

<div>PROJECT DESCRIPTION</div> <div>REPLACE (3) RRH UNITS PER SECTOR, INSTALL (N) 4C & 5C RADIO CARDS IN (E) LTE CABINET</div>				<div><div><div><div><div></div><div>at&t</div><div>Mobility</div></div></div><div><div>SITE NAME: MARKSHEFFEL AND BARNES</div><div>SITE NUMBER: COL02091</div><div>CONSTRUCTION DRAWINGS</div></div></div></div>				<div><div><div><div><div><div><div></div><div>at&t</div><div>Mobility</div></div></div><div>AT&T MOBILITY</div><div>188 INVERNESS DR WEST, SUITE 400</div><div>ENGLEWOOD, CO 80112</div></div></div><div><div><div><div><div></div><div>smartlink</div></div></div><div>8502 E VIA DE VENTURA, SUITE 220</div><div>SCOTTSDALE, AZ 85258</div></div></div><div><div><div><div><div></div><div>WYCO</div><div>FIELD SERVICES</div><div>here quality still counts.</div></div></div><div>4240 E. ELWOOD ST.</div><div>PHOENIX, AZ 85040</div></div></div><div><div><div>ADDRESS</div><div>5210 TAMLIN ROAD</div><div>COLORADO SPRINGS, CO 80915</div></div><div><div>SITE NUMBER</div><div>COL02091</div></div><div><div>SITE NAME</div><div>MARKSHEFFEL AND BARNES</div></div></div></div></div>																							
<div>SCOPE OF WORK</div> <div><div><div><input type="checkbox"/> 1C</div><div><input type="checkbox"/> 3C</div><div><input checked="" type="checkbox"/> 5C</div><div><input type="checkbox"/> RRH SWAP</div><div><input checked="" type="checkbox"/> 4TXRX</div></div><div><div><input type="checkbox"/> 2C</div><div><input checked="" type="checkbox"/> 4C</div><div><input type="checkbox"/> 2ND RRH ADD</div></div></div>				<div>VICINITY MAP</div> <div><div>DIRECTIONS: (188 INVERNESS DR WEST, SUITE 400 ENGLEWOOD, CO 80112):</div><div>GET ON I-25 S IN LONE TREE FOR 1.8 MI, HEAD SOUTH TOWARD INVERNESS DR W FOR 492 FT., TURN LEFT ONTO INVERNESS DR W FOR 0.3 MI, TURN RIGHT ONTO E COUNTY LINE RD FOR 0.3 MI, MERGE ONTO I-25 S VIA THE RAMP TO COLO SPRINGS FOR 1.0 MI, CONTINUE ON I-25 S TO COLORADO SPRINGS FOR 51.1 MI, MERGE ONTO I-25 S FOR 41.1 MI, TAKE EXIT 153 FOR INTERQUEST PKWY FOR 0.7 MI, CONTINUE ONTO INTERQUEST PKWY FOR 1.9 MI, TURN RIGHT ONTO CO-21 S FOR 7.4 MI, CONTINUE ON STETSON HILLS BLVD. DRIVE TO TAMLIN RD FOR 2.9 MI, TURN LEFT ONTO STETSON HILLS BLVD FOR 2.1 MI, TURN RIGHT ONTO MARKSHEFFEL RD FOR 0.5 MI, TURN LEFT ONTO TAMLIN RD, DESTINATION WILL BE ON THE LEFT</div></div>		<div>APPLICABLE BLDG. CODES AND STANDARDS</div> <div><div>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.</div><div>BUILDING CODE: [INTERNATIONAL BUILDING CODE (IBC), 2009 AS ADOPTED BY THE LOCAL JURISDICTION]</div><div>ELECTRICAL CODE: [NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) 70 - 2007, NATIONAL ELECTRICAL CODE, 2014 AS ADOPTED BY THE LOCAL JURISDICTION]</div><div>LIGHTNING PROTECTION CODE: [NFPA 780 - 2002, LIGHTNING PROTECTION CODE]</div><div>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, ASD, THIRTEENTH EDITION ANSI/TIA 222-G, STRUCTURAL STANDARDS FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS.</div><div>TIA 607, COMMERCIAL BUILDING GROUNDING AND BONDING REQUIREMENTS FOR TELECOMMUNICATIONS</div><div>INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE) 81, GUIDE FOR MEASURING EARTH RESISTIVITY, GROUND IMPEDANCE, AND EARTH SURFACE POTENTIALS OF A GROUND SYSTEM IEEE 1100 (1999) RECOMMENDED PRACTICE FOR POWERING AND GROUNDING OF ELECTRONIC EQUIPMENT</div><div>IEEE C2 NATIONAL ELECTRIC SAFETY CODE, LATEST VERSION</div><div>TELCORDIA GR-1275, GENERAL INSTALLATION REQUIREMENTS</div><div>ANSI T1.311, FOR TELECOM - DC POWER SYSTEMS - TELECOM, ENVIRONMENTAL PROTECTION</div><div>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.</div></div>																									
<div>RF DATA SHEET</div> <div>DATE ISSUED: 12/18/2017 VERSION: 2.01</div>				<div><div><div><div><div></div><div>PROJECT SITE</div></div></div><div><div></div><div>NORTH</div></div></div></div>		<div><div><div><div><div></div><div>SEAL</div></div></div></div></div>																									
<div>DRAWING INDEX</div> <div><div><div>10099190-COL02091-T-1</div><div>10099190-COL02091-GN-1</div><div>10099190-COL02091-A-1</div><div>10099190-COL02091-A-2</div><div>10099190-COL02091-A-3</div><div>10099190-COL02091-A-4</div><div>10099190-COL02091-RF-1</div><div>10099190-COL02091-RF-2</div><div>10099190-COL02091-G-1</div><div>10099190-COL02091-G-2</div></div><div><div>TITLE SHEET</div><div>GENERAL NOTES</div><div>OVERALL SITE PLAN</div><div>EXISTING ENLARGED EQUIPMENT LAYOUT</div><div>NEW ENLARGED EQUIPMENT LAYOUT</div><div>EXISTING & NEW ELEVATIONS</div><div>EXISTING & NEW ANTENNA CONFIGURATION</div><div>RF & EQUIPMENT DETAILS</div><div>SCHEMATIC GROUNDING PLAN</div><div>GROUNDING DETAILS</div></div><div><div>B</div><div>B</div><div>B</div><div>B</div><div>B</div><div>B</div><div>B</div><div>B</div><div>B</div><div>B</div></div></div>																															
<div>SITE PROJECT PARTICIPANTS</div> <table><tr><th></th><th>NAME</th><th>COMPANY</th><th>NUMBER</th></tr><tr><td>A/E</td><td>JON BOUTILIER</td><td>WYCO FIELD SERVICES</td><td>602-218-8820</td></tr><tr><td>SAC</td><td>BEN CRUTCHLEY</td><td>SMARTLINK, LLC</td><td>410-980-1269</td></tr><tr><td>RF</td><td>ERICSON FELICIANO</td><td>AT&T WIRELESS</td><td>T.B.D.</td></tr><tr><td>LANDLORD</td><td>T.B.D.</td><td>TROJAN STORAGE OF STETSON HILLS</td><td>719-419-8686</td></tr><tr><td>SAC MNGR</td><td>BEN CRUTCHLEY</td><td>SMARTLINK, LLC</td><td>410-980-1269</td></tr></table>					NAME	COMPANY	NUMBER	A/E	JON BOUTILIER	WYCO FIELD SERVICES	602-218-8820	SAC	BEN CRUTCHLEY	SMARTLINK, LLC	410-980-1269	RF	ERICSON FELICIANO	AT&T WIRELESS	T.B.D.	LANDLORD	T.B.D.	TROJAN STORAGE OF STETSON HILLS	719-419-8686	SAC MNGR	BEN CRUTCHLEY	SMARTLINK, LLC	410-980-1269	<div>DIG INFO</div> <div><div><div><div><div></div><div>CALL COLORADO ONE CALL</div><div>(800) 922-1987</div><div>CALL 3 WORKING DAYS</div><div>BEFORE YOU DIG!</div></div></div><div><div>811</div></div></div></div>		<div>SCALING DRAWINGS</div> <div><div>SUBCONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS & CONDITIONS ON THE JOB SITE & SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR THE SAME.</div><div>IF USING 11"x17" PLOT, DRAWINGS WILL BE AT HALF SCALE.</div></div>	
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GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
CONTRACTOR – SMARTLINK, LLC
SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
OWNER – AT&T MOBILITY
OEM – ORIGINAL EQUIPMENT MANUFACTURE
2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE THEMSELVES 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. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
5. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER’S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
6. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY THE CONTRACTOR.
7. 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.
8. 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.
9. 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.
10. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
11. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.
12. 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.
13. ALL STRUCTURAL STEEL WORK SHALL BE DONE IN ACCORDANCE WITH AISC SPECIFICATIONS.
14. CONSTRUCTION SHALL COMPLY WITH SPECIFICATION 25741–000–3APS–A00Z–00002, "GENERAL CONSTRUCTION SERVICES.
15. 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.
16. 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.
17. 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.

ELECTRICAL INSTALLATION NOTES:

1. WIRING, RACEWAY, AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC AND TELCORDIA.
2. SUBCONTRACTOR SHALL MODIFY EXISTING CABLE TRAY SYSTEM AS REQUIRED TO SUPPORT RF AND TRANSPORT CABLEING TO THE NEW BTS EQUIPMENT. SUBCONTRACTOR SHALL SUBMIT MODIFICATIONS TO CONTRACTOR FOR APPROVAL.
3. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC AND TELCORDIA.

ELECTRICAL INSTALLATION NOTES CONT.:

