section No.	Elevation (ft)	Component Type	Size	% Capacity*	Pass Fail
L1	153 - 150	Pole	TP26.25x24x0.25	2.4	Pass
	150	Flange Bolts	(18) .5" Ø w/ 27" Ø BC	9.2	Pass
	150	Flange Plate	30" Ø x .5" thk PL	4.9	Pass
L2	150 - 110	Pole	TP35.25x26.25x0.25	39.1	Pass
L3	110 - 65	Pole	TP45.375x33.625x0.3125	79.8	Pass
L4	65 - 21	Pole	TP55.275x43.34x0.3125	95.2	Pass
L5	21 - 0	Pole	TP60x52.9791x0.375	90.7	Pass
		Anchor Bolts	(18) 2" Ø w/ 67" Ø BC	89.5	Pass
		Base Plate	PL 73" Ø x 1.5" Thk. w/ Stiffeners	70.6	Pass

*Capacities include 1/3 allowable stress increase for wind per TIA/EIA-222-F standards.

Table 4 - Maximum Base Reactions

Base Reactions	Current Analysis* (TIA/EIA-222-F)	Original Design (TIA/EIA-222-F)
Axial	46 k	---
Shear	39 k	31 k
Moment	3,947 k-ft	3,692 k-ft

*Foundation determined to be adequate per independent analysis.

GENERAL COMMENTS

This engineering analysis is based upon the theoretical capacity of the structure. It is not a condition assessment of the tower and its foundation. It is the responsibility of SBA Network Services, Inc. to verify that the tower modeled and analyzed is the correct structure (with accurate antenna loading information) modeled. If there are substantial modifications to be made or the assumptions made in this analysis are not accurate, FDH Engineering, Inc. should be notified immediately to perform a revised analysis.

LIMITATIONS

All opinions and conclusions are considered accurate to a reasonable degree of engineering certainty based upon the evidence available at the time of this report. All opinions and conclusions are subject to revision based upon receipt of new or additional/updated information. All services are provided exercising a level of care and diligence equivalent to the standard and care of our profession. No other warranty or guarantee, expressed or implied, is offered. Our services are confidential in nature and we will not release this report to any other party without the client's consent. The use of this engineering work is limited to the express purpose for which it was commissioned and it may not be reused, copied, or distributed for any other purpose without the written consent of FDH Engineering, Inc.

