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700 BELL STREET
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WOBURN, MA 01801



TOWER
ENGINEERING
PROFESSIONALS

326 TRYON RD
RALEIGH, NC 27603
(919) 661-6351

TEP JOB #: 61677.633796

AT&T SITE NUMBER:
MA1085

BU #: **806042**
BOS ASHLAND 959026

34 ALBERT RAY DRIVE
ASHLAND, MA 01721
(MIDDLESEX COUNTY)

EXISTING 99' MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	01/05/22	KRS	PRELIMINARY	DA
B	02/22/22	SVP	PRELIMINARY	DA
C	04/07/22	SVP	PRELIMINARY	DA
0	05/20/22	SVP	CONSTRUCTION	DA



05/20/22

IT IS A VIOLATION OF LAW FOR ANY PERSON,
UNLESS THEY ARE ACTING UNDER THE DIRECTION
OF A LICENSED PROFESSIONAL ENGINEER,
TO ALTER THIS DOCUMENT.

SHEET NUMBER:

T-1

REVISION:

0

AT&T SITE NUMBER: MA1085
AT&T SITE NAME: ASHLAND
AT&T FA CODE: 10031986
AT&T PACE NUMBER: MRCTB053860, MRCTB056533, MRCTB055546, MRCTB053629, MRCTB054848, MRCTB054932, MRCTB055960
AT&T PROJECT: 5G NR SOFTWARE RADIO || 5G NR ACTIVATION, 5G NR RADIO || 5G NR 1SR CBAND, 5G NR RADIO || 5G NR 1DR-1, 5G NR SOFTWARE RADIO || 5G NR ACTIVATION, ANTENNA MODIFICATIONS || 4TX4RX SOFTWARE RETROFIT, CELL SITE RF MODIFICATIONS || BBU ADD

BUSINESS UNIT #: 806042
SITE ADDRESS: 34 ALBERT RAY DRIVE
 ASHLAND, MA 01721
COUNTY: MIDDLESEX
STRUCTURE TYPE: MONOPOLE
TOWER HEIGHT: 99'-0"

SITE INFORMATION

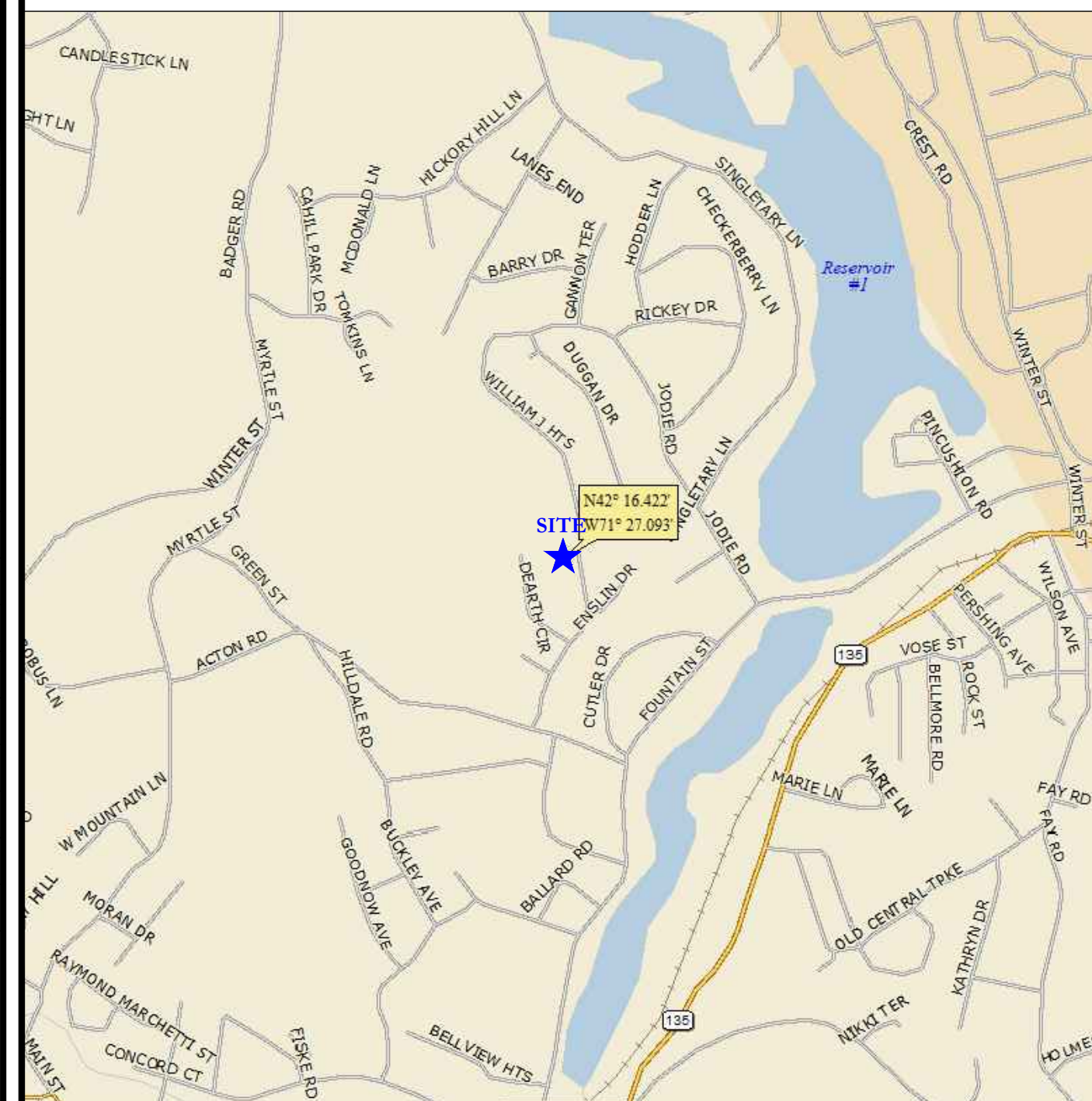
CROWN CASTLE USA INC. BOS ASHLAND 959026
 SITE NAME:
 SITE ADDRESS: 34 ALBERT RAY DRIVE
 ASHLAND, MA 01721
 COUNTY: MIDDLESEX
 PARCEL #: 014/009.0-0173-0000.0
 AREA OF CONSTRUCTION: EXISTING
 LATITUDE: 42° 16' 25.30" (42.273694)
 LONGITUDE: -71° 27' 5.60" (-71.451556)
 LAT/LONG TYPE: NAD83
 GROUND ELEVATION: 322 ±(AMSL)
 CURRENT ZONING: RESIDENTIAL A
 JURISDICTION: TOWN OF ASHLAND
 OCCUPANCY CLASSIFICATION: U
 TYPE OF CONSTRUCTION: IIB
 A.D.A. COMPLIANCE: FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION
 PROPERTY OWNER: CROWN ATLANTIC COMPANY LLC
 4017 WASHINGTON RD
 MCMURRAY, PA 15317
 TOWER OWNER: CROWN CASTLE USA INC.
 2000 CORPORATE DRIVE
 CANONSBURG, PA 15317
 CARRIER/APPLICANT: AT&T MOBILITY
 700 BELL STREET
 AKRON, OHIO 44307
 ELECTRIC PROVIDER: NSTAR
 (800) 572-9337
 TELCO PROVIDER: COMCAST
 (800) 391-1000

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ALL DRAWINGS CONTAINED HEREIN ARE FORMATTED FOR 22x34. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

LOCATION MAP



NO SCALE

SITE PHOTO



PROJECT TEAM

A&E FIRM: TOWER ENGINEERING PROFESSIONALS
 326 TRYON ROAD
 RALEIGH, NC 27603
 JOSEPH T. CRESS - PROJECT MANAGER
 (919) 661-6351
 GRAHAM M. ANDRES - CIVIL ENGINEER
 (919) 661-6351
 GRAHAM M. ANDRES - ELECTRICAL ENGINEER
 (919) 661-6351
 CROWN CASTLE USA INC. DISTRICT CONTACTS:
 12 GILL STREET, SUITE 5800
 WOBURN, MA 01801
 PAUL.PEDICONE - PROJECT MANAGER
 PAUL.PEDICONE@CROWNCastle.COM

PROJECT DESCRIPTION

THE PURPOSE OF THIS PROJECT IS TO ENHANCE BROADBAND CONNECTIVITY AND CAPACITY TO THE EXISTING ELIGIBLE WIRELESS FACILITY.

TOWER SCOPE OF WORK:

- REMOVE (3) 800-10965 ANTENNAS
- REMOVE (3) OPA-65R-LCUU-H8 ANTENNAS
- REMOVE (3) RRUS-11 B12 RRU's
- REMOVE (6) 782-10250 DIPLEXERS
- REMOVE (2) DC6-48-60-18-8F
- REMOVE (1) PWRT-608-S POWER CABLE
- REMOVE (6) 7/8" COAX CABLES
- REMOVE (3) DC TRUNKS AND (1) FIBER TRUNK
- INSTALL (3) AIR6449 B77D ANTENNAS
- INSTALL (3) AIR6419 B77G ANTENNAS
- INSTALL (3) DMP65R-BU6EA-K ANTENNAS
- INSTALL (3) RRUS 4449 B5/B12 RRU
- INSTALL (1) DC9-48-60-24-8C-EV
- INSTALL (3) DC TRUNK 6 AWG
- INSTALL (1) FIBER TRUNK 24 PAIR
- INSTALL (3) Y-CABLES
- INSTALL (3) ANTENNA STANDOFF SITEPRO1 PART# PM1

GROUND SCOPE OF WORK:

- INSTALL (1) 6648 W/ XCEDE CABLE
- INSTALL (2) RECTIFIER IN EXISTING POWER PLANT
- INSTALL (1) DC12-48-60RM

APPLICABLE CODES/REFERENCE DOCUMENTS

ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES:

CODE TYPE	CODE
BUILDING	MA STATE BUILDING CODE/2015 IBC
MECHANICAL	MA STATE BUILDING CODE/2015 IMC
ELECTRICAL	MASSACHUSETTS ELECTRICAL CODE/2020 NEC

REFERENCE DOCUMENTS:

STRUCTURAL ANALYSIS: PAUL J. FORD AND COMPANY
 DATED: 02/24/2022
 MOUNT ANALYSIS: KIMLEY-HORN AND ASSOCIATES, INC.
 DATED: 12/07/2021
 RFDS REVISION: 1.0
 DATED: 10/06/2021
 ORDER ID: 586235
 REVISION: 0

NOTE:
 THE POWER DESIGN FOR ANY AC ELECTRICAL POWER CHANGES IS TO BE PERFORMED BY OTHERS AND IS SHOWN HEREIN FOR REFERENCE PURPOSES ONLY. AT&T IS SOLELY RESPONSIBLE FOR THE ELECTRICAL POWER DESIGN.

NOTE:
 PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE CROWN NOC AT (800) 788-7011 & CROWN CONSTRUCTION MANAGER.

CROWN CASTLE USA INC. SITE ACTIVITY REQUIREMENTS:

- NOTICE TO PROCEED— NO WORK SHALL COMMENCE PRIOR TO CROWN CASTLE USA INC. WRITTEN NOTICE TO PROCEED (NTP) AND THE ISSUANCE OF A PURCHASE ORDER. PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE CROWN CASTLE USA INC. NOC AT 800-788-7011 & THE CROWN CASTLE USA INC. CONSTRUCTION MANAGER.
- "LOOK UP" – CROWN CASTLE USA INC. SAFETY CLIMB REQUIREMENT: THE INTEGRITY OF THE SAFETY CLIMB AND ALL COMPONENTS OF THE CLIMBING FACILITY SHALL BE CONSIDERED DURING ALL STAGES OF DESIGN, INSTALLATION, AND INSPECTION. TOWER MODIFICATION, MOUNT REINFORCEMENTS, AND/OR EQUIPMENT INSTALLATIONS SHALL NOT COMPROMISE THE INTEGRITY OR FUNCTIONAL USE OF THE SAFETY CLIMB OR ANY COMPONENTS OF THE CLIMBING FACILITY ON THE STRUCTURE. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO: PINCHING OF THE WIRE ROPE, BENDING OF THE WIRE ROPE FROM ITS SUPPORTS, DIRECT CONTACT OR CLOSE PROXIMITY TO THE WIRE ROPE WHICH MAY CAUSE FRICTIONAL WEAR, IMPACT TO THE ANCHORAGE POINTS IN ANY WAY, OR TO IMPEDE/BLOCK ITS INTENDED USE. ANY COMPROMISED SAFETY CLIMB, INCLUDING EXISTING CONDITIONS MUST BE TAGGED OUT AND REPORTED TO YOUR CROWN CASTLE USA INC. POC OR CALL THE NOC TO GENERATE A SAFETY CLIMB MAINTENANCE AND CONTRACTOR NOTICE TICKET.
- PRIOR TO THE START OF CONSTRUCTION, ALL REQUIRED JURISDICTIONAL PERMITS SHALL BE OBTAINED. THIS INCLUDES, BUT IS NOT LIMITED TO, BUILDING, ELECTRICAL, MECHANICAL, FIRE, FLOOD ZONE, ENVIRONMENTAL, AND ZONING. AFTER ONSITE ACTIVITIES AND CONSTRUCTION ARE COMPLETED, ALL REQUIRED PERMITS SHALL BE SATISFIED AND CLOSED OUT ACCORDING TO LOCAL JURISDICTIONAL REQUIREMENTS.
- ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN, AND SHALL MEET ANSI/ASSE A10.48 (LATEST EDITION); FEDERAL, STATE, AND LOCAL REGULATIONS; AND ANY APPLICABLE INDUSTRY CONSENSUS STANDARDS RELATED TO THE CONSTRUCTION ACTIVITIES BEING PERFORMED. ALL RIGGING PLANS SHALL ADHERE TO ANSI/ASSE A10.48 (LATEST EDITION) AND CROWN CASTLE USA INC. STANDARD CED–STD–10253, INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION, TO CERTIFY THE SUPPORTING STRUCTURE(S) IN ACCORDANCE WITH ANSI/TIA–322 (LATEST EDITION).
- ALL SITE WORK TO COMPLY WITH OAS–STD–10068 "INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON CROWN CASTLE USA INC. TOWER SITE," CED–STD–10294 "STANDARD FOR INSTALLATION OF MOUNTS AND APPURTENANCES," AND LATEST VERSION OF ANSI/TIA–1019–A–2012 "STANDARD FOR INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS."
- IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY CROWN CASTLE USA INC. PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
- ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR 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.
- THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
- THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
- ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY CONTRACTOR. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION B) CONFINED SPACE C) ELECTRICAL SAFETY D) TRENCHING AND EXCAVATION E) CONSTRUCTION SAFETY PROCEDURES.
- ALL SITE WORK SHALL BE AS INDICATED ON THE STAMPED CONSTRUCTION DRAWINGS AND PROJECT SPECIFICATIONS, LATEST APPROVED REVISION.
- CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH AT THE COMPLETION OF THE WORK. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
- ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF CONTRACTOR, TOWER OWNER, CROWN CASTLE USA INC., AND/OR LOCAL UTILITIES.
- THE CONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR SITE SIGNAGE REQUIRED BY LOCAL JURISDICTION AND SIGNAGE REQUIRED ON INDIVIDUAL PIECES OF EQUIPMENT, ROOMS, AND SHELTERS.
- THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE CARRIER'S EQUIPMENT AND TOWER AREAS.
- THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
- THE AREAS OF THE OWNER'S PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION AS SPECIFIED IN THE CONSTRUCTION DRAWINGS AND/OR PROJECT SPECIFICATIONS.
- CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
- THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
- CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF 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.
- CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.
- NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.

GREENFIELD GROUNDING NOTES:

- 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.
- THE CONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS. THE CONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.
- THE CONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING AND UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT AND PROVIDE TESTING RESULTS.
- METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
- 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.
- EACH CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, #6 STRANDED COPPER OR LARGER FOR INDOOR BTS; #2 BARE SOLID TINNED COPPER FOR OUTDOOR BTS.
- CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED BACK TO BACK CONNECTIONS ON OPPOSITE SIDE OF THE GROUND BUS ARE PERMITTED.
- ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING SHALL BE #2 SOLID TINNED COPPER UNLESS OTHERWISE INDICATED.
- ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
- USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED.
- EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
- ALL GROUND CONNECTIONS ABOVE GRADE (INTERIOR AND EXTERIOR) SHALL BE FORMED USING HIGH PRESS CRIMPS.
- COMPRESSION GROUND CONNECTIONS MAY BE REPLACED BY EXOTHERMIC WELD CONNECTIONS.
- ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.
- APPROVED ANTIOXIDANT COATINGS (I.E. CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
- ALL EXTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
- MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
- BOND ALL METALLIC OBJECTS WITHIN 6 FT OF MAIN GROUND RING WITH (1) #2 BARE SOLID TINNED COPPER GROUND CONDUCTOR.
- GROUND CONDUCTORS USED FOR THE FACILITY GROUNDING 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 CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (I.E., NONMETALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.
- ALL GROUNDS THAT TRANSITION FROM BELOW GRADE TO ABOVE GRADE MUST BE #2 BARE SOLID TINNED COPPER IN 3/4" NON-METALLIC, FLEXIBLE CONDUIT FROM 24" BELOW GRADE TO WITHIN 3" TO 6" OF CAD-WELD TERMINATION POINT. THE EXPOSED END OF THE CONDUIT MUST BE SEALED WITH SILICONE CAULK. (ADD TRANSITIONING GROUND STANDARD DETAIL AS WELL).
- BUILDINGS WHERE THE MAIN GROUNDING CONDUCTORS ARE REQUIRED TO BE ROUTED TO GRADE, THE CONTRACTOR SHALL ROUTE TWO GROUNDING CONDUCTORS FROM THE ROOFTOP, TOWERS, AND WATER TOWERS GROUNDING RING, TO THE EXISTING GROUNDING SYSTEM. THE GROUNDING CONDUCTORS SHALL NOT BE SMALLER THAN 2/0 COPPER. ROOFTOP GROUNDING RING SHALL BE BONDED TO THE EXISTING GROUNDING SYSTEM, THE BUILDING STEEL COLUMNS, LIGHTNING PROTECTION SYSTEM, AND BUILDING MAIN WATER LINE (FERROUS OR NONFERROUS METAL PIPING ONLY).

GENERAL NOTES:

- FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
CONTRACTOR: AT&T
CARRIER: GENERAL CONTRACTOR RESPONSIBLE FOR CONSTRUCTION
TOWER OWNER: CROWN CASTLE USA INC.
- THESE DRAWINGS HAVE BEEN PREPARED USING STANDARDS OF PROFESSIONAL CARE AND COMPLETENESS NORMALLY EXERCISED UNDER SIMILAR CIRCUMSTANCES BY REPUTABLE ENGINEERS IN THIS OR SIMILAR LOCALITIES. IT IS ASSUMED THAT THE WORK DEPICTED WILL BE PERFORMED BY AN EXPERIENCED CONTRACTOR AND/OR WORKPEOPLE WHO HAVE A WORKING KNOWLEDGE OF THE APPLICABLE CODE STANDARDS AND REQUIREMENTS AND OF INDUSTRY ACCEPTED STANDARD GOOD PRACTICE. AS NOT EVERY CONDITION OR ELEMENT IS (OR CAN BE) EXPLICITLY SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL USE INDUSTRY ACCEPTED STANDARD GOOD PRACTICE FOR MISCELLANEOUS WORK NOT EXPLICITLY SHOWN.
- THESE DRAWINGS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE MEANS OR METHODS OF CONSTRUCTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY FOR PROTECTION OF LIFE AND PROPERTY DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO, BRACING, FORMWORK, SHORING, ETC. SITE VISITS BY THE ENGINEER OR HIS REPRESENTATIVE WILL NOT INCLUDE INSPECTION OF THESE ITEMS AND IS FOR STRUCTURAL OBSERVATION OF THE FINISHED STRUCTURE ONLY.
- NOTES AND DETAILS IN THE CONSTRUCTION DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS. WHERE NO DETAILS ARE SHOWN, CONSTRUCTION SHALL CONFORM TO SIMILAR WORK ON THE PROJECT, AND/OR AS PROVIDED FOR IN THE CONTRACT DOCUMENTS. WHERE DISCREPANCIES OCCUR BETWEEN PLANS, DETAILS, GENERAL NOTES, AND SPECIFICATIONS, THE GREATER, MORE STRICT REQUIREMENTS, SHALL GOVERN. IF FURTHER CLARIFICATION IS REQUIRED CONTACT THE ENGINEER OF RECORD.
- SUBSTANTIAL EFFORT HAS BEEN MADE TO PROVIDE ACCURATE DIMENSIONS AND MEASUREMENTS ON THE DRAWINGS TO ASSIST IN THE FABRICATION AND/OR PLACEMENT OF CONSTRUCTION ELEMENTS BUT IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY THE DIMENSIONS, MEASUREMENTS, AND/OR CLEARANCES SHOWN IN THE CONSTRUCTION DRAWINGS PRIOR TO FABRICATION OR CUTTING OF ANY NEW OR EXISTING CONSTRUCTION ELEMENTS. IF IT IS DETERMINED THAT THERE ARE DISCREPANCIES AND/OR CONFLICTS WITH THE CONSTRUCTION DRAWINGS THE ENGINEER OF RECORD IS TO BE CONTACTED AS SOON AS POSSIBLE.
- PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING CONTRACTOR 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 CROWN CASTLE.
- ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR 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.
- UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
- THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
- IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY THE CARRIER AND CROWN CASTLE PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
- CONTRACTOR IS TO PERFORM A SITE INVESTIGATION AND IS TO DETERMINE THE BEST ROUTING OF ALL CONDUITS FOR POWER, AND TELCO AND FOR GROUNDING CABLES AS SHOWN IN THE POWER, TELCO, AND GROUNDING PLAN DRAWINGS.
- THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF CROWN CASTLE USA INC. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF 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.
- CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

- ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST-IN-PLACE CONCRETE.
- UNLESS NOTED OTHERWISE, SOIL BEARING PRESSURE USED FOR DESIGN OF SLABS AND FOUNDATIONS IS ASSUMED TO BE 1000 psf.
- ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH (f'c) OF 3000 psi AT 28 DAYS, UNLESS NOTED OTHERWISE. NO MORE THAN 90 MINUTES SHALL ELAPSE FROM BATCH TIME TO TIME OF PLACEMENT UNLESS APPROVED BY THE ENGINEER OF RECORD. TEMPERATURE OF CONCRETE SHALL NOT EXCEED 90° AT TIME OF PLACEMENT.
- CONCRETE EXPOSED TO FREEZE–THAW CYCLES SHALL CONTAIN AIR ENTRAINING ADMIXTURES, AMOUNT OF AIR ENTRAINMENT TO BE BASED ON SIZE OF AGGREGATE AND F3 CLASS EXPOSURE (VERY SEVERE). CEMENT USED TO BE TYPE II PORTLAND CEMENT WITH A MAXIMUM WATER–TO–CEMENT RATIO (W/C) OF 0.45.
- ALL STEEL REINFORCING SHALL CONFORM TO ASTM A615. ALL WELDED WIRE FABRIC (WWF) SHALL CONFORM TO ASTM A185. ALL SPLICES SHALL BE CLASS "B" TENSION SPLICES, UNLESS NOTED OTHERWISE. ALL HOOKS SHALL BE STANDARD 90 DEGREE HOOKS, UNLESS NOTED OTHERWISE. YIELD STRENGTH (Fy) OF STANDARD DEFORMED BARS ARE AS FOLLOWS:
#4 BARS AND SMALLER.....40 ksi
#5 BARS AND LARGER.....60 ksi
- THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:
CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH.....3"
CONCRETE EXPOSED TO EARTH OR WEATHER:
#6 BARS AND LARGER.....2"
#5 BARS AND SMALLER.....1-1/2"
CONCRETE NOT EXPOSED TO EARTH OR WEATHER:
SLAB AND WALLS.....3/4"
BEAMS AND COLUMNS.....1-1/2"
- A TOOLED EDGE OR A 3/4" CHAMFER SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNLESS NOTED OTHERWISE, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.