4. CABLES SHALL NOT BE ROUTED THROUGH LADDER–STYLE CABLE TRAY RUNGS.
5. EACH END OF EVERY POWER, GROUNDING, AND T1 CONDUCTOR AND CABLE SHALL BE LABELED WITH COLOR–CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2 INCH PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC & OSHA, AND MATCH EXISTING INSTALLATION REQUIREMENTS.
6. POWER PHASE CONDUCTORS (I.E., HOTS) SHALL BE LABELED WITH COLOR–CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, ½ INCH PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). PHASE CONDUCTOR COLOR CODES SHALL CONFORM WITH THE NEC & OSHA AND MATCH EXISTING INSTALLATION REQUIREMENTS.
7. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH ENGRAVED LAMACOID PLASTIC LABELS. ALL EQUIPMENT SHALL BE LABELED WITH THEIR VOLTAGE RATING, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING, AND BRANCH CIRCUIT ID NUMBERS (I.E., PLANELOAD AND CIRCUIT ID’S).
8. PANELBOARDS (ID NUMBERS) AND INTERNAL CIRCUIT BREAKERS (CIRCUIT ID NUMBERS) SHALL BE CLEARLY LABELED WITH ENGRAVED LAMACOID PLASTIC LABELS.
9. ALL TIE WRAPS WHERE PERMITTED SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES. USE LOW PROFILES TIE WRAPS.
10. POWER, CONTROL, AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE CONDUCTOR (12 AWG OR LARGER), 600 V, OIL RESISTANT THHN OR THWN–2, CLASS B STRANDED COPPER CABLE RATED FOR 90 °C (WET AND DRY) OPERATION; LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED, UNLESS OTHERWISE SPECIFIED.
11. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE CONDUCTOR (6 AWG OR LARGER), 600 V, OIL RESISTANT THHN OR THWN–2 GREEN INSULATION, CLASS B STRANDED COPPER CABLE RATED FOR 90 °C (WET AND DRY) OPERATION; LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED, UNLESS OTHERWISE SPECIFIED.
12. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED OUTDOORS, OR BELOW GRADE, SHALL BE SINGLE CONDUCTOR 2 AWG SOLID TINNED COPPER CABLE, UNLESS OTHERWISE SPECIFIED.
13. POWER WIRING, NOT IN TUBING OR CONDUIT, SHALL BE MULTI–CONDUCTOR, TYPE TC CABLE (12 AWG OR LARGER), 600 V, OIL RESISTANT THHN OR THWN–2, CLASS B STRANDED COPPER CABLE RATED FOR 90 °C (WET AND DRY) OPERATION; WITH OUTER JACKET; LISTED OR LABELED FOR THE LOCATION USED, UNLESS OTHERWISE SPECIFIED.
14. ALL POWER AND GROUNDING CONNECTIONS SHALL BE CRIMP–STYLE, COMPRESSION WIRE LUGS AND WIRENUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRENUTS SHALL BE RATED FOR OPERATION AT NO LESS THAN 75°C (90°C IF AVAILABLE).
15. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE, AND NEC.
16. NEW RACEWAY OR CABLE TRAY WILL MATCH THE EXISTING INSTALLATION WHERE POSSIBLE.
17. ELECTRICAL METALLIC TUBING (EMT) OR RIGID NONMETALLIC CONDUIT (I.E., RIGID PVC SCHEDULE 40, OR RIGID PVC SCHEDULE 80 FOR LOCATIONS SUBJECT TO PHYSICAL DAMAGE) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.
18. ELECTRICAL METALLIC TUBING (EMT), ELECTRICAL NONMETALLIC TUBING (ENT), OR RIGID NONMETALLIC CONDUIT (RIGID PVC, SCHEDULE 40) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
19. GALVANIZED STEEL INTERMEDIATE METALLIC CONDUIT (IMC) SHALL BE USED FOR OUTDOOR LOCATIONS ABOVE GRADE.
20. RIGID NONMETALLIC CONDUIT (I.E., RIGID PVC SCHEDULE 40 OR RIGID PVC SCHEDULE 80) SHALL BE USED UNDERGROUND; DIRECT BURIED, IN AREAS OF OCCASIONAL LIGHT VEHICLE TRAFFIC OR ENCASED IN REINFORCED CONCRETE IN AREAS OF HEAVY VEHICLE TRAFFIC.
21. LIQUID–TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID–TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
22. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION–TYPE AND APPROVED FOR THE LOCATION USED. SETSCREW FITTINGS ARE NOT ACCEPTABLE.
23. CABINETS, BOXES, AND WIREWAYS SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE, AND NEC.
24. CABINETS, BOXES, AND WIREWAYS TO MATCH THE EXISTING INSTALLATION WHERE POSSIBLE.
25. WIREWAYS SHALL BE EPOXY–COATED (GRAY) AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARD; SHALL BE PANDUIT TYPE E (OR EQUAL); AND RATED NEMA 1 (OR BETTER) INDOORS, OR NEMA 3R (OR BETTER) OUTDOORS.
26. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES, AND PULL BOXES SHALL BE GALVANIZED OR EPOXY–COATED SHEET STEEL, SHALL MEET OR EXCEED UL 50, AND RATED NEMA 1 (OR BETTER) INDOORS, OR NEMA 3R (OR BETTER) OUTDOORS.
27. 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 RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.

ELECTRICAL INSTALLATION NOTES CONT.:

28. NONMETALLIC RECEPTACLE, SWITCH, AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2; AND RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.
29. THE SUBCONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CONTRACTOR BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
30. THE SUBCONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD AGAINST LIFE AND PROPERTY.

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 8 FEET TO 10 FEET.



AT&T MOBILITY
188 INVERNESS DR WEST, SUITE 400
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8502 E VIA DE VENTURA, SUITE 220
SCOTTSDALE, AZ 85258



4240 E. ELWOOD ST.
PHOENIX, AZ 85040

ADDRESS
5210 TAMLIN ROAD
COLORADO SPRINGS, CO 80915

SITE NUMBER
COL02091

SITE NAME
MARKSHEFFEL AND BARNES

SEAL

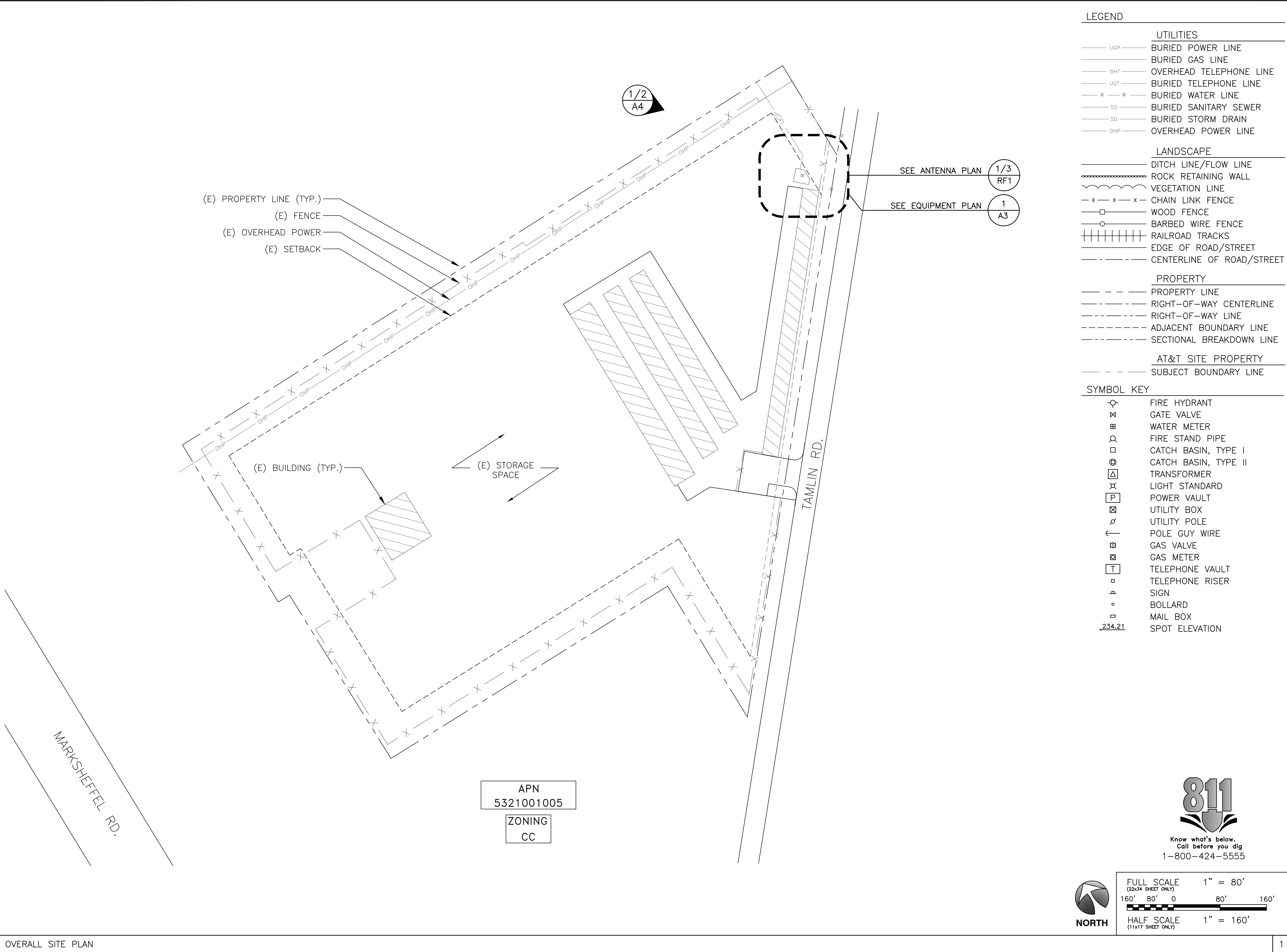
FA #: 10099190

DRAWN BY: JD CHECKED BY: CW APPROVED BY: CW

SHEET TITLE
GENERAL NOTES

SHEET NUMBER

GN-1



AT&T MOBILITY
188 INVERNESS DR WEST, SUITE 400
ENGLEWOOD, CO 80112

8502 E VIA DE VENTURA, SUITE 220
SCOTTSDALE, AZ 85258

here quality still counts.
4240 E. ELWOOD ST.
PHOENIX, AZ 85040

ADDRESS
5210 TAMLIN ROAD
COLORADO SPRINGS, CO 80915

SITE NUMBER
COL02091

SITE NAME
MARKSHEFFEL AND BARNES

SEAL

REV	DATE	DESCRIPTION
A	12/12/17	PRELIMINARY CONSTRUCTION DRAWINGS
B	01/04/18	CLIENT COMMENTS

FA #: 10099190

OVERALL SITE PLAN

SHEET NUMBER
A-1

DRAWN BY: JD
CHECKED BY: CW
APPROVED BY: CW

1

LEGEND

- UTILITIES
- UGP BURIED POWER LINE
 - BURIED GAS LINE
 - OHT OVERHEAD TELEPHONE LINE
 - UGT BURIED TELEPHONE LINE
 - W BURIED WATER LINE
 - SS BURIED SANITARY SEWER
 - SD BURIED STORM DRAIN
 - OHP OVERHEAD POWER LINE

- LANDSCAPE
- DITCH LINE/FLOW LINE
 - ROCK RETAINING WALL
 - VEGETATION LINE
 - x - x - x - CHAIN LINK FENCE
 - WOOD FENCE
 - BARBED WIRE FENCE
 - RAILROAD TRACKS
 - EDGE OF ROAD/STREET
 - CENTERLINE OF ROAD/STREET

- PROPERTY
- PROPERTY LINE
 - RIGHT-OF-WAY CENTERLINE
 - RIGHT-OF-WAY LINE
 - ADJACENT BOUNDARY LINE
 - SECTIONAL BREAKDOWN LINE

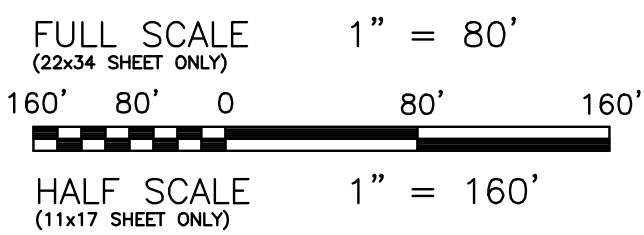
- AT&T SITE PROPERTY
- SUBJECT BOUNDARY LINE