APPENDIX

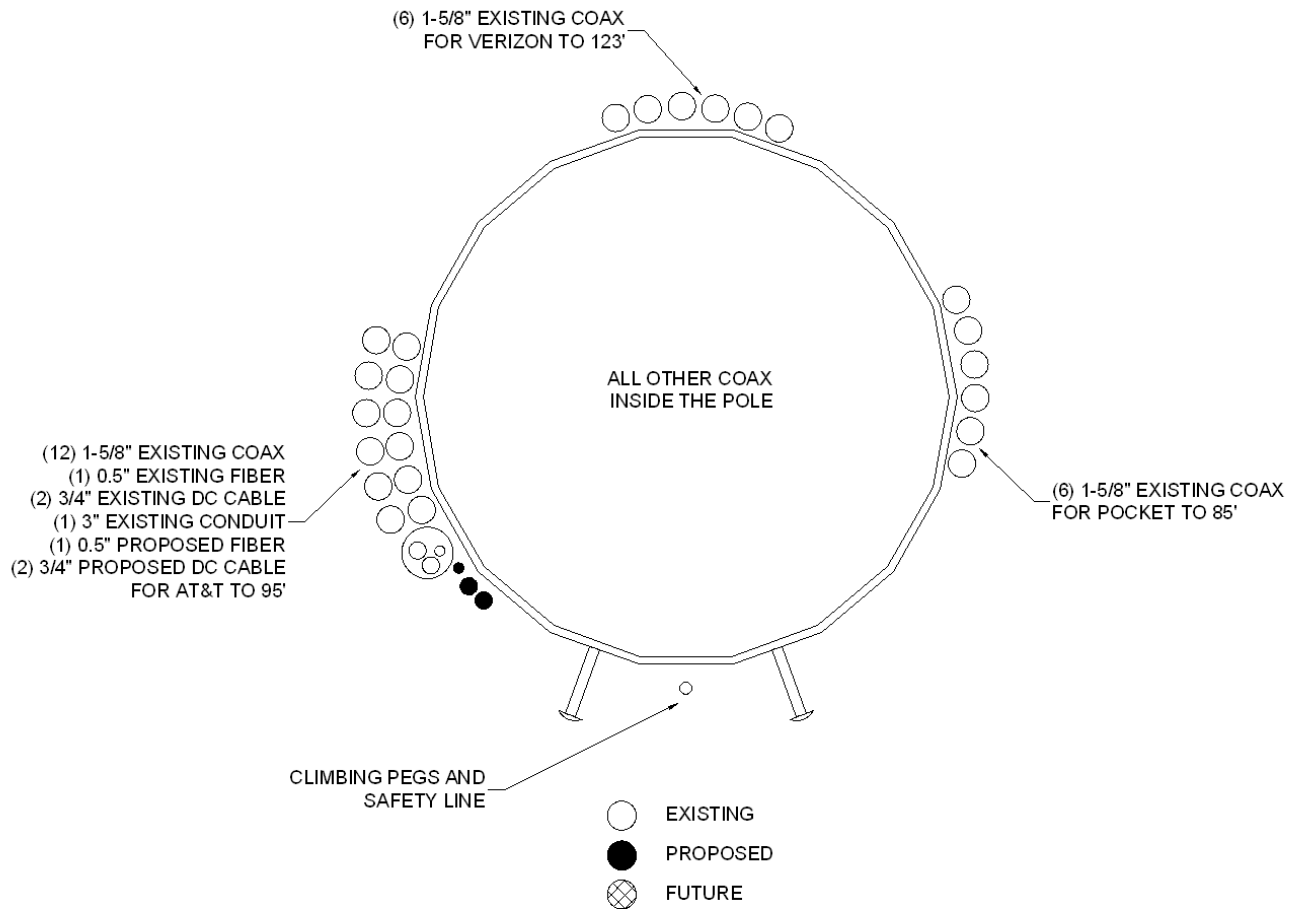


Figure 1 - Assumed Feed line Layout

DESIGNED APPURTENANCE LOADING

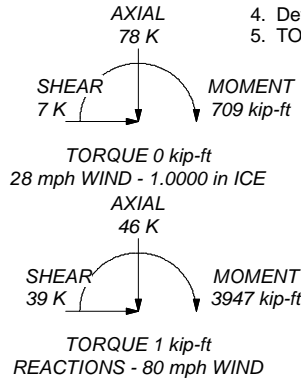
TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod	153	(1) Standoff	105
APXVSP18-C-A20 w/ Mount Pipe	153	(2) HPA-65R-BUU-H8 w/ Mount Pipe	95
APXVSP18-C-A20 w/ Mount Pipe	153	HPA-65R-BUU-H8 w/ Mount Pipe	95
APXVSP18-C-A20 w/ Mount Pipe	153	HPA-65R-BUU-H8 w/ Mount Pipe	95
1900 RRU	153	OPA-65R-LCUU-H6 w/ Mount Pipe	95
1900 RRU	153	OPA-65R-LCUU-H6 w/ Mount Pipe	95
1900 RRU	153	OPA-65R-LCUU-H6 w/ Mount Pipe	95
800 RRU	153	SBNH-1D65A w/ Mount Pipe	95
800 RRU	153	SBNH-1D65A w/ Mount Pipe	95
800 RRU	153	7770 w/ Mount Pipe	95
800 Filter	153	7770 w/ Mount Pipe	95
800 Filter	153	7770 w/ Mount Pipe	95
800 Filter	153	(2) LGP21401 TMA	95
ACU-A20-N RET	153	(2) LGP21401 TMA	95
(2) ACU-A20-N RET	153	(2) LGP21401 TMA	95
ACU-A20-N RET	153	(2) LGP21903 Diplexer	95
Low Profile Platform	153	(2) LGP21903 Diplexer	95
Empty Mount Pipe	153	(2) LGP21903 Diplexer	95
Empty Mount Pipe	153	(2) RRUS-11	95
Empty Mount Pipe	153	(2) RRUS-11	95
APXVTM14-C-I20 w/ Mount Pipe	153	(2) RRUS-11	95
APXVTM14-C-I20 w/ Mount Pipe	153	RRUS 12	95
APXVTM14-C-I20 w/ Mount Pipe	153	RRUS 12	95
TD-RRH8x20-25	153	RRUS 12	95
TD-RRH8x20-25	153	RRUS A2	95
TD-RRH8x20-25	153	RRUS A2	95
(4) DB844H90E-XY w/ Mount Pipe	143	RRUS A2	95
(4) DB844H90E-XY w/ Mount Pipe	143	RRUS-32	95
(4) DB844H90E-XY w/ Mount Pipe	143	RRUS-32	95
Low Profile Platform	143	RRUS-32	95
(2) RR90-17-02DP w/ Mount Pipe	133	RRUS-E2	95
(2) RR90-17-02DP w/ Mount Pipe	133	RRUS-E2	95
(2) RR90-17-02DP w/ Mount Pipe	133	RRUS-E2	95
Low Profile Platform	133	Polyphaser 1000860	95
(2) LPA-80063/6CF w/ Mount Pipe	123	Polyphaser 1000860	95
(2) LPA-80063/6CF w/ Mount Pipe	123	Polyphaser 1000860	95
(2) LPA-80063/6CF w/ Mount Pipe	123	Raycap Squid	95
(2) LPA-171063-12CF w/ Mount Pipe	123	Raycap Squid	95
(2) LPA-171063-12CF w/ Mount Pipe	123	(3) Commscope MTC3615	95
(2) LPA-171063-12CF w/ Mount Pipe	123	APXV18-206517S-C w/ Mount Pipe	85
BXA-70063/6CF w/ Mount Pipe	123	APXV18-206517S-C w/ Mount Pipe	85
BXA-70063/6CF w/ Mount Pipe	123	APXV18-206517S-C w/ Mount Pipe	85
BXA-70063/6CF w/ Mount Pipe	123	GPS	70
Low Profile Platform	123	Standoff	70
10' Omni	105		