ELECTRICAL INSTALLATION NOTES:

- ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES/ORDINANCES.
- CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED AND TRIP HAZARDS ARE ELIMINATED.
- WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC.
- ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.
 - ALL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OF APPROVAL, AND SHALL CONFORM TO REQUIREMENT OF THE NATIONAL ELECTRICAL CODE.
 - ALL OVERCURRENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED, 22,000 AIC MINIMUM. VERIFY AVAILABLE SHORT CIRCUIT CURRENT DOES NOT EXCEED THE RATING OF ELECTRICAL EQUIPMENT IN ACCORDANCE WITH ARTICLE 110.24 NEC OR THE MOST CURRENT ADOPTED CODE PER THE GOVERNING JURISDICTION.
- EACH END OF EVERY POWER PHASE CONDUCTOR, GROUNDING CONDUCTOR, AND TELCO CONDUCTOR OR CABLE SHALL BE LABELED WITH COLOR–CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2" PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC AND OSHA.
- ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH LAMICOID TAGS SHOWING THEIR RATED VOLTAGE, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING AND BRANCH CIRCUIT ID NUMBERS (I.E. PANEL BOARD AND CIRCUIT ID'S).
- PANEL BOARDS (ID NUMBERS) SHALL BE CLEARLY LABELED WITH PLASTIC LABELS.
- ALL THE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.
- ALL POWER AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE COPPER CONDUCTOR (#14 OR LARGER) WITH TYPE THHW, THWN, THWN–2, XHHW, XHHW–2, THW, THW–2, RHW, OR RHW–2 INSULATION UNLESS OTHERWISE SPECIFIED.
- SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE COPPER CONDUCTOR (#6 OR LARGER) WITH TYPE THHW, THWN, THWN–2, XHHW, XHHW–2, THW, THW–2, RHW, OR RHW–2 INSULATION UNLESS OTHERWISE SPECIFIED.
- POWER AND CONTROL WIRING IN FLEXIBLE CORD SHALL BE MULTI–CONDUCTOR, TYPE SOOW CORD (#14 OR LARGER) UNLESS OTHERWISE SPECIFIED.
- POWER AND CONTROL WIRING FOR USE IN CABLE TRAY SHALL BE MULTI–CONDUCTOR, TYPE TC CABLE (#14 OR LARGER), WITH TYPE THHW, THWN, THWN–2, XHHW, XHHW–2, THW, THW–2, RHW, OR RHW–2 INSULATION UNLESS OTHERWISE SPECIFIED.
- ALL POWER AND GROUNDING CONNECTIONS SHALL BE CRIMP–STYLE, COMPRESSION WIRE LUGS AND WIRE NUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRE NUTS SHALL BE RATED FOR OPERATION NOT LESS THAN 75° C (90° C IF AVAILABLE).
- RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.
- ELECTRICAL METALLIC TUBING (EMT), INTERMEDIATE METAL CONDUIT (IMC), OR RIGID METAL CONDUIT (RMC) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.
- ELECTRICAL METALLIC TUBING (EMT) OR METAL–CLAD CABLE (MC) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
- SCHEDULE 40 PVC UNDERGROUND ON STRAIGHTS AND SCHEDULE 80 PVC FOR ALL ELBOWS/90s AND ALL APPROVED ABOVE GRADE PVC CONDUIT.
- LIQUID–TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID–TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
- CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION–TYPE AND APPROVED FOR THE LOCATION USED. SET SCREW FITTINGS ARE NOT ACCEPTABLE.
- CABINETS, BOXES AND WIRE WAYS SHALL BE LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND THE NEC.
- WIREWAYS SHALL BE METAL WITH AN ENAMEL FINISH AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARDS (WIREMOLD SPECMATE WIREWAY).
- SLOTTED WIRING DUCT SHALL BE PVC AND INCLUDE COVER (PANDUIT TYPE E OR EQUAL).
- CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON–PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES (I.E. POWDER–ACTUATED) FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO ROUTE AROUND OBSTACLES SHALL BE MADE WITH CONDUIT OUTLET BODIES. CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER, PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CEILING LINES. ALL CONDUIT SHALL BE FISHED TO HIDE OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE TEMPORARILY CAPPED FLUSH TO FINISH GRADE TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHING ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.
- EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES AND PULL BOXES SHALL BE GALVANIZED OR EPOXY–COATED SHEET STEEL. SHALL MEET OR EXCEED UL 50 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND NEMA 3R (OR BETTER) FOR EXTERIOR LOCATIONS.
- METAL RECEPTACLE, SWITCH AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY–COATED OR NON–CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
- NONMETALLIC RECEPTACLE, SWITCH AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2 (NEWEST REVISION) AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
- THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CARRIER AND/OR CROWN CASTLE USA INC. BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
- THE CONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD LIFE AND PROPERTY.
- INSTALL LAMICOID LABEL ON THE METER CENTER TO SHOW "AT&T".
- ALL EMPTY/SPARE CONDUITS THAT ARE INSTALLED ARE TO HAVE A METERED MULE TAPE PULL CORD INSTALLED.

CONDUCTOR COLOR CODE		
SYSTEM	CONDUCTOR	COLOR
120/240V, 1Ø	A PHASE	BLACK
	B PHASE	RED
	NEUTRAL	WHITE
120/208V, 3Ø	A PHASE	BLACK
	B PHASE	RED
	C PHASE	BLUE
277/480V, 3Ø	A PHASE	BROWN
	B PHASE	ORANGE OR PURPLE
	C PHASE	YELLOW
DC VOLTAGE	POS (+)	RED**
	NEG (-)	BLACK**

APWA UNIFORM COLOR CODE:

- WHITE PROPOSED EXCAVATION
- PINK TEMPORARY SURVEY MARKINGS
- RED ELECTRIC POWER LINES, CABLES, CONDUIT, AND LIGHTING CABLES
- YELLOW GAS, OIL, STEAM, PETROLEUM, OR GASEOUS MATERIALS
- ORANGE COMMUNICATION, ALARM OR SIGNAL LINES, CABLES, OR CONDUIT AND TRAFFIC LOOPS
- BLUE POTABLE WATER
- PURPLE RECLAIMED WATER, IRRIGATION, AND SLURRY LINES
- GREEN SEWERS AND DRAIN LINES

* SEE NEC 210.5(C)(1) AND (2)
** POLARITY MARKED AT TERMINATION

ABBREVIATIONS:

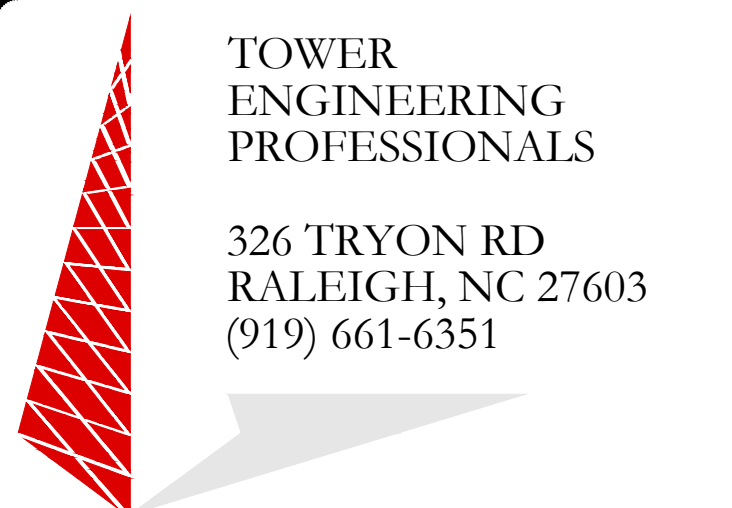
ANT	ANTENNA
(E)	EXISTING
FF	FACILITY INTERFACE FRAME
GEN	GENERATOR
GPS	GLOBAL POSITIONING SYSTEM
GSM	GLOBAL SYSTEM FOR MOBILE
LTE	LONG TERM EVOLUTION
MGB	MASTER GROUND BAR
MW	MICROWAVE
(N)	NEW
NEC	NATIONAL ELECTRIC CODE
(P)	PROPOSED
PP	POWER PLANT
QTY	QUANTITY
RECT	RECTIFIER
RBS	RADIO BASE STATION
RET	REMOTE ELECTRIC TLT
RFDS	RADIO FREQUENCY DATA SHEET
RRH	REMOTE RADIO HEAD
RRU	REMOTE RADIO UNIT
SIAD	SMART INTEGRATED DEVICE
TMA	TOWER MOUNTED AMPLIFIER
TP	TYPICAL
UMTS	UNIVERSAL MOBILE TELECOMMUNICATIONS SYSTEM
W.P.	WORK POINT



700 BELL STREET
AKRON, OHIO 44307



12 GILL STREET, SUITE 5800
WOBRUN, MA 01801



TOWER
ENGINEERING
PROFESSIONALS

326 TRYON RD
RALEIGH, NC 27603
(919) 661-6351

TEP JOB #: 61677.633796

**AT&T SITE NUMBER:
MA1085**

**BU #: 806042
BOS ASHLAND 959026**

**34 ALBERT RAY DRIVE
ASHLAND, MA 01721
(MIDDLESEX COUNTY)**

EXISTING 99' MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	01/05/22	KRS	PRELIMINARY	DA
B	02/22/22	SVP	PRELIMINARY	DA
C	04/07/22	SVP	PRELIMINARY	DA
D	05/20/22	SVP	CONSTRUCTION	DA



05/20/22

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SHEET NUMBER:

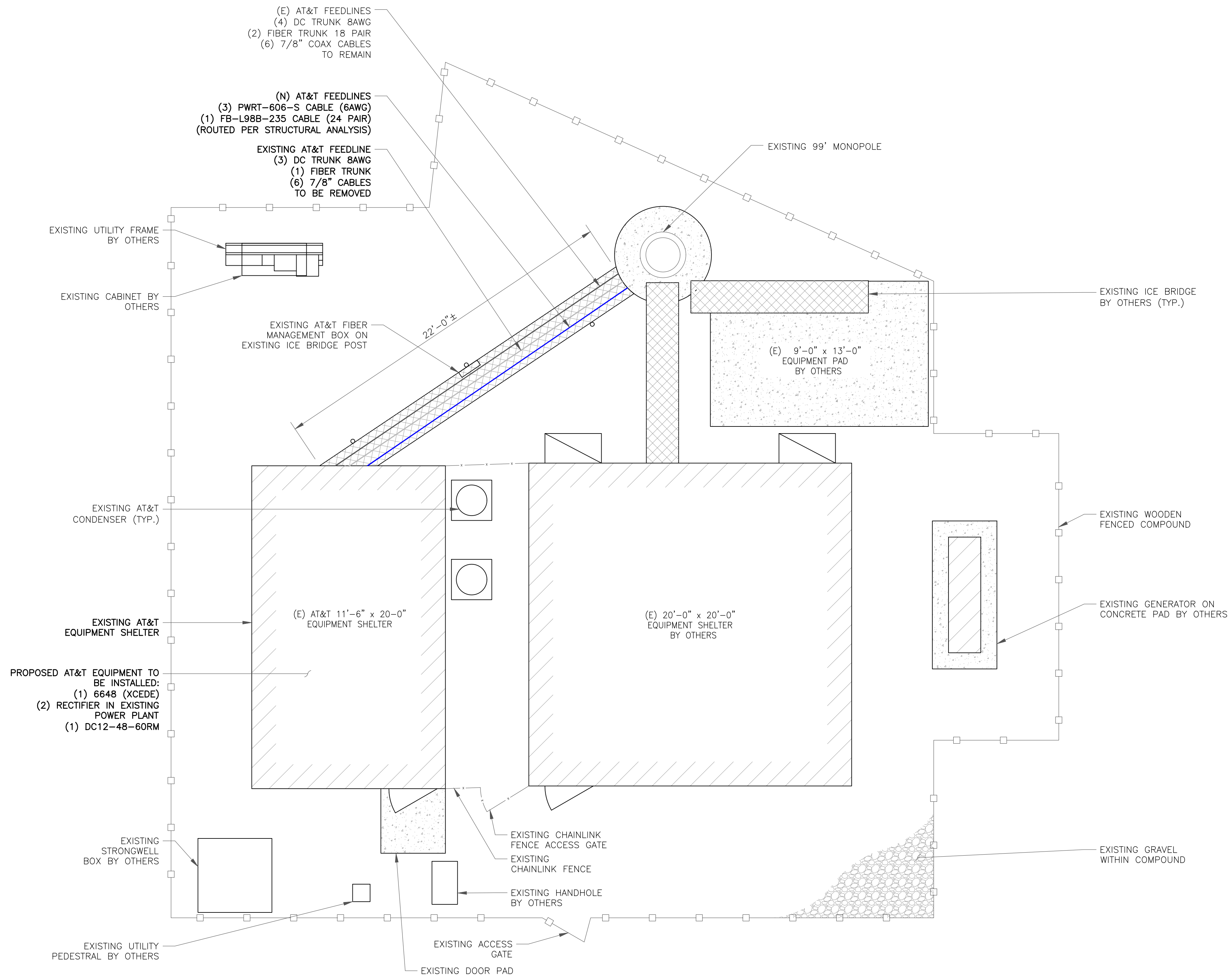
T-2

REVISION:

0

NOTE:
TEP DID NOT CONDUCT FIELD VISIT TO VERIFY LAYOUT. LAYOUT SHOWN BELOW GENERATED FROM INFORMATION PROVIDED BY CROWN CASTLE. FIELD VERIFY EXISTING CONDITIONS PRIOR TO CONSTRUCTION.

- GROUND SCOPE OF WORK:**
- REMOVE (1) DC6-48-60-RM
 - INSTALL (1) 6648 (XCEDE)
 - INSTALL (2) RECTIFIER IN EXISTING POWER PLANT
 - INSTALL (1) DC12-48-60RM



PROPOSED AT&T EQUIPMENT TO BE INSTALLED:
(1) 6648 (XCEDE)
(2) RECTIFIER IN EXISTING POWER PLANT
(1) DC12-48-60RM

at&t
700 BELL STREET
AKRON, OHIO 44307

CROWN CASTLE
12 GILL STREET, SUITE 5800
WOBURN, MA 01801

TOWER ENGINEERING PROFESSIONALS
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RALEIGH, NC 27603
(919) 661-6351
TEP JOB #: 61677.633796

AT&T SITE NUMBER:
MA1085
BU #: 806042
BOS ASHLAND 959026
34 ALBERT RAY DRIVE
ASHLAND, MA 01721
(MIDDLESEX COUNTY)
EXISTING 99' MONOPOLE

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0	05/20/22	SVP	CONSTRUCTION	DA



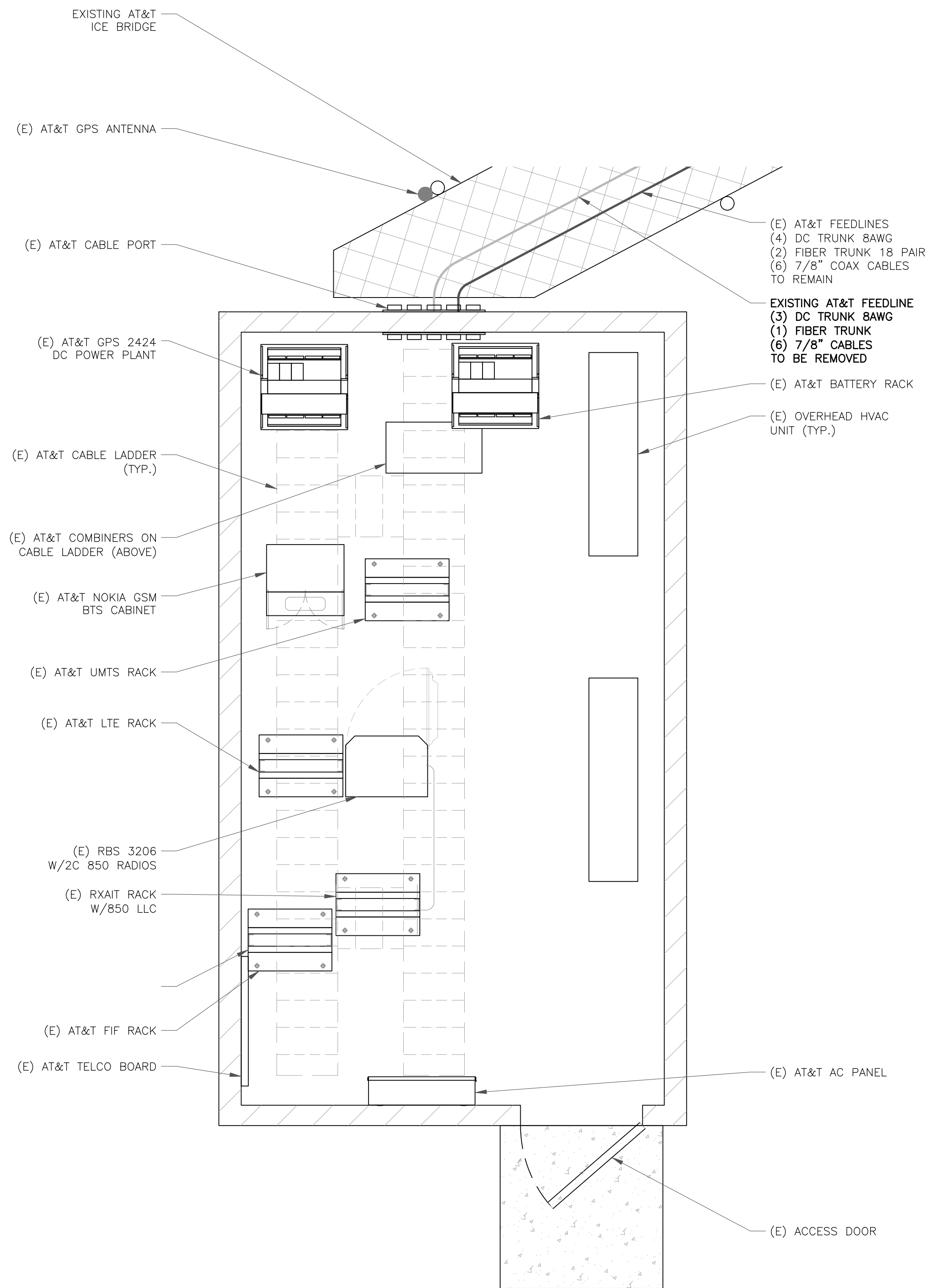
05/20/22

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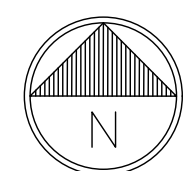
SHEET NUMBER: **C-1.1** REVISION: **0**

1 COMPOUND PLAN
SCALE: 1/4"=1'-0" (FULL SIZE)
1/8"=1'-0" (11x17)

NOTE:
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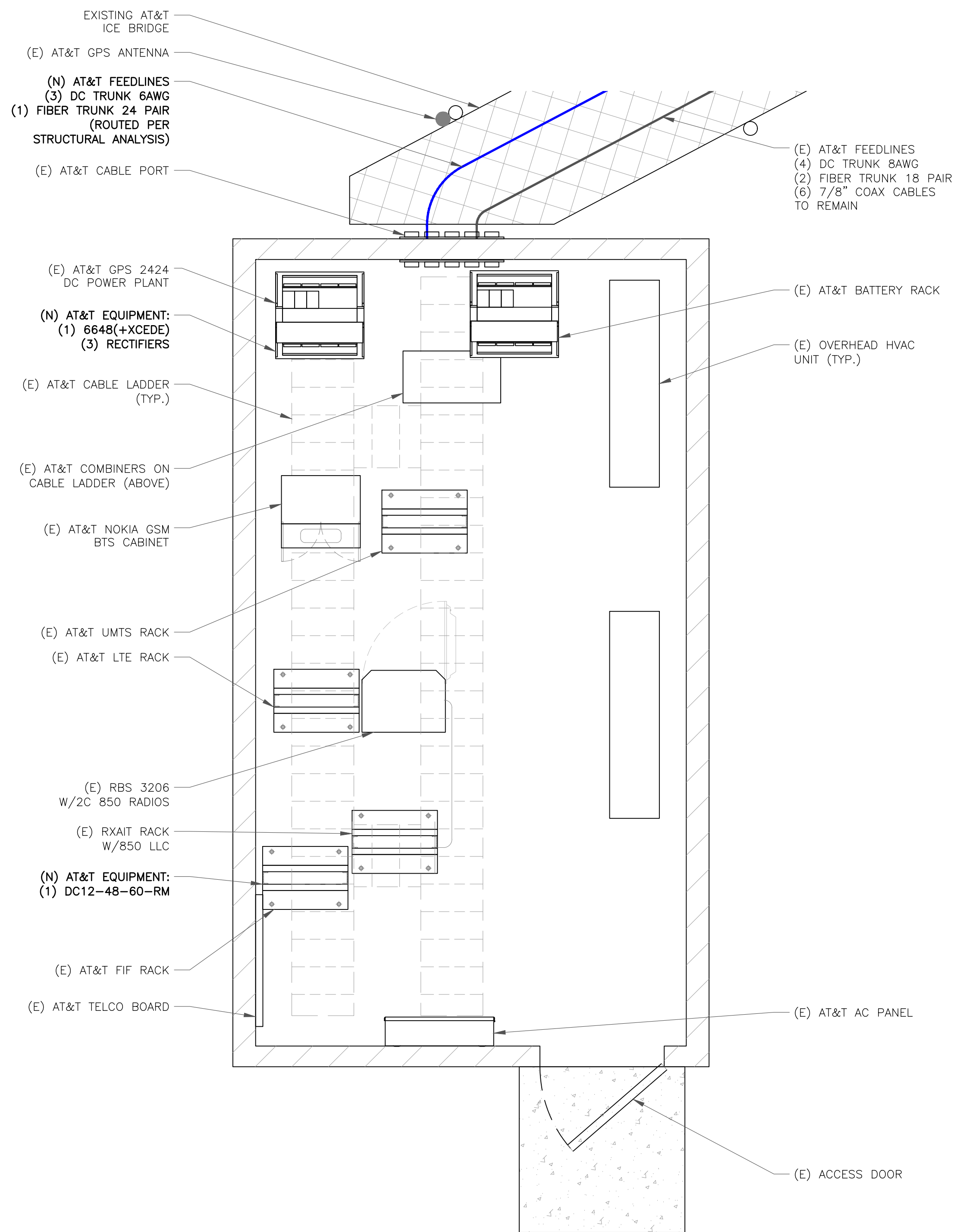