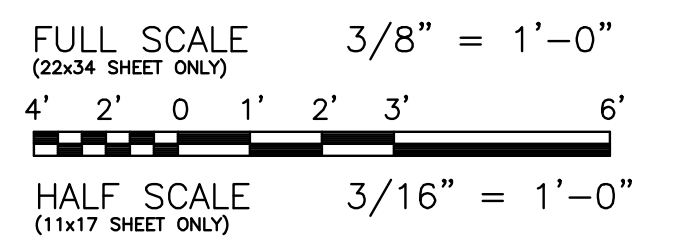
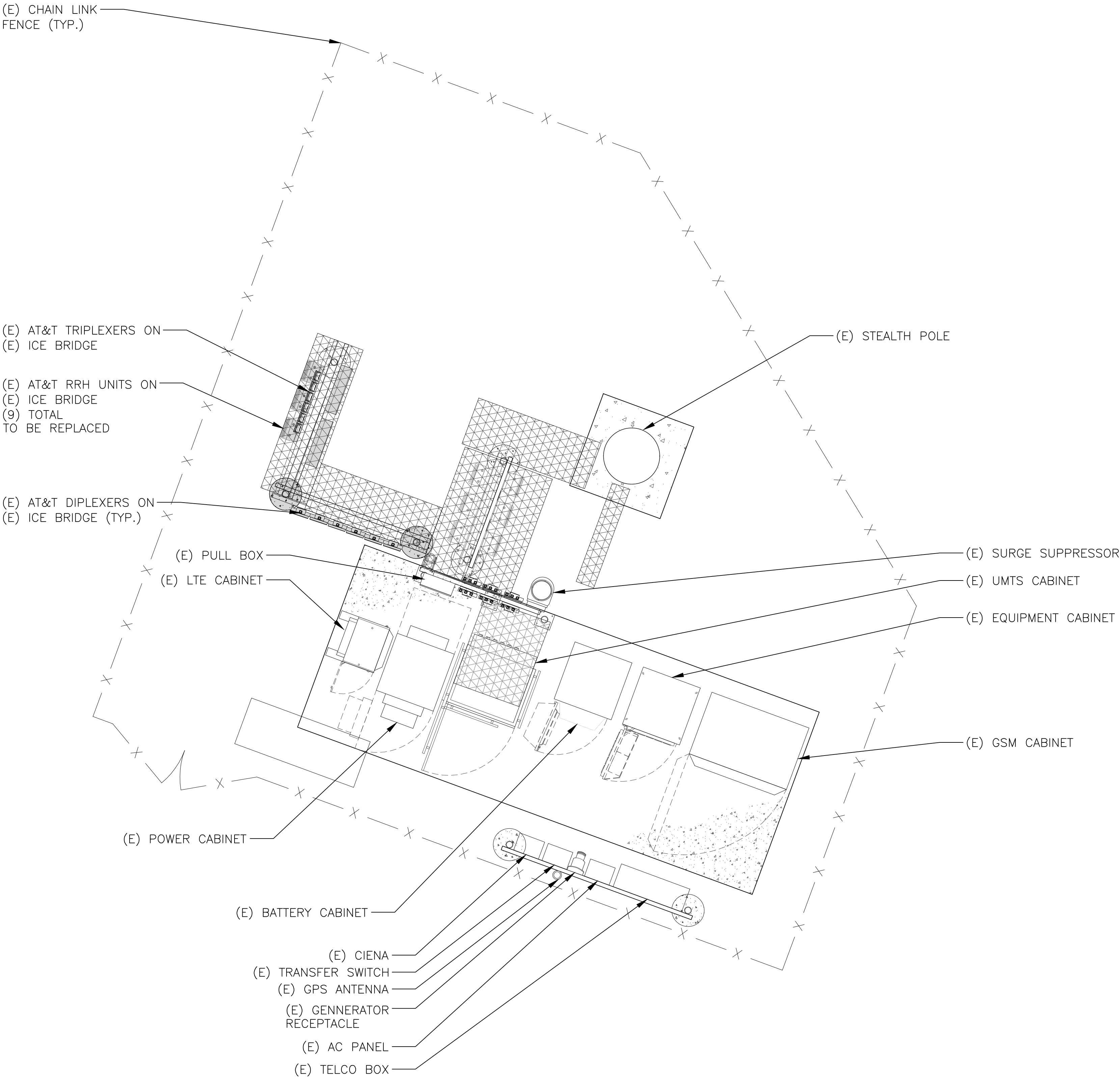
SYMBOL KEY

- FIRE HYDRANT
- GATE VALVE
- WATER METER
- FIRE STAND PIPE
- CATCH BASIN, TYPE I
- CATCH BASIN, TYPE II
- TRANSFORMER
- LIGHT STANDARD
- POWER VAULT
- UTILITY BOX
- UTILITY POLE
- POLE GUY WIRE
- GAS VALVE
- GAS METER
- TELEPHONE VAULT
- TELEPHONE RISER
- SIGN
- BOLLARD
- MAIL BOX
- SPOT ELEVATION



Know what's below.
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1-800-424-5555





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4240 E. ELWOOD ST.
PHOENIX, AZ 85040

ADDRESS
5210 TAMLIN ROAD
COLORADO SPRINGS, CO 80915

SITE NUMBER
COL02091

SITE NAME
MARKSHEFFEL AND BARNES

SEAL

FA #: 10099190

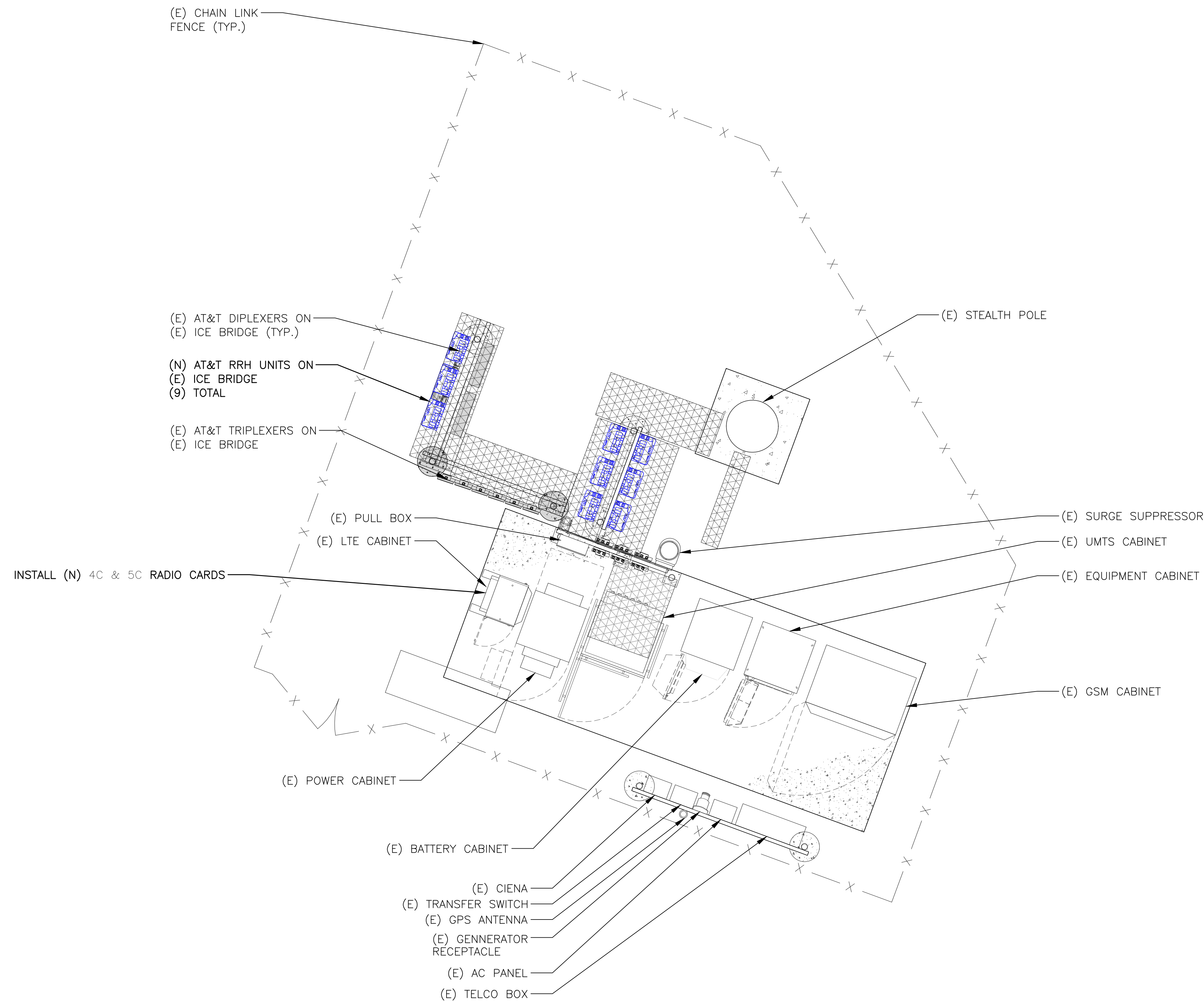
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REV	DATE	DESCRIPTION
A	12/12/17	PRELIMINARY CONSTRUCTION DRAWINGS
B	01/04/18	CLIENT COMMENTS

SHEET TITLE
EXISTING ENLARGED
EQUIPMENT PLAN

SHEET NUMBER

A-2



ELECTRICAL SOW SUMMARY:
1. EXISTING CONFIGURATION PER RFDS V1.0 10.02.17 (UPDATED 11.01.17)
2. PASSES RECTIFIER @ N+1; EXISTING -48VDC POWER PLANT IS EQUIPPED WITH (5) CORDEX HP 4.0 KW (74A @ -54VDC) RECTIFIERS [NEQ.15852].
4. PASSES CONVERTER; SITE IS EQUIPPED WITH (5) EA. CORDEX -48VDC/+24VDC CONVERTER MODULES [NEQ.12401] ONLY (3) CONVERTERS NEEDED TO SATISFY N+1.
5. NO PERMANENT STANDBY GENERATOR
6. PASSES BATTERY RESERVE CAPACITY @ 9.46 HRS; SITE HAS (32) EXISTING GNB MARATHON M12V155FT 155AHR. BATTERIES [NEQ.12090] I.E (8) STRINGS CONFIGURED @ -48VDC NOMINAL
7. HVAC TONNAGE CAPACITY: N/A OUTDOOR SITE



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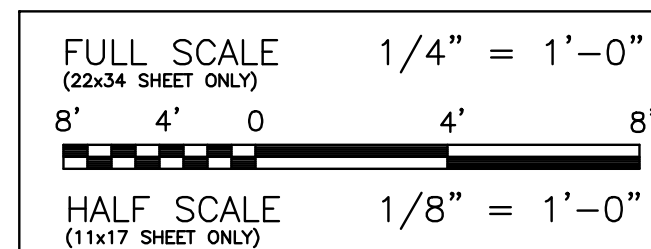
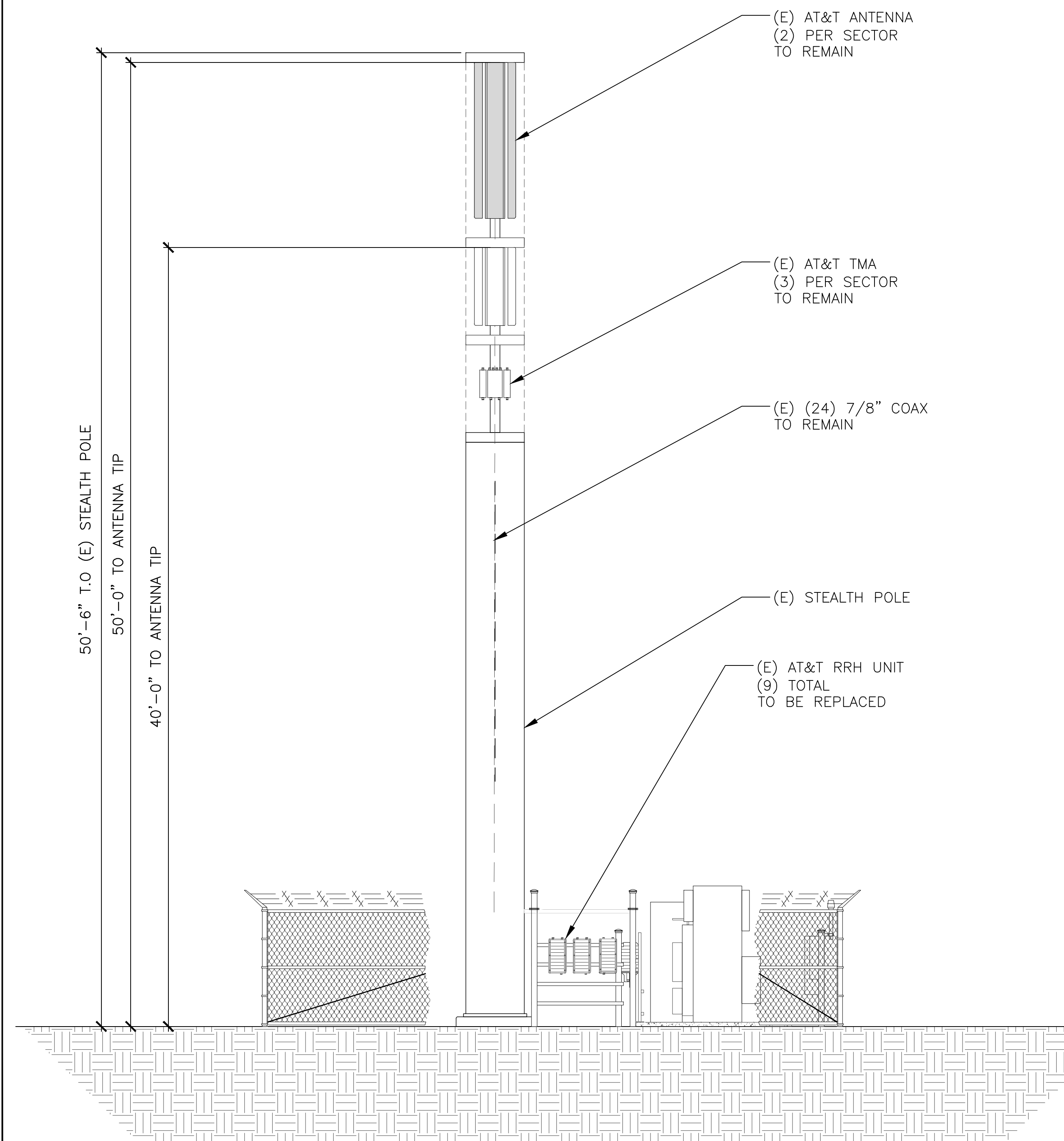
SHEET TITLE
NEW ENLARGED
EQUIPMENT LAYOUT