MATERIAL STRENGTH


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

TOWER DESIGN NOTES

1. Tower is located in Litchfield County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 28 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 95.2%



Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	5.00	18	0.3750	5.00	31.8750	30.7500	A572-65	0.2500
2	5.00	18	0.3750	5.00	31.8750	29.6250	A572-65	0.2500
3	5.00	18	0.3750	5.00	31.8750	28.5000	A572-65	0.2500
4	5.00	18	0.3750	5.00	31.8750	27.3750	A572-65	0.2500
5	5.00	18	0.3750	5.00	31.8750	26.2500	A572-65	0.2500
6	5.00	18	0.3750	5.00	31.8750	25.1250	A572-65	0.2500
7	5.00	18	0.3750	5.00	31.8750	24.0000	A572-65	0.2500
8	5.00	18	0.3750	5.00	31.8750	22.8750	A572-65	0.2500
9	5.00	18	0.3750	5.00	31.8750	21.7500	A572-65	0.2500
10	5.00	18	0.3750	5.00	31.8750	20.6250	A572-65	0.2500
11	5.00	18	0.3750	5.00	31.8750	19.5000	A572-65	0.2500
12	5.00	18	0.3750	5.00	31.8750	18.3750	A572-65	0.2500
13	5.00	18	0.3750	5.00	31.8750	17.2500	A572-65	0.2500
14	5.00	18	0.3750	5.00	31.8750	16.1250	A572-65	0.2500
15	5.00	18	0.3750	5.00	31.8750	15.0000	A572-65	0.2500
16	5.00	18	0.3750	5.00	31.8750	13.8750	A572-65	0.2500
17	5.00	18	0.3750	5.00	31.8750	12.7500	A572-65	0.2500
18	5.00	18	0.3750	5.00	31.8750	11.6250	A572-65	0.2500
19	5.00	18	0.3750	5.00	31.8750	10.5000	A572-65	0.2500
20	5.00	18	0.3750	5.00	31.8750	9.3750	A572-65	0.2500
21	5.00	18	0.3750	5.00	31.8750	8.2500	A572-65	0.2500
22	5.00	18	0.3750	5.00	31.8750	7.1250	A572-65	0.2500
23	5.00	18	0.3750	5.00	31.8750	6.0000	A572-65	0.2500
24	5.00	18	0.3750	5.00	31.8750	4.8750	A572-65	0.2500
25	5.00	18	0.3750	5.00	31.8750	3.7500	A572-65	0.2500
26	5.00	18	0.3750	5.00	31.8750	2.6250	A572-65	0.2500
27	5.00	18	0.3750	5.00	31.8750	1.5000	A572-65	0.2500
28	5.00	18	0.3750	5.00	31.8750	0.3750	A572-65	0.2500
29	5.00	18	0.3750	5.00	31.8750	0.2500	A572-65	0.2500
30	5.00	18	0.3750	5.00	31.8750	0.1250	A572-65	0.2500
31	5.00	18	0.3750	5.00	31.8750	0.0000	A572-65	0.2500
32	5.00	18	0.3750	5.00	31.8750	0.0000	A572-65	0.2500