1 EXISTING EQUIPMENT LAYOUT
SCALE: 1/2"=1'-0" (FULL SIZE)
1/4"=1'-0" (11x17)

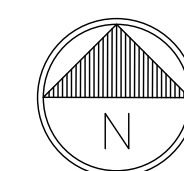


NOTE TITLE

- INSTALL (1) 6648 (XCEDE)
- INSTALL (2) RECTIFIER IN EXISTING POWER PLANT
- INSTALL (1) DC12-48-60RM



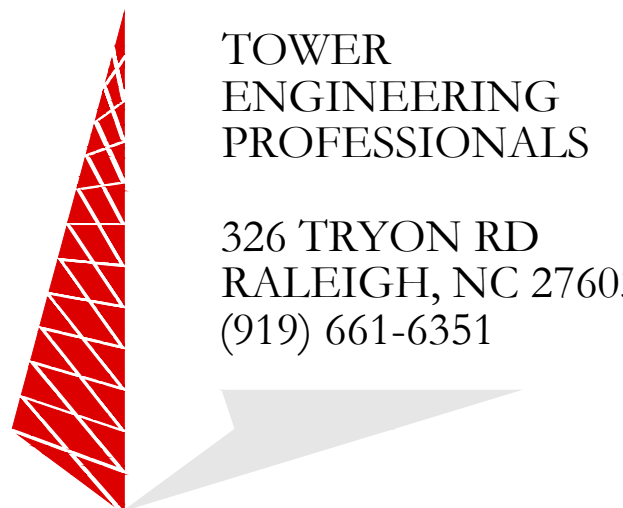
2 FINAL EQUIPMENT LAYOUT
SCALE: 1/2"=1'-0" (FULL SIZE)
1/4"=1'-0" (11x17)



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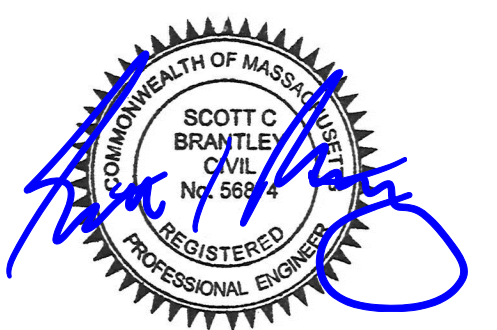
BU #: 806042
BOS ASHLAND 959026

34 ALBERT RAY DRIVE
ASHLAND, MA 01721
(MIDDLESEX COUNTY)

EXISTING 99' MONOPOLE

ISSUED FOR:

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C	04/07/22	SVP	PRELIMINARY	DA
0	05/20/22	SVP	CONSTRUCTION	DA



05/20/22

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SHEET NUMBER:
C-1.2

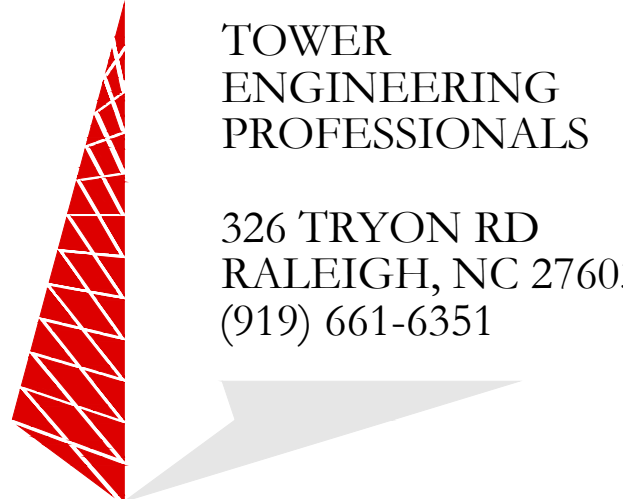
REVISION:
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WOBURN, MA 01801



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TEP JOB #: 61677.633796

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BU #: **806042**
BOS ASHLAND 959026

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ASHLAND, MA 01721
(MIDDLESEX COUNTY)

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05/20/22

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SHEET NUMBER:

C-3

REVISION:

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EXISTING ANTENNA SCHEDULE (RFDS 03/25/2022, VERSION 2.00)

SECTOR	ANTENNA					TMA	RRH	RAYCAP	DIPLEXER	TRANSMISSION LINE		
	POS.	TECHNOLOGY	AZIMUTH	MODEL NO.	RAD CL.	MODEL NO.	MODEL NO.	MODEL NO.	MODEL NO.	DC POWER	FIBER	COAX
A	A1	LTE WCS	10°	*CCI OPA-65R-LCUU-H8	87'-0"	-	***(1) RRUS-32 B30	-	-			
	A2	LTE 700, LTE AWS	10°	*KATHREIN 800-10965	87'-0"	-	(1) RADIO 4478 B14 (1) RRUS-32 B66A	*(1) RAYCAP DC6-48-60-0-8F	-			
	A3	LTE 700, LTE 1900, UMTS 850	10°	***KATHREIN 800-10965	87'-0"	-	*(1) RRUS-11 B12 (1) RRUS-32 B2	-	*(2) KATHREIN - 782-10250			
B	B1	LTE WCS	130°	*CCI OPA-65R-LCUU-H8	87'-0"	-	***(1) RRUS-32 B30	-	-	*(3) DC TRUNK 8AWG (4) DC TRUNK 8AWG	*(1) FIBER TRUNK (2) FIBER TRUNK	*(6) 7/8" COAX (6) 7/8" COAX
	B2	LTE 700, LTE AWS	130°	*KATHREIN 800-10965	87'-0"	-	(1) RADIO 4478 B14 (1) RRUS-32 B66A	*(1) RAYCAP DC6-48-60-0-8F	-			
	B3	LTE 700, LTE 1900, UMTS 850	130°	KATHREIN 800-10965	87'-0"	-	*(1) RRUS-11 B12 (1) RRUS-32 B2	(1) RAYCAP DC6-48-60-18-8F	*(2) KATHREIN - 782-10250			
C	C1	LTE WCS	250°	*CCI OPA-65R-LCUU-H8	87'-0"	-	***(1) RRUS-32 B30	-	-			
	C2	LTE 700, LTE AWS	250°	*KATHREIN 800-10965	87'-0"	-	(1) RADIO 4478 B14 (1) RRUS-32 B66A	(1) RAYCAP DC6-48-60-18-8F	-			
	C3	LTE 700, LTE 1900, UMTS 850	250°	KATHREIN 800-10965	87'-0"	-	*(1) RRUS-11 B12 (1) RRUS-32 B2	-	*(2) KATHREIN - 782-10250			

*ANTENNA/TOWER MOUNTED EQUIPMENT TO BE REMOVED

**COAX TO BE REMOVED

***TO BE RELOCATED

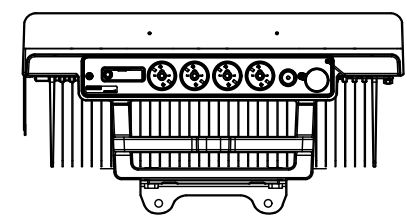
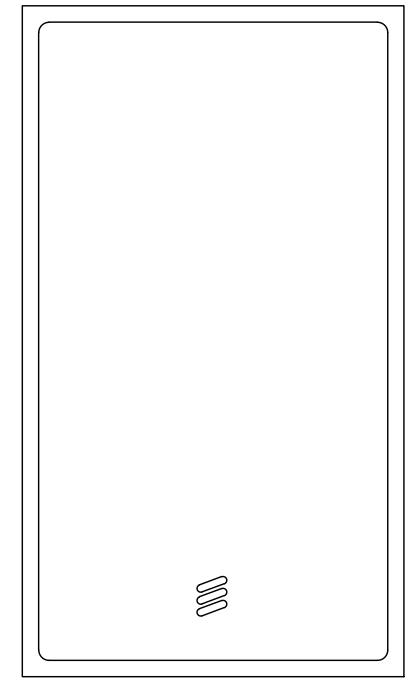
1 EXISTING EQUIPMENT SCHEDULE
SCALE: NOT TO SCALE

FINAL ANTENNA SCHEDULE (RFDS 03/25/2022, VERSION 2.00)

SECTOR	ANTENNA					TMA	RRH	RAYCAP	DIPLEXER	TRANSMISSION LINE			ADDITIONAL COMPONENT
	POS.	TECHNOLOGY	AZIMUTH	MODEL NO.	RAD CL.	MODEL NO.	MODEL NO.	MODEL NO.	MODEL NO.	DC POWER	FIBER	COAX	
A	A1	LTE 700, LTE AWS, 5G AWS	10°	KATHREIN 800-10965	87'-0"	-	(1) RRH 4478 B14 (1) RRUS-32 B66A	-	-				
	A2A	5G CBAND	10°	ERICSSON AIR6419 B77D	89'-6"	-	-	(1) RAYCAP DC9-48-60-24-8C-EV	-				
	A2B	5G DoD	10°	ERICSSON AIR6449 B77D	86'-0"	-	-	-	-				
	A3	LTE 700, LTE WCS, LTE 1900, 5G 1900, 5G 850	10°	CCI DMP65R-BU6e	87'-0"	-	(1) RRH RRUS-32 B2 (1) RRH RRUS-32 B30 (1) RRH 4449 B5/B12	-	-				
B	B1	LTE 700, LTE AWS, 5G AWS	130°	KATHREIN 800-10965	87'-0"	-	(1) RRH 4478 B14 (1) RRUS-32 B66A	-	-	(4) DC TRUNK 8AWG (3) DC TRUNK 6AWG	(2) FIBER TRUNK (1) FIBER TRUNK (24 PAIR)		
	B2A	5G CBAND	130°	ERICSSON AIR6419 B77D	89'-6"	-	-	(1) RAYCAP DC6-48-60-18-8F	-				
	B2B	5G DoD	130°	ERICSSON AIR6449 B77D	86'-0"	-	-	-	-				
	B3	LTE 700, LTE WCS, LTE 1900, 5G 1900, 5G 850	130°	CCI DMP65R-BU6e	87'-0"	-	(1) RRH RRUS-32 B2 (1) RRH RRUS-32 B30 (1) RRH 4449 B5/B12	-	-				
C	C1	LTE 700, LTE AWS, 5G AWS	250°	KATHREIN 800-10965	87'-0"	-	(1) RRH 4478 B14 (1) RRUS-32 B66A	-	-				
	C2A	5G CBAND	250°	ERICSSON AIR6419 B77D	89'-6"	-	-	(1) RAYCAP DC6-48-60-18-8F	-				
	C2B	5G DoD	250°	ERICSSON AIR6449 B77D	86'-0"	-	-	-	-				
	C3	LTE 700, LTE WCS, LTE 1900, 5G 1900, 5G 850	250°	CCI DMP65R-BU6e	87'-0"	-	(1) RRH RRUS-32 B2 (1) RRH RRUS-32 B30 (1) RRH 4449 B5/B12	-	-				

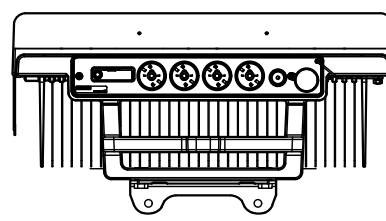
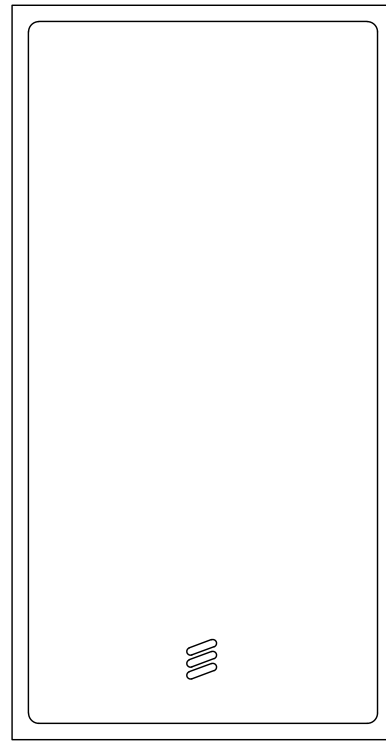
NEW ANTENNA/TOWER MOUNTED EQUIPMENT IN BOLD.

2 FINAL EQUIPMENT SCHEDULE
SCALE: NOT TO SCALE



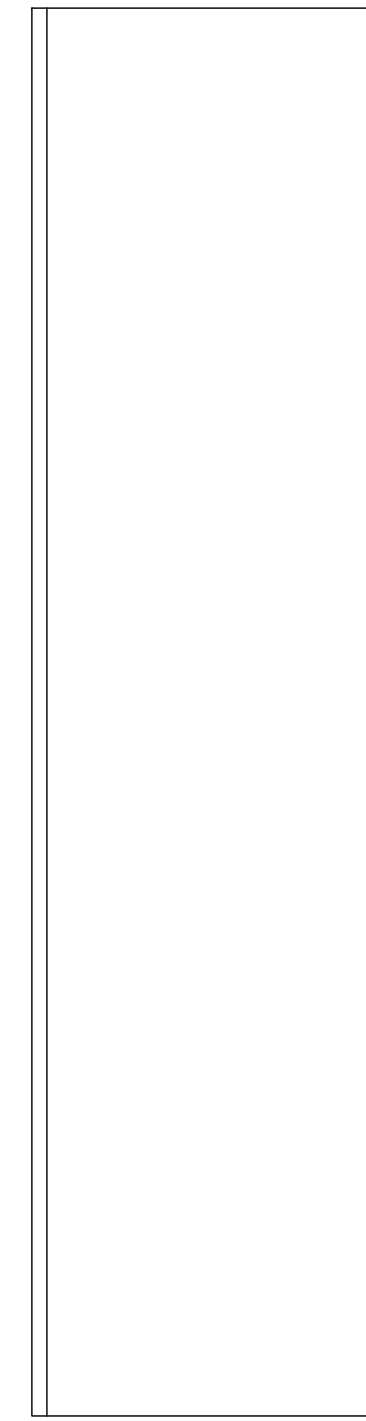
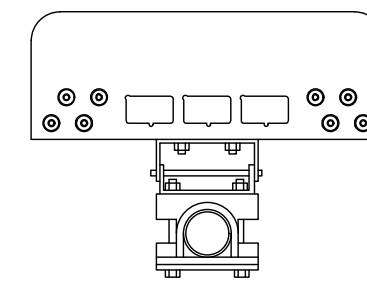
ERICSSON - AIR 6419 B77G
 WEIGHT (WITHOUT MOUNTING HARDWARE): 66.20 LBS
 SIZE (HxWxD): 27.95x15.75x6.68 IN.

1 ERICSSON - AIR 6419 B77G
 SCALE: NOT TO SCALE



ERICSSON - AIR 6449 B77D
 WEIGHT (WITHOUT MOUNTING HARDWARE): 81.60 LBS
 SIZE (HxWxD): 30.39x15.87x8.07 IN.

2 ERICSSON - AIR 6419 B77D
 SCALE: NOT TO SCALE



CCI - DMP65R-BU6DA
 WEIGHT (WITHOUT MOUNTING HARDWARE): 89.30 LBS
 SIZE (HxWxD): 71.20x20.70x7.70 IN.

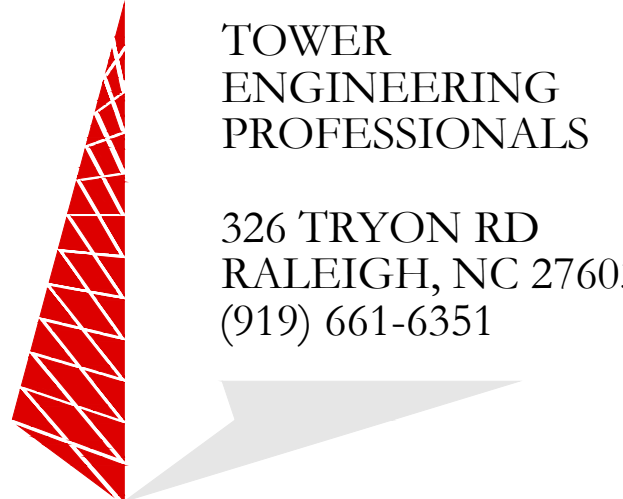
3 CCI-DMP65R-BU6DA
 SCALE: NOT TO SCALE



700 BELL STREET
 AKRON, OHIO 44307



12 GILL STREET, SUITE 5800
 WOBURN, MA 01801



TOWER
 ENGINEERING
 PROFESSIONALS
 326 TRYON RD
 RALEIGH, NC 27603
 (919) 661-6351

TEP JOB #: 61677.633796

AT&T SITE NUMBER:
MA1085

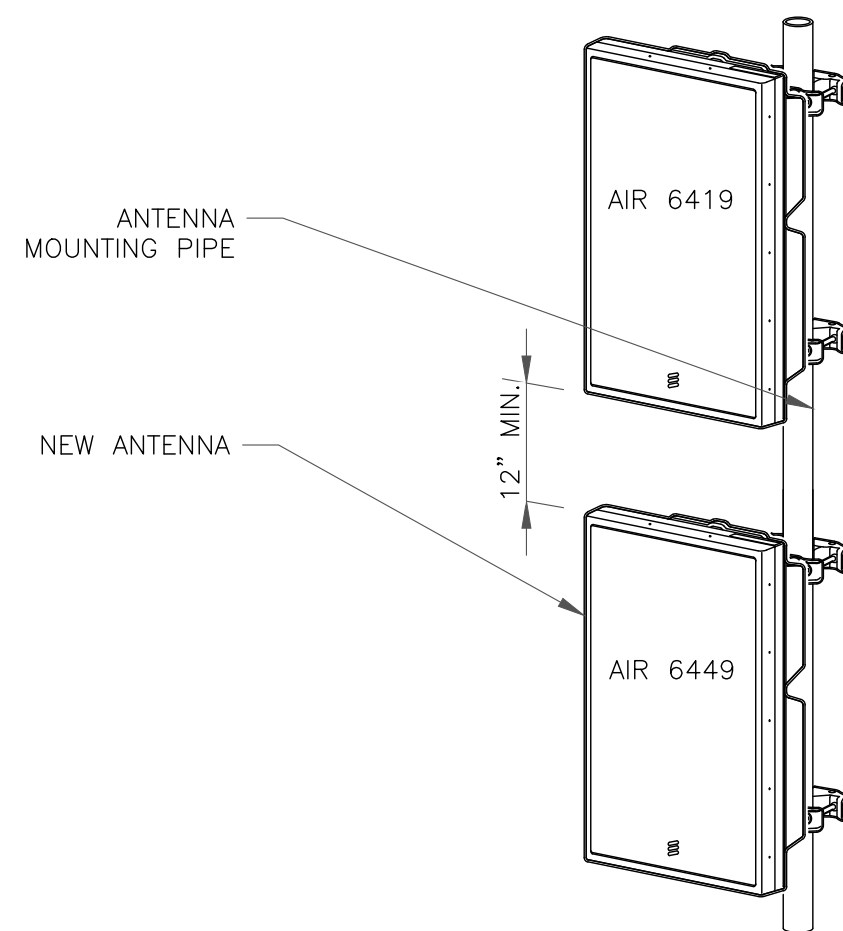
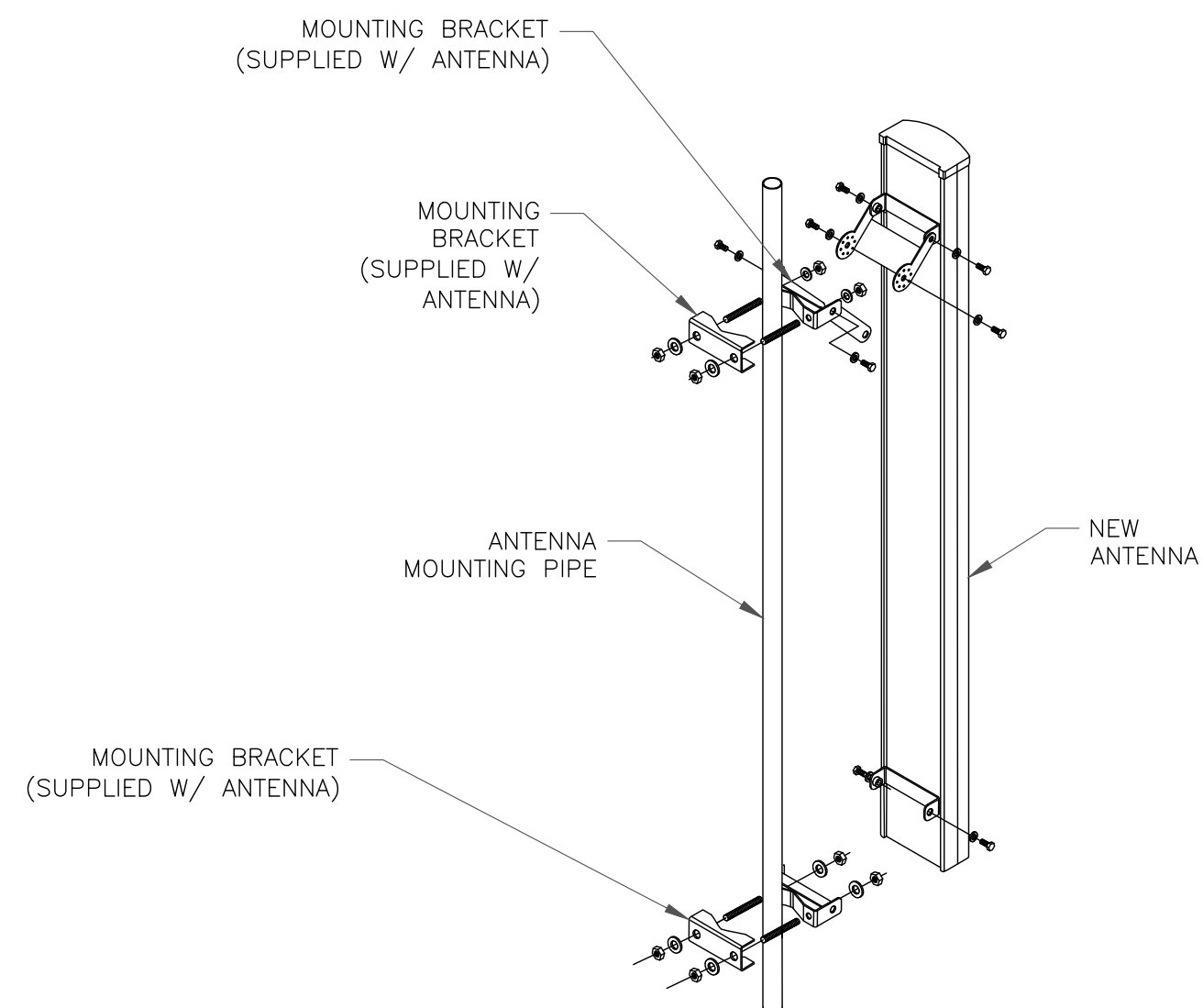
BU #: **806042**
BOS ASHLAND 959026