SHEET NUMBER

A-3

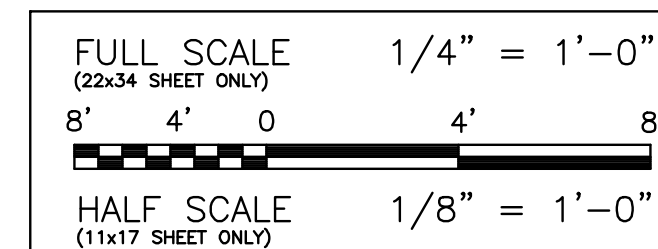
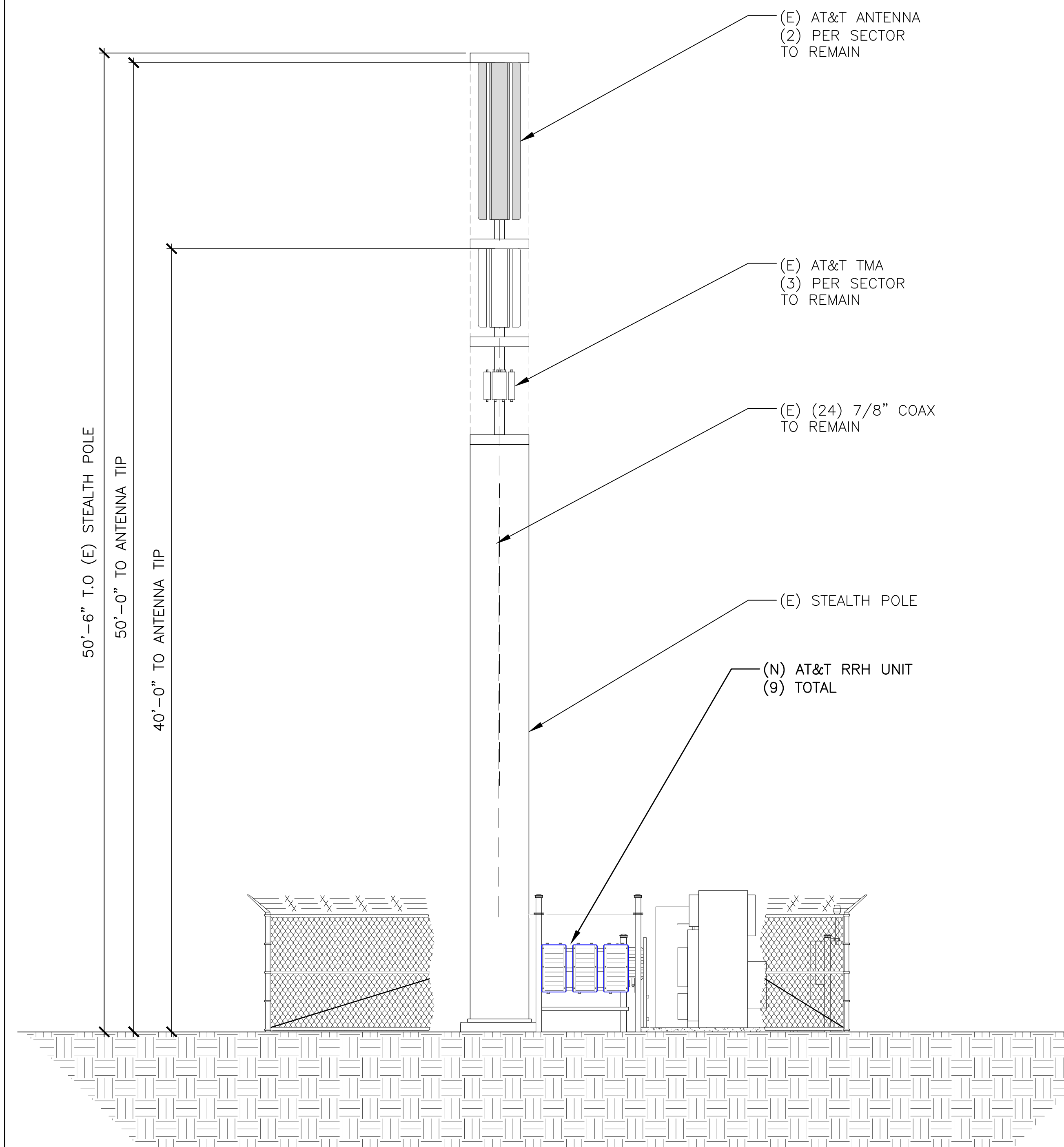


FULL SCALE 3/8" = 1'-0"
(22x34 SHEET ONLY)
4' 2' 0 1' 2' 3' 6'
HALF SCALE 3/16" = 1'-0"
(11x17 SHEET ONLY)



EXISTING NORTHWEST TOWER ELEVATION

--	--



NEW NORTHWEST TOWER ELEVATION

--	--



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FA #: 10099190

REV	DATE	DESCRIPTION
A	12/12/17	PRELIMINARY CONSTRUCTION DRAWINGS
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SHEET TITLE
**EXISTING & NEW
TOWER ELEVATIONS**

SHEET NUMBER

A-4

EXISTING ANTENNA SCHEDULE					
SECTOR	POSITION	TECH	ANTENNA	RRH	FEED LINE TYPE
ALPHA	1	UMTS	51" PANEL	—	EXISTING COAX CABLES
ALPHA	2	—	—	—	—
ALPHA	3	—	—	—	—
ALPHA	4	LTE/GSM	96" PANEL	(3) LTE	EXISTING COAX CABLES
BETA	1	UMTS	51" PANEL	—	EXISTING COAX CABLES
BETA	2	—	—	—	—
BETA	3	—	—	—	—
BETA	4	LTE/GSM	96" PANEL	(3) LTE	EXISTING COAX CABLES
GAMMA	1	UMTS	51" PANEL	—	EXISTING COAX CABLES
GAMMA	2	—	—	—	—
GAMMA	3	—	—	—	—
GAMMA	4	LTE/GSM	96" PANEL	(3) LTE	EXISTING COAX CABLES

NEW ANTENNA SCHEDULE					
SECTOR	POSITION	TECH	ANTENNA	RRH	FEED LINE TYPE
ALPHA	1	UMTS	51" PANEL	—	EXISTING COAX CABLES
ALPHA	2	—	—	—	—
ALPHA	3	—	—	—	—
ALPHA	4	LTE/GSM	96" PANEL	(3) LTE	EXISTING COAX CABLES
BETA	1	UMTS	51" PANEL	—	EXISTING COAX CABLES
BETA	2	—	—	—	—
BETA	3	—	—	—	—
BETA	4	LTE/GSM	96" PANEL	(3) LTE	EXISTING COAX CABLES
GAMMA	1	UMTS	51" PANEL	—	EXISTING COAX CABLES
GAMMA	2	—	—	—	—
GAMMA	3	—	—	—	—
GAMMA	4	LTE/GSM	96" PANEL	(3) LTE	EXISTING COAX CABLES

NOTES:
1. DO NOT USE COAX LENGTHS FOR CUT LENGTHS: ESTIMATES ONLY
2. CONFIRM THAT GENERAL CONTRACTOR IS USING LATEST VERSION OF RFDS.
* OR SIMILAR