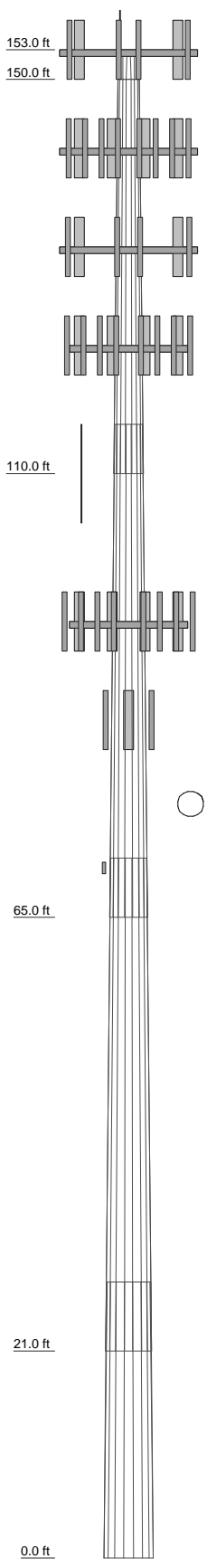
FDH Engineering, Inc.
6521 Meridien Drive
Raleigh, NC 27616
Phone: (919) 755-1012
FAX: (919) 755-1031

Job: **Torrington, CT01499-S-00**

Project: **15BFJD1400**

Client: SBA Network Services, Inc.	Drawn by: Mark S. Gorgis	App'd:
Code: TIA/EIA-222-F	Date: 03/10/15	Scale: NTS
Path:		Dwg No. E-1

Section	1	2	3	4	5	6.2	6.6	8.3	6.4	0.2
Length (ft)	3.00	40.00	50.00	50.00	28.00	110.0 ft	65.0 ft	21.0 ft	24.7	
Number of Sides	18	18	18	18	18					
Thickness (in)	0.2500	0.2500	0.3125	0.3125	0.3750					
Socket Length (ft)		5.00	6.00	7.00						
Top Dia (in)	24.0000	26.2500	33.6250	43.3400	52.9791					
Bot Dia (in)	26.2500	35.2500	45.3750	55.2750	60.0000					
Grade			A572-65							
Weight (K)		3.3	6.6	8.3	6.4					