34 ALBERT RAY DRIVE
 ASHLAND, MA 01721
 (MIDDLESEX COUNTY)

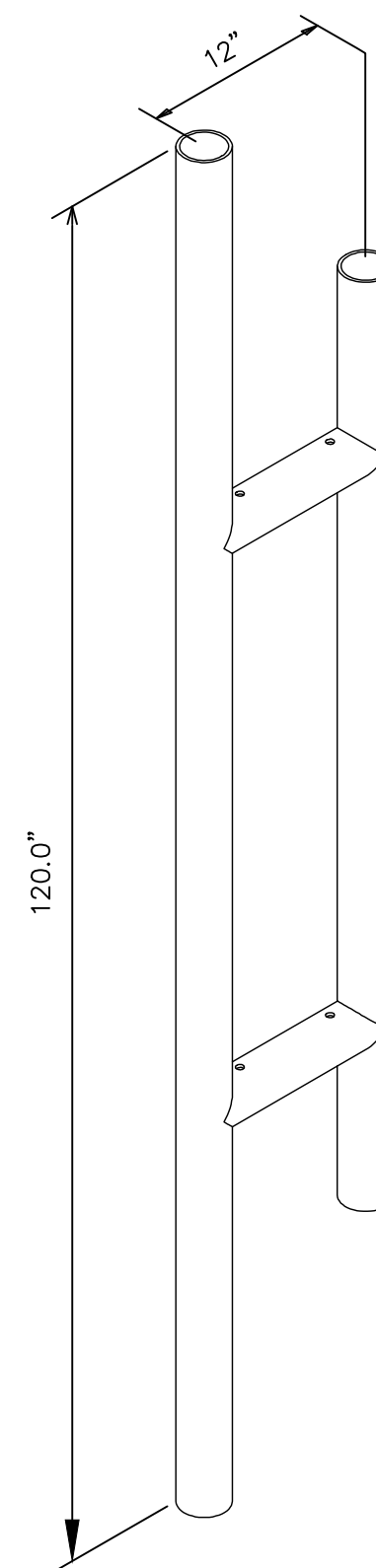
EXISTING 99' MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	01/05/22	KRS	PRELIMINARY	DA
B	02/22/22	SVP	PRELIMINARY	DA
C	04/07/22	SVP	PRELIMINARY	DA
0	05/20/22	SVP	CONSTRUCTION	DA



4 ANTENNA MOUNTING DETAIL
 SCALE: NOT TO SCALE



PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	1	X-PM1	PM1 STANDOFF MOUNT WELDMENT		60	60

5 ANTENNA STANDOFF DETAIL
 SCALE: NOT TO SCALE

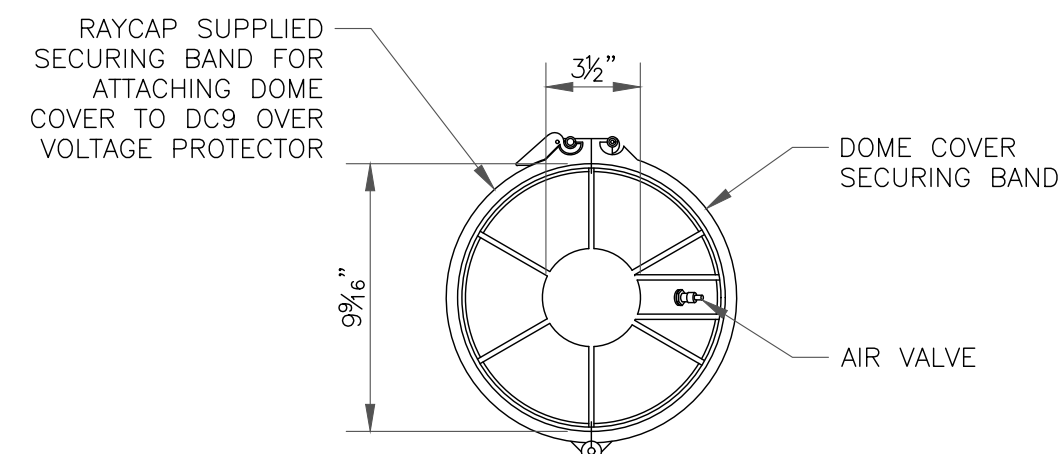


05/20/22

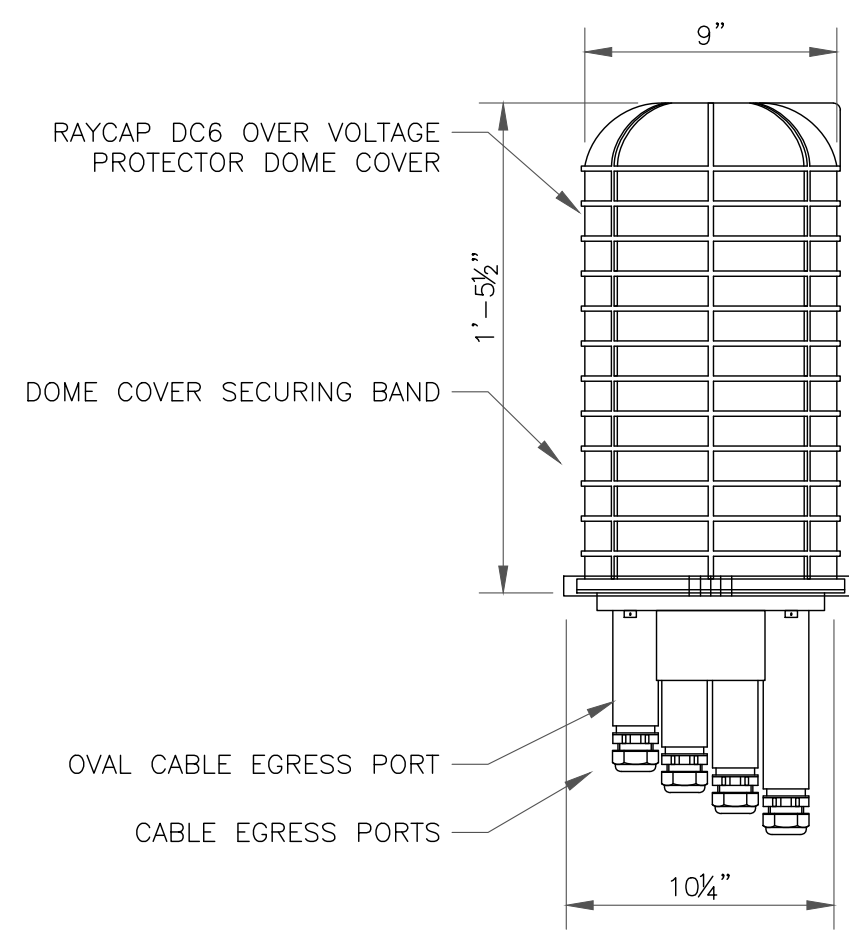
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SHEET NUMBER:
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REVISION:
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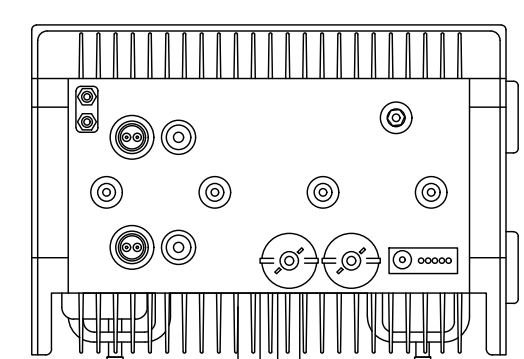
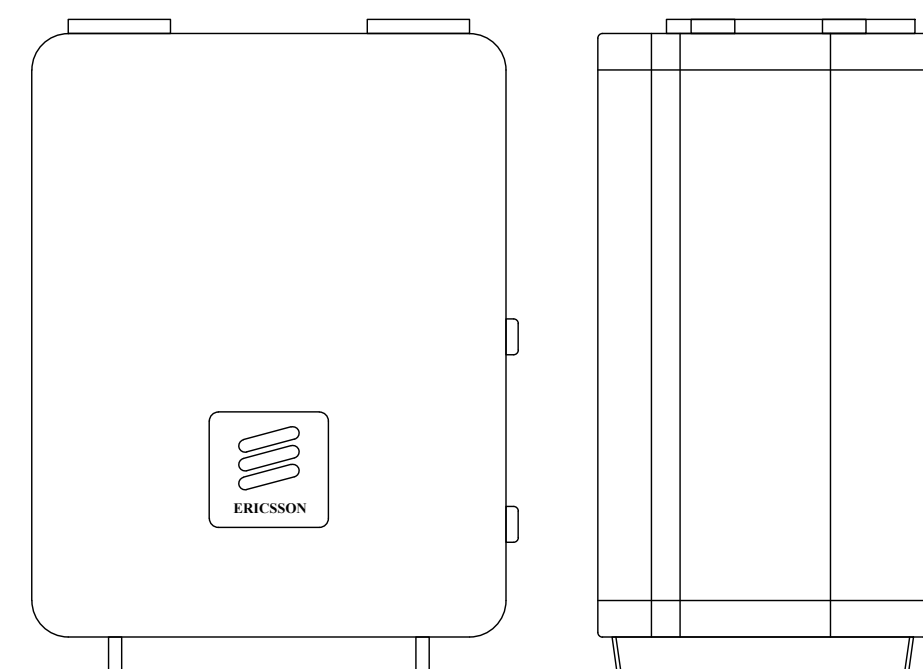
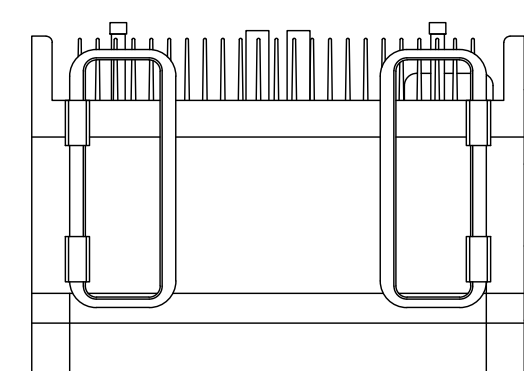


TOP VIEW



SIDE VIEW

1 RAYCAP-DC9-48-60-24-8C-EV
SCALE: NOT TO SCALE

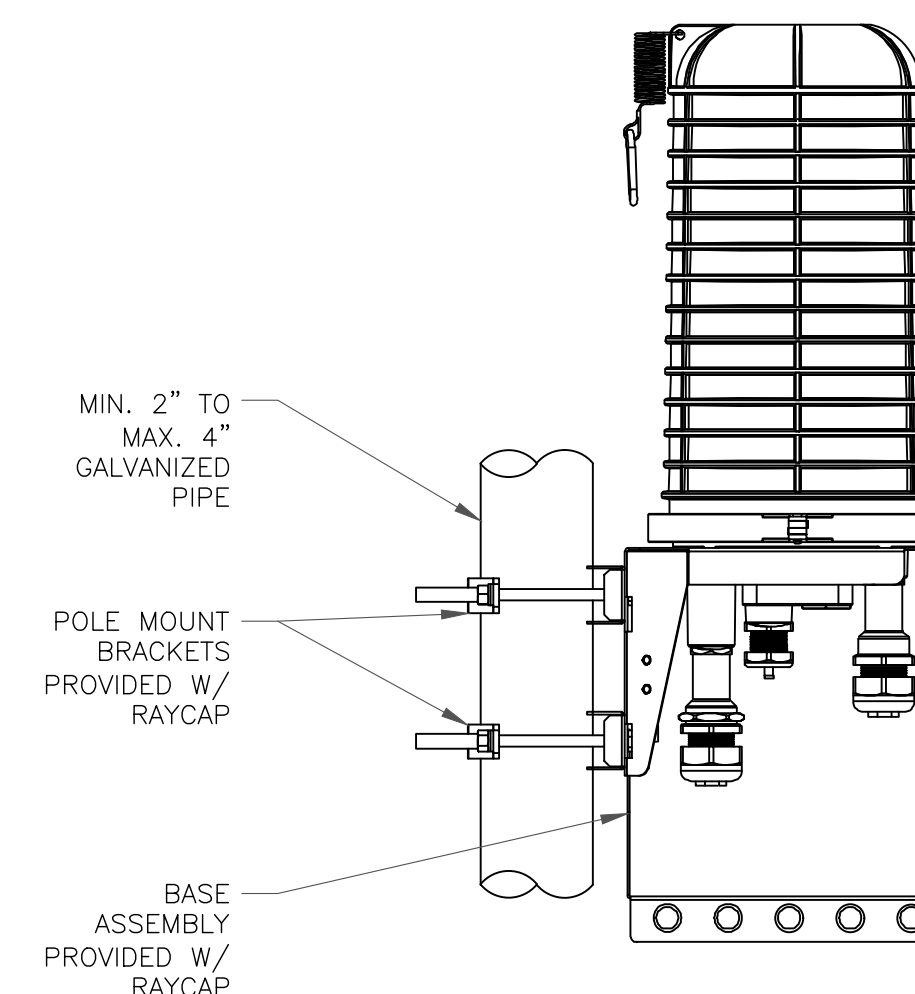


ERICSSON - RADIO 4449 B5/B12
WEIGHT: 75.0 LBS
SIZE (HxWxD): 16.50X13.4X5.9 IN.

2 ERICSSON - RADIO 4449 B5/B12
SCALE: NOT TO SCALE

NOTE:

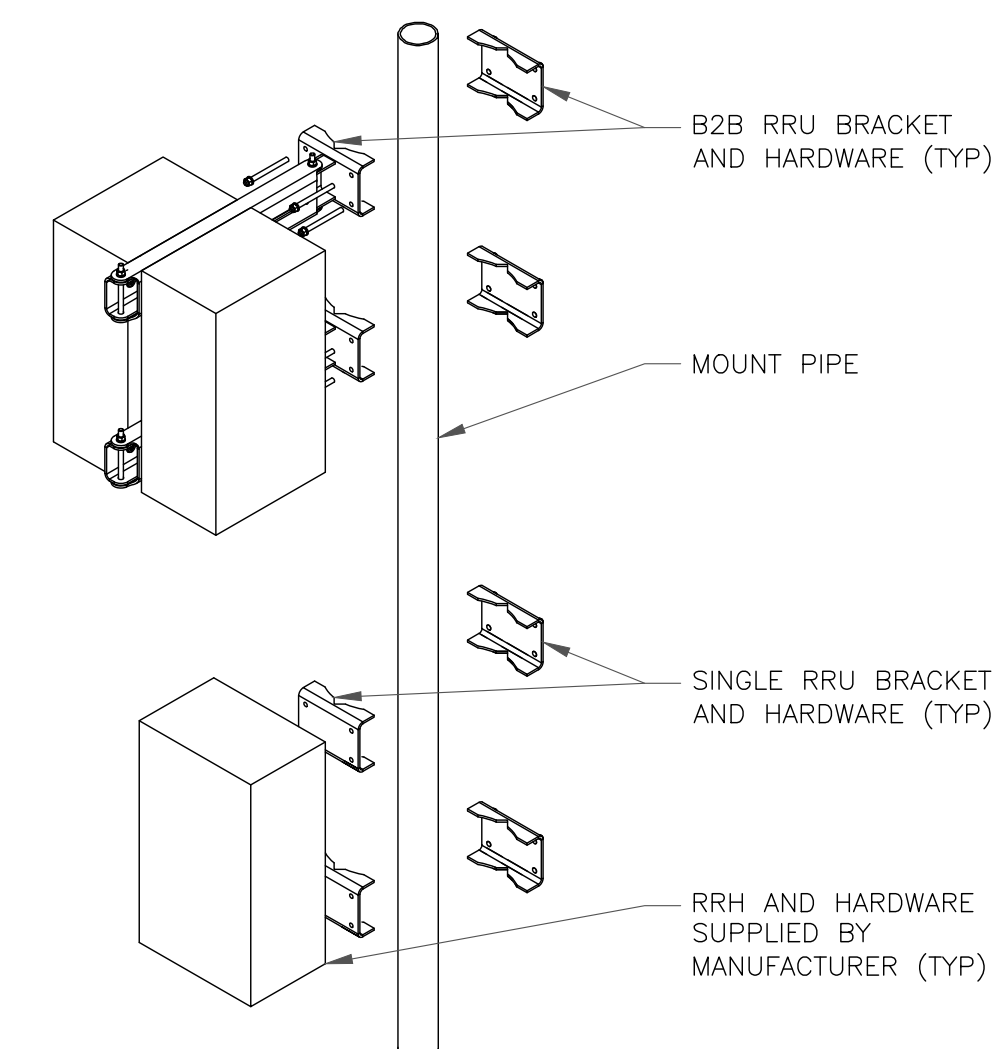
1. RAYCAP TO BE MOUNTED PER MANUFACTURER'S SPECIFICATIONS.
2. CONTRACTOR TO TIGHTEN ALL BOLTS TO A 'SNUG TIGHT' CONDITION AS DEFINED BY AISC.
3. CONTRACTOR SHALL INSTALL RAYCAP DISTRIBUTION UNIT WITHIN 15 FT FROM ALL RRHS.



3 NOT USED
SCALE: NOT TO SCALE

INSTALLER NOTES:

1. COMPLY WITH MANUFACTURER'S INSTRUCTIONS TO ENSURE THAT ALL RRHS RECEIVE ELECTRICAL POWER WITHIN 24 HOURS OF BEING REMOVED FROM THE MANUFACTURER'S PACKAGING.
2. DO NOT OPEN RRH PACKAGES IN THE RAIN.
3. ALL PIPES, BRACKETS, AND MISCELLANEOUS HARDWARE TO BE GALVANIZED UNLESS NOTED OTHERWISE.