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SHEET TITLE
EXISTING & NEW
ANTENNA CONFIGURATION

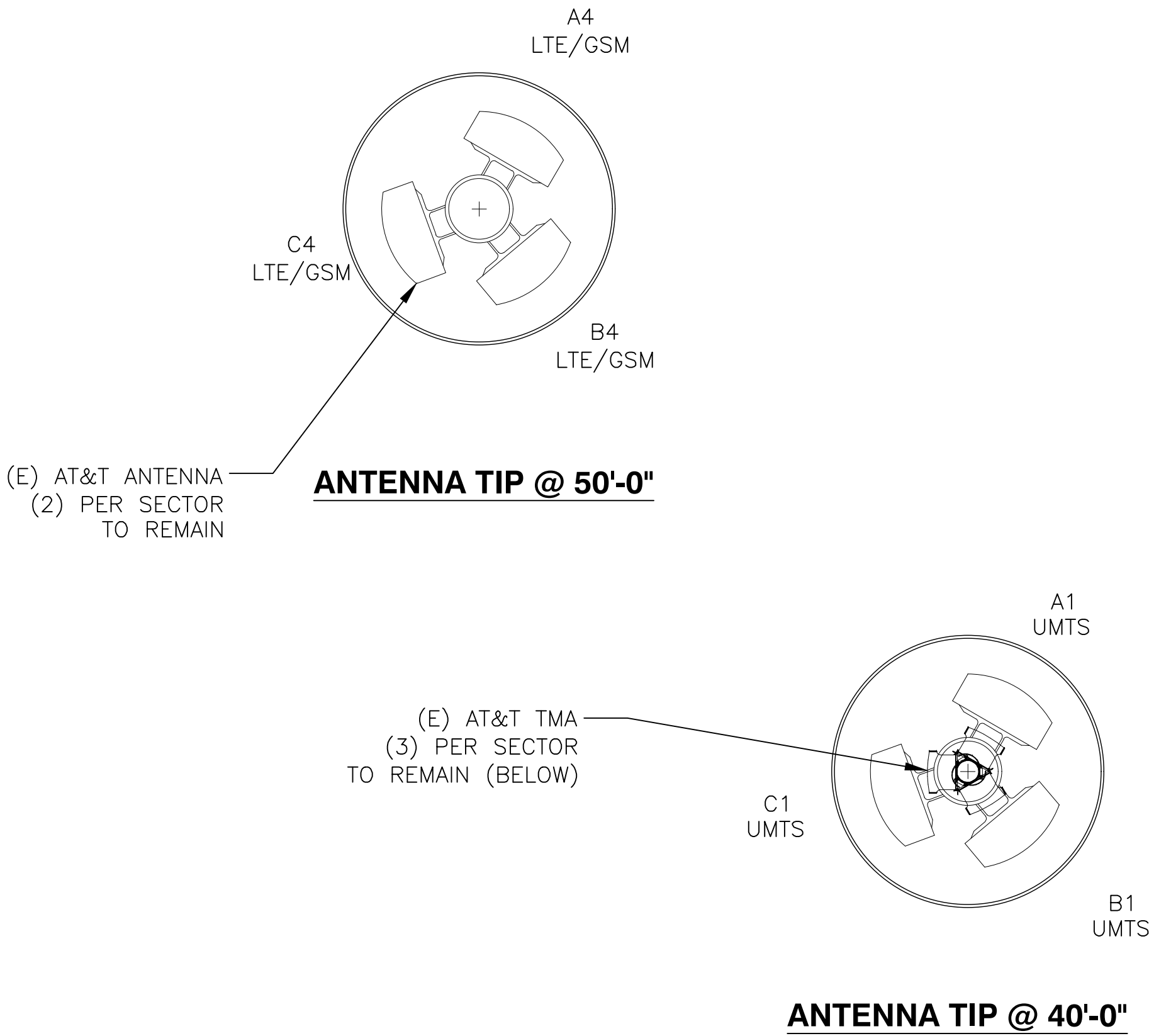
SHEET NUMBER

RF-1

EXISTING ANTENNAS AND COAX CONFIGURATION AND SCHEDULE

NEW ANTENNA AND COAX CONFIGURATION AND SCHEDULE

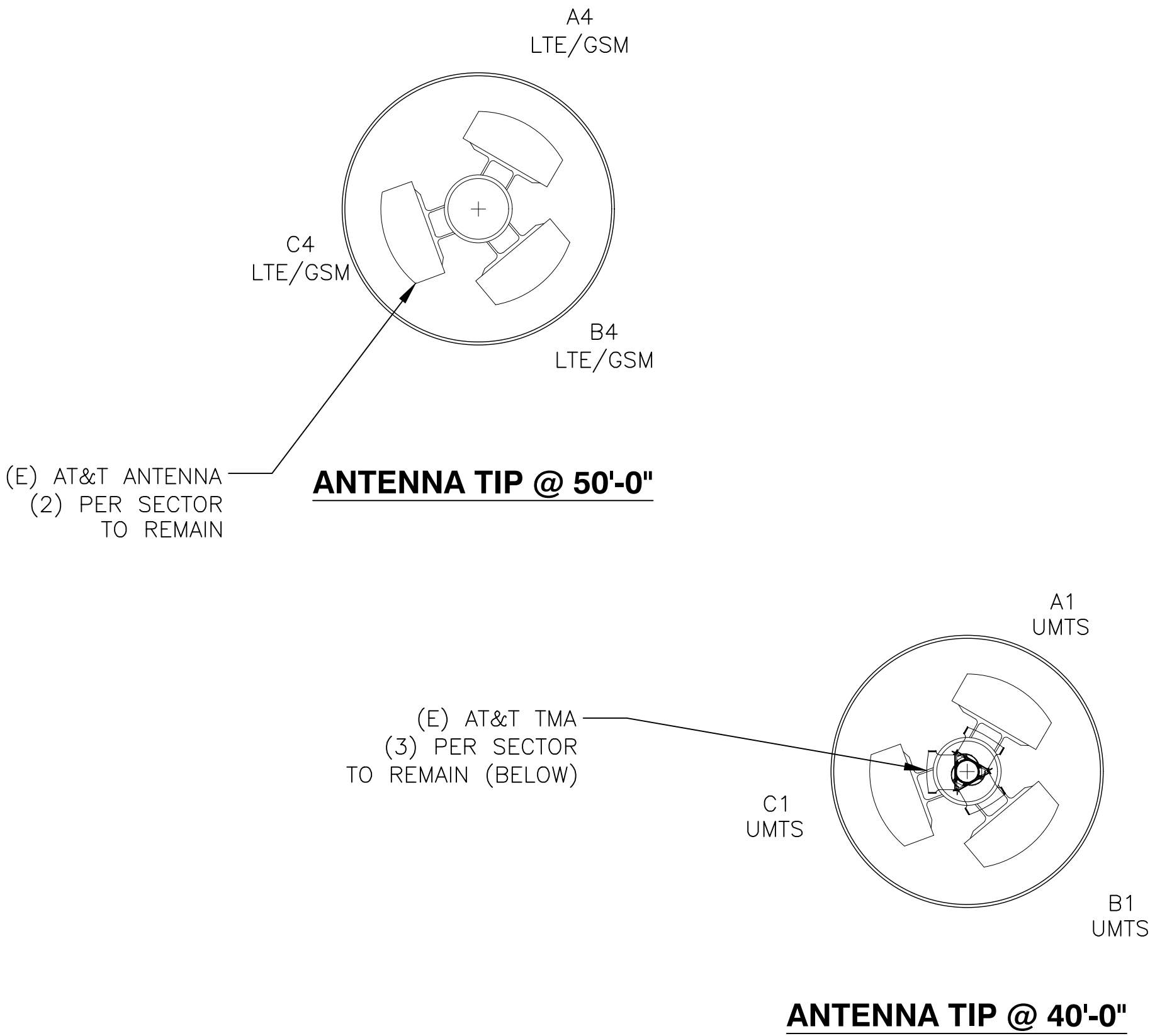
NOTE:
STRUCTURAL ANALYSIS
REQUIRED & DONE
BY OTHERS



FULL SCALE
(22x34 SHEET ONLY)
2' 1' 0 1' 3'
HALF SCALE
(11x17 SHEET ONLY)
3/8" = 1'-0"

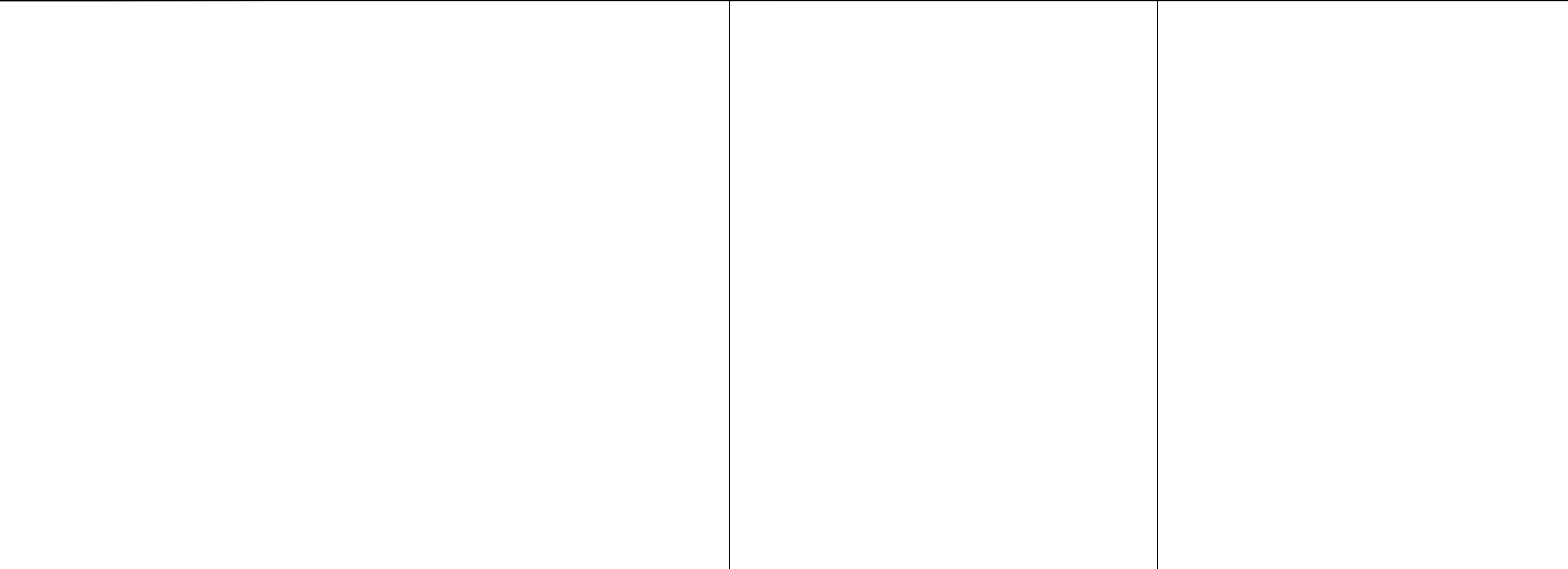
EXISTING ANTENNA CONFIGURATION

NEW ANTENNA CONFIGURATION (NO WORK)



FULL SCALE
(22x34 SHEET ONLY)
2' 1' 0 1' 3'
HALF SCALE
(11x17 SHEET ONLY)
3/8" = 1'-0"