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod	153	(1) Standoff	105
APXVSP18-C-A20 w/Mount Pipe	153	(2) HPA-65R-BUU-H8 w/ Mount Pipe	95
APXVSP18-C-A20 w/Mount Pipe	153	HPA-65R-BUU-H8 w/ Mount Pipe	95
APXVSP18-C-A20 w/Mount Pipe	153	HPA-65R-BUU-H8 w/ Mount Pipe	95
1900 RRU	153	OPA-65R-LCUU-H6 w/ Mount Pipe	95
1900 RRU	153	OPA-65R-LCUU-H6 w/ Mount Pipe	95
1900 RRU	153	OPA-65R-LCUU-H6 w/ Mount Pipe	95
800 RRU	153	SBNH-1D65A w/ Mount Pipe	95
800 RRU	153	SBNH-1D65A w/ Mount Pipe	95
800 RRU	153	7770 w/ Mount Pipe	95
800 Filter	153	7770 w/ Mount Pipe	95
800 Filter	153	7770 w/ Mount Pipe	95
800 Filter	153	(2) LGP21401 TMA	95
ACU-A20-N RET	153	(2) LGP21401 TMA	95
(2) ACU-A20-N RET	153	(2) LGP21401 TMA	95
ACU-A20-N RET	153	(2) LGP21903 Diplexer	95
Low Profile Platform	153	(2) LGP21903 Diplexer	95
Empty Mount Pipe	153	(2) LGP21903 Diplexer	95
Empty Mount Pipe	153	(2) RRUS-11	95
Empty Mount Pipe	153	(2) RRUS-11	95
APXVTM14-C-I20 w/ Mount Pipe	153	(2) RRUS-11	95
APXVTM14-C-I20 w/ Mount Pipe	153	RRUS 12	95
APXVTM14-C-I20 w/ Mount Pipe	153	RRUS 12	95
TD-RRH8x20-25	153	RRUS 12	95
TD-RRH8x20-25	153	RRUS A2	95
TD-RRH8x20-25	153	RRUS A2	95
(4) DB844H90E-XY w/Mount Pipe	143	RRUS A2	95
(4) DB844H90E-XY w/Mount Pipe	143	RRUS-32	95
(4) DB844H90E-XY w/Mount Pipe	143	RRUS-32	95
Low Profile Platform	143	RRUS-32	95
(2) RR90-17-02DP w/Mount Pipe	133	RRUS-E2	95
(2) RR90-17-02DP w/Mount Pipe	133	RRUS-E2	95
(2) RR90-17-02DP w/Mount Pipe	133	RRUS-E2	95
Low Profile Platform	133	Polyphaser 1000860	95
(2) LPA-80063/6CF w/ Mount Pipe	123	Polyphaser 1000860	95
(2) LPA-80063/6CF w/ Mount Pipe	123	Polyphaser 1000860	95
(2) LPA-80063/6CF w/ Mount Pipe	123	Raycap Squid	95
(2) LPA-171063-12CF w/ Mount Pipe	123	Raycap Squid	95
(2) LPA-171063-12CF w/ Mount Pipe	123	(3) Commscope MTC3615	95
(2) LPA-171063-12CF w/ Mount Pipe	123	APXV18-206517S-C w/Mount Pipe	85
BXA-70063/6CF w/ Mount Pipe	123	APXV18-206517S-C w/Mount Pipe	85
BXA-70063/6CF w/ Mount Pipe	123	APXV18-206517S-C w/Mount Pipe	85
BXA-70063/6CF w/ Mount Pipe	123	GPS	70
Low Profile Platform	123	Standoff	70
10' Omni	105		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Litchfield County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 28 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.

	FDH Engineering, Inc.		Job: Torrington, CT01499-S-00		
	6521 Meriden Drive		Project: 15BFJD1400		
	Raleigh, NC 27616		Client: SBA Network Services, Inc.	Drawn by: Mark S. Girgis	App'd:
	Phone: (919) 755-1012		Code: TIA/EIA-222-F	Date: 03/10/15	Scale: NTS
	FAX: (919) 755-1031		Path:		Dwg No. E-1

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

AT&T Existing Facility

Site ID: CT1118

Torrington East Main Street
1925 East Main Street
Torrington, CT 06790

December 2, 2014

EBI Project Number: 62146230

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	75.28 %

December 2, 2014

AT&T Mobility – New England
Attn: Cameron Syme
550 Cochituate Road
Suite 550 – 13&14
Framingham, MA 01701

Emissions Analysis for Site: **CT1118 – Torrington East Main Street**

EBI Consulting was directed to analyze the proposed AT&T facility located at **1925 East Main Street, Torrington, 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 MHz and 800 MHz Bands are $467 \mu\text{W}/\text{cm}^2$ and $567 \mu\text{W}/\text{cm}^2$ respectively. The general population exposure limit for the PCS, AWS & 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 **1925 East Main Street, Torrington, 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) 4 GSM channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 2) 2 UMTS channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 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 LTE channels (WCS Band – 2300 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.
- 5) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.
- 6) 4 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. This channel has a transmit power of 60 Watts

- 7) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
- 8) For the following calculations the sample point was the top of a 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.
- 9) The antennas used in this modeling are the **Powerwave 7770** for 850 MHz and 1900 MHz (PCS) channels and the **CCI OPA-65R-LCUU-H6**, **CCI OPA-65R-LCUU-H4** and the **Andrew SBNHH-1D65A** for 700 MHz, 850 MHz, 1900 MHz and 2300 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The manufacturers maximum gain values per assigned frequency band are listed in the following data table on the next page. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 10) The antenna mounting height centerlines of the proposed antennas are **95 feet** above ground level (AGL).
- 11) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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