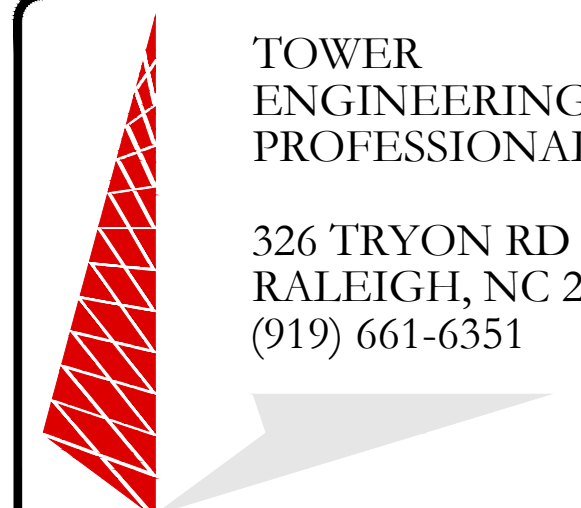
4 RRHs MOUNTING DETAIL
SCALE: NOT TO SCALE



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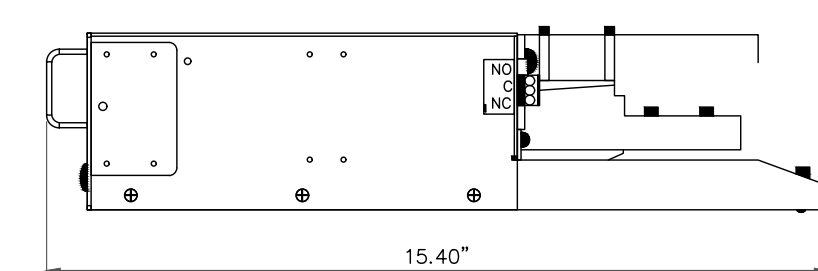
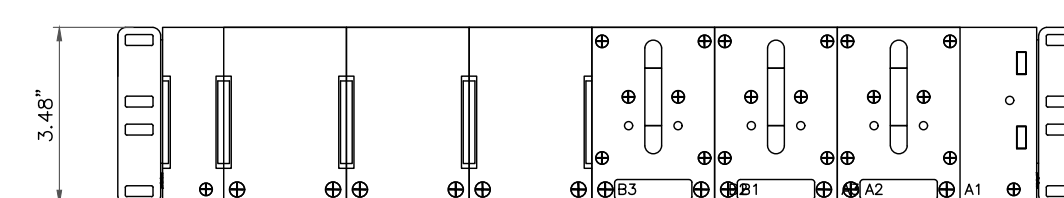
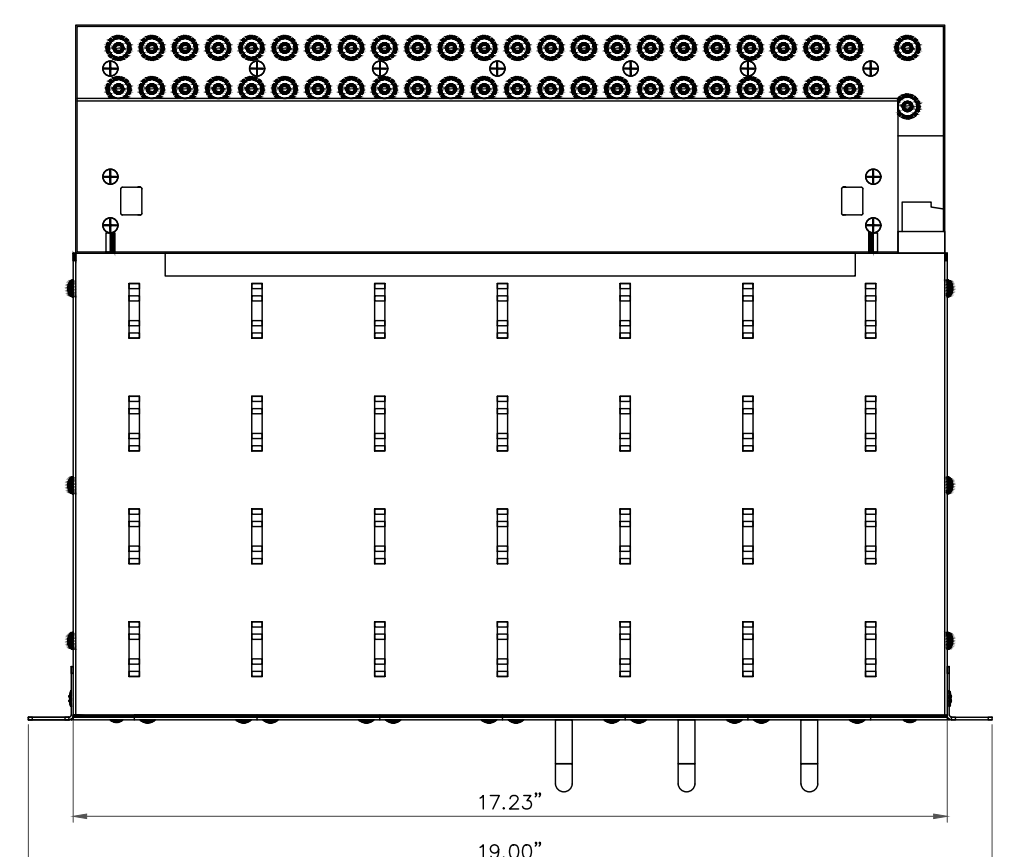
TEP JOB #: 61677.633796

AT&T SITE NUMBER:
MA1085

BU #: 806042
BOS ASHLAND 959026

34 ALBERT RAY DRIVE
ASHLAND, MA 01721
(MIDDLESEX COUNTY)

EXISTING 99' MONOPOLE



RAYCAP DC12-48-60-RM
WEIGHT: 27.0 LBS
SIZE: 19.0" X 15.40" X 3.48" IN.

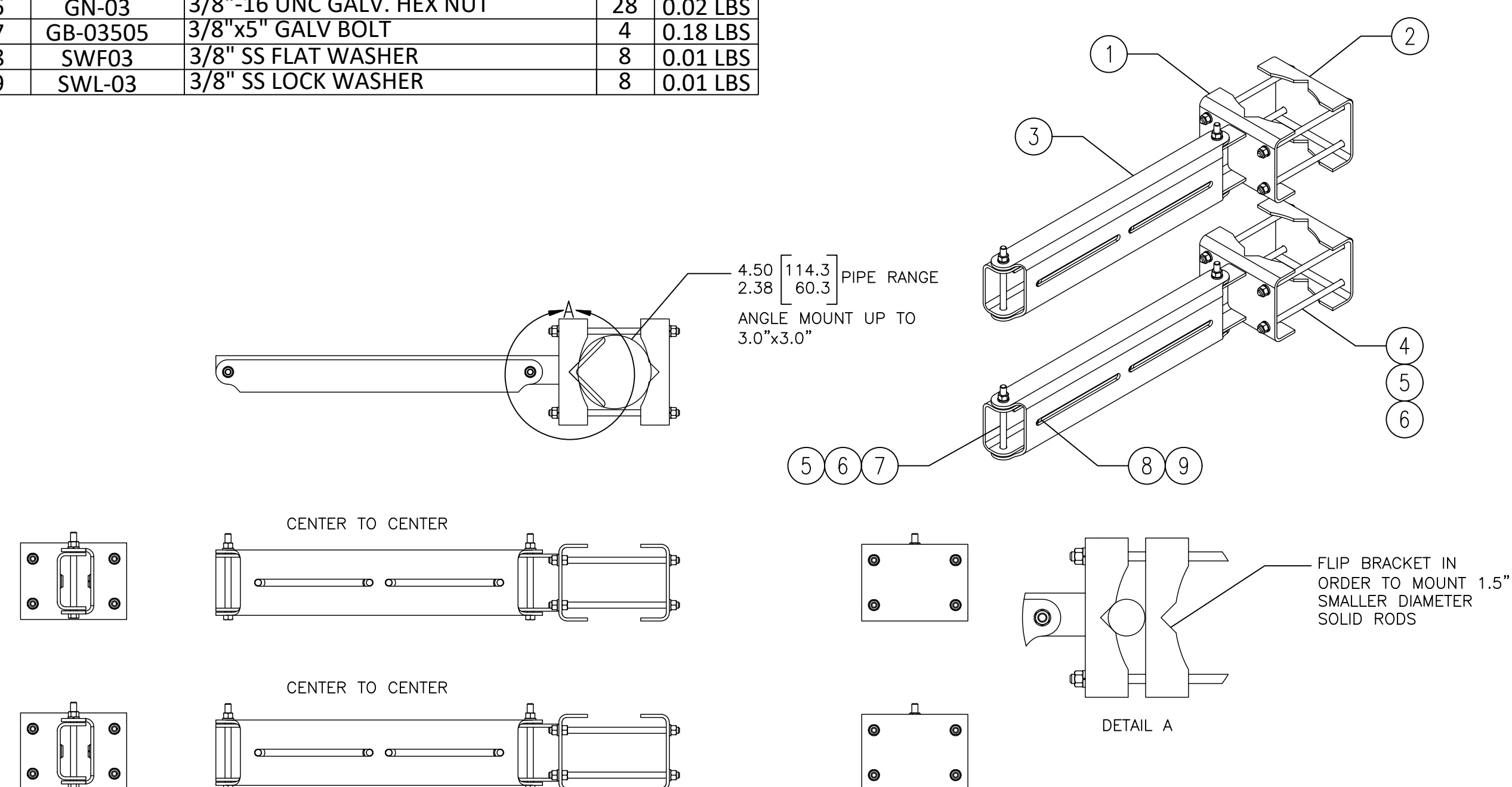
5 RAYCAP - DC12-48-60-RM
SCALE: NOT TO SCALE

6 NOT USED
SCALE: NOT TO SCALE

ITEM	PART NO.	DESCRIPTION	QTY.	WEIGHT
1	RRUDSM.01	MOUNTING ARM	2	8.92 LBS
2	RRUDSM.02	CLAMP PLATE	2	2.33 LBS
3	RRUDSM.03	SWIVEL MOUNT	2	6.60 LBS
4	GD03800	3/8"-16 UNCx8" GALV THREADED ROD	8	0.25 LBS
5	GWL-03	3/8" GALV LOCK WASHER	20	0.01 LBS
6	GN-03	3/8"-16 UNC GALV. HEX NUT	28	0.02 LBS
7	GB-03505	3/8"x5" GALV BOLT	4	0.18 LBS
8	SWF03	3/8" SS FLAT WASHER	8	0.01 LBS
9	SWL-03	3/8" SS LOCK WASHER	8	0.01 LBS

NOTE:

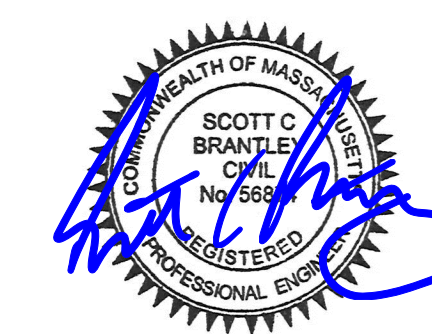
INSTALL AS NEEDED.



7 ROSENBERGER D220RUDSM DUAL RRH MOUNT
SCALE: NOT TO SCALE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	01/05/22	KRS	PRELIMINARY	DA
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C	04/07/22	SVP	PRELIMINARY	DA
0	05/20/22	SVP	CONSTRUCTION	DA



05/20/22

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C-4.1

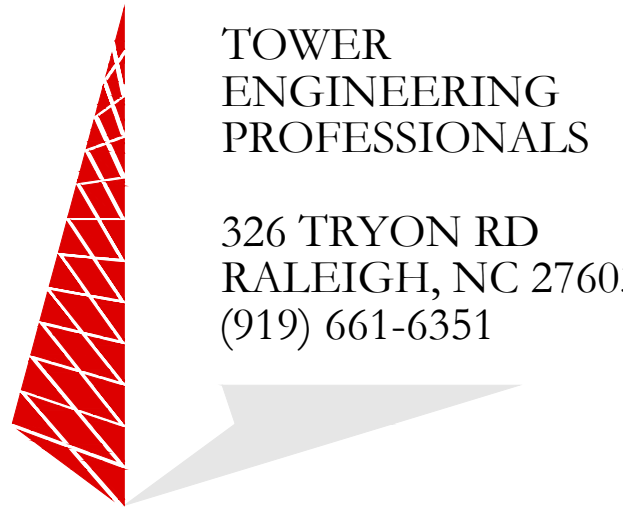
REVISION:
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AT&T SITE NUMBER:
MA1085

BU #: 806042
BOS ASHLAND 959026

34 ALBERT RAY DRIVE
ASHLAND, MA 01721
(MIDDLESEX COUNTY)

EXISTING 99' MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
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C	04/07/22	SVP	PRELIMINARY	DA
0	05/20/22	SVP	CONSTRUCTION	DA



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SHEET NUMBER:

C-5

REVISION:

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Table 1: E. PA/S. NJ/DE Coax Trunk/Jumper Color Code Definition

Sector	Alpha	Green
	Beta	Blue
	Gamma	White
	Delta	Orange
	Epsilon	Brown
	Psi	Violet
Frequency Band	700 (B/C)	Violet
	850	Yellow
	850 - 2nd Block	Yellow
	1900	Red
	1900 - 2nd Block	Red
	2100 (AWS)	Orange
	2100 (AWS) - 2nd Block	Orange
	2300 (WCS)	Brown
	2300 (WCS) - 2nd Block	Brown
	700 (D/E)	Slate
	700 - FIRSTNET	Violet/ Blue

Table 2 E. PA/S. NJ/DE Coax Trunk/Jumper Color Code Standard

Sector	Technology	Frequency Band	Color Code - Additional Stripe for Sector Split	Color Code - Sector (Amount of Stripes based on Antenna Position)	BOTTOM - Code Code - Frequency Band (RRH JUMPERS ONLY)	45+ Coax	45- Coax	TOP - Low Port (ANTENNA JUMPERS ONLY)	TOP - High Port (ANTENNA JUMPERS ONLY)
A	LTE	700 B/C	Blank	GREEN	VIOLET	YELLOW	Blank	Blank	RED
A	LTE	850	Blank	GREEN	YELLOW	YELLOW	Blank	Blank	RED
A	LTE	850 - 2nd Block	Blank	GREEN	YELLOW	YELLOW	Blank	Blank	RED
A	LTE	1900	Blank	GREEN	RED	YELLOW	Blank	Blank	RED
A	LTE	1900 - 2nd Block	Blank	GREEN	RED	YELLOW	Blank	Blank	RED
A	LTE	2100	Blank	GREEN	ORANGE	YELLOW	Blank	Blank	RED
A	LTE	2100 - 2nd Block	Blank	GREEN	ORANGE	YELLOW	Blank	Blank	RED
A	LTE	700 D/E	Blank	GREEN	SLATE	YELLOW	Blank	Blank	RED
A	LTE	2300	Blank	GREEN	BROWN	YELLOW	Blank	Blank	RED
A	LTE	2300 - 2nd Block	Blank	GREEN	BROWN	YELLOW	Blank	Blank	RED
A	LTE FirstNet	700 - FirstNet	Blank	GREEN	VIOLET BLUE	YELLOW	Blank	Blank	RED
A	UMTS	850	Blank	GREEN	YELLOW	YELLOW	Blank	Blank	RED
A	UMTS	1900	Blank	GREEN	RED	YELLOW	Blank	Blank	RED
B	LTE	700 B/C	Blank	BLUE	VIOLET	YELLOW	Blank	Blank	RED
B	LTE	850	Blank	BLUE	YELLOW	YELLOW	Blank	Blank	RED
B	LTE	850 - 2nd Block	Blank	BLUE	YELLOW	YELLOW	Blank	Blank	RED
B	LTE	1900	Blank	BLUE	RED	YELLOW	Blank	Blank	RED
B	LTE	1900 - 2nd Block	Blank	BLUE	RED	YELLOW	Blank	Blank	RED
B	LTE	2100	Blank	BLUE	ORANGE	YELLOW	Blank	Blank	RED
B	LTE	2100 - 2nd Block	Blank	BLUE	ORANGE	YELLOW	Blank	Blank	RED
B	LTE	700 D/E	Blank	BLUE	SLATE	YELLOW	Blank	Blank	RED
B	LTE	2300	Blank	BLUE	BROWN	YELLOW	Blank	Blank	RED
B	LTE	2300 - 2nd Block	Blank	BLUE	BROWN	YELLOW	Blank	Blank	RED
B	LTE FirstNet	700 - FirstNet	Blank	BLUE	VIOLET BLUE	YELLOW	Blank	Blank	RED
B	UMTS	850	Blank	BLUE	YELLOW	YELLOW	Blank	Blank	RED
B	UMTS	1900	Blank	BLUE	RED	YELLOW	Blank	Blank	RED
C	LTE	700 B/C	Blank	WHITE	VIOLET	YELLOW	Blank	Blank	RED
C	LTE	850	Blank	WHITE	YELLOW	YELLOW	Blank	Blank	RED
C	LTE	850 - 2nd Block	Blank	WHITE	YELLOW	YELLOW	Blank	Blank	RED
C	LTE	1900	Blank	WHITE	RED	YELLOW	Blank	Blank	RED
C	LTE	1900 - 2nd Block	Blank	WHITE	RED	YELLOW	Blank	Blank	RED
C	LTE	2100	Blank	WHITE	ORANGE	YELLOW	Blank	Blank	RED
C	LTE	2100 - 2nd Block	Blank	WHITE	ORANGE	YELLOW	Blank	Blank	RED
C	LTE	700 D/E	Blank	WHITE	SLATE	YELLOW	Blank	Blank	RED
C	LTE	2300	Blank	WHITE	BROWN	YELLOW	Blank	Blank	RED
C	LTE	2300 - 2nd Block	Blank	WHITE	BROWN	YELLOW	Blank	Blank	RED
C	LTE FirstNet	700 - FirstNet	Blank	WHITE	VIOLET BLUE	YELLOW	Blank	Blank	RED
C	UMTS	850	Blank	WHITE	YELLOW	YELLOW	Blank	Blank	RED
C	UMTS	1900	Blank	WHITE	RED	YELLOW	Blank	Blank	RED
D	LTE	700 B/C	Blank	ORANGE	VIOLET	YELLOW	Blank	Blank	RED
D	LTE	850	Blank	ORANGE	YELLOW	YELLOW	Blank	Blank	RED
D	LTE	850 - 2nd Block	Blank	ORANGE	YELLOW	YELLOW	Blank	Blank	RED
D	LTE	1900	Blank	ORANGE	RED	YELLOW	Blank	Blank	RED
D	LTE	1900 - 2nd Block	Blank	ORANGE	RED	YELLOW	Blank	Blank	RED
D	LTE	2100	Blank	ORANGE	ORANGE	YELLOW	Blank	Blank	RED
D	LTE	2100 - 2nd Block	Blank	ORANGE	ORANGE	YELLOW	Blank	Blank	RED
D	LTE	700 D/E	Blank	ORANGE	SLATE	YELLOW	Blank	Blank	RED
D	LTE	2300	Blank	ORANGE	BROWN	YELLOW	Blank	Blank	RED
D	LTE	2300 - 2nd Block	Blank	ORANGE	BROWN	YELLOW	Blank	Blank	RED
D	LTE FirstNet	700 - FirstNet	Blank	ORANGE	VIOLET BLUE	YELLOW	Blank	Blank	RED
D	UMTS	850	Blank	ORANGE	YELLOW	YELLOW	Blank	Blank	RED
D	UMTS	1900	Blank	ORANGE	RED	YELLOW	Blank	Blank	RED

1 COLOR CODE CHART
SCALE: NOT TO SCALE

3. ATT Naming Convention for "RET NAME"

ATT-002-290-125 (Issue 8, 02/03/14)
Antenna Remote Electrical Tilt (RET) Guidelines

Usage: [USID][CellId1][CellId2][CellId3][AntPos][FrequencyBand][Tech]

USID						CellId 1	CellId 2	CellId 3	AntPos	Freq	Tech
1	2	3	4	5	6	7	8	9	10	11	12

Field	Length	Description	
USID	6	Six characters that define the sites USID. USID's less than 6 characters in length are preceded with 0's (zeros) (example: 003831)	
CellId1	1	Allowed Value	Description
		A	Alpha
		B	Beta
		C	Gamma
CellId2	1	D	Delta
		E	Epsilon
CellId3	1	F	Zeta
		-	No Transmitter connected to this port
AntPos	1	Allowed Value	Description
		1	Antenna Position 1 on this face
		2	Antenna Position 2 on this face
		3	Antenna Position 3 on this face
		4	Antenna Position 4 on this face
		5	Antenna Position 5 on this face
FreqBand	1	Allowed Value	Description
		2	2100 MHz (AWS)
		7	700 MHz
		8	850 MHz
		9	1900 MHz
		Q	700 MHz D & E Band Only
		W	2300 MHz (WCS)

Field	Length	Description				
		Allowed Value	GSM	UMTS	LTE	Split Sector
Tech	1	G	GSM			
		J	GSM	UMTS		
		K	GSM		LTE	
		L			LTE	
		N				
		U		UMTS		
		V		UMTS	LTE	
		Y	GSM	UMTS	LTE	
		H	GSM			Split
		M	GSM	UMTS		Split
		P	GSM		LTE	Split
		Q			LTE	Split
		R				Split
		S		UMTS		Split
		T		UMTS	LTE	Split



AT&T SITE NUMBER:
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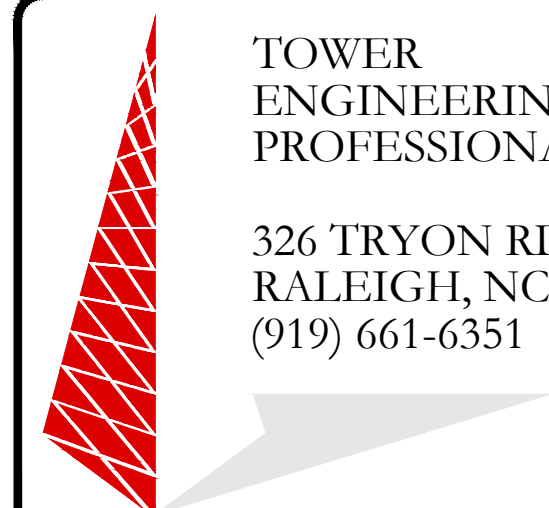
SHEET NUMBER: **C-6** REVISION: **0**



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SHEET NUMBER:

E-1

REVISION:

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SCOPE:

1. PROVIDE LABOR, MATERIALS, INSPECTION, AND TESTING TO PROVIDE CODE COMPLIANCE FOR ELECTRIC, TELEPHONE, AND GROUNDING/LIGHTNING SYSTEMS.

CODES:

1. THE INSTALLATION SHALL COMPLY WITH APPLICABLE LAWS AND CODES. THESE INCLUDE BUT ARE NOT LIMITED TO THE LATEST ADOPTED EDITIONS OF:
 - A. THE NATIONAL ELECTRICAL SAFETY CODE
 - B. THE NATIONAL ELECTRIC CODE – NFPA-70
 - C. REGULATIONS OF THE SERVING UTILITY COMPANY
 - D. LOCAL AND STATE AMENDMENTS
 - E. THE INTERNATIONAL ELECTRIC CODE – IEC (WHERE APPLICABLE)
2. PERMITS REQUIRED SHALL BE OBTAINED BY THE CONTRACTOR.
3. AFTER COMPLETION AND FINAL INSPECTION OF THE WORK, THE OWNER SHALL BE FURNISHED A CERTIFICATE OF COMPLETION AND APPROVAL.

TESTING:

1. UPON COMPLETION OF THE INSTALLATION, OPERATE AND ADJUST THE EQUIPMENT AND SYSTEMS TO MEET SPECIFIED PERFORMANCE REQUIREMENTS. THE TESTING SHALL BE DONE BY QUALIFIED PERSONNEL.

GUARANTEE:

1. IN ADDITION TO THE GUARANTEE OF THE EQUIPMENT BY THE MANUFACTURER, EACH PIECE OF EQUIPMENT SPECIFIED HEREIN SHALL ALSO BE GUARANTEED FOR DEFECTS OF MATERIAL OR WORKMANSHIP OCCURRING DURING A PERIOD OF ONE (1) YEAR FROM FINAL ACCEPTANCE OF THE WORK BY THE OWNER AND WITHOUT EXPENSE TO THE OWNER.
2. THE WARRANTY CERTIFICATES & GUARANTEES FURNISHED BY THE MANUFACTURERS SHALL BE TURNED OVER TO THE OWNER.

UTILITY CO-ORDINATION:

1. CONTRACTOR SHALL COORDINATE WORK WITH THE POWER AND TELEPHONE COMPANIES AND SHALL COMPLY WITH THE SERVICE REQUIREMENTS OF EACH UTILITY COMPANY.