3



NOT USED

7

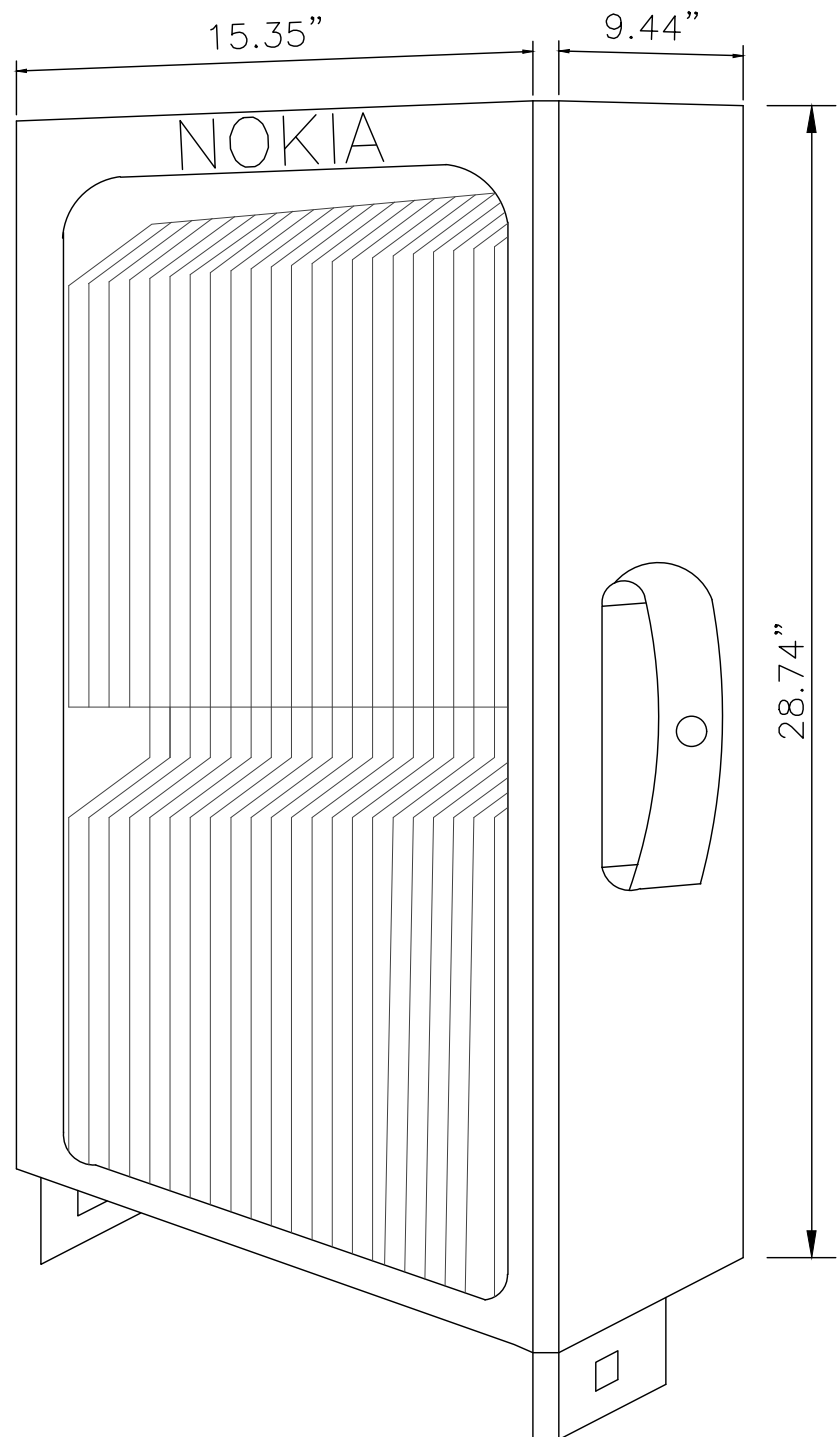
NEW ANTENNA DETAIL

6

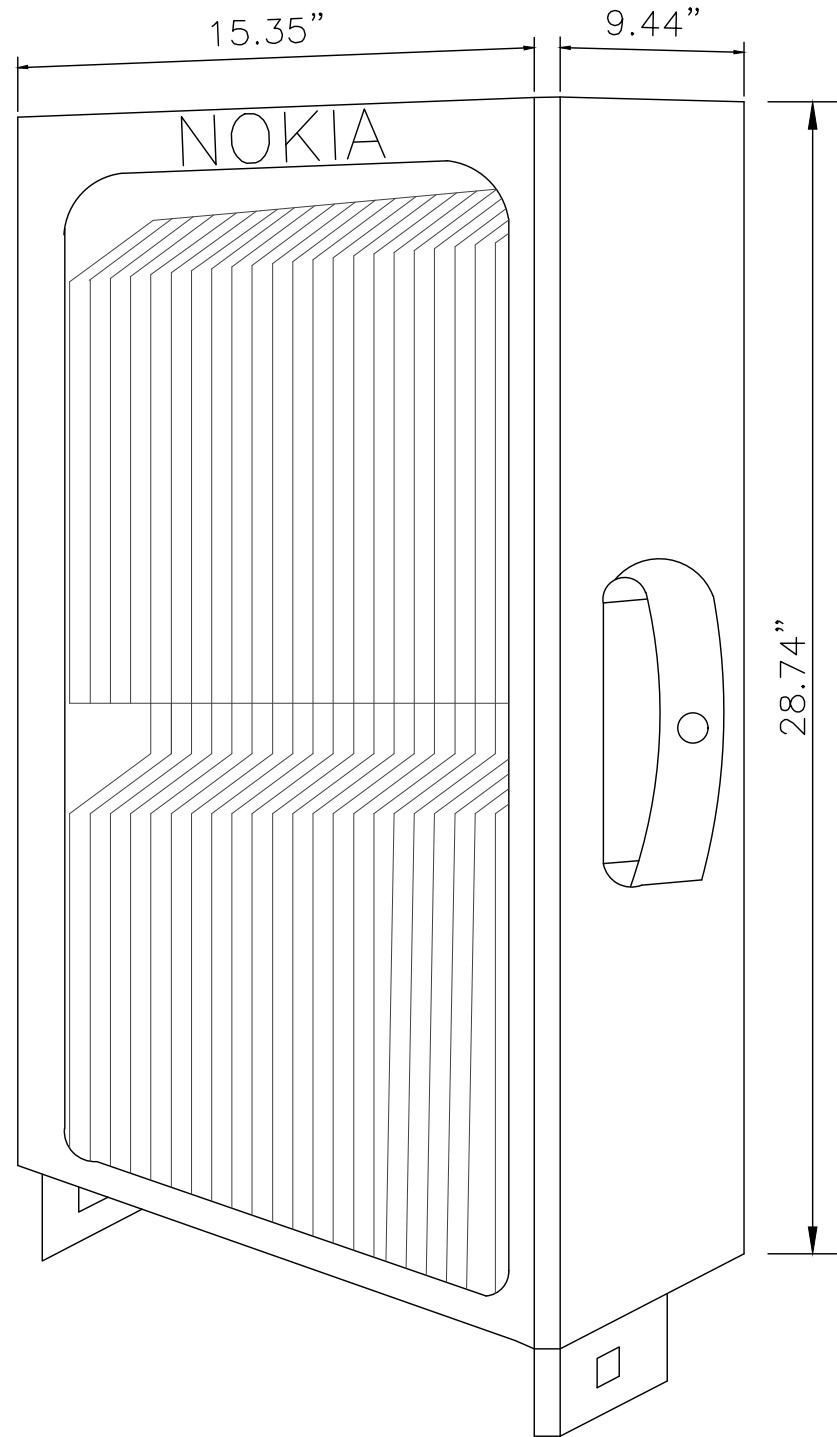
NOT USED

5

MANUFACTURER: NOKIA
MODEL: AIRSCALE RRH 4T4R B12/B14 320W
HEIGHT: 28.74" (730mm)
WIDTH: 15.35" (390mm)
DEPTH: 9.44" (240mm)
WEIGHT: 28.50 LBS (12.92KG)



MANUFACTURER: NOKIA
MODEL: AIRSCALE RRH 4T4R B25/B66 320W
HEIGHT: 28.74" (730mm)
WIDTH: 15.35" (390mm)
DEPTH: 9.44" (240mm)
WEIGHT: 28.50 LBS (12.92KG)



NOT USED

4

NEW RRH DETAIL

3

NEW RRH DETAIL

2

NOT USED

1



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APPROVED BY: CW

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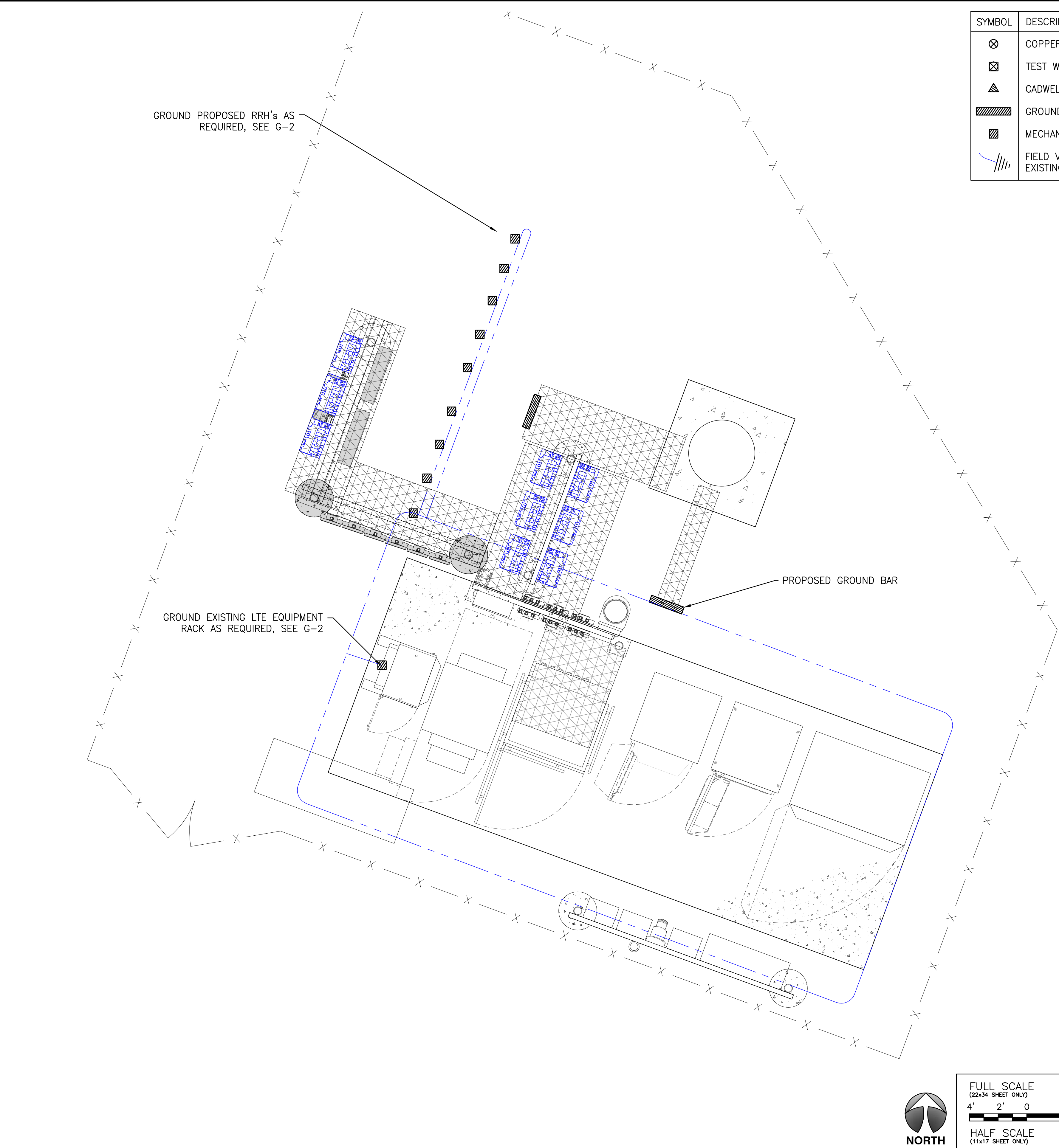
REV	DATE	DESCRIPTION
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SHEET TITLE

RF & EQUIPMENT DETAILS

SHEET NUMBER

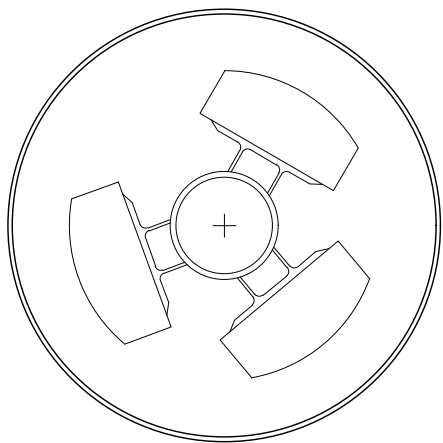
RF-2



SYMBOL	DESCRIPTION
	COPPER GROUND ROD
	TEST WELL
	CADWELD CONNECTION
	GROUND BAR
	MECHANICAL CONNECTION
	FIELD VERIFY & TIE INTO EXISTING GROUNDING SYSTEM

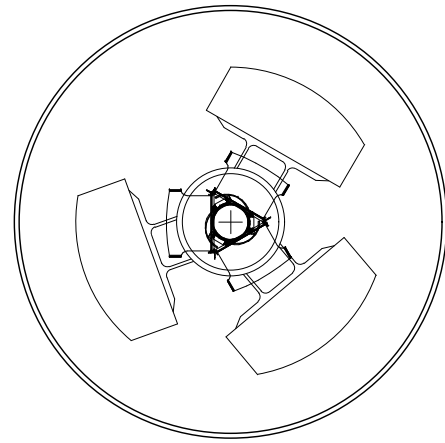
- GENERAL GROUNDING NOTES:
- GROUNDING SHALL BE INSTALLED 6" BELOW FROST DEPTH OR 30" BELOW GRADE, WHICHEVER IS GREATER. CONFIRM FROST DEPTH WITH JURISDICTION.
 - ALL DETAILS ARE SHOWN IN GENERAL TERMS. ACTUAL INSTALLATION AND CONSTRUCTION MAY VARY DUE TO SITE SPECIFIC CONDITIONS.
 - GROUND ALL ANTENNA BASES, FRAMES, CABLE RUNS, AND OTHER METALLIC COMPONENTS USING GROUND WIRES AND CONNECT TO SURFACE MOUNTED BUS BARS. FOLLOW ANTENNA AND BTS MANUFACTURERS PRACTICES FOR GROUNDING REQUIREMENTS. GROUND COAX SHIELD AT BOTH ENDS AND EXIT FROM TOWER OR POLE USING MFR'S PRACTICES.
 - ALL GROUND CONNECTIONS SHALL BE CADWELDED. ALL WIRES SHALL BE COPPER THHN/THWN. ALL GROUND WIRE SHALL BE GREEN INSULATED WIRE ABOVE GROUND.
 - CONTRACTOR TO VERIFY AND TEST GROUND TO SOURCE. GROUNDING AND OTHER OPERATIONAL TESTING WILL BE WITNESSED BY AT&T REPRESENTATIVE.
 - REFER TO DIVISION 16 GENERAL ELECTRIC; GENERAL ELECTRICAL PROVISION AND COMPLY WITH ALL REQUIREMENTS OF GROUNDING STANDARDS.
 - ELECTRICAL CONTRACTOR TO PROVIDE DETAILED DESIGN OF GROUNDING SYSTEM, AND RECEIVE APPROVAL OF DESIGN BY AUTHORIZED AT&T MOBILITY REPRESENTATIVE, PRIOR TO INSTALLATION OF GROUNDING SYSTEM. PHOTO DOCUMENT ALL CADWELDS AND GROUND RING
 - NOTIFY CONSTRUCTION MANAGER IF THERE ARE ANY DIFFICULTIES INSTALLING GROUNDING SYSTEM DUE TO SITE SOIL CONDITIONS.