AT&T Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770
Gain:	13.4 / 11.4 dBd	Gain:	13.4 / 11.4 dBd	Gain:	13.4 / 11.4 dBd
Height (AGL):	95 feet	Height (AGL):	95 feet	Height (AGL):	95 feet
Frequency Bands	1900 MHz(PCS) / 850 MHz	Frequency Bands	1900 MHz(PCS) / 850 MHz	Frequency Bands	1900 MHz(PCS) / 850 MHz
Channel Count	4	Channel Count	4	# PCS Channels:	4
Total TX Power:	120	Total TX Power:	120	# AWS Channels:	120
ERP (W):	1404.91	ERP (W):	1404.91	ERP (W):	1404.91
Antenna A1 MPE%	1.27	Antenna B1 MPE%	1.27	Antenna C1 MPE%	1.27
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	CCI OPA-65R-LCUU-H6	Make / Model:	CCI OPA-65R-LCUU-H4	Make / Model:	CCI OPA-65R-LCUU-H6
Gain:	12 / 12.7 / 15.3 dBd	Gain:	10.9 / 11.4 / 14.4 dBd	Gain:	12 / 12.7 / 15.3 dBd
Height (AGL):	95 feet	Height (AGL):	95 feet	Height (AGL):	95 feet
Frequency Bands	700 MHz / 850 MHz / 2300 MHz (WCS)	Frequency Bands	700 MHz / 850 MHz / 2300 MHz (WCS)	Frequency Bands	700 MHz / 850 MHz / 2300 MHz (WCS)
Channel Count	8	Channel Count	8	Channel Count	8
Total TX Power:	360	Total TX Power:	360	Total TX Power:	360
ERP (W):	4618.99	ERP (W):	4070.46	ERP (W):	4618.99
Antenna A2 MPE%	5.40	Antenna B2 MPE%	4.26	Antenna C2 MPE%	5.40
Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	CCI OPA-65R-LCUU-H6	Make / Model:	Commscope SBNHH-1D65A	Make / Model:	CCI OPA-65R-LCUU-H6
Gain:	15.1 dBd	Gain:	14.9 dBd	Gain:	15.1 dBd
Height (AGL):	95 feet	Height (AGL):	95 feet	Height (AGL):	95 feet
Frequency Bands	2100 MHz (PCS)	Frequency Bands	2100 MHz (PCS)	Frequency Bands	2100 MHz (PCS)
Channel Count	2	Channel Count	2	Channel Count	2
Total TX Power:	120	Total TX Power:	120	Total TX Power:	120
ERP (W):	1843.26	ERP (W):	1794.98	ERP (W):	1843.26
Antenna A3 MPE%	1.76	Antenna B3 MPE%	1.61	Antenna C3 MPE%	1.76
Antenna #:	4	Antenna #:	4	Antenna #:	4
Make / Model:	CCI OPA-65R-LCUU-H6	Make / Model:	Commscope SBNHH-1D65A	Make / Model:	CCI OPA-65R-LCUU-H6
Gain:	12 dBd	Gain:	10.9 dBd	Gain:	12 dBd
Height (AGL):	95 feet	Height (AGL):	95 feet	Height (AGL):	95 feet
Frequency Bands	700 MHz	Frequency Bands	700 MHz	Frequency Bands	700 MHz
Channel Count	2	Channel Count	2	Channel Count	2
Total TX Power:	120	Total TX Power:	120	Total TX Power:	120
ERP (W):	1320.36	ERP (W):	1112.13	ERP (W):	1320.36
Antenna A4 MPE%	1.85	Antenna B4 MPE%	1.43	Antenna C4 MPE%	1.85

Site Composite MPE%	
Carrier	MPE%
AT&T	29.14 %
Nextel	2.79 %
T-Mobile	2.39 %
Sprint	0.15 %
MetroPCS	9.42 %
Verizon Wireless	26.39 %
Town	5.00 %
Site Total MPE %:	75.28 %

AT&T Sector 1 Total:	10.28%
AT&T Sector 2 Total:	8.58%
AT&T Sector 3 Total:	10.28%
Site Total:	75.28 %

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:	10.28%
Sector 2:	8.58%
Sector 3 :	10.28%
AT&T Total:	29.14 %
Site Total:	75.28 %
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **75.28%** 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.



Scott Heffernan
RF Engineering Director

EBI Consulting

21 B Street
Burlington, MA 01803