EXAMINATION OF SITE:

1. PRIOR TO BEGINNING WORK, THE CONTRACTOR SHALL VISIT THE SITE OF THE JOB AND SHALL FAMILIARIZE HIMSELF WITH THE CONDITIONS AFFECTING THE PROPOSED ELECTRICAL INSTALLATION AND SHALL MAKE PROVISIONS AS TO THE COST THEREOF. FAILURE TO COMPLY WITH THE INTENT OF THIS SECTION WILL IN NO WAY RELIEVE THE CONTRACTOR OF PERFORMING THE WORK NECESSARY FOR A COMPLETE AND WORKING SYSTEM OR SYSTEMS.

CUTTING, PATCHING AND EXCAVATION:

1. COORDINATION OF SLEEVES, CHASES, ETC., BETWEEN SUBCONTRACTORS WILL BE REQUIRED PRIOR TO THE CONSTRUCTION OF ANY PORTION OF THE WORK. CUTTING AND PATCHING OF WALLS, PARTITIONS, FLOORS, AND CHASES IN CONCRETE, WOOD, STEEL OR MASONRY SHALL BE DONE AS PROVIDED ON THE DRAWINGS.
2. NECESSARY EXCAVATIONS AND BACKFILLING INCIDENTAL TO THE ELECTRICAL WORK SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR UNLESS SPECIFICALLY NOTED OTHERWISE ON THE DRAWING.
3. SEAL PENETRATIONS THROUGH RATED WALLS, FLOORS, ETC., WITH APPROVED METHOD AS LISTED BY UL.

RACEWAYS / CONDUITS GENERAL:

1. CONDUCTORS SHALL BE INSTALLED IN LISTED RACEWAYS. CONDUIT SHALL BE RIGID STEEL, EMT, SCH40 PVC, OR SCH80PVC AS INDICATED ON THE DRAWINGS. THE RACEWAY SYSTEM SHALL BE COMPLETE BEFORE INSTALLING CONDUCTORS.
2. EXTERIOR RACEWAYS AND GROUNDING SLEEVES SHALL BE SEALED AT POINTS OF ENTRANCE AND EXIT. THE RACEWAY SYSTEM SHALL BE BONDED PER NEC.

EXTERIOR CONDUIT:

1. EXPOSED CONDUIT SHALL BE NEATLY INSTALLED AND RUN PARALLEL OR PERPENDICULAR TO STRUCTURAL ELEMENTS. SUPPORTS AND MOUNTING HARDWARE SHALL BE HOT DIPPED GALVANIZED STEEL.
2. THE CONDUIT SHALL BE RIGID STEEL AT GRADE TRANSITIONS OR WHERE EXPOSED TO DAMAGE.
3. UNDERGROUND CONDUITS SHALL BE RIGID STEEL, SCH40 PVC, OR SCH80 PVC AS INDICATED ON THE DRAWINGS.
4. BURIAL DEPTH OF CONDUITS SHALL BE AS REQUIRED BY CODE FOR EACH SPECIFIC CONDUIT TYPE AND APPLICATION, BUT SHALL NOT BE LESS THAN THE FROST DEPTH AT THE SITE.
5. CONDUIT ROUTES ARE SCHEMATIC. CONTRACTOR SHALL FIELD VERIFY ROUTES BEFORE BID. COORDINATE ROUTE WITH WIRELESS CARRIER AND/OR BUILDING OWNER.

INTERIOR CONDUIT:

1. CONCEALED CONDUIT IN WALLS OR INTERIOR SPACES ABOVE GRADE MAY BE EMT OR PVC.
2. CONDUIT RUNS SHALL USE APPROVED COUPLINGS AND CONNECTORS. PROVIDE INSULATED BUSHING FOR ALL CONDUIT TERMINATIONS. CONDUIT RUNS IN A WET LOCATION SHALL HAVE WATERPROOF FITTINGS.
3. PROVIDE SUPPORTS FOR CONDUITS IN ACCORDANCE WITH NEC REQUIREMENTS. CONDUITS SHALL BE SIZED AS REQUIRED BY NEC.

EQUIPMENT:

1. DISCONNECT SWITCHES SHALL BE SERVICE ENTRANCE RATED, HEAVY DUTY TYPE.
2. CONTRACTOR SHALL VERIFY MAXIMUM AVAILABLE FAULT CURRENT AND COORDINATE INSTALLATION WITH THE LOCAL UTILITY BEFORE STARTING WORK. CONTRACTOR WILL VERIFY THAT EXISTING CIRCUIT BREAKERS ARE RATED FOR MORE THAN AVAILABLE FAULT CURRENT AND REPLACE AS NECESSARY.
3. NEW CIRCUIT BREAKERS SHALL BE RATED TO WITHSTAND THE MAXIMUM AVAILABLE FAULT CURRENT AS DETERMINED BY THE LOCAL UTILITY.

CONDUCTORS:

1. FURNISH AND INSTALL CONDUCTORS SPECIFIED IN THE DRAWINGS. CONDUCTORS SHALL BE COPPER AND SHALL HAVE TYPE THWN (MIN) (75° C) INSULATION, RATED FOR 600 VOLTS.
2. THE USE OF ALUMINUM CONDUCTORS SHALL BE LIMITED TO THE SERVICE FEEDERS INSTALLED BY THE UTILITY.
3. CONDUCTORS SHALL BE PROVIDED AND INSTALLED AS FOLLOWS:
 - A. MINIMUM WIRE SIZE SHALL BE #12 AWG.
 - B. CONDUCTORS SIZE #8 AND LARGER SHALL BE STRANDED. CONDUCTORS SIZED #10 AND #12 MAY BE SOLID OR STRANDED.
 - C. CONNECTION FOR #10 AWG #12 AWG SHALL BE BY TWISTING TIGHT AND INSTALLING INSULATED PRESSURE OR WIRE NUT CONNECTIONS.
 - D. CONNECTION FOR #8 AWG AND LARGER SHALL BE BY USE OF STEEL CRIMP-ON SLEEVES WITH NYLON INSULATOR.
3. CONDUCTORS SHALL BE COLOR CODED IN ACCORDANCE WITH NEC STANDARDS.

UL COMPLIANCE:

1. ELECTRICAL MATERIALS, DEVICES, CONDUCTORS, APPLIANCES, AND EQUIPMENT SHALL BE LABELED/LISTED BY UL OR ACCEPTED BY JURISDICTION (I.E., LOCAL COUNTY OR STATE) APPROVED THIRD PARTY TESTING AGENCY.

GROUNDING:

1. ELECTRICAL NEUTRALS, RACEWAYS AND NON-CURRENT CARRYING PARTS OF ELECTRICAL EQUIPMENT AND ASSOCIATED ENCLOSURES SHALL BE GROUNDED IN ACCORDANCE WITH NEC ARTICLE 250. THIS SHALL INCLUDE NEUTRAL CONDUCTORS, CONDUITS, SUPPORTS, CABINETS, BOXES, GROUND BUSSES, ETC. THE NEUTRAL CONDUCTOR FOR EACH SYSTEM SHALL BE GROUNDED AT A SINGLE POINT.
2. PROVIDE GROUND CONDUCTOR IN RACEWAYS PER NEC.
3. PROVIDE BONDING AND GROUND TO MEET NFPA 780 – "LIGHTNING PROTECTION" AS A MINIMUM.
4. PROVIDE GROUNDING SYSTEM AS INDICATED ON THE DRAWINGS, AS REQUIRED BY THE NATIONAL ELECTRIC CODE, RADIO EQUIPMENT MANUFACTURERS, AND MOTOROLA R56 (AS APPLICABLE).

ABBREVIATIONS AND LEGEND

A	– AMPERE	PNLBD	– PANELBOARD
AFG	– ABOVE FINISHED GRADE	PVC	– RIGID NON-METALLIC CONDUIT
ATS	– AUTOMATIC TRANSFER SWITCH	RGS	– RIGID GALVANIZED STEEL CONDUIT
AWG	– AMERICAN WIRE GAUGE	SW	– SWITCH
BCW	– BARE COPPER WIRE	TGB	– TOWER GROUND BAR
BFG	– BELOW FINISHED GRADE	UL	– UNDERWRITERS LABORATORIES
BKR	– BREAKER	V	– VOLTAGE
C	– CONDUIT	W	– WATTS
CKT	– CIRCUIT	XFMR	– TRANSFORMER
DISC	– DISCONNECT	XMTR	– TRANSMITTER
EGR	– EXTERNAL GROUND RING		
EMT	– ELECTRIC METALLIC TUBING		
FSC	– FLEXIBLE STEEL CONDUIT		
GEN	– GENERATOR		
GPS	– GLOBAL POSITIONING SYSTEM		
GRD	– GROUND		
IGB	– ISOLATED GROUND BAR		
IGR	– INTERIOR GROUND RING (HALO)		
KW	– KILOWATTS		
NEC	– NATIONAL ELECTRIC CODE		
PCS	– PERSONAL COMMUNICATION SYSTEM		
PH	– PHASE		
PNL	– PANEL		

— E —	UNDERGROUND ELECTRICAL CONDUIT
— T —	UNDERGROUND TELEPHONE CONDUIT
	KILOWATT-HOUR METER
—	UNDERGROUND BONDING AND GROUNDING CONDUCTOR.
∅	GROUND ROD
●	CADWELD
⊠	GROUND ROD WITH INSPECTION WELL

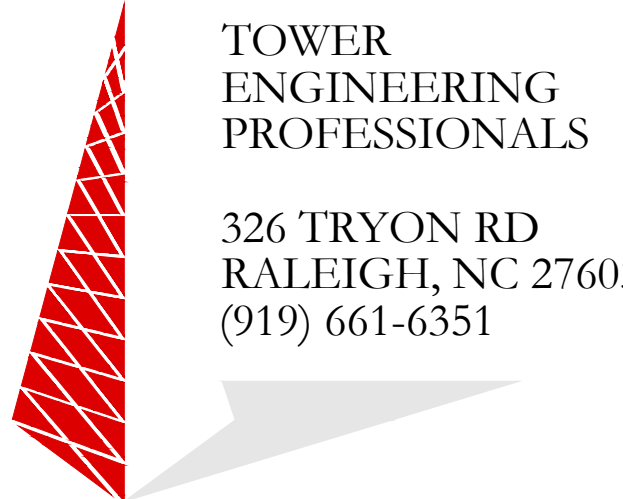
1 ELECTRICAL NOTES
SCALE: NOT TO SCALE



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BU #: **806042**
BOS ASHLAND 959026

34 ALBERT RAY DRIVE
ASHLAND, MA 01721
(MIDDLESEX COUNTY)

EXISTING 99' MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
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05/20/22

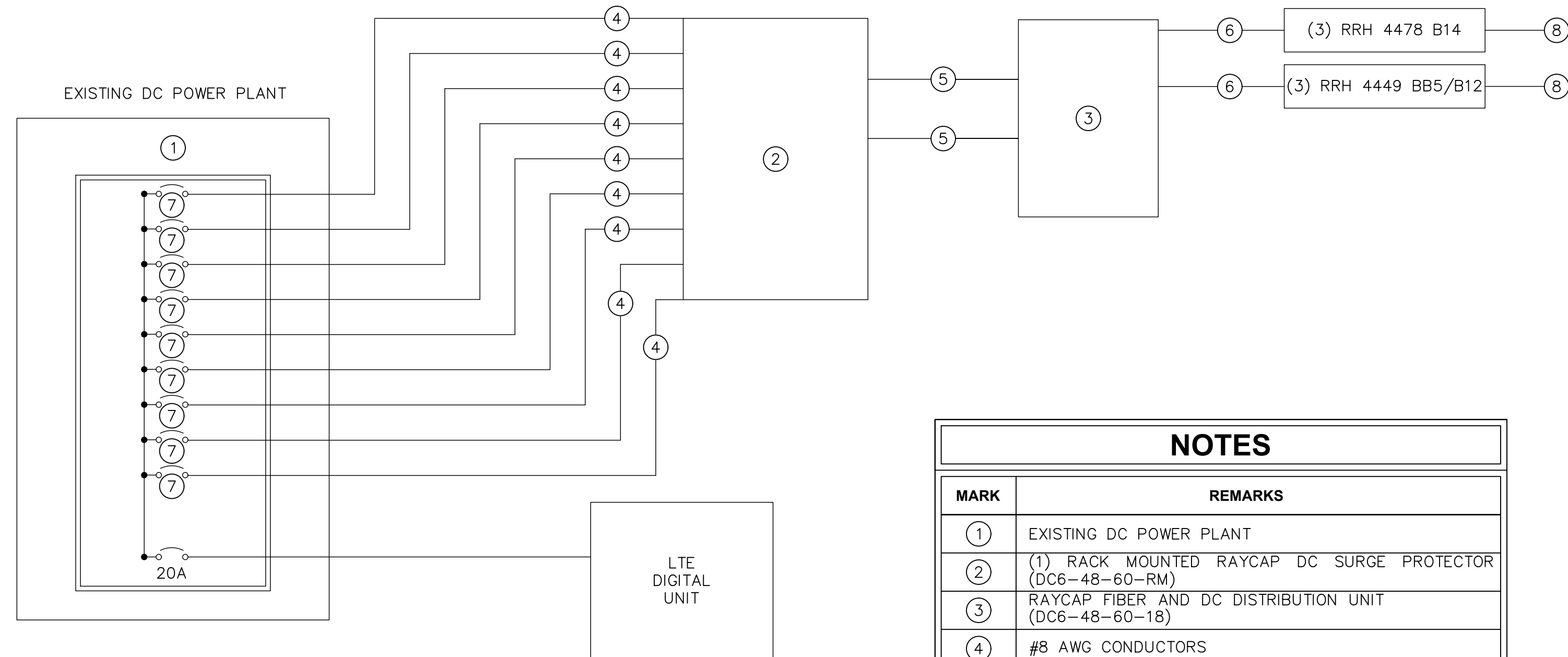
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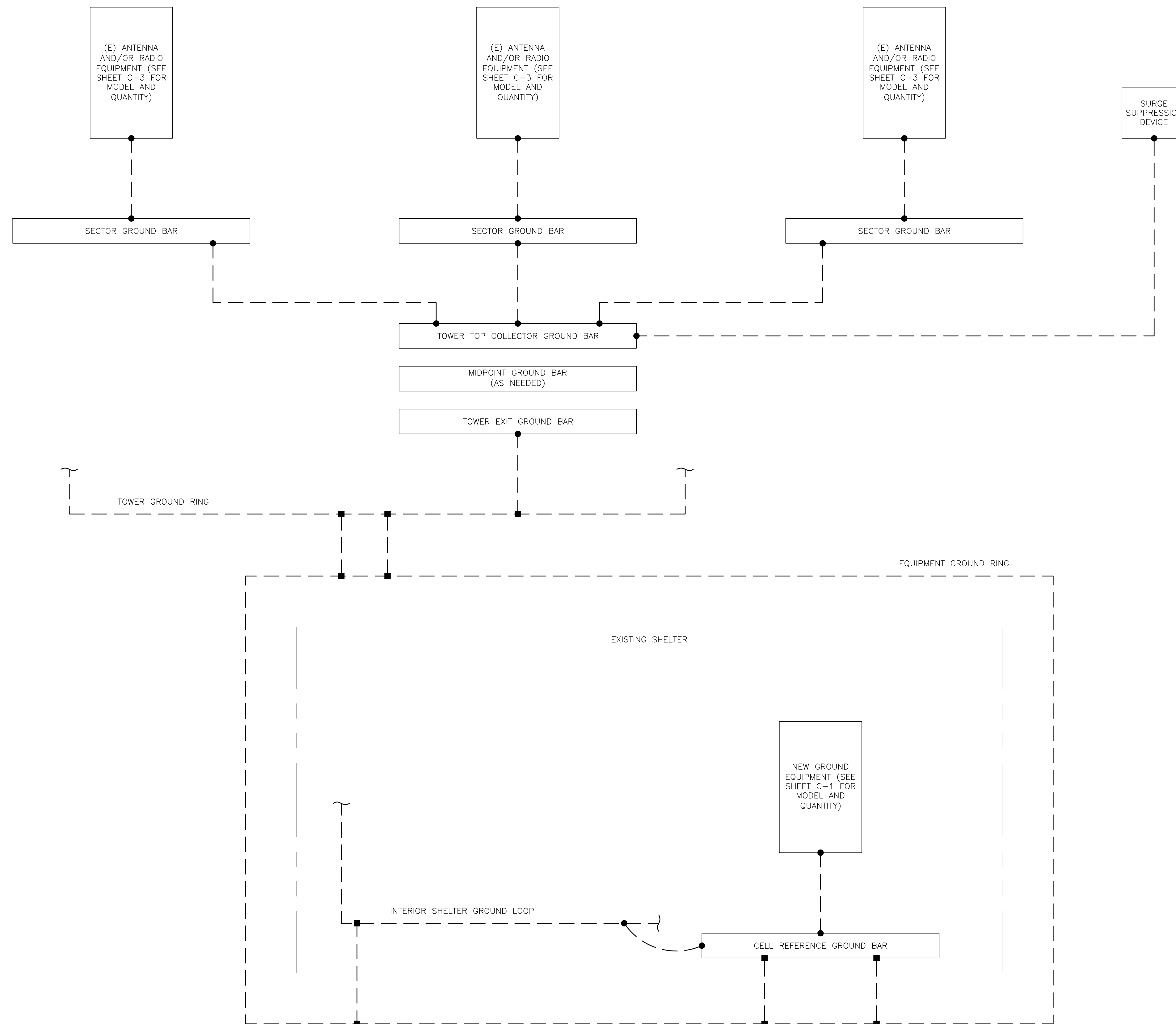
NOTES

MARK	REMARKS
①	EXISTING DC POWER PLANT
②	(1) RACK MOUNTED RAYCAP DC SURGE PROTECTOR (DC6-48-60-RM)
③	RAYCAP FIBER AND DC DISTRIBUTION UNIT (DC6-48-60-1B)
④	#8 AWG CONDUCTORS
⑤	PROVIDE (2) 6-CONDUCTOR #8 AWG BUNDLES FOR DC POWER FROM RACK MOUNTED RAYCAP SURGE PROTECTION UNIT TO THE RAYCAP FIBER AND DISTRIBUTION UNIT ON TOWER
⑥	EXISTING FIBER AND DC CABLE ROUTED TO EXISTING RRH UNITS
⑦	REFER TO BREAKER SCHEDULE FOR BREAKER SIZES
⑧	REFER TO LATEST RFDS FOR RRH TECHNOLOGIES AND QUANTITIES

RRUS BREAKER SCHEDULE

RRU MODEL	BREAKER SIZE	TECHNOLOGY
RRUS 32 B66	30A	AWS (2100)
RRUS 32 B30	20A	WCS (2300)
RRUS 32 B2	30A	PCS (1900)
RRUS 11	25A	VARIOUS BANDS (700 [B12], 850 [B5], 1900 [B2], 2100 [B4])
RRUS 12	25A	VARIOUS BANDS (850 [B5], 1900 [B2], 2100 [B4])
RRUS 4415 B25	25A	1900
RRUS 4426 B66	30A	2100
RRUS 4478 B14	25A	700
RRUS 4478 B5	25A	850
RRUS E2 B29	25A	700
RRUS 4449 B5/B12	(2) 25A	700/850
RRUS 8843 B2/B66	(2) 30A	1900/2100
RRUS 2203 B5	10A	850
RRUS 2205 B46	10A	5 GHz

① EQUIPMENT ONE-LINE DIAGRAM
SCALE: NOT TO SCALE



GROUNDING PLAN LEGEND:

---	GROUND WIRE	⊙	COPPER GROUND ROD
■	EXOTHERMIC WELD	⊗	GROUND ROD W/ TEST WELL
●	MECHANICAL CONNECTION		

CELL REFERENCE GROUND BAR: POINT OF GROUND REFERENCE FOR ALL COMMUNICATIONS EQUIPMENT FRAMES. ALL BONDS ARE MADE WITH #2 STRANDED GREEN INSULATED COPPER CONDUCTORS. BOND TO GROUND RING WITH (2) #2 SOLID TINNED COPPER CONDUITS (ATT-TP-76416 7.6.7).

HATCH PLATE GROUND BAR: BOND TO THE INTERIOR GROUND RING WITH (2) #2 STRANDED GREEN INSULATED COPPER CONDUCTORS. WHEN A HATCH-PLATE AND A CELL REFERENCE GROUND BAR ARE BOTH PRESENT, THE CELL SITE REFERENCE GROUND BAR MUST BE CONNECTED TO THE HATCH-PLATE AND TO THE INTERIOR GROUND RING USING (2) #2 STRANDED GREEN INSULATED COPPER CONDUCTORS.

EXTERIOR CABLE ENTRY PORT GROUND BARS: LOCATED AT THE ENTRANCE TO THE CELL SITE BUILDING. BOND TO GROUND RING WITH A #2 SOLID TINNED COPPER CONDUCTORS WITH AN EXOTHERMIC WELD AND INSPECTION SLEEVE (ATT-TP-76416 7.6.7.2).

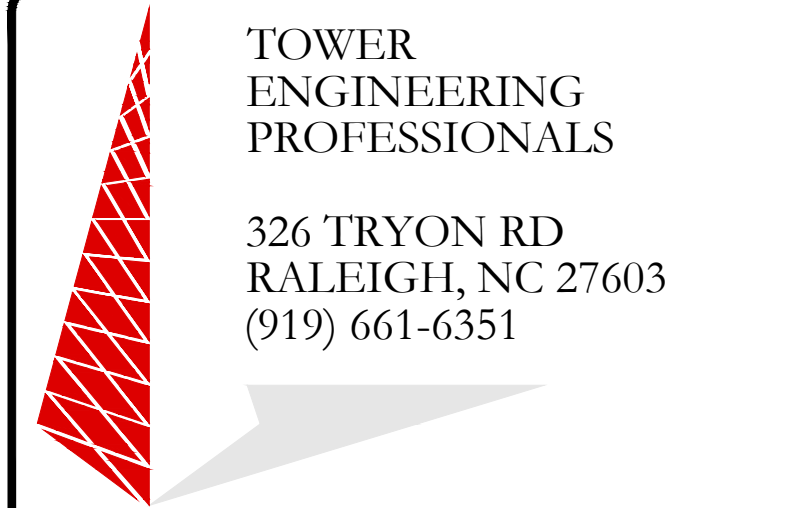
DURING ALL DC POWER SYSTEM CHANGES INCLUDING DC SYSTEM CHANGE OUTS, RECTIFIER REPLACEMENTS OR ADDITIONS, BREAKER DISTRIBUTION CHANGES, BATTERY ADDITIONS, BATTERY REPLACEMENTS AND INSTALLATIONS OR CHANGES TO DC CONVERTER SYSTEMS IT SHALL BE REQUIRED THAT SERVICES CONTRACTORS VERIFY ALL DC POWER SYSTEMS ARE EQUIPPED WITH MASTER DC SYSTEM RETURN GROUND CONDUCTOR FROM THE DC POWER SYSTEM COMMON RETURN BUS DIRECTLY CONNECTED TO THE CELL SITE REFERENCE GROUND BAR PER TP76300 SECTION H.6 AND TP76416 FIGURE 7-11 REQUIREMENTS.