- GENERAL ROD NOTES (WHERE APPLICABLE):
- ELECTRICAL CONTRACTOR SHALL ORDER GROUND RESISTANCE TESTING ONCE THE GROUND SYSTEM HAS BEEN INSTALLED; A QUALIFIED INDIVIDUAL, UTILIZING THE FALL OF POTENTIAL METHOD, SHOULD PERFORM THE TEST. THE REPORT WILL SHOW THE LOCATION OF THE TEST AND CONTAIN NO LESS THAN 9 TEST POINTS ALONG THE TESTING LINE, GRAPHED OUT TO SHOW THE PLATEAU.
 - 2 POINT GROUND TEST OR 3 POINT 62% TESTS WILL NOT BE ACCEPTED AS ALTERNATIVES TO THE AFOREMENTIONED GROUND TESTS. TEST SHALL BE PERFORMED WHILE THE COUNTERPOISE IS ISOLATED FROM THE A/C SYSTEM GRIDS AND EXISTING COMMUNICATIONS FACILITY.

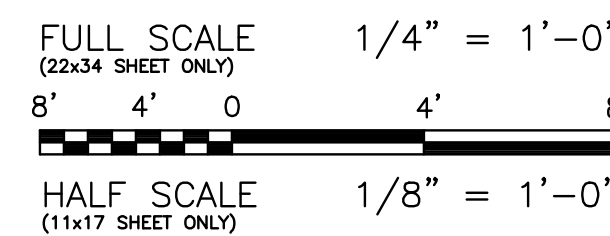
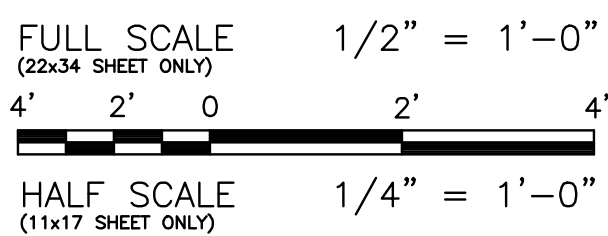


ANTENNA TIP @ 50'-0"

**NO NEW TOWER
GROUNDING REQUIRED**



ANTENNA TIP @ 40'-0"



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FA #: 10099190

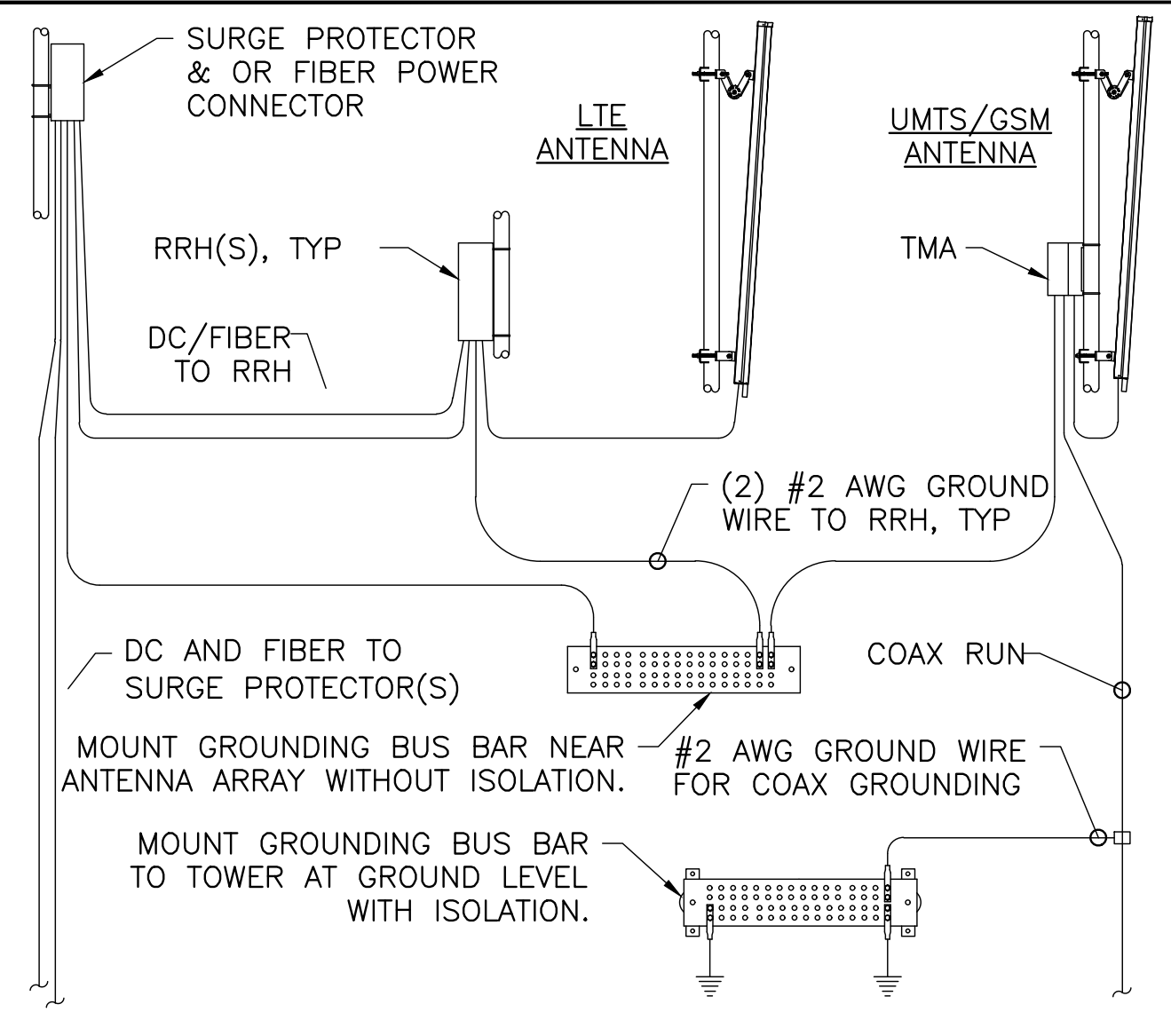
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B	01/04/18	CLIENT COMMENTS

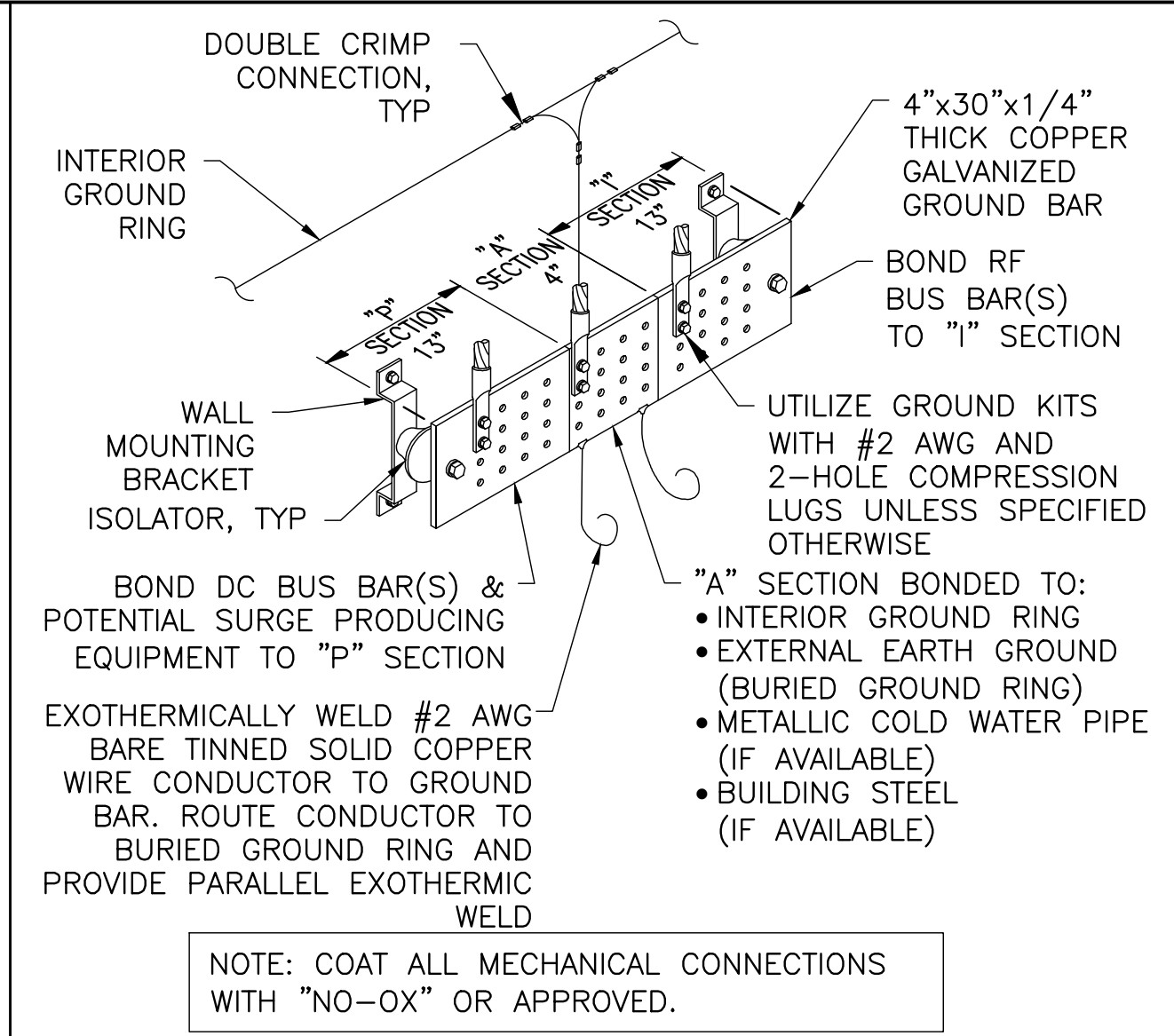
SHEET TITLE
**SCHEMATIC GROUNDING
PLAN**