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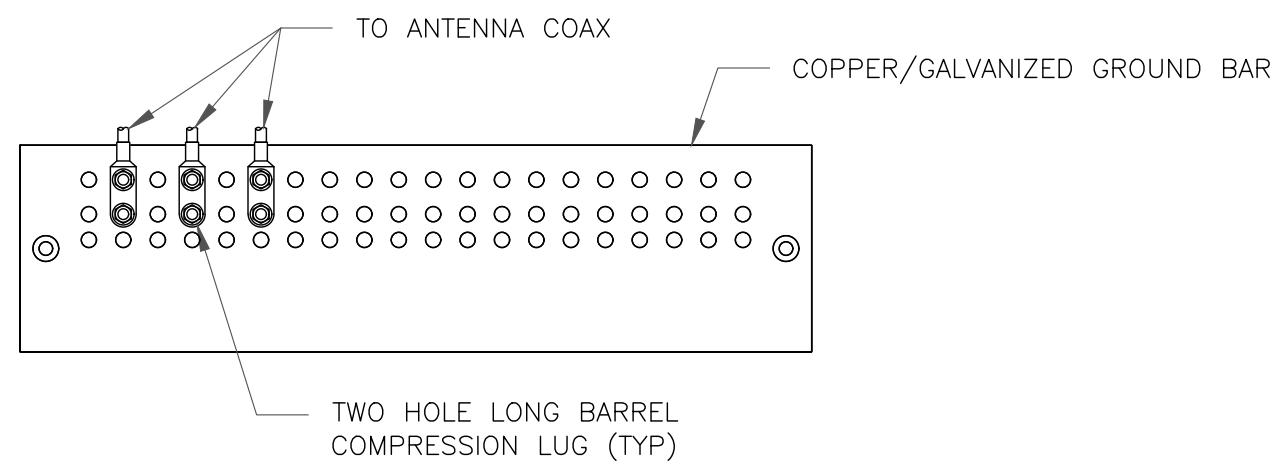
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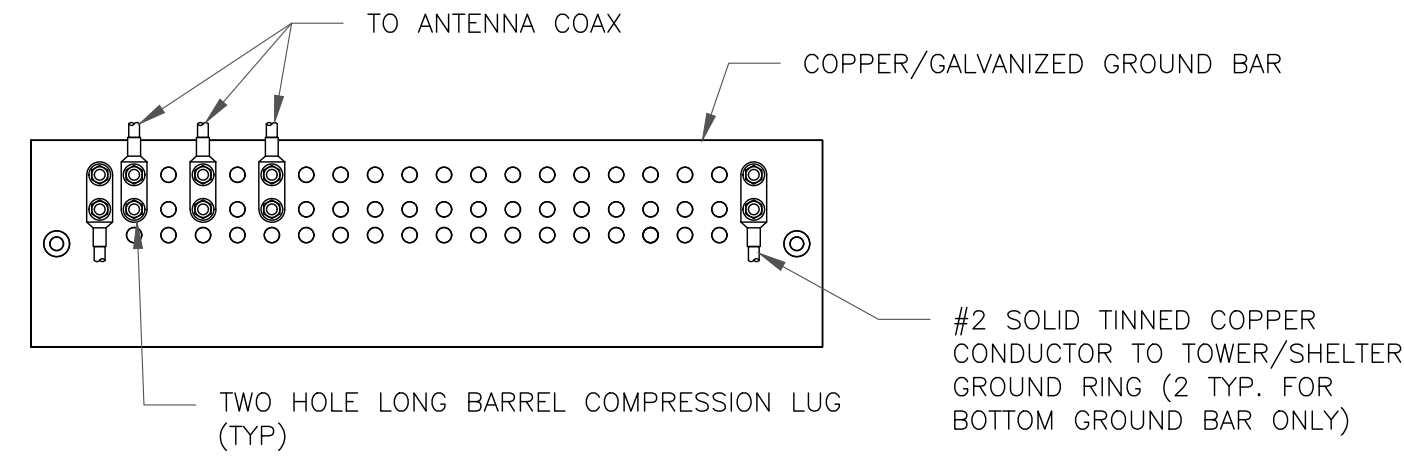
1 TYPICAL GROUNDING SCHEMATIC
SCALE: NOT TO SCALE



NOTES:

- DOUBLING UP "OR STACKING" OF CONNECTIONS IS NOT PERMITTED.
- EXTERIOR ANTIOXIDANT JOINT COMPOUND TO BE USED ON ALL EXTERIOR CONNECTIONS.
- GROUND BAR SHALL NOT BE ISOLATED FROM TOWER. MOUNT DIRECTLY TO ANTENNA MOUNT STEEL.

1 ANTENNA SECTOR GROUND BAR DETAIL
SCALE: NOT TO SCALE

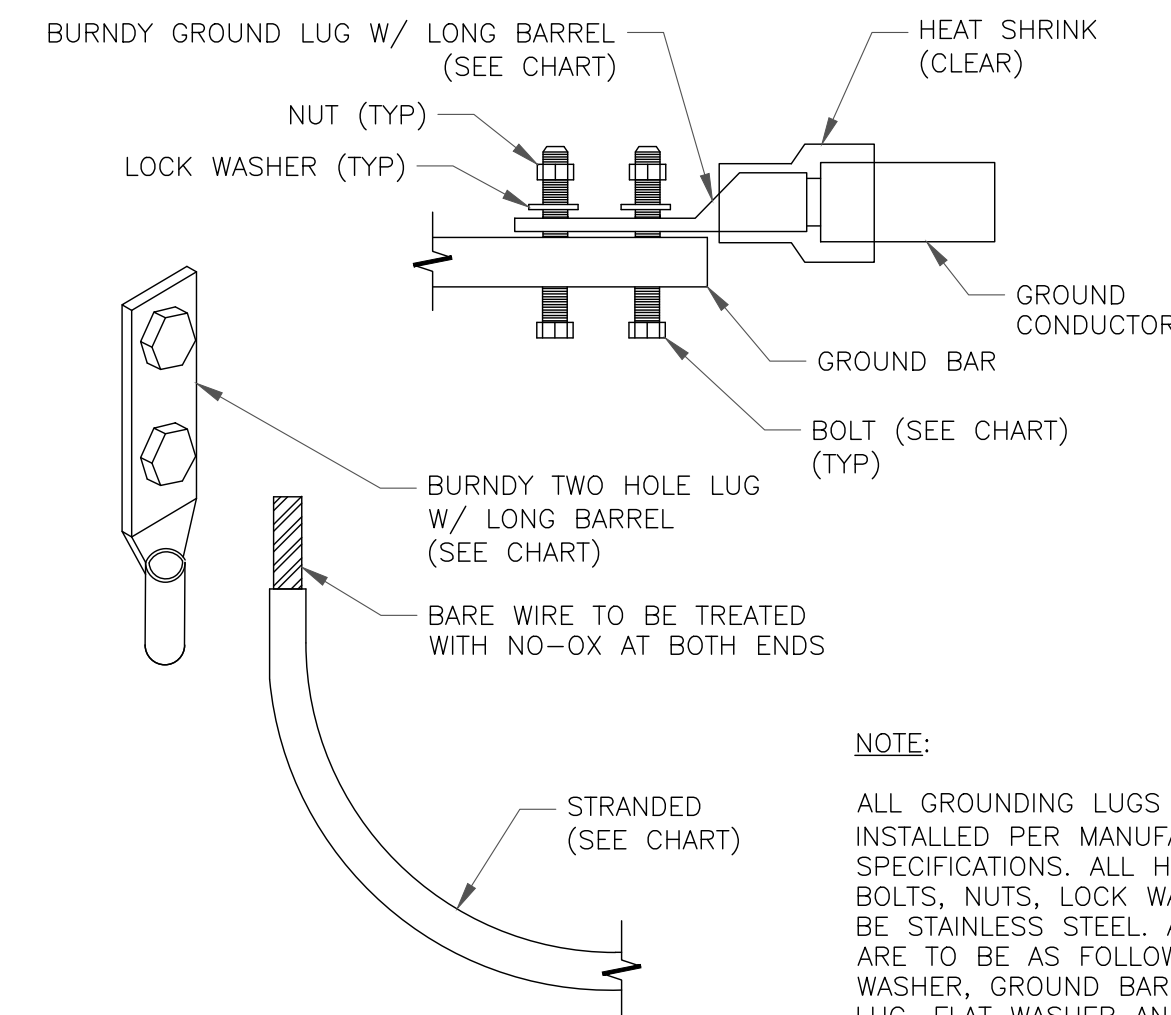


NOTES:

- EXTERIOR ANTIOXIDANT JOINT COMPOUND TO BE USED ON ALL EXTERIOR CONNECTIONS.
- GROUND BAR SHALL NOT BE ISOLATED FROM TOWER. MOUNT DIRECTLY TO TOWER STEEL (TOWER ONLY).
- GROUND BAR SHALL BE ISOLATED FROM BUILDING OR SHELTER.

2 TOWER/SHELTER GROUND BAR DETAIL
SCALE: NOT TO SCALE

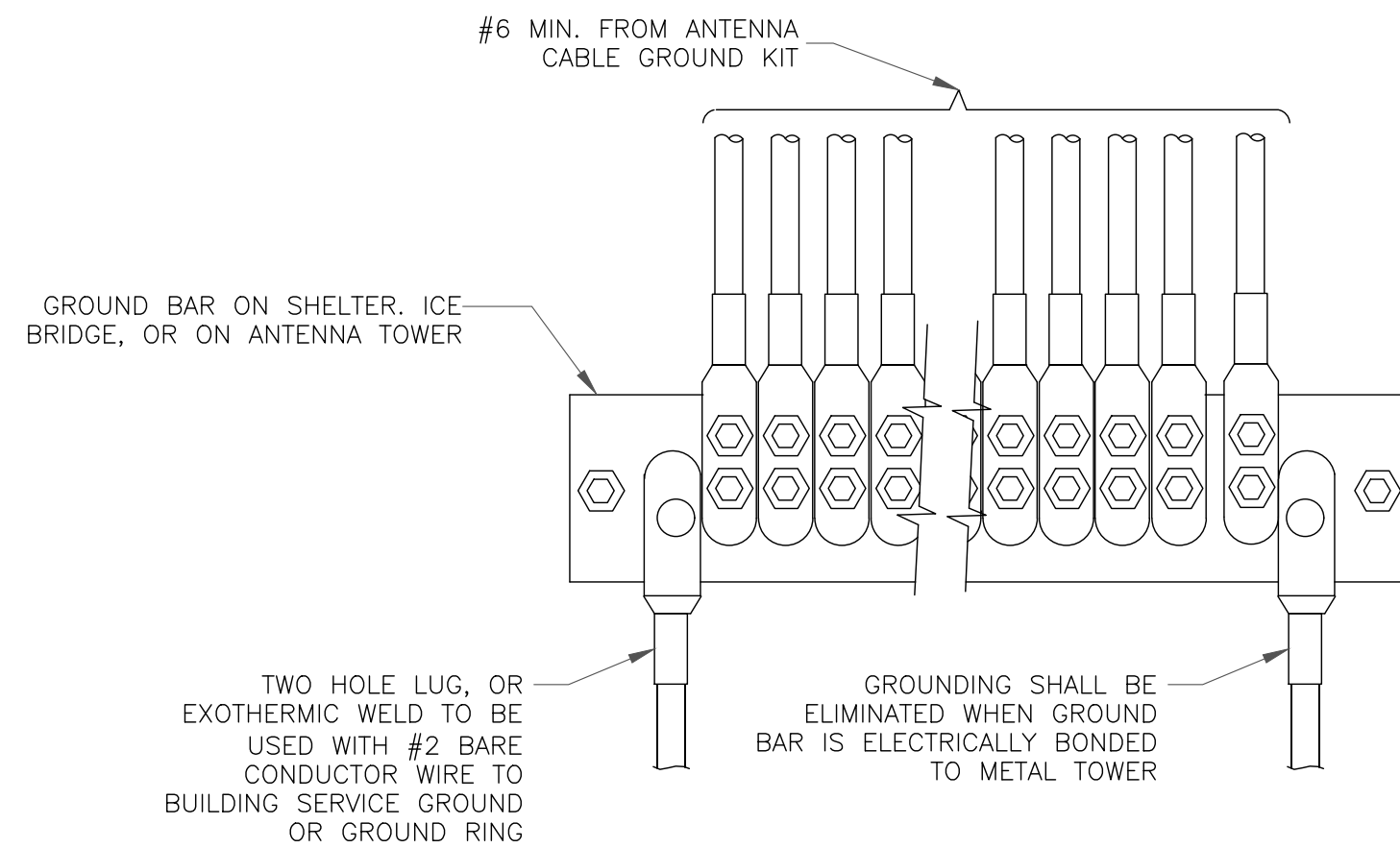
WIRE SIZE	BURNDY LUG	BOLT SIZE
#6 GREEN INSULATED	YA6C-2TC38	3/8" - 16 NC SS 2 BOLT
#2 SOLID TINNED	YA3C-2TC38	3/8" - 16 NC SS 2 BOLT
#2 STRANDED	YA2C-2TC38	3/8" - 16 NC SS 2 BOLT
#2/0 STRANDED	YA26-2TC38	3/8" - 16 NC SS 2 BOLT
#4/0 STRANDED	YA28-2N	1/2" - 16 NC SS 2 BOLT



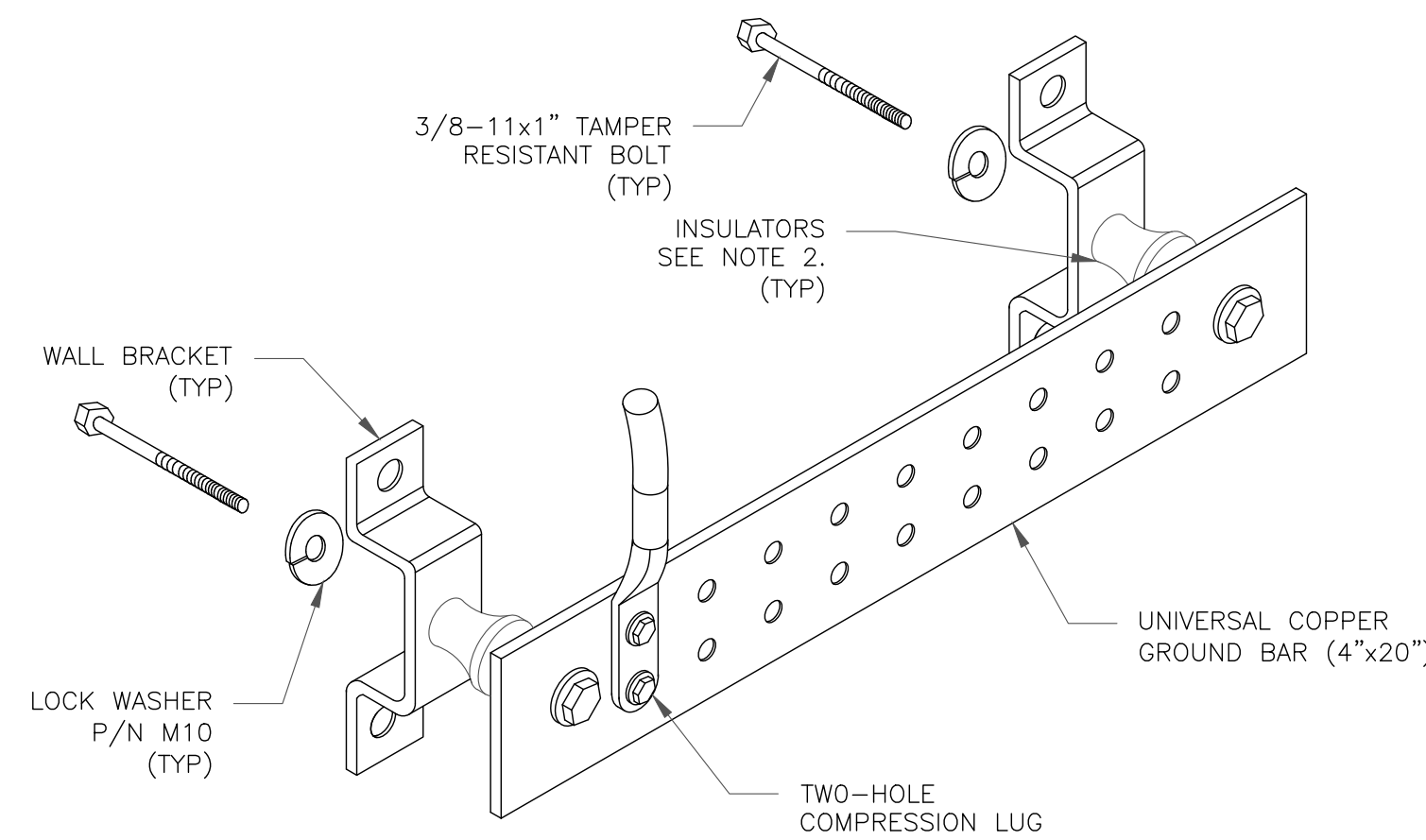
NOTE:

ALL GROUNDING LUGS ARE TO BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS. ALL HARDWARE BOLTS, NUTS, LOCK WASHERS SHALL BE STAINLESS STEEL. ALL HARDWARE ARE TO BE AS FOLLOWS: BOLT, FLAT WASHER, GROUND BAR, GROUND LUG, FLAT WASHER AND NUT.

3 MECHANICAL LUG CONNECTION
SCALE: NOT TO SCALE



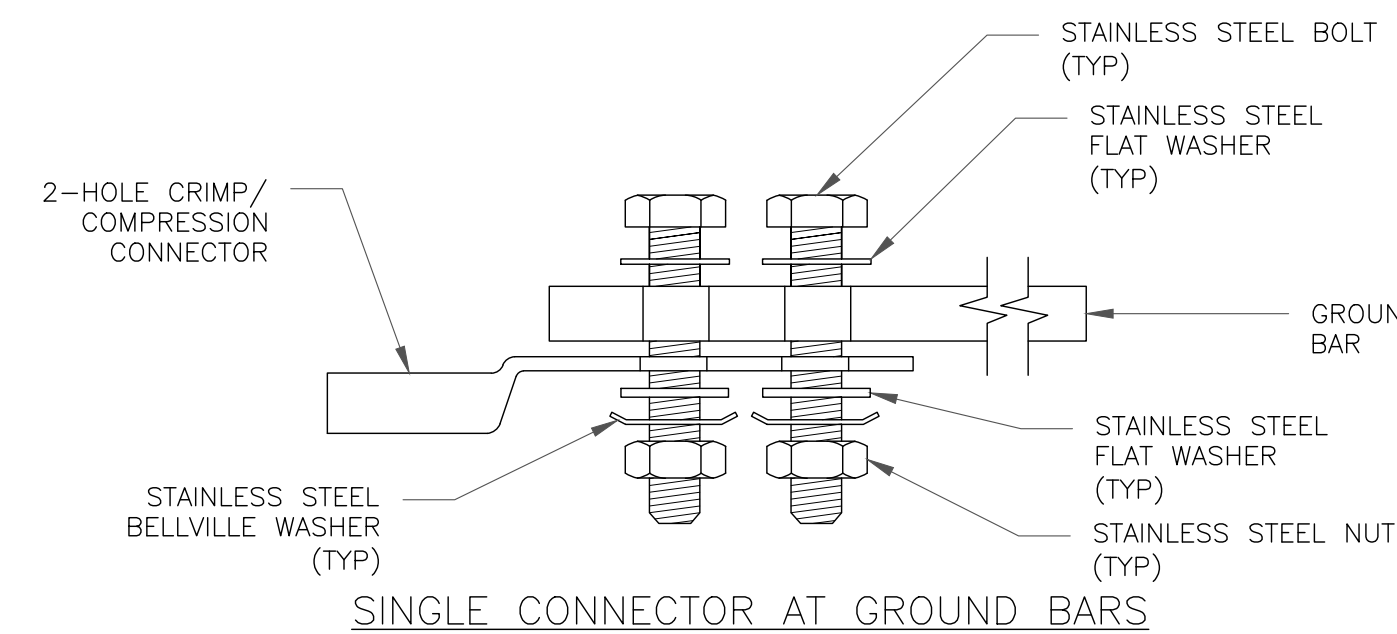
4 GROUNDWIRE INSTALLATION
SCALE: NOT TO SCALE



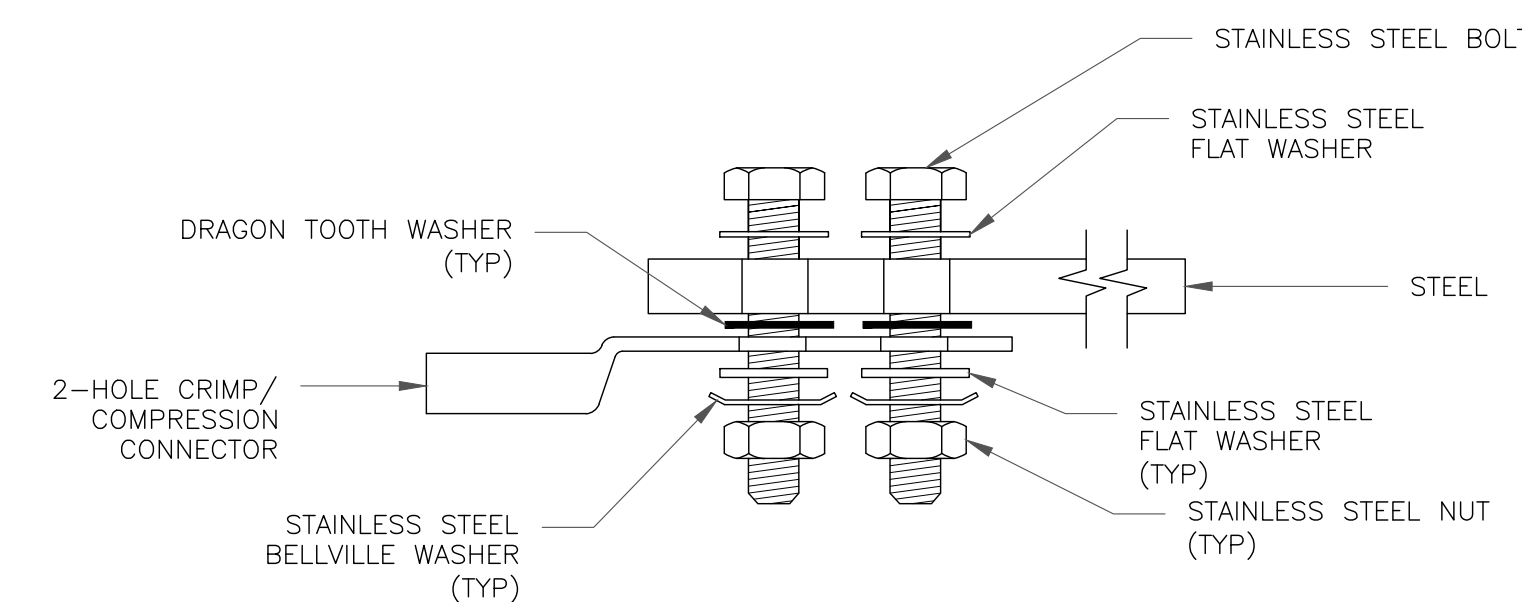
NOTES:

- DOWN LEAD (HOME RUN) CONDUCTORS ARE NOT TO BE INSTALLED ON CROWN CASTLE USA INC. TOWER, PER THE GROUNDING DOWN CONDUCTOR POLICY QAS-STD-10091. NO MODIFICATION OR DRILLING TO TOWER STEEL IS ALLOWED IN ANY FORM OR FASHION, CAD-WELDING ON THE TOWER AND/OR IN THE AIR ARE NOT PERMITTED.
- OMIT INSULATOR WHEN MOUNTING TO TOWER STEEL OR PLATFORM STEEL. USE INSULATORS WHEN ATTACHING TO BUILDING OR SHELTERS.

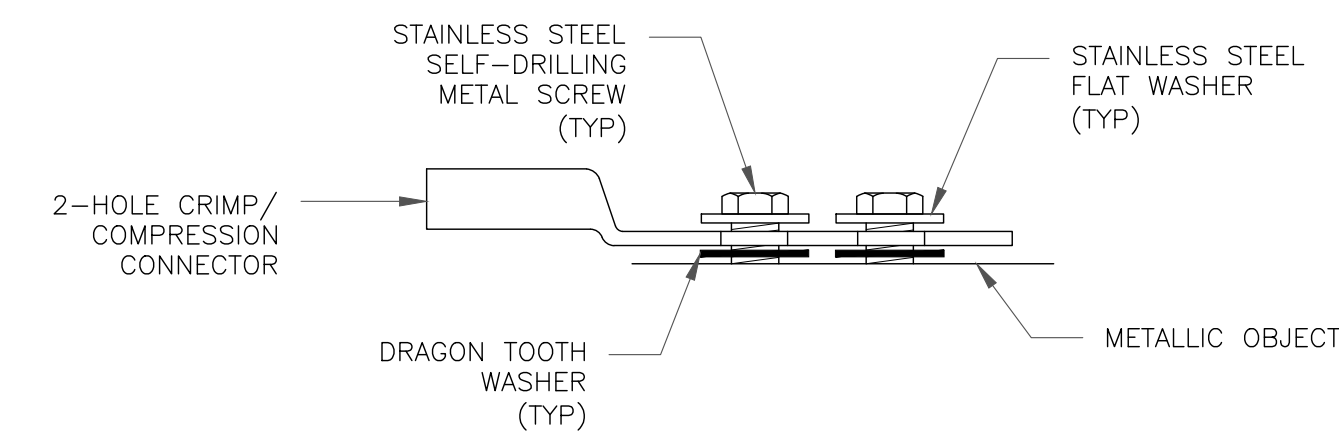
5 GROUND BAR DETAIL
SCALE: NOT TO SCALE



SINGLE CONNECTOR AT GROUND BARS

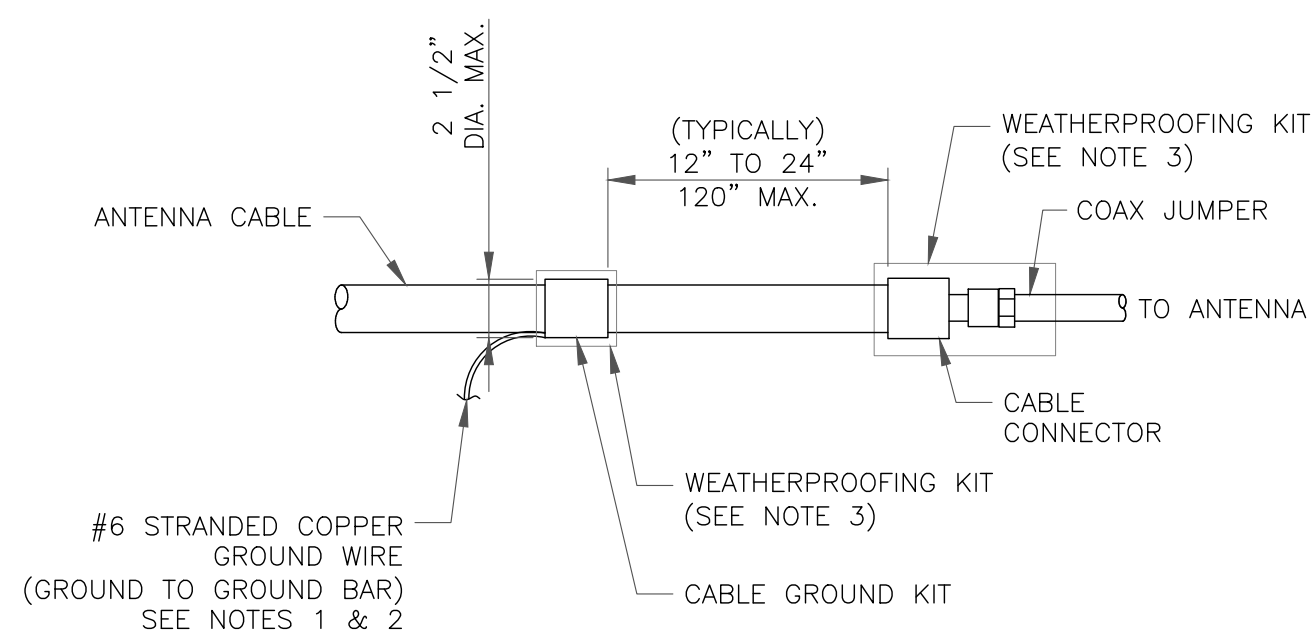


SINGLE CONNECTOR AT STEEL OBJECTS



SINGLE CONNECTOR AT METALLIC/STEEL OBJECTS

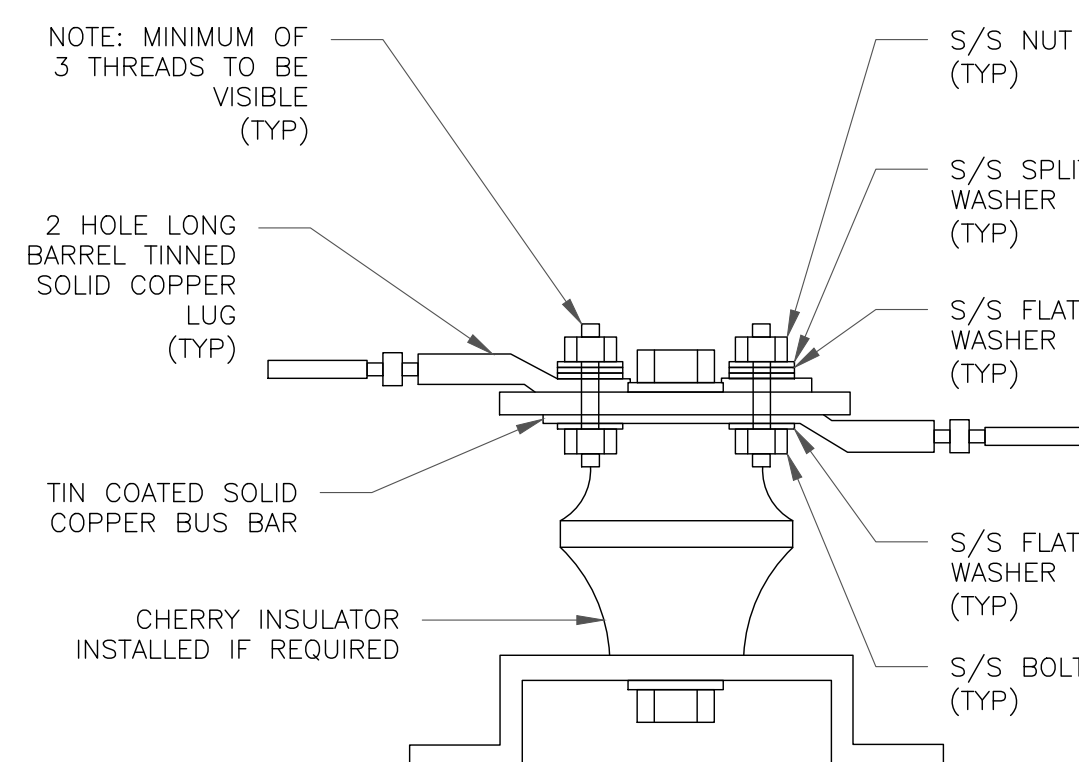
8 HARDWARE DETAIL FOR EXTERIOR CONNECTIONS
SCALE: NOT TO SCALE



NOTES:

- DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
- GROUNDING KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
- WEATHER PROOFING SHALL BE TWO-PART TAPE KIT, COLD SHRINK SHALL NOT BE USED.

6 CABLE GROUND KIT CONNECTION
SCALE: NOT TO SCALE



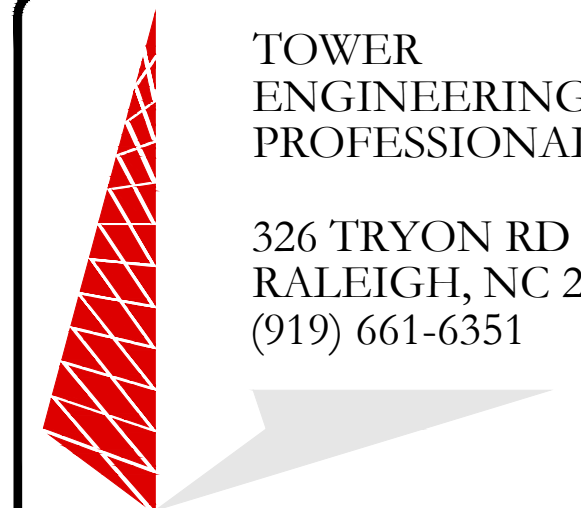
7 LUG DETAIL
SCALE: NOT TO SCALE



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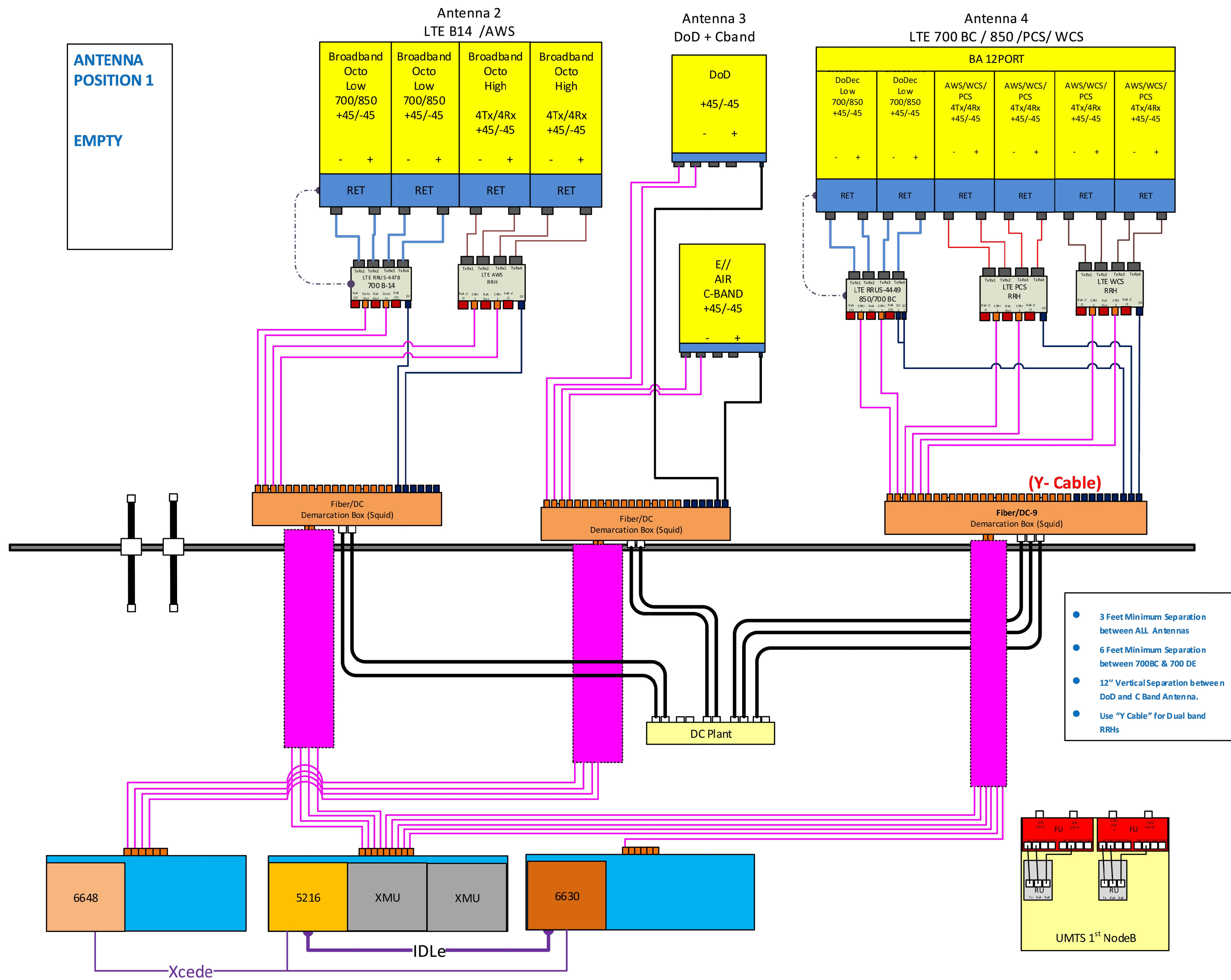
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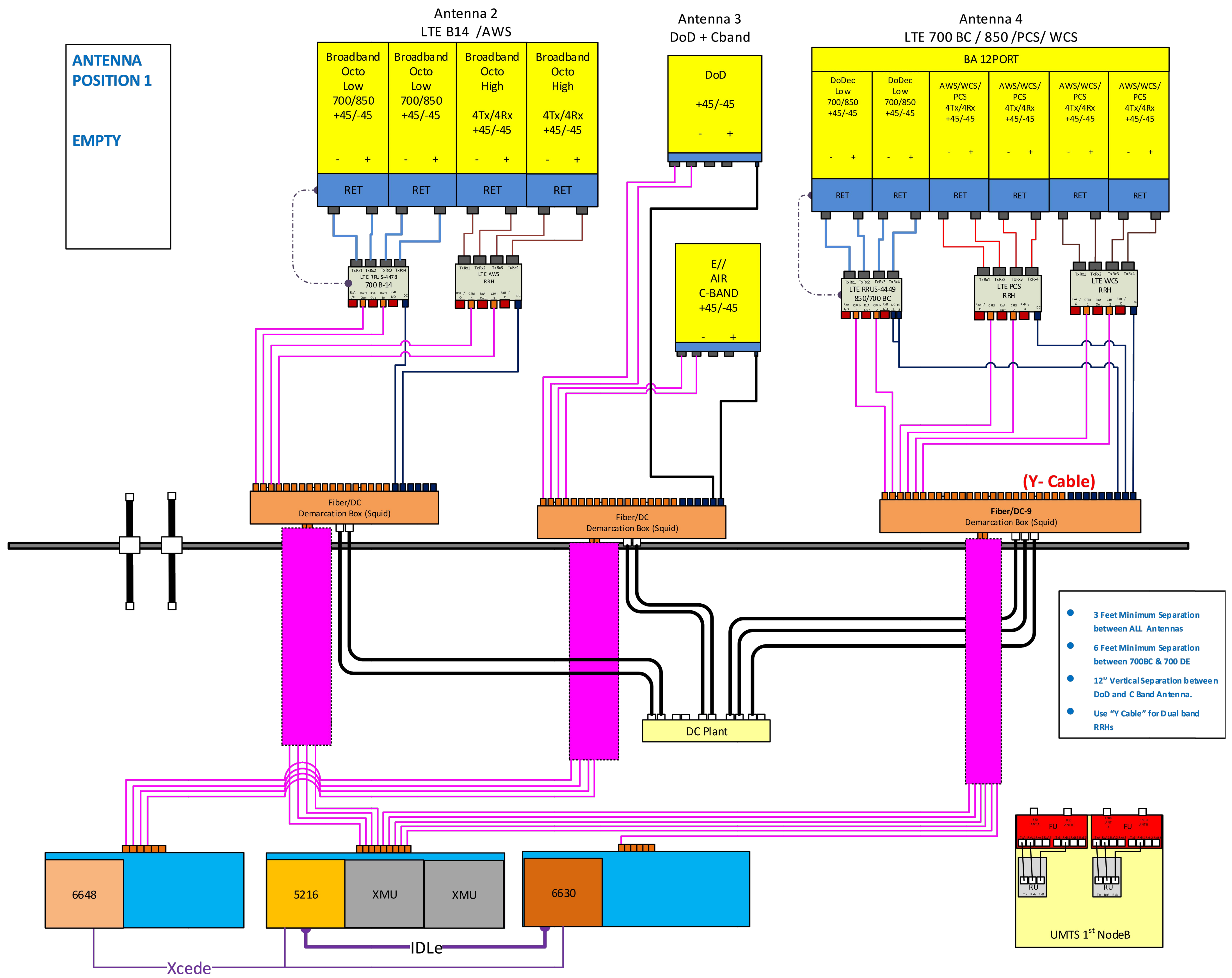
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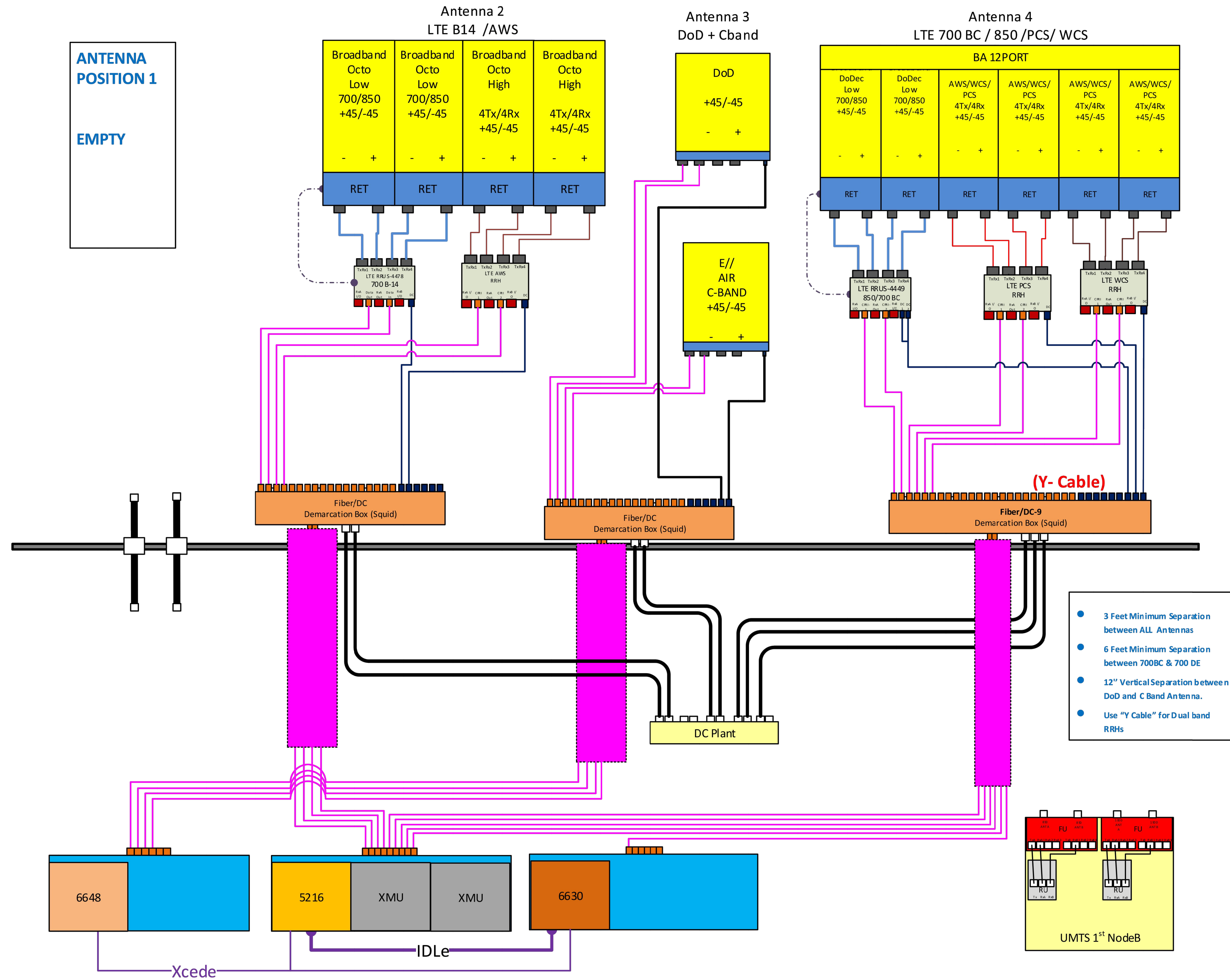
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PLUMBING DIAGRAM



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