SHEET NUMBER

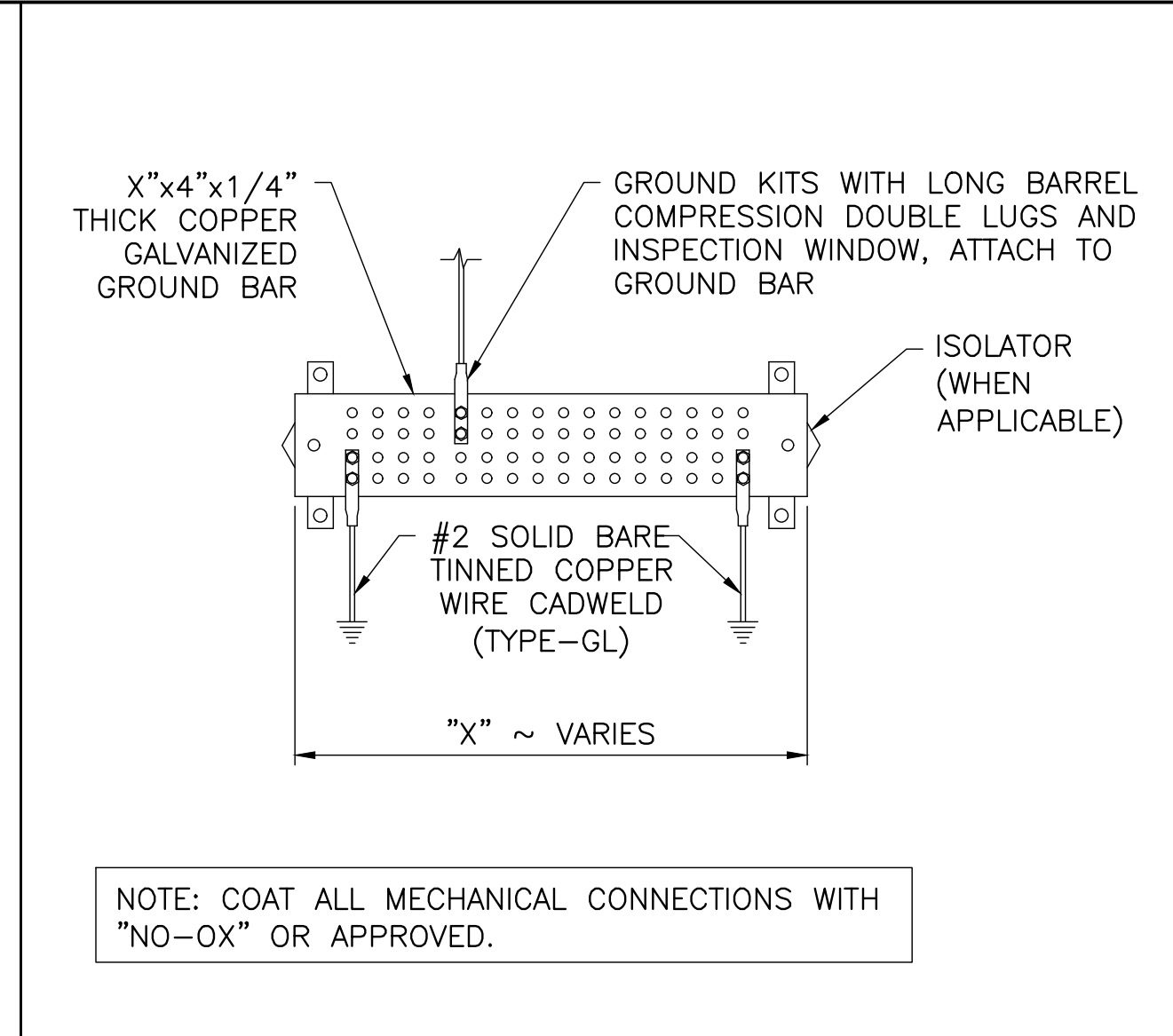
G-1



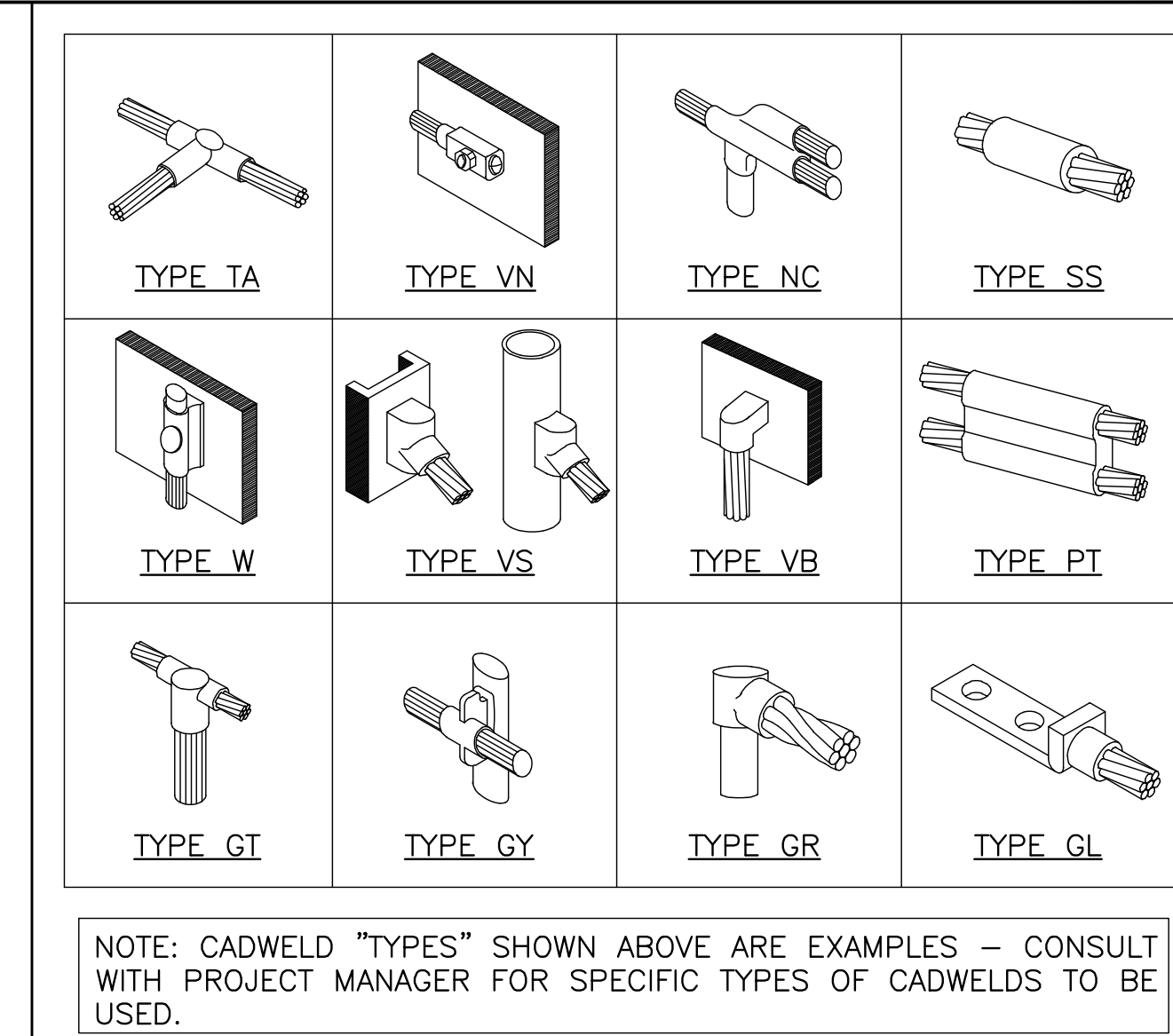
GROUNDING DETAILS



GROUNDING DETAILS



GROUNDING DETAILS



CAD WELD EXAMPLES

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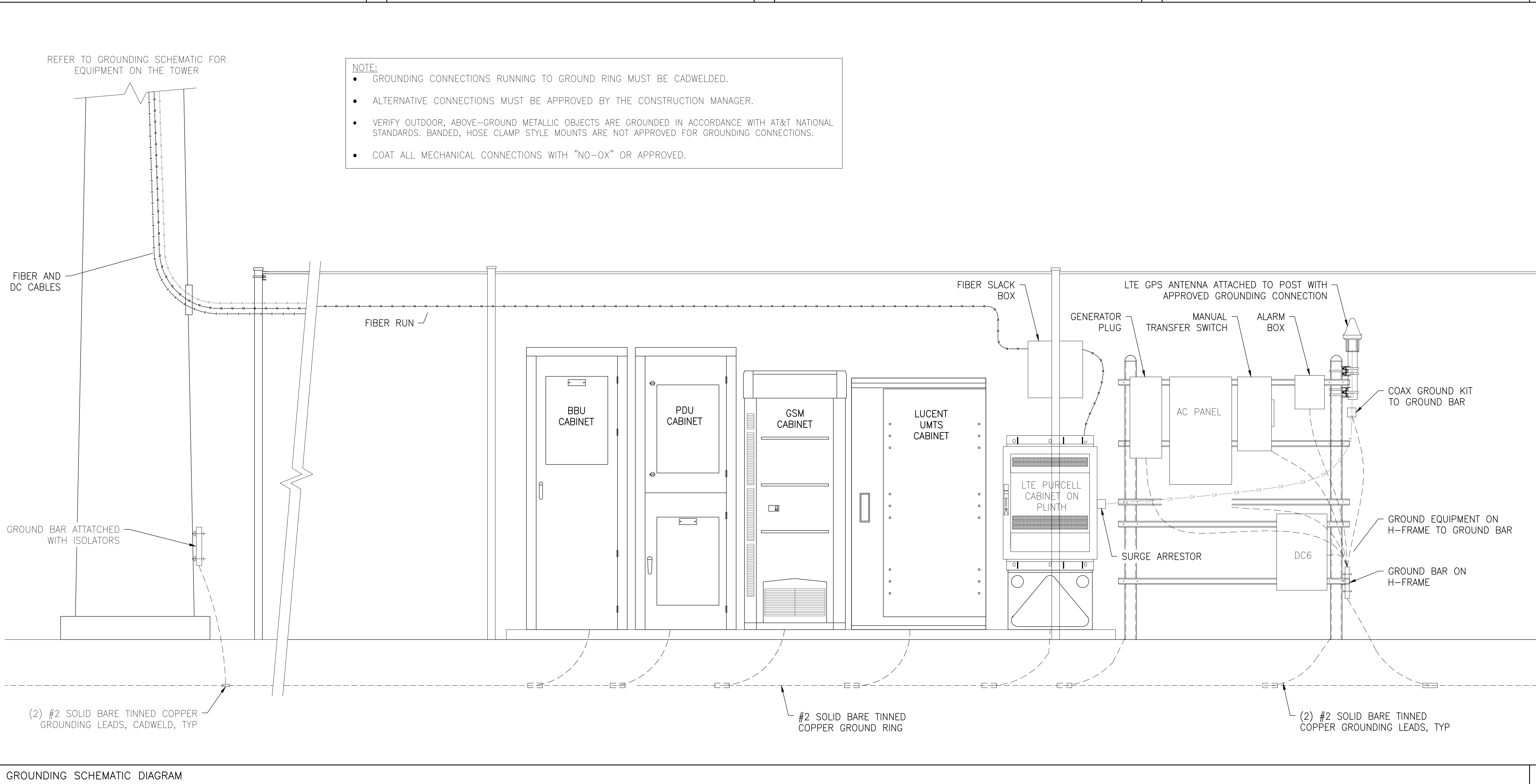
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GROUNDING SCHEMATIC DIAGRAM

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CHECKED BY: CW

APPROVED BY: CW

FA #: 10099190

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SHEET TITLE

GROUNDING DETAILS

SHEET NUMBER

G-2